





Products for Totally Integrated Automation and Micro Automation

Catalog ST 70 · 2011

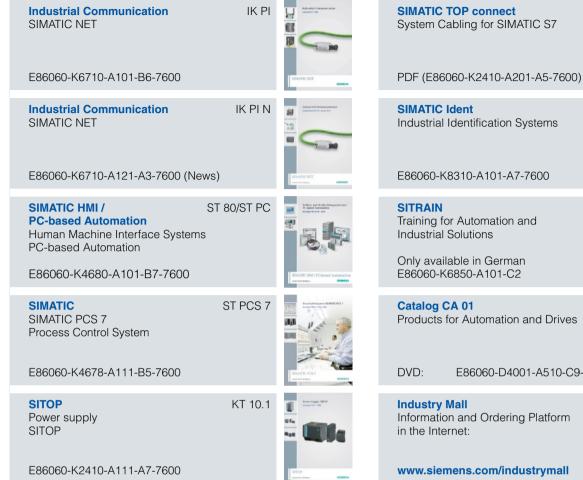


SIMATIC

Answers for industry.

SIEMENS

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CA 01 Products for Automation and Drives



E86060-D4001-A510-C9-7600



SIMATIC

Products for Totally Integrated Automation and Micro Automation

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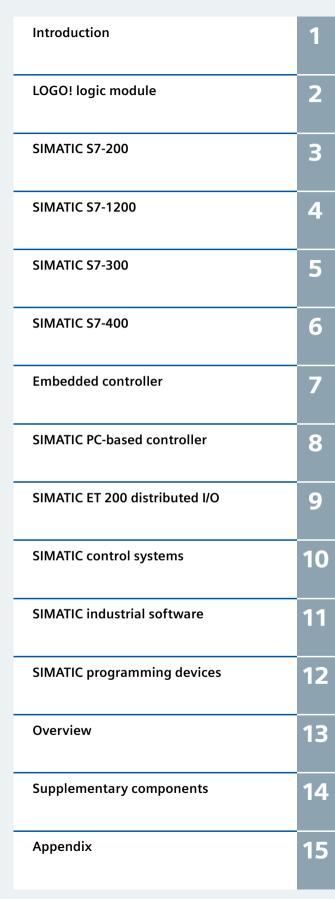
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The products contained in this catalog can also be found in the Interactive Catalog CA 01.
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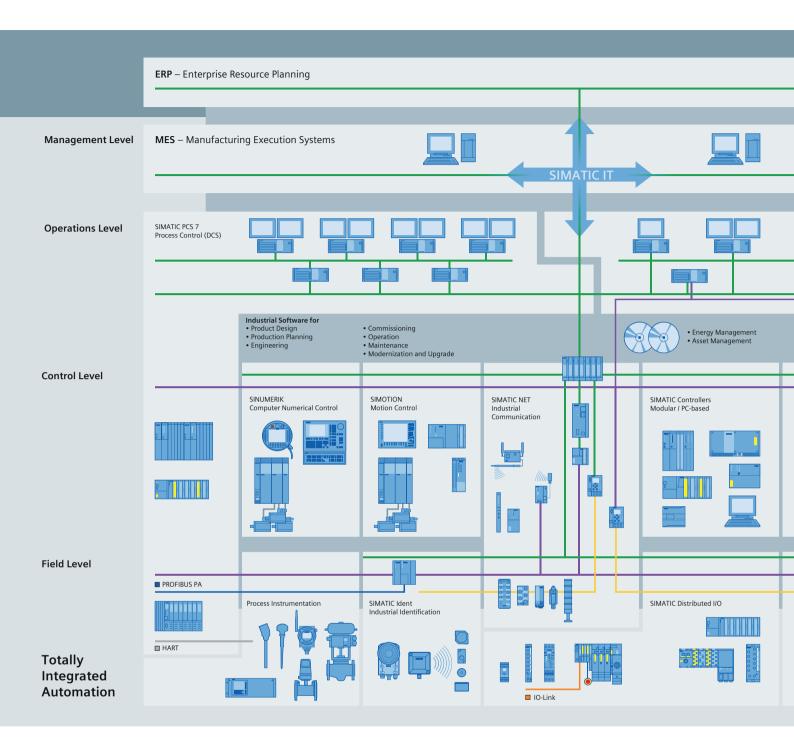
Answers for industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

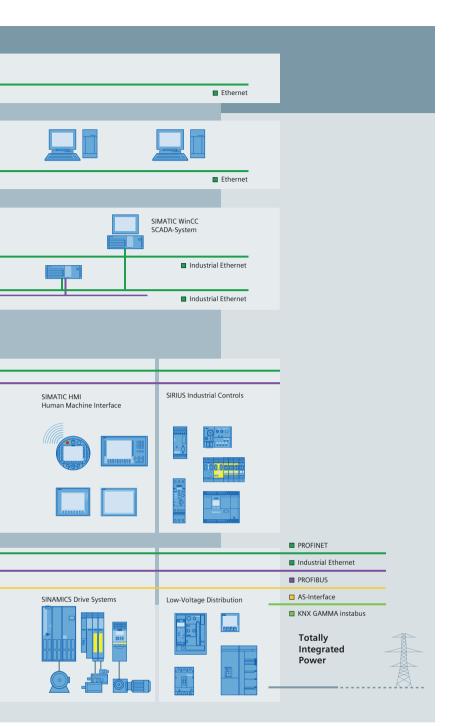
The high quality of our products sets industry-wide benchmarks. High environmental aims are part of our eco-management, and we implement these aims consistently. Right from product design, possible effects on the environment are examined. Hence many of our products and systems are RoHS compliant (Restriction of Hazardous Substances). As a matter of course, our production sites are certified according to DIN EN ISO 14001, but to us, environmental protection also means most efficient utilization of valuable resources. The best example are our energy-efficient drives with energy savings up to 60 %.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.



Setting standards in productivity and competitiveness.

Totally Integrated Automation.



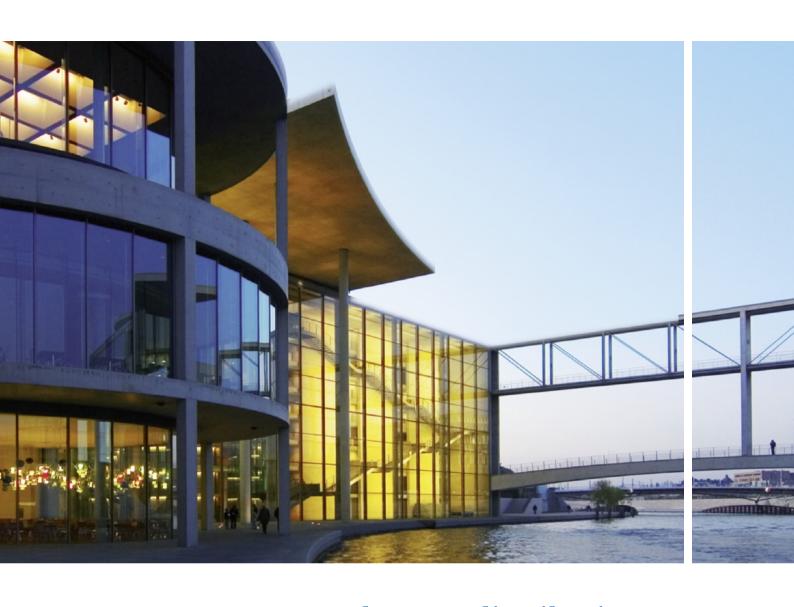
Thanks to Totally Integrated Automation, Siemens provides an integrated basis for the implementation of customized automation solutions – in all industries from inbound to outbound.

TIA is characterized by its unique continuity.

It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

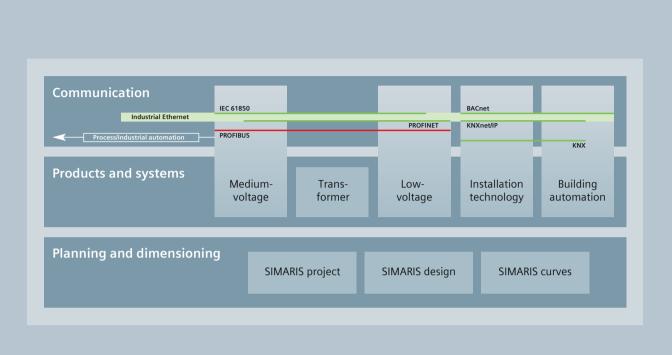
The unique continuity is already a defined characteristic at the development stage of our products and systems.

The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.



Integrated power distribution from one source.

Totally Integrated Power.



Electrical power distribution requires integrated solutions. Our answer: Totally Integrated Power (TIP). This includes tools and support for planning and configuration and a complete, optimally harmonized product and system portfolio for integrated power distribution from medium-voltage switchgear right to socket outlets.

The power distribution products and systems can be interfaced to building or industrial automation systems (as part of Total Building Solutions or Totally Integrated Automation) via communication capable circuit breakers and modules, allowing the full potential for optimization that an integrated solution offers to be exploited throughout the product cycle – from planning right through to installation and operation.

Thanks to a comprehensive energy management system, power flows can be made transparent and the energy consumption of individual loads can be calculated and allocated. Building operators can thus identify power-intensive loads and implement effective optimization measures. With its products and systems, Totally Integrated Power forms the basis for this functionality and guarantees greater cost-efficiency in industrial applications, infrastructure and buildings.



Much more than a catalog. The Industry Mall.

You have a catalog in your hands that will serve you well for selecting and ordering your products. But have you heard of the electronic online catalog (the Industry Mall) and all its benefits? Take a look around it sometime:

www.siemens.com/industrymall



Selecting

Find your products in the structure tree, in the new "Bread-crumb" navigation or with the integral search machine with expert functions. Electronic configurators are also integrated into the Mall. Enter the various characteristic values and the appropriate product will be displayed with the relevant order numbers. You can save configurations, load them and reset them to their initial status.

Ordering

You can load the products that you have selected in this way into the shopping basket at a click of the mouse. You can create your own templates and you will be informed about the availability of the products in your shopping cart. You can load the completed parts lists directly into Excel or Word.

Delivery status

When you have sent the order, you will receive a short e-mail confirmation which you can print out or save. With a click on "Carrier", you will be directly connected to the website of the carrier where you can easily track the delivery status.

Added value due to additional information

So you have found your product and want more information about it? In just a few clicks of the mouse, you will arrive at the image data base, manuals and operating instructions. Create your own user documentation with My Documentation Manager.

Also available are FAQs, software downloads, certificates and technical data sheets as well as our training programs. In the image database you will find, depending on the product, 2D/3D graphics, dimension drawings and exploded drawings, characteristic curves or circuit diagrams which you can download.

Convinced? We look forward to your visit!

Micro Automation

LOGO!:

Easy-to-use technology with a future

The compact, easy-to use and low-cost solution for control tasks of low complexity.

For universal use in industry, non-residential buildings or private buildings.

Replaces wiring by the interconnection of functions. Operates in a manner similar to a PLC.

With integral HMI unit for direct input on the device and display of message texts/variables.

Simple operation:

• Interconnection of functions by mouse click on the PC or by pressing buttons on the device

Minimum time requirements:

- · Wiring solely of the inputs and outputs
- Parallel creation of circuit diagram and assembly of control cabinet

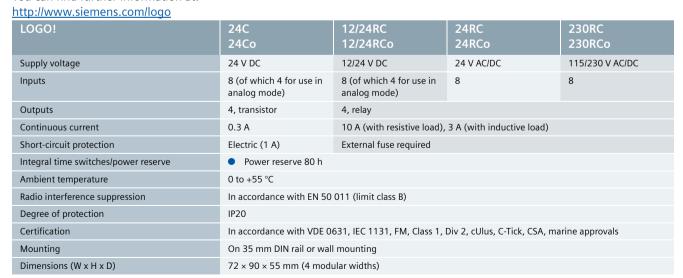
Reduced costs:

· Many integral functions of switching technology

High degree of flexibility:

- Simple modification of functionality at the press of a button
- Versions for different operating voltages
- Modular design, therefore expandable at any time

You can find further information at:



- = cannot be used/not available
- = can be used/available



Micro Automation

SIMATIC S7-200: Control technology at its best

SIMATIC S7-200 really is in a class of its own: it is compact yet extremely powerful (e.g. real-time response), it is fast, exceptionally communicative, and very user-friendly with regard to software and hardware handling.

- Graded range of CPUs with wide basic PLC functionality.
- Modular expandability for individual adaptation to specific tasks.
- Simple networking using point-to-point interface (PPI) with programming, communication, operation and monitoring functions
- Programming with STEP 7 Micro/WIN, specially designed for the scope of performance of the S7-200 optimized software.
- Wizards for particularly simple and user-friendly operation.

You can find further information at: http://www.siemens.com/simatic-s7-200



SIMATIC S7-200, CPU	221	222	224	224 XP, 224 XPsi	226		
Program memory	4 KB	4 KB	8/12 KB	12/16 KB	16/24 KB		
Data memory	2 KB	2 KB	8 KB	10 KB	10 KB		
Processing time per binary instruction	0.22 μs						
Bit memories	256						
Counters	256	256					
Timers	256						
Digital inputs/outputs	Max. 10; 10 integrated	Max. 40/38; 14 integrated	Max. 94/74; 24 integrated	Max. 94/74; 24 integrated	Max. 128/120; 40 integrated		
Analog inputs and outputs	_	Max. 8/2 or 0/4	Max. 28/7 or 0/14	Max. 28/7 or 0/14, 3 integrated	Max. 28/7 or 0/14		
HMI devices	•	•	•	•	•		
Communication interface	1 x PPI (point-to-point)	2 x PPI (point-to-point)					
Networking	_	— AS-Interface, PROFIBUS DP, Ethernet, Internet, modem					
Real-time clock	Optional						

- = cannot be used/not available
- = can be used/available

SIMATIC modular controllers

SIMATIC S7-1200:

Modular, compact controllers for discrete and stand-alone automation solutions

- Scalable and flexible design:
 - The SIMATIC S7-1200 controller family has been designed with maximum flexibility to fit your individual machine requirements. This allows you to custom design your controller system to meet your needs; it also makes future system expansions quick and easy.
- Integrated Industrial Ethernet/PROFINET interface.
 The Industrial Ethernet/PROFINET interface integrated into SIMATIC S7-1200 offers seamless communication with distributed I/O with SIMATIC HMI Basic Panels for visualization and additional controllers for CPU-to-CPU communication. Also with devices from third parties for extended integration possibilities as well as the SIMATIC STEP 7 Basic engineering system for configuring and programming.
- Integrated technology functions:
 The name SIMATIC has been synonymous with reliability in the field of automation for many years. Based on long years of experience, we have integrated our proven and innovative technology functions into our new controller ranging from counting and measuring, speed, position and duty cycle control to simple process control functionality. This wide variety of functionality enables you to solve a wide array of applications.



You decide what you want. Use the innovative S7-1200 in your application as an autonomous mini programmable controller, or apply it to conquer the world of TIA.

You can find further information at: http://www.siemens.com/simatic-s7-1200

SIMATIC S7-1200, CPU	1211C	1212C	1214C
RAM	25 KB		50 KB
Processing times (µs) Bit/word/floating point	0.1/12/18		
Address ranges Digital channels Analog channels	6/4 2/0	8/6 2/0	14/10 2/0
Interfaces DP master DP slaves PtP communication PROFINET	(via CM 1243-5)(via CM 1242-5)(via CM 1241)		
Integrated inputs/outputs DI/DO AI/AO	4/4 2/0	8/6 2/0	14/10 2/0
Integrated functions Counters Pulse outputs Closed-loop control/positioning	3 (100 kHz) 2	4 (3 x 100 kHz, 1 x 30 kHz) 2	6 (3 x 100 kHz, 3 x 30 kHz) 2
Mounting dimensions W x H x D (mm)	90 x 100 x 75	110 x 100 x 75	

- = cannot be used/not available
- = can be used/available

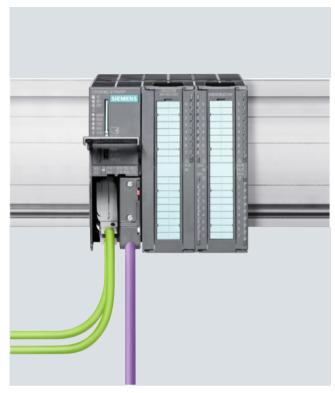
SIMATIC modular controllers

SIMATIC S7-300:

The modular controller for system solutions in the manufacturing industry

The SIMATIC S7-300 has been designed for innovative system solutions with a focus on manufacturing engineering, and as a universal automation system, it is the ideal solution for applications in centralized and distributed configurations:

- The ability to integrate powerful CPUs with Industrial Ethernet/PROFINET interface, integrated technological functions, or fail-safe designs make additional investments unnecessary.
- The S7-300 can be set up in a modular configuration without the need for slot rules for I/O modules. There is a wide range of modules available both for the centralized and the distributed configuration with ET200M.
- The Micro Memory Card as a data and program memory makes a backup battery superfluous, and with it, part of the maintenance costs. In addition, an associated project, including symbols and comments, can be stored on this memory card to facilitate service calls.



SIMATIC S7-300, CPU	312/314	315-2 DP 315-2 PN/DP	317-2 DP 317-2 PN/DP	319-3 PN/DP	315T-2 DP	317T-2 DP 317TF-2 DP
RAM Instructions	32/128 ¹⁾ KB 10/42 ¹⁾ K	256/384 ²⁾ KB 85/128 ²⁾ K	512/1024 ³⁾ KB 170/340 ³⁾ K	2 MB 680 K	256 KB 84 K	1/1.5 ⁴⁾ MB 340/400 ⁴⁾ K
Processing times (µs) Bit/word/fixed point/floating point	0.1/0.24/ 0.32/1.1; 0.06/0.12/ 0.16/0.59 ¹⁾	0.05/0.09/0.12/ 0.45	0.05/0.2/0.2/1; 0.025/0.03/0.04/ 0.16 ³⁾	0.004/0.01/0.01/ 0.04	0.1/0.2/2/3	0.05/0.2/0.2/1
Timers/counters	256/256	256/256	512/512	2048/2048	256/256	512/512
Address ranges Digital channels Analog channels	256/1024 64/256	1024 256	1024 256	1024 256	512 64	512 64
Interfaces DP master syst. int./CP 342-5 DP slaves PtP communication	—/• — —	- (2)	- 3)	• / • · · · · · · · · · · · · · · · · ·	• / • •	• / • •
PROFINET Integrated inputs/outputs	_		- 3/	•	_	_
DI/DO AI/AO	_	_	_		4/8 —	4/8 —
Integrated functions Counters/frequency meters Pulse outputs Closed-loop control/positioning	_ _ _/_	_ _ _/_	_ _ _/_	_ _ _/_		travel to fixed stop, lent cam switching,
Mounting dimensions W x H x D (mm)	40 x 125 x 130	40 x 125 x 130	80/40 x 125 x 130	120 x 125 x 130	160 x 125 x 130	160 x 125 x 130

^{— =} cannot be used/not available

⁼ can be used/available

¹⁾ CPU 314

²⁾ CPU 315-2 PN/DP

³⁾ CPU 317-2 PN/DP

⁴⁾ CPU 317TF-2 PN/DP

- The Micro Memory Card also enables simple program or firmware updates without a programming device. The Micro Memory Card can be used during operation for storing and accessing data, e.g. for measured value archiving or recipe processing.
- In addition to standard automation, safety technology and motion control can also be integrated in an S7-300 controller.
- Many of the S7-300 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. extended temperature range (-40/-25...+60/+70 °C) and for use where there is corrosive atmosphere/condensation. For more detailed information, visit: www.siemens.com/siplus-extreme

You can find further information at: http://www.siemens.com/simatic-s7-300



SIMATIC S7-300, CPU	312C/313C	313C-2 PtP/ 313C-2 DP	314C-2 PtP / DP / PN/DP	315F-2 DP/ 315F-2 PN/DP	317F-2 DP/ 317F-2 PN/DP	319F-3 PN/ DP
RAM Instructions	32/64 ¹⁾ KB 10/21 ¹⁾ K	64 KB 21 K	96/192 ⁴⁾ KB 32/64 ⁴⁾ K	384/512 ⁴⁾ KB	1/ 1.5 ⁸⁾ MB	2.5 MB
Processing times (μs) Bit/word/fixed point/floating point	0.2/0.4/5/6 0.1/0.2/2/3 ¹⁾	0.1/0.2/2/3	0.1/0.2/2/3; 0.06/0.12/0.16/ 0.59 ⁴⁾	0.05/0.09/0.12/ 0.45	0.05/0.2/0.2/1; 0.025/0.03/0.04/ 0.16 ⁸⁾	0.004/0.01/ 0.01/0.04
Timers/counters	128/128 256/256 ¹⁾	256/256	256/256	256/256	512/512	2048/2048
Address ranges Digital channels Analog channels	266/1016 ¹⁾ 64/253 ¹⁾	1008 248	1016 253	1024 256	1024 256	1024 256
Interfaces DP master syst. int./CP 342-5 DP slaves PtP communication PROFINET	_/• _ _ _	—/● (●/●) ²⁾ — (●) ²⁾ ASCII, RK512, 3964R ³⁾	—/• (•/•) ⁵⁾ — (•) ⁵⁾ ASCII, RK512, 3964R ³⁾	• / • • - • ⁷⁾	• / • • • 8)	• / • • •
Integrated inputs/outputs DI/DO AI/AO	10/6 (24/16) ¹⁾ 4/2 ¹⁾	16/16 —	24/16 4/2	=		_
Integrated functions Counters/frequency meters Pulse outputs Closed-loop control/positioning	2 (10 kHz)/3 (30 kHz) ¹⁾ 2 (2.5 kHz)/3 (2.5 kHz) ¹⁾ •/-	3 (30 kHz) 3 (2.5 kHz)	4 (60 kHz) 4 (2.5 kHz)	=		=
Mounting dimensions W x H x D (mm)	80/120 x 125 x 130	120 x 125 x 130	120 x 125 x 130	40/80 x 125 x 130	80/40 x 125 x 130	120 x 125 x 130

^{- =} cannot be used/not available

= can be used/available

¹⁾ CPU 313C

²⁾ CPU 313C-2 DP

³⁾ CPU 313C-2 PtP

⁴⁾ CPU 314C-2 PN/DP

⁵⁾ CPU 314C-2 DP CPU 314C-2 PN/DP

⁷⁾ CPU 315F-2 PN/DP

⁸⁾ CPU 317F-2 PN/DP 6) CPU 314C-2 PtP

SIMATIC modular controllers

SIMATIC S7-400:

The power controller for system solutions in the manufacturing and processing industry

Within the controller family, the SIMATIC S7-400 is designed for system solutions in the manufacturing and process automation industry.

- The S7-400 is especially suitable for data-intensive tasks in the process industry. High processing speeds and deterministic response times guarantee short machine cycle times on high-speed machines in the manufacturing industry. The high-speed backplane bus of S7-400 ensures efficient linking of central I/O modules.
- The S7-400 is used preferably to coordinate overall plants and to control lower-level communications lines with slave stations; this is guaranteed by the high communication power and the integral interfaces.
- The power of the S7-400 is scalable thanks to a graded range of CPUs; the capacity for I/O is almost unlimited.
- The power reserves of the CPUs enable new functions to be integrated without further hardware investment, e.g. processing of quality data, user-friendly diagnostics, integration into higher-level MES solutions or high-speed communication via bus systems.



SIMATIC S7-400, CPU	412-1/ 412-2	412-2 PN	414-2 / 414-3	414-3 PN/DP	416-2 / 416-3	416-3 PN/DP
RAM Instructions	288/512 ¹⁾ KB 48/84 ¹⁾ K	1 MB 170 K	1/2.8 ²⁾ MB 170/460 ²⁾ K	4 MB 680 K	5.6/11.2 ³⁾ MB 920/1840 ³⁾ K	16 MB 2680 K
Processing times (ns) Bit/word/fixed point/floating point	75/75/75/225	75/75/75/225	45/45/45/135	45/45/45/135	30/30/30/90	30/30/30/90
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
Address ranges Digital channels Analog channels	32768/32768 2048/2048	32768/32768 2048/2048	65536/65536 4096/4096	65536/65536 4096/4096	131072/131072 8192/8192	131072/131072 8192/8192
DP interfaces Number of DP interfaces Number of DP slaves Plug-in interface modules	1(MPI/DP) / 1 ¹⁾ 32/64 —	1(MPI/DP) / 1 ¹⁾ 32/64 —	1 (2) ²⁾ 96 each — / 1 x DP ²⁾	1 125 each 1 x DP	1 (2) ³⁾ 125 each — / 1 x DP ³⁾	1 125 each 1 x DP
PN interfaces Number of PN interfaces PROFINET IO PROFINET with IRT PROFINET CBA TCP/IP UDP Web server ISO-on-TCP (RFC 1006) Data set gateway	- - - - - -	1 (2 ports)	- - - - - -	1 (2 ports)	- - - - - -	1 (2 ports)
Mounting dimensions W x H x D (mm)	25 x 290 x 219	25 x 290 x 219	50 x 290 x 219	50 x 290 x 219	25 (50) ³ x 290 x 219	50x290x219

^{— =} cannot be used/not available

¹⁾ CPU 412-2

³⁾ CPU 416-3

⁼ can be used/available

- The S7-400 can be configured in a modular way without any slot rules; there is a wide range of modules available both for centralized configurations and distributed structures.
- The configuration of the distributed I/O of the S7-400 can be modified during operation. In addition, signal modules can be removed and inserted while live (hot swapping). This makes it very easy to expand the system or replace modules in the event of a fault.
- Storage of the entire project data, including symbols and comments, on the CPU makes service and maintenance work easier.
- Safety engineering and standard automation can be integrated into a single S7-400 controller; plant availability can be increased through the redundant structure of the S7-400.
- Many S7-400 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. for use where there is a corrosive atmosphere/condensation. For more detailed information, visit www.siemens.com/siplus-extreme

You can find further information at: http://www.siemens.com/simatic-s7-400



SIMATIC S7-400, CPU	417-4	412-3H	414-4H	417-4H	414F-3 PN/DP	416F-2	416F-3 PN/DP
RAM Instructions	30 MB 5 M	768 KB 128 K	2.8 MB 460 K	30 MB 5 M	4 MB	5.6 MB	16 MB
Processing times (ns) Bit/word/fixed point/ floating point	18/18/18/54	75/75/75/225	45/45/45/135	18/18/18/54	45/45/45/135	30/30/30/90	30/30/30/90
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
Address ranges Digital channels Analog channels	131072/131072 8192/8192	65536/65536 4096/4096	65536/65536 4096/4096	131072/131072 8192/8192	65536/65536 4096/4096	131072/131072 8192/8192	131072/131072 8192/8192
DP interfaces Number of DP interfaces Number of DP slaves Plug-in interface modules	3 125 each 2 x DP	1 (MPI/DP) — 2 x sync ¹⁾	2 — 2 x sync ¹⁾	2 — 2 x sync ¹⁾	1 125 each 1 x DP	1 125 —	1 125 each 1 x DP
PN interfaces Number of PN interfaces PROFINET IO PROFINET with IRT PROFINET CBA TCP/IP UDP Web server ISO-on-TCP (RFC 1006) Data set gateway	- - - - - -				1 (2 ports)		1 (2 ports)
Mounting dimensions W x H x D (mm)	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	25 x 290 x 219	50 x 290 x 219

- = cannot be used/not available
- = can be used/available

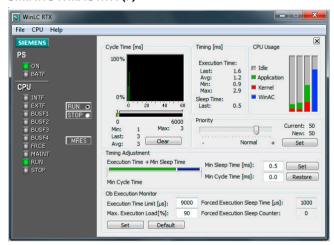
SIMATIC controllers

SIMATIC WinAC RTX (F) / Embedded Bundles

SIMATIC PC-based Automation uses the real-time-capable software controller WinAC RTX or its fail-safe version WinAC RTX F on the basis of Windows operating systems. Any PC applications, operator control and monitoring tasks, as well as technological functions can simply be combined here to form an overall automation solution.

Through their rugged design and preinstalled, ready-to-use automation software, the SIMATIC Embedded Bundles allow the advantages of PC-based automation to be used at the machine.

SIMATIC WinAC RTX (F)



SIMATIC WinAC (Windows Automation Center) is the PC-based software controller from Siemens with a real-time response. The WinAC RTX PC-based controller is used when high performance, high data volumes and at the same time hard real time are required. WinAC uses a real-time core for real-time and deterministic response. WinAC RTX offers an open data interface to the standard software of the office world on the basis of OPC.

WinAC RTX is programmed using the standard SIMATIC programming tools, and is code-compatible with SIMATIC S7, i.e. program components can be used in SIMATIC S7-300/400 and WinAC RTX.

With WinAC RTX F, a TÜV-certified (German Technical Inspectorate), fail-safe software controller for safety-oriented applications is available. The S7 Distributed Safety software is used for programming the fail-safe program. The PROFISafe profile permits fail-safe communication via PROFIBUS DP and PROFINET IO.

WinAC RTX is open for integration of technological applications. C/C++/C# programs can also be integrated into the WinAC RTX control program. Extremely flexible solutions can therefore be generated with access to all the hardware and software components of the PC. C/C++/C# is frequently used to program complex technology functions.

C / C ++ / C# encapsulates these programs. The openness of WinAC RTX can therefore also be used to protect the know-how in customized functions.

Embedded Bundles

SIMATIC Embedded Bundles are a ready-to-use combination of hardware and software for control and HMI applications. This results in simple handling and fast commissioning for automation solutions at machine level. Embedded Bundles combine the openness of PC-based controllers with the ruggedness of conventional controllers. In addition, they boast flexible software installed on powerful, scalable hardware in an open, compact combination.

SIMATIC Embedded Bundles are available based on the following hardware:

- SIMATIC IPC227D
- SIMATIC IPC427C
- SIMATIC HMI IPC277D
- SIMATIC HMI IPC477C (PRO)
- SIMATIC S7-mEC Embedded Controller

Thanks to their fan-free and disk-free design, the SIMATIC Embedded Bundles can be used direct at the machine in harsh environments. Windows Embedded Standard is used as the embedded operating system.



You can find further information at: http://www.siemens.com/pc-based-automation

SIMATIC programming devices

SIMATIC Field PG M3:

High-performance industrial notebook with new design

The SIMATIC Field PG M3, a member of the SIMATIC family, offers you a whole range of advantages in addition to wireless technology and Bluetooth at an attractive price/performance ratio: powerful Intel® Core™ i5 processor, high-resolution and luminous 15.6" widescreen display with 16:9 format, uniform data backup concept, powerful battery, fold-out handle, and quick-change hard disk. Furthermore, all standard interfaces for industrial applications are already onboard.

The ready-to-run SIMATIC Field PG M3 with preinstalled SIMATIC engineering software is the ideal industrial notebook – optimized for use when configuring, commissioning, servicing and maintaining your automation system.

Application

The Field PG M3 is equipped for industrial use:

- Suitable for use in harsh industrial environments due to state-of-the-art material technology
- Protected against shock and vibration: rugged magnesium die-cast housing with protector strips on the edges
- Safe grip in mobile use: fold-out handle
- Dirt-resistant: new industrial design with dark colors and keyboard with abrasion-resistant laser inscription
- Protection against electromagnetic influences: metalized plastic components on the inside of the enclosure (EMC/ EMS-tested)

Interfaces

- 2x fully-featured Ethernet interfaces with high data throughput (10 / 100 / 1000 Mbit)
- 5 x USB 2.0 ports (2x2 plus 1); each pair provides a total of 1 A for stable power supply to external devices
- Industrial WLAN, based on the WLAN standards 802.11 a, b, g and n, permits secure and wireless communication with programmable controllers. The radio link to the terminal equipment is monitored cyclically in the IWLAN and is safe and reliable even in critical situations.
- USB Bluetooth dongle (for insertion into separate USB port) for synchronization and transmission of data to devices with Bluetooth capability such as PDAs or mobile phones
- PROFIBUS/MPI interface as well as SIMATIC Memory Card and MultiMedia Card slot



Powerful hardware components

The very latest Intel Multicore processors together with the current Mobile Intel chipset provide maximum performance even for programs requiring a very high computing performance. The premium version has an Intel i5, 2.4 GHz processor with 3 MB L3 cache and 3 GB DDR3 RAM 1066 MHz (1x 2 GB, 1x 1 GB).

An additional feature of the Intel i5 processor is supporting of turbo boost which provides increased performance even for applications not using multi-threading.

Combination of a 9-cell Li-ion battery with Intel chipset components of highest quality designed for mobile use results in a long mobile application period of more than 3.5 hours. An easily-replaceable high-speed hard disk with serial ATA interface allows fast data access and also data exchange between different operating systems and software configurations

Operating system

Microsoft Windows XP Professional MUI (32-bit), Windows 7 Ultimate 32 bit (available soon).

You can find further information at: http://www.siemens.com/simatic-pg

SIMATIC IPC

SIMATIC IPC The more industrial PC

Professional automation solutions place a wide range of different demands on the industrial PCs used – vibration, cold, dust, heat – year in, year out, and round the clock. SIMATIC IPCs are the ideal industry-standard PC platforms for this, and offer:

- · high system availability,
- · high degree of investment protection,
- · best industrial functionality.

SIMATIC IPCs are available in various designs and with different functionalities.

SIMATIC Rack PC

Flexible and powerful industrial PC in 19" design.

SIMATIC Box PC

Compact and rugged industrial PC for universal applicability.

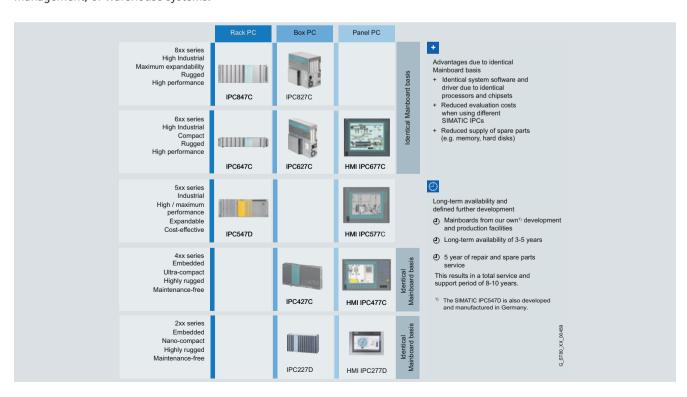
SIMATIC Panel PC

Rugged and high-performance industrial PC with brilliant display.

SIMATIC IPCs can be configured individually and ordered online. Well-matched expansion components, e.g. the SIMATIC IPC DiagMonitor for diagnostics and preventive maintenance, are available for individual expansion of the system availability. SIMATIC IPCs are the ideal platform for PC-based automation and are used in the manufacturing and process industry, as well as in industry-oriented sectors such as transportation systems and traffic engineering, building management, or warehouse systems.



You can find further information at: http://www.siemens.com/simatic-ipc



SIMATIC software

Efficient engineering for all SIMATIC controllers

SIMATIC software is a core component of Totally Integrated Automation and provides the optimum tool for every automation task and every phase of a project. Whether for the manufacturing or process industry, in machine or plant construction, SIMATIC software will allow you to fully utilize the potentials in the engineering workflow.

- Fewer interfaces thanks to integrated engineering environment for logic, HMI, motion control, and process engineering.
- Fast integration of process design into the automation structure as a result of system-wide engineering from a central position.
- Design and implementation times are shortened by structured, process-oriented programming methodology.
- The costs of subsequent projects are reduced because blocks are easy to reuse.
- Increased system availability due to efficient process diagnostics.

Totally Integrated Automation Portal (TIA Portal)

The engineering framework with the name Totally Integrated Automation Portal (TIA Portal) will in future form the basis for all engineering systems for configuring, programming and commissioning programmable controllers. As an integral component of the various engineering systems, the engineering framework will automatically provide a uniform and consistent system response through shared services and features.

SIMATIC STEP 7 V11 is based on the TIA Portal, and offers the standardized operating concept of the new TIA Portal and uses its automatic data consistency and shared services such as configuration, communication and diagnostics. STEP 7 is universally suitable for the current SIMATIC controllers S7-1200, S7-300, S7-400 and WinAC, and offers users a uniform, efficient and intuitive solution.

Standard engineering

- STEP 7, the basic engineering environment for SIMATIC S7-300, S7-400 and WinAC.
- STEP 7 Professional, the comprehensive engineering suite for SIMATIC S7-300, S7-400 and WinAC.
- STEP 7 Micro/WIN, the programming software for SIMATIC S7-200.



Standard engineering options

- SIMATIC iMap, software for Component Based Automation.
- CFC, technology charts.
- Distributed Safety Software, configuration of fail-safe applications.
- DOCPRO, creation of plant documentation.
- S7-PDIAG, process diagnostics.
- TeleService, remote maintenance and remote linking.

Engineering systems - based on TIA Portal

- STEP 7 Basic V11, shared engineering for SIMATIC S7-1200 and SIMATIC HMI Basic Panels.
- STEP 7 Professional V11, the easy-to-use, uniform engineering system for all SIMATIC controllers.

You can find further information at: http://www.siemens.com/simatic-software

SIMATIC ET 200

The right solution for every application

SIMATIC ET 200 offers a broad selection of distributed I/O systems - for solutions in a control cabinet, directly on the machine, or in hazardous areas. SIMATIC ET 200 systems for cabinet-free configurations are installed in a rugged, fiberglass reinforced plastic enclosure, making them resistant to shock and dirt, as well as watertight. Furthermore, you need fewer additional components, save on cabling, and profit from extremely fast response times.

The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs and

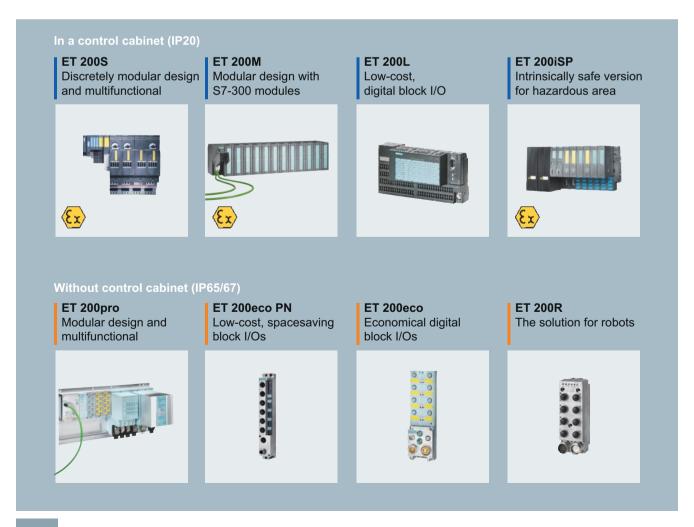
simultaneously offer a wide range of possible applications. You can choose from many different combination options: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety engineering, motor starters, pneumatic systems, frequency converters, and diverse technology modules.

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostics options as well as optimum interfacing to SIMATIC controllers and HMI devices prove the unique integration of

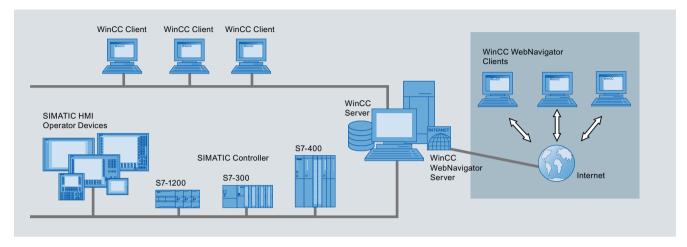
Totally Integrated Automation.

In addition to the fieldbus systems, the point-to-point connection IO-Link is also available for intelligent interfacing of sensors and actuators.

You can find further information at: http://www.siemens.com/et200



SIMATIC HMI



Increase transparency and reduce costs: SIMATIC HMI systems

The interface between human and machine – the human machine interface or HMI for short – connects the world of automation with the individual requirements of the operator. Human machine interfacing is about managing the process, optimizing machine and system operation, availability and productivity.

Everything from a single source

With SIMATIC HMI, Siemens Automation and Drives offers a complete range of innovative and low-cost products and systems for the multi-faceted tasks of operator control and monitoring: Ranging from operator panels and visualization software for operator control and monitoring at the machine through to SCADA systems for widely differing requirements in process visualization. For special requirements, optimally adapted products are offered such as especially rugged operator panels with all-round IP65 protection for mounting on support arms/pedestals, or operator panels with stainless steel front for use in the food and beverages industry. Of course, individual, customer-specific requirements can also be implemented.

Perfectly equipped for integration in the automation environment

With their open, standardized interfaces in hardware and software, SIMATIC HMI products can be integrated at any time in the production and automation level as well as in the corporate management level. Connectability to almost every controller on the market as well as multiple language capability of the configuration and visualization software – including Asian ideographic languages, of course – facilitate operation worldwide.

Flexibility in all HMI applications – from the Basic Panel through the Comfort Panel up to process visualization

SIMATIC WinCC in the Totally Integrated Automation Portal (TIA Portal) is part of a new, integrated engineering framework which offers a uniform engineering environment for programming and configuration of control, visualization and drive solutions.

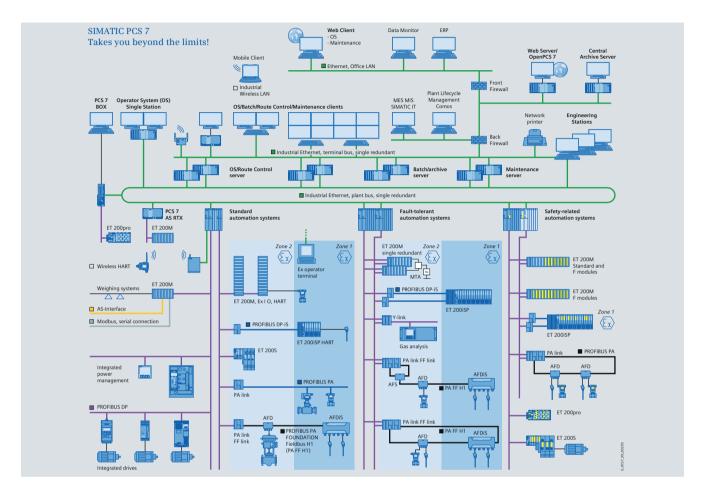
With WinCC in the TIA Portal it is possible to configure HMI applications ranging from very simple operating solutions with Basic Panels and Comfort Panels up to SCADA applications on PC-based multi-user systems. The possible range of solutions is thus greatly extended compared to the predecessor product SIMATIC WinCC flexible.

Functional or industry-specific expansions of the runtime software are available in the form of options. Some of the options are already integrated as standard functions in the HMI devices of different performance classes, while others can only be executed together with the corresponding runtime basic software.

The powerful SCADA system SIMATIC WinCC is additionally available for highly complex applications with plant intelligence solutions, integral archive servers or redundant architectures, whereas WinCC Open Architecture is available for applications with high customer-specific adaptation requirements – even for non-Windows platforms.

You can find further information at: http://www.siemens.com/simatic-hmi

SIMATIC PCS 7



A process control system with seven advantages

The homogenous and integrated SIMATIC PCS 7 process control system with its unique scalable architecture and outstanding system characteristics is an ideal basis for cost-effective implementation and economic operation of control equipment.

Specifically expanded by the seamless integration of additional functions, SIMATIC PCS 7 offers far more than a typical process control system, for example:

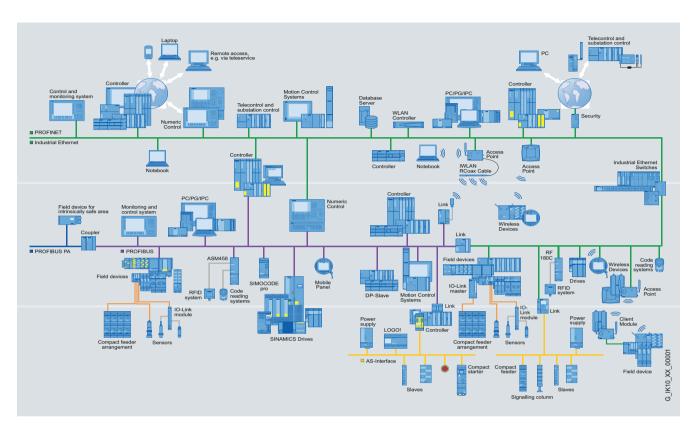
- Asset management
- · Automation of batch processes
- Control of material transportation
- Safety
- · Advanced Process Control
- Telecontrol
- Energy management
- IT security
- Evaluation/management of process data
- IT system interfacing

This is reflected in the seven advantages of the SIMATIC PCS 7 process control system:

- Reduction of total cost of ownership through integration
- High performance and quality coupled with efficient engineering, reliability, and availability
- Flexibility and scalability from small laboratory systems to large plant networks
- Protection of investments thanks to step-by-step modernization of Siemens systems and third-party systems
- Safety & security integrated safety technology and comprehensive IT security for reliable protection of personnel and environment, as well as process and plant
- Continuous technological innovations from the world's leading provider of automation technology
- Global network of experts local service and support through a worldwide network of experts and authorized partners

You can find further information at: http://www.siemens.com/simatic-pcs7

SIMATIC NET



Networking for Industry

Communication networks are of utmost importance for automation solutions. SIMATIC NET – Networking for Industry stands for a diverse range of modular blocks designed for industry – to efficiently solve your communications tasks:

SIMATIC NET offers solutions which both maximize the benefits of Ethernet and simply integrate fieldbus systems. Significant examples include:

- The development of the field level for the use of Industrial Ethernet.
- Complete integration from the field level to the corporate management level.
- The promotion of wireless communication.
- The integration of IT technologies.

SIMATIC NET supports the following communications systems:

Industrial Ethernet (in accordance with IEEE 802.3) — the international standard for area networking is currently the number one network in the LAN environment. Powerful communications networks with long ranges can be established via Industrial Ethernet.

The international standard **PROFINET** (IEC 61158/61784) uses Industrial Ethernet and allows real-time communication all the way to the field level, but also integrates the enterprise level. With full utilization of existing IT standards, PROFINET also allows isochronous motion control applications on the

Industrial Ethernet, efficient cross-vendor engineering, and high availability of machines and plants on the Industrial Ethernet.

PROFIBUS (IEC 61158/61784) – the international standard for the field level is the global market leader among fieldbus systems. It is the only fieldbus that allows communication in both manufacturing and process applications.

AS-Interface (IEC 62026-2/EN 50295) – as a low-cost alternative to the cable tree, the AS-Interface connects sensors and actuators via twisted-pair cable.

IO-Link – the standard for intelligently connecting sensors and actuators from the field level to the control level.

Telecontrol – telecontrol and remote maintenance over "classical" connections (radio modems, dial-up connections, dedicated lines) as well as over IP-based networks (Ethernet, Internet, GPRS/UMTS mobile radio).

Industrial Wireless Communication – wireless communication over mobile radio (Industrial Wireless Telecontrol), with Industrial Wireless LAN (IWLAN in accordance with IEEE 802.11) and for connection of field devices in process automation with the WirelessHART radio standard.

You can find further information at: http://www.siemens.com/simatic-net

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LOGO! logic module



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Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

LOGO! logic module

Introduction

LOGO! logic module

Overview



LOGO! logic module

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the click of a button or by means of PC software; up to 130 times over
- Functions are easily changed at the press of a key. No more time-consuming rewiring

SIPLUS LOGO!

- The controller for use in the toughest ambient conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for medial exposure (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, conveying technology, food industry, etc.

Accessories:

- The front plate mounting set also allows simple and reliable installation of the logic modules in front plates; IP65 protection is thus possible.
- In order to ensure dependable operation of SIPLUS devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

For further information, please go to:

www.siemens.com/siplus-extreme

For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

General technical data of the SIPL	US LOGO
Ambient temperature range	-40/-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100%, condensation allowed
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA– S71.04 severity level G1; G2; G3; GX ¹⁾²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

1) ISA-S71.04 severity level GX: Long-term load:

 $SO_2 < 4.8 \text{ ppm; } H_2S < 9.9 \text{ ppm; } CI < 0.2 \text{ ppm; } HCI < 0.66 \text{ ppm; } HF < 0.12 \text{ ppm; } NH < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } NOX < 5.2 \text{ ppm } Limit value (max. 30 min/d): }$

 $SO_2 < 17.8 \text{ ppm}; H_2S < 49.7 \text{ ppm}; CI < 1.0 \text{ ppm}; HCI < 3.3 \text{ ppm}; HF < 2.4 \text{ ppm}; NH < 247 \text{ ppm}; O_3 < 1.0 \text{ ppm}; NOX < 10.4 \text{ ppm}$

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

LOGO! modular basic versions

Overview



- The space-saving basic versions
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic versions)

Technical specifications

	6ED1 052-1CC01-0BA6	6ED1 052-1MD00-0BA6	6ED1 052-1HB00-0BA6	6ED1 052-1FB00-0BA6
Supply voltages				
Rated value				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
 Permissible range, lower limit (DC) 	20.4 V	10.8 V	20.4 V	100 V
 Permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V	253 V
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
 Permissible range, lower limit (AC) 			20.4 V	85 V
 Permissible range, upper limit (AC) 			26.4 V	265 V
Time				
Time switching clocks				
Power reserve	80 h	80 h	80 h	80 h
Digital inputs				
Number of digital inputs	8; of which 4 can be used in analog mode (0 to 10 V)	8; of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relay	4; Relay	4; Relay
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A			
Relay outputs				
Switching capacity of contacts				
with inductive load, max.		3 A	3 A	3 A
with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
Emission of radio inter-	Yes; Radio interference	Yes	Yes	Yes
ference acc. to EN 55 011 (limit value class B)	suppression according to EN55011, limit value class B			

LOGO! modular basic versions

Technical specifications (continued)

	6ED1 052-1CC01-0BA6	6ED1 052-1MD00-0BA6	6ED1 052-1HB00-0BA6	6ED1 052-1FB00-0BA6
Environmental requirements				
Operating temperature				
• Min.	0 °C	0 °C	0 °C	0 °C
• Max.	55 °C	55 °C	55 °C	55 °C
Degree of protection				
IP20	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CSA approval	Yes	Yes	Yes	Yes
Developed according to IEC1131	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
According to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
• Width	72 mm	72 mm	72 mm	72 mm
 Height 	90 mm	90 mm	90 mm	90 mm
• Depth	55 mm	55 mm	55 mm	55 mm

Ordering data	Order No.		Order No.
LOGO! logic module 24C	6ED1 052-1CC01-0BA6	Accessories	
12/24 V DC power supply,		LOGO! TD text display	6ED1 055-4MH00-0BA0
8x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V), 4x 10 A relay outputs, integral time switch;		4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	
200 function blocks can be interlinked.		SIPLUS LOGO! TD text display	6AG1 055-4MH00-2BA0
modular expansion capability		(extended temperature range -10 +60 °C and medial	
LOGO! logic module 12/24RC	6ED1 052-1MD00-0BA6	exposure)	
12/24 V DC power supply, 8 x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V),		4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	
4 x 10 A relay outputs, integrated time switch;		LOGO! manual	
200 function blocks can be interlinked.		German	6ED1 050-1AA00-0AE7
modular expansion capability		English	6ED1 050-1AA00-0BE7
LOGO! logic module 24RC	6ED1 052-1HB00-0BA6	French	6ED1 050-1AA00-0CE7
24 V AC/DC power supply,		Spanish	6ED1 050-1AA00-0DE7
8x 24 V AC/DC digital inputs, 4x 10 A relay outputs,		Italian	6ED1 050-1AA00-0EE7
integral time switch; 200 function blocks can be interlinked, modular expansion capability		Chinese	6ED1 050-1AA00-0KE7
LOGO! logic module 230RC	6ED1 052-1FB00-0BA6		
115/230 V AC/DC power supply, 8x 115/230 V AC/DC digital inputs, 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability		I: Subject to export regulations AI:	

LOGO! modular basic versions

Ordering data	Order No.		Order No.
LOGO! Memory Card	6ED1 056-1DA00-0BA0	LOGO! modem cable	6ED1 057-1CA00-0BA0
Program module for copying, with know-how protection		Adapter cable for analog modem communication	
LOGO! battery card	6ED1 056-6XA00-0BA0	Front plate mounting set	
Battery module for backing up the		Width 4 modular spacings	6AG1 057-1AA00-0AA0
integral real-time clock (not LOGO! 24)		Width 4 modular spacings, with keys	6AG1 057-1AA00-0AA3
LOGO! memory/battery card	6ED1 056-7DA00-0BA0	Width 8 modular spacings	6AG1 057-1AA00-0AA1
Combined program and battery module, with know-how protection and for backing up the integral		Width 8 modular spacings, with keys	6AG1 057-1AA00-0AA2
real-time clock (not LOGO! 24)		LOGO! News Box, 12/24 V	
LOGO! PROM	6AG1 057-1AA01-0BA6	Contains LOGO! 12/24RC,	
Programming device used to simultaneously reproduce program module contents on up		LOGO! USB PC cable, LOGO!Soft Comfort V6.0, manual, screwdriver, information material	
to 8 program modules		German J	6ED1 057-3BA00-0AA5
LOGO!Soft Comfort V6.0	6ED1 058-0BA02-0YA0	English J	6ED1 057-3BA00-0BA5
For programming on the PC in		LOGO! News Box, 230 V	
LAD/FBD; executes on Windows 98 SE and higher, Linux, MAC OSX; on CD-ROM		Contains LOGO! 230RC, LOGO! USB PC cable, LOGO!Soft Comfort V6.0, manual, screw-	
LOGO!Soft Comfort V6.0	6ED1 058-0CA02-0YE0	driver, information material	
upgrade		German J	6ED1 057-3AA02-0AA0
Upgrade from V1.0 to V6.0		English J	6ED1 057-3AA02-0BA0
LOGO! PC cable	6ED1 057-1AA00-0BA0	LOGO! TD News Box, 12/24 V	
For program transfer between LOGO! and the PC		Contains LOGO! 12/24RCo, LOGO! TD. LOGO! USB PC	
LOGO! USB PC cable	6ED1 057-1AA01-0BA0	cable, LOGO! Soft Comfort V6.0,	
For transferring the program between LOGO! and PC,		manual, screwdriver, information material	
including driver on CD-ROM		German J	6ED1 057-3BA10-0AA0
		English J	6ED1 057-3BA10-0BA0

- J: Subject to export regulations AL: N and ECCN: EAR99S
- L: Subject to export regulations AL: 91999 and ECCN: N

LOGO! logic module

LOGO! modular

SIPLUS LOGO! modular basic versions

Overview



- The space-saving basic versions
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! text display TD (can be connected to all LOGO! 0BA6 basic versions)

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS LOGO! 24	SIPLUS LOGO! 12/24RC	SIPLUS LOGO! 24RC	SIPLUS LOGO! 230RC
Order number	6AG1 052-1CC01-2BA6	6AG1 052-1FB00-2BA6	6AG1 052-1HB00-2BA6	6AG1 052-1MD00-2BA6
Order No. based on	6ED1 052-1CC01-0BA6	6ED1 052-1FB00-0BA6	6ED1 052-1HB00-0BA6	6ED1 052-1MD00-0BA6
Ambient temperature range	-25°C to +70 °C			
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions.			
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m)			
	derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K			

¹⁾ ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS LOGO! modular basic versions

Ordering data	Order No.		Order No.
SIPLUS LOGO! 24	6AG1 052-1CC01-2BA6	Accessories	
(extended temperature range and medial exposure)		SIPLUS Upmiter upstream L device	6AG1 053-1AA00-2AA0
24 V DC power supply, 8x 24 V DC digital inputs, of		for reliable operation at the battery of combustion engines	
which 4 can be used in analog mode (0 to 10 V), 4x 24 V DC digital outputs, 0.3 A; integrated time switch; 200 function blocks can be interlinked, modular expansion capability		Additional accessories	See LOGO! modular basic versions
SIPLUS LOGO! 12/24RC	6AG1 052-1MD00-2BA6		
(extended temperature range and medial exposure)			
12/24 V DC power supply, 8x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V), 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability			
SIPLUS LOGO! 24RC	6AG1 052-1HB00-2BA6		
(extended temperature range and medial exposure)			
24 V AC/DC power supply, 8x 24 V AC/DC digital inputs, 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability			
SIPLUS LOGO! 230RC	6AG1 052-1FB00-2BA6		
(extended temperature range and medial exposure)			
115/230 V AC/DC power supply, 8x 115/230 V AC/DC digital inputs, 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability			

I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

LOGO! modular pure versions

Overview



- The cost-optimized basic versions
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic versions)

Technical specifications

	6ED1 052-2CC01-0BA6	6ED1 052-2MD00-0BA6	6ED1 052-2HB00-0BA6	6ED1 052-2FB00-0BA6
Supply voltages				
Rated value				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
 permissible range, lower limit (DC) 	20.4 V	10.8 V	20.4 V	100 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V	253 V
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
 permissible range, lower limit (AC) 			20.4 V	85 V
 permissible range, upper limit (AC) 			26.4 V	265 V
Time of day				
Time switching clocks				
Number	190	8	8	8
 Power reserve 	80 h	80 h	80 h	80 h
Digital inputs				
Number of digital inputs	8; of which 4 can be used in analog mode (0 to 10 V)	8; of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relay	4; Relay	4; Relay
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current • for signal "1" permissible range for 0 to 55 °C, max.	0.3 A			
Relay outputs Switching capacity of contacts				
with inductive load, max.with resistive load, max.		3 A 10 A	3 A 10 A	3 A 10 A

LOGO! modular pure versions

Technical specifications (continued)

	6ED1 052-2CC01-0BA6	6ED1 052-2MD00-0BA6	6ED1 052-2HB00-0BA6	6ED1 052-2FB00-0BA6
EMC Emission of radio interference acc. to EN 55 011 • Emission of radio inter-	Yes; Radio interference	Yes	Yes	Yes
ference acc. to EN 55 011 (limit value class B)	suppression according to EN55011, limit value class B			
Environmental requirements Operating temperature				
Min.Max.	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C
Degree of protection IP20	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CSA approval	Yes	Yes	Yes	Yes
Developed according to IEC1131	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
According to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
• Width	72 mm	72 mm	72 mm	72 mm
HeightDepth	90 mm 55 mm	90 mm 55 mm	90 mm 55 mm	90 mm 55 mm

Ordering data	Order No.		Order No.
LOGO! logic module 24Co	6ED1 052-2CC01-0BA6	LOGO! logic module 24RCo	6ED1 052-2HB00-0BA6
24 V DC power supply, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; without display and keyboard; 200 function blocks		24 V AC/DC power supply, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	
can be interlinked, modular expansion capability		LOGO! logic module 230RCo	6ED1 052-2FB00-0BA6
LOGO! logic module 12/24RCo	6ED1 052-2MD00-0BA6	115/230 V AC/DC power supply, 8 digital inputs 115/230 V AC/DC,	
12/24 V DC power supply, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be inter- linked, modular expansion capability		4 relay outputs 10 A, integral time clock; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	

I: Subject to export regulations AL: N and ECCN: EAR99H

LOGO! modular pure versions

Ordering data	Order No.	Order No.	
Accessories		LOGO! memory/battery card	6ED1 056-7DA00-0BA0
LOGO! TD text display	6ED1 055-4MH00-0BA0	Combined program and battery	
4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions,	module, with know-how protection and for backing up the integral real-time clock (not LOGO! 24o)		
including connecting cable		LOGO! PROM	6AG1 057-1AA01-0BA6
SIPLUS LOGO! TD text display	6AG1 055-4MH00-2BA0	Programming device used to simultaneously reproduce	
(extended temperature range -10 +60 °C and medial exposure)	program module contents to 8 program modules		
4-line text display, can be		LOGO!Soft Comfort V6.0	6ED1 058-0BA02-0YA0
connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable		For programming on the PC in LAD/FBD; executes on Windows 98 SE and higher, Linux, MAC	
LOGO! manual		OSX; on CD-ŘOM	
German	6ED1 050-1AA00-0AE7 LOGO!Soft Comfort V6.0 upgrade		6ED1 058-0CA02-0YE0
English	6ED1 050-1AA00-0BE7	Upgrade from V1.0 to V6.0	
French	6ED1 050-1AA00-0CE7	LOGO! PC cable	6ED1 057-1AA00-0BA0
Spanish	6ED1 050-1AA00-0DE7 For program transfer between		
Italian	6ED1 050-1AA00-0EE7	LOGO! and the PC	
Chinese	6ED1 050-1AA00-0KE7	LOGO! USB PC cable	6ED1 057-1AA01-0BA0
LOGO! Memory Card	6ED1 056-1DA00-0BA0 For transferring the program		
Program module for copying, with know-how protection		between LOGO! and PC, including driver on CD-ROM	
LOGO! battery card	6ED1 056-6XA00-0BA0		6ED1 057-1CA00-0BA0
Battery module for backing up the integral real-time clock (not LOGO! 24)		Adapter cable for analog modem communication	

J: Subject to export regulations AL: N and ECCN: EAR99S

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS LOGO! modular pure versions

Overview



- Basic versions optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! text display TD (can be connected to all LOGO! 0BA6 basic versions)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS LOGO! 24o	SIPLUS LOGO! 12/24RCo	SIPLUS LOGO! 24RCo	SIPLUS LOGO! 230RCo	
Order number	6AG1 052-2CC01-2BA6	6AG1 052-2MD00-2BA6	6AG1 052-2HB00-2BA6	6AG1 052-2FB00-2BA6	
Order No. based on	6ED1 052-2CC01-0BA6	6ED1 052-2MD00-0BA6	6ED1 052-2HB00-0BA6	6ED1 052-2FB00-0BA6	
Ambient temperature range	-40 °C to +70 °C				
Conformal coating	Coating of the printed circu	it boards and the electronic co	mponents		
Technical data	The technical data of the st	andard product applies excep	t for the ambient conditions.		
Ambient conditions					
Relative humidity	5 100 % Condensation permissible				
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)				
Chemically active substances	Conformity with EN 60721-3	3-3, Class 3C4 incl. salt mist ar	nd ISA-S71.04 severity level (G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾				
Air pressure (depending on the highest positive temper-	1080 795 hPa (-1000 +2000 m) see ambient temperature range				
ature range specified)	795 658 hPa (+2000 +3500 m) derating 10 K				
	658 540 hPa (+3500 +5000 m) derating 20 K				

¹⁾ ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm</p>

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS LOGO! modular pure versions

Ordering data	Order No.		Order No.
SIPLUS LOGO! 24o		Accessories	
(extended temperature range and medial exposure)		SIPLUS Upmiter upstream device	6AG1 053-1AA00-2AA0
24 V DC power supply, 8 digital inputs 24 V DC, of which	6AG1 052-2CC01-2BA6	for reliable operation at the battery of combustion engines	
4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability		Additional accessories	See LOGO! modular pure versions, page 2/10
SIPLUS LOGO! 12/24RCo			
(extended temperature range and medial exposure)			
12/24 V DC power supply, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6AG1 052-2MD00-2BA6		
SIPLUS LOGO! 24RCo			
(extended temperature range and medial exposure)			
24 V AC/DC power supply, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6AG1 052-2HB00-2BA6		
SIPLUS LOGO! 230RCo			
(extended temperature range and medial exposure)			
115/230 V AC/DC power supply, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time clock; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6AG1 052-2FB00-2BA6		

I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

LOGO! modular expansion modules

Overview



- Expansion modules for the connection to LOGO! Modular
- With digital inputs and outputs, analog inputs or analog outputs

Technical specifications

	6ED1 055-1CB00-0BA0	6ED1 055-1HB00-0BA0	6ED1 055-1MB00-0BA1	6ED1 055-1FB00-0BA1
Supply voltages				
Rated value				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
 Permissible range, lower limit (DC) 	20.4 V	20.4 V	10.8 V	100 V
 Permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V	253 V
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
 Permissible range, lower limit (AC) 		20.4 V		85 V
 Permissible range, upper limit (AC) 		26.4 V		265 V
Digital inputs				
Number of digital inputs	4	4	4	4
Digital outputs				
Number of digital outputs	4	4; Relay	4; Relay	4; Relay
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Relay outputs				
Switching capacity of contacts				
with inductive load, max.		3 A	3 A	3 A
 with resistive load, max. 		5 A	5 A	5 A
 thermal continuous current, max. 	0.3 A			
EMC				
Emission of radio interference acc. to EN 55 011				
 Emission of radio inter- ference acc. to EN 55 011 (limit value class B) 	Yes	Yes	Yes	Yes

LOGO! modular expansion modules

	6ED1 055-1CB00-0BA0	6ED1 055-1HB00-0BA0	6ED1 055-1MB00-0BA1	6ED1 055-1FB00-0BA1
Environmental requirements				
Operating temperature				
• Min.	0 °C	0 °C	0 °C	0 °C
• Max.	55 °C	55 °C	55 °C	55 °C
Degree of protection				
IP20	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CSA approval	Yes	Yes	Yes	Yes
Developed according to IEC1131	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
According to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
• Width	36 mm; 2 DU			
 Height 	90 mm	90 mm	90 mm	90 mm
• Depth	55 mm	55 mm	55 mm	55 mm

	6ED1 055-1CB10-0BA0	6ED1 055-1NB10-0BA0	6ED1 055-1FB10-0BA0
Supply voltages			
Rated value			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
• Permissible range, lower limit (DC)	20.4 V	20.4 V	100 V
• Permissible range, upper limit (DC)	28.8 V	28.8 V	253 V
• 115 V AC			Yes
• 230 V AC			Yes
• Permissible range, lower limit (AC)			85 V
• Permissible range, upper limit (AC)			265 V
Permissible frequency range,			47 Hz
lower limit			C2.1.I-
 Permissible frequency range, upper limit 			63 Hz
Digital inputs			
Number of digital inputs	8	8	8
Input voltage			
• for signal "0"	< 5 V DC	< 5 V DC	< 40 V AC; < 30 V DC
• for signal "1"	> 12 V DC	> 12 V DC	> 79 V AC; > 79 V DC
Input current			
• for signal "0", max. (permissible	1 mA	1 mA	0.03 mA
quiescent current)			
• for signal "1", typ.	2 mA	2 mA	0.08 mA
Input delay (for rated value of input			
voltage)			
• for standard inputs			
- at "0" to "1", max.	1.5 ms	1.5 ms	50 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	50 ms

LOGO! modular expansion modules

	6ED1 055-1CB10-0BA0	6ED1 055-1NB10-0BA0	6ED1 055-1FB10-0BA0
Digital outputs Number of digital outputs	8	8; Relay	8; Relay
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	external fusing necessary
Lamp load, max.		1 000 W; 500 W at 115 V AC	1 000 W; 500 W at 115 V AC
Controlling a digital input	Yes	Yes	Yes
Parallel switching of 2 outputs • for increased power	No	No	No
Switching frequency • with resistive load, max. • with inductive load, max. • mechanical, max.	10 Hz 0.5 Hz	2 Hz 0.5 Hz 10 Hz	2 Hz 0.5 Hz 10 Hz
Relay outputs Switching capacity of contacts with inductive load, max. with resistive load, max. thermal continuous current, max.	0.3 A	3 A 5 A	3 A 5 A
EMC Emission of radio interference acc. to EN 55 011 • Emission of radio interference acc. to EN 55 011 (limit value class B)	Yes	Yes	Yes
Environmental requirements Operating temperature • Min. • Max.	0 °C 55 °C	0 °C 55 °C	0 °C 55 °C
Degree of protection	Yes	Yes	Yes
Standards, approvals, certificates CSA approval	Yes	Yes	Yes
Developed according to IEC1131	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
According to VDE 0631	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
Dimensions and weight Dimensions • Mounting • Width • Height • Depth	on 35 mm DIN rail, 4 spacing units wide 72 mm; 4 DU 90 mm 53 mm	on 35 mm DIN rail, 4 spacing units wide 72 mm; 4 DU 90 mm 53 mm	on DIN rail 25 mm, 4 module spaces wide 72 mm; 4 DU 90 mm 53 mm

	6ED1 055-1MA00-0BA0	6ED1 055-1MD00-0BA1
Product type designation		LOGO! AM2 RTD
Supply voltages		
Rated value		
• 12 V DC	Yes	Yes; 10,8 28.8 V DC
• 24 V DC	Yes	Yes; 10.8 28.8 V DC

LOGO! modular expansion modules

	6ED1 055-1MA00-0BA0	6ED1 055-1MD00-0BA1
Analog inputs		
Number of analog inputs	2	2; 2 or 3 wire connection
Input ranges		
Voltage	Yes	
• Current	Yes	
Resistance thermometer		Yes; for PT100/PT1000 sensors
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
EMC		
Emission of radio interference acc. to EN 55 011		
 Emission of radio interference acc. to EN 55 011 (limit value class B) 	Yes	Yes; Radio interference suppression according to EN55011, limit value class B
Environmental requirements		
Operating temperature		
• Min.	0 °C	0 °C
• Max.	55 °C	55 °C
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CSA approval	Yes	Yes; C22.2 Number 142
Developed according to IEC1131	Yes	Yes; EN 61131-2 (IEC 1131-2)
FM approval	Yes	Yes; FM-Standards No. 3611, 3600, 3810 Class I, Division 2, Group A, B, C, D
According to VDE 0631	Yes	
Marine approval	Yes	Yes; ABS, BV, DNV, GL, LRS, Class NK
UL approval	Yes	Yes; UL 508
Dimensions and weight		
Dimensions		
Mounting	on 35 mm DIN rail, 2 spacing units wide	
• Width	36 mm	36 mm
• Height	90 mm	90 mm
• Depth	55 mm	53 mm

6ED1 055-1MM00-0BA1
No
Yes
2
Yes
Yes; Radio interference suppression according to EN55011, limit value class B
0 °C
55 °C

	6ED1 055-1MM00-0BA1
Degree of protection	
IP20	Yes
Standards, approvals, certificates	
CSA approval	Yes
Developed according to IEC1131	Yes
FM approval	Yes
According to VDE 0631	Yes
Marine approval	Yes
UL approval	Yes
Dimensions and weight	
Dimensions	
Mounting	on 35 mm DIN rail, 2 spacing units wide
• Width	36 mm
Height	90 mm
• Depth	55 mm

LOGO! modular expansion modules

Ordering data	Order No.		Order No.
LOGO! DM8 24	6ED1 055-1CB00-0BA0	Accessories	
Supply voltage 24 V DC, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A		LOGO! Manual German	6ED1 050-1AA00-0AE7
LOGO! DM16 24	6ED1 055-1CB10-0BA0	English	6ED1 050-1AA00-0BE7
Supply voltage 24 V DC,		French	6ED1 050-1AA00-0CE7
8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A		Spanish	6ED1 050-1AA00-0DE7
LOGO! DM8 12/24R	6ED1 055-1MB00-0BA1	Italian	6ED1 050-1AA00-0EE7
Supply voltage 12/24 V DC,	0251 000 1111500 05/(1	Chinese	6ED1 050-1AA00-0KE7
4 digital inputs 12/24 V DC,		LOGO! memory card	6ED1 056-1DA00-0BA0
4 relay outputs 5 A	6ED1 055-1HB00-0BA0	for copying, with know-how protection	
Supply voltage24 V AC/DC,	0ED1 033-1HB00-0BA0	LOGO!Soft Comfort V6.0	6ED1 058-0BA02-0YA0
4 digital inputs 24 V AC/DC, 4 relay outputs 5 A		For programming on the PC in LAD/FBD; executes on Windows	
LOGO! DM16 24R	6ED1 055-1NB10-0BA0	98 SE and higher, Linux, MAC OSX; on CD-ROM	
Supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 relay outputs 5 A		LOGO!Soft Comfort V6.0 Jupgrade	6ED1 058-0CA02-0YE0
LOGO! DM8 230R	6ED1 055-1FB00-0BA1	Upgrade from V1.0 to V6.0	
Supply voltage 115/230 V AC/DC, 4 digital inputs 115/230 V AC/DC, 4 relay outputs 5 A		LOGO! PC cable For program transfer between LOGO! and PC	6ED1 057-1AA00-0BA0
LOGO! DM16 230R	6ED1 055-1FB10-0BA0	2000. 41010	
Supply voltage 115/230 V AC/DC, 8 digital inputs 115/230 V AC/DC, 8 relay outputs 5 A			
LOGO! AM2	6ED1 055-1MA00-0BA0		
Supply voltage 12/24 V DC, two analog inputs 0 10 V or 0 20 mA, 10-bit resolution			
LOGO! AM2 PT 100	6ED1 055-1MD00-0BA1		
Supply voltage 12/24 V DC, 2 analog inputs Pt100, temper- ature range -50 °C 200 °C			
LOGO! AM2 AQ	6ED1 055-1MM00-0BA1		
Supply voltage 24 V DC, 2 analog outputs 0 to 10 V, 0/4 to 20 mA			

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS LOGO! modular expansion modules

Overview



- Expansion modules for connection to LOGO! Modular
- With digital inputs and outputs, analog inputs, or analog outputs

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS LOGO! DM8 24				
Order No.	6AG1 055-1CB00-2BY0	6AG1 055-1CB00-2XB0		
Order No. based on	6ED1 055-1CB00-0BA0			
Ambient temperature range	-40 +70 °C	-25 +70 °C		
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS LOGO! DM8 24			
Order No.	6AG1 055-1PB00-2BY0	6AG1 055-1PB00-2XB0	
Order No. based on	6ED1 055-1CB00-0BA0	6ED1 055-1CB00-0BA0	
Ambient temperature range	-40 +70 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS LOGO! DM8 24 R			
Order Nor	6AG1 055-1HB00-2BY0	6AG1 055-1HB00-2XB0	
Order No. based on	6ED1 055-1HB00-0BA0	6ED1 055-1HB00-0BA0	
Ambient temperature range	-40 +70 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

Order No.	6AG1 055-1MB00-2BY1	6AG1 055-1MB00-2XB1	
Order No. based on	6ED1 055-1MB00-0BA1		
Ambient temperature range	-40 +70 °C	-40 +70 °C -25 +70 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS LOGO! modular expansion modules

Overview (continued)

SIPLUS LOGO! DM8 230R			
Order No.	6AG1 055-1FB00-2BY1	6AG1 055-1FB00-2XB1	
Order No. based on	6ED1 055-1FB00-0BA1	6ED1 055-1FB00-0BA1	
Ambient temperature range	-40 +70 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS LOGO! AM2			
Order number	6AG1 055-1MA00-2BY0	6AG1055-1MA00-2XB0	
Order No. based on	6ED1 055-1MA00-0BA0	6ED1 055-1MA00-0BA0	
Ambient temperature range	-40 +70 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.	

	SIPLUS LOGO! AM2 AQ	SIPLUS LOGO! DM16 24R	
Order number	6AG1 055-1MM00-2BY1	6AG1 055-1NB10-2BA0	
Order No. based on	6ED1 055-1MM00-0BA1	6ED1 055-1CB10-0BA0	
Ambient temperature range	-40 +70 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.	

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA– S71.04 severity level G1; G2; G3; GX ¹) ²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾

Ambient conditions

Air pressure (depending on the highest positive temperature range specified)

1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS LOGO! modular expansion modules

Ordering data	Order No.		Order No.
SIPLUS LOGO! DM8 24		SIPLUS LOGO! AM2	
(extended temperature range and medial exposure)		(extended temperature range and medial exposure)	
24 V DC power supply, four 24 V DC digital inputs, four 24 V DC digital outputs, 0.3 A		12/24 V DC power supply, two analog inputs 0 10 V or 0 20 mA, 10 bit resolution	
Temperature range -25 +70 °C H	6AG1 055-1CB00-2XB0	Temperature range -25 +70 °C H	6AG1 055-1MA00-2XB0
Temperature range -40 +70 °C L	6AG1 055-1CB00-2BY0	Temperature range -40 +70 °C L	6AG1 055-1MA00-2BY0
SIPLUS LOGO! DM8 12/24		SIPLUS LOGO! AM2 AQ	
(extended temperature range and medial exposure)		(extended temperature range and medial exposure)	
12/24 V DC power supply, four 12/24 V DC digital inputs, four 24 V DC digital outputs, 0.3 A		24 V DC power supply, 2x analog inputs 0 10 V, 0/4 20 mA, 10-bit resolution	
Temperature range -25 +70 °C L	6AG1 055-1PB00-2XB0	Temperature range -40 +70 °C L	6AG1 055-1MM00-2BY1
Temperature range -40 +70 °C L	6AG1 055-1PB00-2BY0	SIPLUS LOGO! DM16 24R	
SIPLUS LOGO! DM8 24R		(extended temperature range and	
(extended temperature range and medial exposure)		medial exposure) Supply voltage 24 V DC,	
24 V AC/DC power supply, four 24 V AC/DC digital inputs,		8x digital outputs 24 V DC, 8x relay outputs 5 A	
four 5 A relay outputs		Temperature range -25 +70 °C L	6AG1 055-1NB10-2BA0
Temperature range -25 +70 °C A		Accessories	
Temperature range -40 +70 °C L	6AG1 055-1HB00-2BY0	SIPLUS Upmiter upstream L	6AG1 053-1AA00-2AA0
SIPLUS LOGO! DM8 12/24R		for reliable operation at the	
(extended temperature range and medial exposure)		battery of combustion engines	0.1000
12/24 V DC power supply, four 12/24 V DC digital inputs, four 5 A relay outputs		Additional accessories	See LOGO! modular pure versions, page 2/17
Temperature range -25 +70 °C H	6AG1 055-1MB00-2XB1		
Temperature range -40 +70 °C L	6AG1 055-1MB00-2BY1		
SIPLUS LOGO! DM8 230R			
(extended temperature range and medial exposure)			
115/230 V AC/DC power supply, four 115/230 V AC/DC digital inputs, four 5 A relay outputs			
Temperature range -25 +70 °C A	6AG1 055-1FB00-2XB1		
Temperature range -40 +70 °C L	6AG1 055-1FB00-2BY1		

A: Subject to export regulations AL: 91999 and ECCN: 4A994X H: Subject to export regulations AL: 91999 and ECCN: EAR99H L: Subject to export regulations AL: 91999 and ECCN: N

LOGO! CM EIB/KNX communication module

Overview



- Expansion module for LOGO! basic versions
- For communication between the LOGO! master and external EIB components through EIB

Technical specifications

CM EIB/KNX	
Supply voltage	24 V AC/DC
Inputs, max.	16 DI/12 DO/8 AI/2 AO
Outputs, max.	16 digital
Continuous current	25 mA
Short-circuit protection	External fuse protection is required
Integrated time switches/power reserve	-
Ambient temperature	0 +55°C
RI specification	To EN 55 011 (limit value class B)
Degree of protection	IP20
Certification	to VDE 0631, IEC61131-2, cULus, FM
Mounting	On DIN rail 35 mm, 2 module widths wide
Dimensions (W x H x D) in mm	36 (2 MW) × 90 × 55

Ordering data	Order No.
LOGO! CM EIB KNX communi- cation module	6BK1 700-0BA00-0AA1
for connection to <i>EIB</i> , supply voltage 24 V DC	
Accessories	
LOGO! manual	
German	6ED1 050-1AA00-0AE7
English	6ED1 050-1AA00-0BE7
French	6ED1 050-1AA00-0CE7
Spanish	6ED1 050-1AA00-0DE7
Italian	6ED1 050-1AA00-0EE7
Chinese	6ED1 050-1AA00-0KE7

I: Subject to export regulations AL: N and ECCN: EAR99H

LOGO! logic module

LOGO! modular

AS-Interface connection for LOGO!

Overview

Each LOGO! can now be connected to the AS-Interface



An intelligent slave can be integrated into the AS-Interface system with the AS-Interface for LOGO!. The modular interface allows the different basic units to be integrated into the system depending on the required functionality. In addition, the functionality can be quickly and simply adapted to changed requirements by replacing the basic unit.

The interface provides four inputs and four outputs for the system. These I/Os, however, are not implemented in hardware, but are only virtually available via the interface.

Technical specifications

Supply oltage	24 V DC
nputs outputs	4 / 4 (virtual inputs / outputs)
us connection	AS-Interface according to specification
Ambient temperature	0 +55 °C
egree of protection	IP20
ounting	Onto standard mounting rail
imensions x x	36 x 90 x 58 mm
ndications of the E s	
Е	
 Green 	Status
• Red	No data traffic
 Flashes red/yellow 	Zero address

Ordering data

Order No.

AS-Interface connection for

3RK1 400-0CE10-0AA2

F: Subject to export regulations AL: N and ECCN: EAR99

LOGO!Power

Overview



The LOGO!Power miniature power supply units from Siemens are the perfect solution for many applications – their flat, step-shaped profile makes them perfectly suited for distribution boards, for example. Even more fields of application in the lower

performance range are made possible by: wide-range input, radio interference class B, the extensive temperature range as well as numerous certificates.

Main product features:

- 2 performance classes with 5 V, 12 V, and 15 V each
- 3 performance classes with 24 V
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range
- Low no-load loss
- Wide-range input from 85 V to 264 V AC
- Operation on DC voltage of 110 V to 300 V
- Constant current for connection of loads with high inrush current
- Adjustable output voltage
- Green LED for "Output voltage OK"
- Temperature range from -20 °C to +70 °C
- Numerous certificates, such as CE, cULus, FM, GL and ATEX

Technical specifications LOGO!Power 5 V

Power supply, type	5 V/3 A	5 V/6.3 A
Order No.	6EP1 311-1SH03	6EP1 311-1SH13
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage U _{in rated}	100-240 V AC Wide-range input	100-240 V AC Wide-range input
Voltage range	85 264 V AC 110 300 V DC	85 264 V AC 110 300 V DC
Overvoltage strength	2.3 x <i>U</i> _{in rated} , 1.3 ms	2.3 x <i>U</i> _{in rated} , 1.3 ms
Mains buffering at I _{out rated}	$>$ 40 ms at U_{in} = 187 V	$>$ 40 ms at U_{in} = 187 V
Rated line frequency, rated line frequency range	50/60 Hz; 47 63 Hz	50/60 Hz; 47 63 Hz
Rated current I _{in rated}	0.36-0.22 A	0.71-0.37 A
Switch-on current limitation (+25 °C)	< 26 A	< 50 A
₽t .	$< 0.8 \text{ A}^2 \text{s}$	< 3 A ² s
Built-in incoming fuse	Internal	Internal
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C	16 A or higher, Characteristic B or 10 A or higher, Characteristic C
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{\text{out rated}}$	5 V DC	5 V DC
Total tolerance, static Static line compensation Static load compensation	±3 % Approx. 0.2% Approx. 1.5%	±3 % Approx. 0.1% Approx. 2%
Residual ripple	$< 100 \text{ mV}_{pp} \text{ (typ. } 10 \text{ mV}_{pp} \text{)}$	$< 100 \text{ mV}_{pp} \text{ (typ. 15 mV}_{pp})$
Spikes (bandwidth approx. 20 MHz)	$< 100 \text{ mV}_{pp} \text{ (typ. 20 mV}_{pp})$	$< 100 \text{ mV}_{pp} \text{ (typ. } 70 \text{ mV}_{pp} \text{)}$
Adjustment range	4.6 5.4 V	4.6 5.4 V
Status indicator	5 V OK = green LED	5 V OK = green LED
On/Off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay / voltage rise	< 0.5 s/typ. 15 ms	< 0.5 s/typ. 10 ms
Rated current I _{out rated}	3 A	6.3 A
Current range up to +55 °C • Derating	0 3 A 0 2.1 A (up to +70 °C)	0 6.3 A 0 4.4 A (up to +70 °C)
	0 2.177 (ap to 170 0)	0 1.17 (ap to 170 0)

LOGO!Power

Technical specifications LOGO!Power 5 V (continued)

Paragramma trans	<u> </u>	E.V.C.O.A
Power supply, type Order No.	5 V/3 A 6EP1 311-1SH03	5 V/6.3 A 6EP1 311-1SH13
Efficiency	0EF1311-13H03	0EF1311-13H13
•	Approx. 77%	Approx 929/
Efficiency at Uout rated, Jour rated	• • •	Approx. 83% Approx. 6 W
Power loss at <i>U</i> _{out rated} , <i>I</i> _{out rated}	Approx. 4 W	Арргох. 6 W
Closed-loop control	.0.2.9/ 11	.029/11
Dyn. line compensation (<i>U</i> _{in rated} ±15%)	< 0.2 % <i>U</i> _{out}	< 0.2 % <i>U</i> _{out}
Dynamic load compensation (I _{out} : 10/90/10 %)	Typ. ±3% U _{out}	Typ. ±3% U _{out}
Load step settling time		
• 10 to 90%	Typ. 2 ms	Typ. 2 ms
• 90 to 10%	Typ. 2 ms	Typ. 2 ms
Protection and monitoring	T 00A	T 00A
Current limitation	Typ. 3.8 A	Typ. 8.2 A
Short-circuit protection	Constant current characteristic	Constant current characteristic
Sustained short-circuit current rms value	< 5 A	< 10 A
Safety		
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950 and EN 50178	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950 and EN 50178
Safety class	Class II (without protective conductor)	Class II (without protective conductor)
Safety test	Yes; CB scheme	Yes; CB scheme
CE marking	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), cURus-recognized (UL 60950, CSA C22.2 No. 60950)	cULus-listed (UL 508, CSA C22.2 No. 107.1), cURus-recognized (UL 60950, CSA C22.2 No. 60950)
Protection against explosion	ATEX (available soon)	ATEX (available soon)
FM approval	Class I Div. 2, Group A, B, C, D T4	Class I Div. 2, Group A, B, C, D T4
Marine approval	GL (available soon)	GL (available soon)
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature range	-20 +70 °C with natural convection	-20 +70 °C with natural convection
Transport and storage temperature range	-40 +85 °C	-40 +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation	Climate class 3K3 according to EN 60721, no condensation
Mechanics		
Supply-input connections L1, N Connections • Output +	Solid/finely-stranded per screw-type terminal for 0.5 mm 2.5 mm ² 2 screw terminals each for 0.5 2.5 mm ²	Solid/finely-stranded per screw-type terminal for 0.5 mm 2.5 mm ² 2 screw terminals each for 0.5 2.5 mm ²
• Output -		
Dimensions (W x H x D) in mm	54 x 90 x 55	72 x 90 x 55
Weight, approx.	0.17 kg	0.25 kg
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15	Can be snapped onto standard mounting rail EN 60715 35x7.5/15

LOGO!Power

Power supply, type	12 V/1.9 A	12 V/4.5 A
Order No.	6EP1 321-1SH03	6EP1 322-1SH03
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $U_{ m in\ rated}$	100-240 V AC Wide-range input	100-240 V AC Wide-range input
Voltage range	85 264 V AC 110 300 V DC	85 264 V AC 110 300 V DC
Overvoltage resistance	2.3 x <i>U</i> _{in rated} , 1.3 ms	2.3 x <i>U</i> _{in rated} , 1.3 ms
Mains buffering at I _{out rated}	$>$ 40 ms at $U_{in} = 187 \text{ V}$	> 40 ms at U_{in} = 187 V
Rated line frequency, rated line-frequency range	50/60 Hz; 47 63 Hz	50/60 Hz; 47 63 Hz
Rated current value I _{in rated}	0.53-0.3 A	1.13-0.61 A
Switch-on current limitation (+25 °C)	< 26 A	< 54 A
Pt	$< 0.8 \text{ A}^2 \text{s}$	$< 3 A^2 s$
Built-in incoming fuse	Internal	Internal
Recommended miniature circuit breaker (IEC 898) n the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C	16 A or higher, Characteristic B or 10 A or higher, Characteristic C
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage value <i>U</i> out rated	12 V DC	12 V DC
Total tolerance, static Static mains compensation Static load smoothing	±3 % Approx. 0.2 % Approx. 1.5 %	±3 % Approx. 0.1 % Approx. 1.5 %
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$
Spikes (bandwidth approx. 20 MHz)	< 300 mV _{pp} (typ. 20 mV _{pp})	< 300 mV _{pp} (typ. 70 mV _{pp})
Adjustment range	10.5 16.1 V	10.5 16.1 V
Status indicator	Green LED for 12 V OK	Green LED for 12 V OK
On/Off behavior	No overshoot of U_{out} (soft start)	No overshoot of Uout (soft start)
Startup delay / voltage rise	< 0.5 s/typ. 15 ms	< 0.5 s/typ. 15 ms
Rated current value I _{out rated}	1.9 A	4.5 A
Current range up to +55 °C • Derating	0 1.9 A 0 1.3 A (up to +70 °C)	0 4.5 A 0 3.1 A (up to +70 °C)
Parallel switching for enhanced performance	Yes, 2 units	Yes, 2 units
Efficiency		
Efficiency at <i>U</i> out rated, <i>I</i> out rated	Typ. 80 %	Typ. 85 %
Heat loss at <i>U</i> _{out rated} , <i>I</i> _{out rated}	Typ. 5 W	Typ. 10 W
Closed-loop control		
Dyn. mains compensation (<i>U</i> _{in rated} ±15 %)	< 0.2 % <i>U</i> _{out}	< 0.2 % <i>U</i> _{out}
Dynamic load smoothing (Iout: 10/90/10%)	Typ. ±3 % <i>U</i> _{out}	Typ. ±4 % <i>U</i> _{out}
Load step settling time 10 to 90 %	Approx. 1 ms	Approx. 1 ms
• 90 to 10 %	Approx. 1 ms	Approx. 1 ms
Protection and monitoring	T 0.0 A	T
Current limitation	Typ. 2.8 A	Typ. 5.8 A
Short-circuit protection	Constant current characteristic	Constant current characteristic
Sustained short-circuit current rms value	< 4 A	< 8 A
Safety Primary/secondary isolation	Yes, safety extra low output voltage <i>U</i> _{out} according to EN 60950 and EN 50178	Yes, safety extra low output voltage U_{out} according to EN 60950 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
German Technical Inspectorate approval CE mark	Yes; CB scheme Yes	Yes; CB scheme Yes

LOGO!Power

Technical specifications LOGO!Power 12 V (continued)

Power supply, type	12 V/1.9 A	12 V/4.5 A
Order No.	6EP1 321-1SH03	6EP1 322-1SH03
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1); cURus-recognized (UL 60950, CSA C22.2 No. 60950)	cULus-listed (UL 508, CSA C22.2 No. 107.1); cURus-recognized (UL 60950, CSA C22.2 No. 60950)
Explosion protection	ATEX (available soon)	ATEX (available soon)
FM approval	Class I Div. 2, Group A, B, C, D T4	Class I Div. 2, Group A, B, C, D T4
Marine approval	GL, ABS (available soon)	GL, ABS (available soon)
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature range	-20 +70 °C with natural convection	-20 +70 °C with natural convection
Transport and storage temperature range	-40 +85 °C	-40 +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation	Climate class 3K3 according to EN 60721, no condensation
Mechanics		
Supply-input connections L1, N	1 screw terminal each for 0.5 mm 2.5 mm ² single-core/finely stranded	1 screw terminal each for 0.5 mm 2.5 mm ² single-core/finely stranded
Connections • Output + • Output -	2 screw terminals each for 0.5 2.5 mm ²	2 screw terminals each for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	54 x 90 x 55	72 x 90 x 55
Weight, approx.	Approx. 0.17 kg	Approx. 0.25 kg
Installation	Snaps onto standard mounting rail EN 60715 35x7.5/15	Snaps onto standard mounting rail EN 60715 35x7.5/15

Technical specifications LOGO!Power 15 V

Power supply, type	15 V/1.9 A	15 V/4 A
Order No.	6EP1 351-1SH03	6EP1 352-1SH03
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $U_{\text{in rated}}$	100-240 V AC Wide-range input	100-240 V AC Wide-range input
Voltage range	85 264 V AC 110 300 V DC	85 264 V AC 110 300 V DC
Overvoltage resistance	2.3 x <i>U</i> _{in rated} , 1.3 ms	2.3 x <i>U</i> _{in rated} , 1.3 ms
Mains buffering at I _{out rated}	$>$ 40 ms at $U_{\rm in}$ = 187 V	$>$ 40 ms at U_{in} = 187 V
Rated line frequency, rated line-frequency range	50/60 Hz; 47 63 Hz	50/60 Hz; 47 63 Hz
Rated current value I _{in rated}	0.63-0.33 A	1.24-0.68 A
Switch-on current limit (+25 °C)	< 26 A	< 54 A
ρ_t	$< 0.8 A^2 s$	< 3 A ² s
Built-in incoming fuse	Internal	Internal
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C	16 A or higher, Characteristic B or 10 A or higher, Characteristic C
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage Uout rated	15 V DC	15 V DC
Total tolerance, static Static mains compensation Static load smoothing	±3 % Approx. 0.1 % Approx. 1.5 %	±3 % Approx. 0.1 % Approx. 1.5 %
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$

LOGO!Power

Technical specifications LOGO!Power 15 V (continued)

Power supply, type Order No.	15 V/1.9 A 6EP1 351-1SH03	15 V/4 A 6EP1 352-1SH03
Spikes (bandwidth approx. 20 MHz)	< 300 mV _{pp} (typ. 30 mV _{pp})	< 300 mV _{pp} (typ. 70 mV _{pp})
Adjustment range	10.5 16.1 V	10.5 16.1 V
Status indicator	Green LED for 15 V OK	Green LED for 15 V OK
On/Off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay / voltage rise	< 0.5 s/typ. 15 ms	< 0.5 s/typ. 15 ms
Rated current value Iin rated	1.9 A	4 A
Current range up to +55 °C ◆ Derating	0 1.9 A 0 1.3 A (up to +70 °C)	0 4 A 0 2.8 A (up to +70 °C)
Parallel switching for enhanced performance	Yes, 2 units	Yes, 2 units
Efficiency		
Efficiency at Uout rated, Iout rated	Approx. 81 %	Approx. 85 %
Heat loss at $U_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 7 W	Approx. 11 W
Closed-loop control		
Dyn. mains compensation (<i>U</i> _{in rated} ±15%)	< 0.2 % <i>U</i> _{out}	< 0,2 % <i>U</i> _{out}
Dynamic load smoothing (I _{out} : 10/90/10%)	Typ. ±2.8 % <i>U</i> _{out}	Typ. ±3 % <i>U</i> _{out}
Load step settling time • 10 to 90 % • 90 to 10 %	Typ. 1 ms Typ. 1 ms	Typ. 1 ms Typ. 1 ms
Protection and monitoring		1)[0.1.116
Current limitation	Typ. 2.7 A	Typ. 5.7 A
Short-circuit protection	Constant current characteristic	Constant current characteristic
Sustained short-circuit current rms value	< 4 A	< 8 A
Safety		
Primary/secondary isolation	Yes, safety extra low output voltage U_{out} according to EN 60950 and EN 50178	Yes, safety extra low output voltage <i>U</i> _{out} according to EN 60950 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
Safety test	Yes; CB scheme	Yes; CB scheme
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1); cURus-recognized (UL 60950, CSA C22.2 No. 60950)	cULus-listed (UL 508, CSA C22.2 No. 107.1); cURus-recognized (UL 60950, CSA C22.2 No. 60950)
Explosion protection	ATEX (available soon)	ATEX (available soon)
FM approval	Class I Div. 2, Group A, B, C, D T4	Class I Div. 2, Group A, B, C, D T4
Marine approval	GL (available soon)	GL (available soon)
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature range	-20 +70 °C with natural convection	-20 +70 °C with natural convection
Transport and storage temperature range	-40 +85 °C	-40 +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation	Climate class 3K3 according to EN 60721, no condensation

LOGO!Power

Technical specifications LOGO!Power 15 V (continued)

Power supply, type	15 V/1.9 A	15 V/4 A
Order No.	6EP1 351-1SH03	6EP1 352-1SH03
Mechanics		
Supply-input connections L1, N	1 screw terminal each for 0.5 mm 2.5 mm ² single-core/finely stranded	1 screw terminal each for 0.5 mm 2.5 mm ² single-core/finely stranded
Connections • Output + • Output -	2 screw terminals each for 0.5 2.5 mm ²	2 screw terminals each for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	54 x 90 x 55	72 x 90 x 55
Weight, approx.	Approx. 0.17 kg	Approx. 0.25 kg
Installation	Snaps onto standard mounting rail EN 60715 35x7.5/15	Snaps onto standard mounting rail EN 60715 35x7.5/15

Technical specifications LOGO!Power 24 V/1.3 A

Technical specifications LOGO: Fower 24 V/1.3 A			
Power supply, type	24 V/1.3 A		
Order No.	6EP1 331-1SH03		
Input	1-phase AC or DC		
Rated voltage U _{in rated}	100-240 V AC Wide-range input		
Voltage range	85 264 V AC		
	110 300 V DC		
Overvoltage strength	2.3 x <i>U</i> _{in rated} , 1.3 ms		
Mains buffering at I _{out rated}	$>$ 40 ms at U_{in} = 187 V		
Rated line frequency, rated line-frequency range	50/60 Hz; 47 63 Hz		
Rated current Iin rated	0.7-0.35 A		
Switch-on current limitation (+25 °C)	< 30 A		
l ² t	$< 0.8 A^2 s$		
Built-in incoming fuse	Internal		
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C		
Output	Controlled, isolated DC voltage		
Rated voltage U _{out rated}	24 V DC		
Total tolerance	±3 %		
Static mains compensationStatic load smoothing	Approx. 0.1% Approx. 1.5%		
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$		
Spikes (bandwidth approx. 20 MHz)	$< 300 \text{ mV}_{pp} \text{ (typ. 20 mV}_{pp})$		
Adjustment range	22.2 26.4 V		
Status indicator	24 V OK = green LED		
On/Off behavior	No overshoot of U_{out} (soft start)		
Startup delay / voltage rise	< 0.5 s/typ. 15 ms		
Rated current I _{out rated}	1.3 A		
Current range			
Current range up to +60 °CDerating	0 1.3 A (up to +55°C) 0 0.9 A (up to +70°C)		
Parallel switching for enhanced performance	Yes, 2 units		
Efficiency			
Efficiency at Uout rated, Iout rated	Approx. 83%		
Power loss at Uout rated, Iout rated	Approx. 6.3 W		

Power supply, type Order No.	24 V/1.3 A 6EP1 331-1SH03
Closed-loop control	
Dyn. mains compensation (<i>U</i> _{in rated} ±15%)	< 0,2 % U _{out}
Dynamic load smoothing (I _{out} : 50/100/50 %)	Typ. ±1% <i>U</i> _{out} (<i>I</i> _{out} : 10/90/10 %)
Load step settling time • 50 to 100% • 100 to 50%	Typ. 1 ms (10 to 90%) Typ. 1 ms (90 to 10%)
Protection and monitoring	
Output overvoltage protection	Yes, according to EN 60950
Current limitation	Typ. 1.7 A
Short-circuit protection	Constant current character- istic
Sustained short-circuit current rms value	< 4 A
Overload/short-circuit indicator	
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178
Safety class	Class II (without protective conductor)
Leakage current	
Safety test	Yes; CB scheme
CE marking	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), cURus- recognized (UL 60950, CSA C22.2 No. 60950)
Protection against explosion	ATEX EX II 3G Ex nA IIC T3
FM approval	Class I Div. 2, Group A, B, C, D T4
Marine approval	GL, ABS
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	Not applicable
Noise immunity	EN 61000-6-2

LOGO!Power

Technical specifications LOGO!Power 24 V/1.3 A (continued)

Power supply, type	24 V/1.3 A
Order No.	6EP1 331-1SH03
Operating data	
Ambient temperature range	-20 +70 °C with natural convection
Transport and storage temperature range	-40 +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections	
 Supply input L, N, PE DC input: L+1, M1, PE 	Solid/finely-stranded per screw-type terminal (L, N) for 0.5 mm 2.5 mm ²
• Output +	2 screw-type terminals for 0.5 2.5 mm ²
• Output -	2 screw-type terminals for 0.5 2.5 mm ²

24 V/1.3 A
6EP1 331-1SH03
54 x 90 x 55
Approx. 0.17 kg
Can be snapped onto standard mounting rail EN 60715 35x7.5/15
-

Technical specifications LOGO!Power 24 V/2.5 A

Power supply, type	24 V/2.5 A
Order No	6EP1 332-1SH43
Input	1-phase AC or DC
Rated voltage $U_{\text{in rated}}$	100-240 V AC Wide-range input
Voltage range	85 264 V AC 110 300 V DC
Overvoltage strength	2.3 x <i>U</i> _{in rated} , 1.3 ms
Mains buffering at I _{out rated}	$>$ 40 ms at $U_{in} = 187 \text{ V}$
Rated line frequency, rated line-frequency range	50/60 Hz; 47 63 Hz
Rated current Iin rated	1.22-0.66 A
Switch-on current limitation (+25 °C)	< 46 A
P_t	$< 3 A^2 s$
Built-in incoming fuse	Internal
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C
Output	Controlled, isolated DC voltage
Rated voltage Uout rated	24 V DC
Total tolerance • Static mains compensation • Static load smoothing	±3 % Approx. 0.1% Approx. 1.5%
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$
Spikes (bandwidth approx. 20 MHz)	$< 300 \text{ mV}_{pp} \text{ (typ. 50 mV}_{pp})$
Adjustment range	22.2 26.4 V
Status indicator	24 V OK = green LED
On/Off behavior	No overshoot of U_{out} (soft start)
Startup delay / voltage rise	< 0.5 s/typ. 10 ms
Rated current Iout rated	2.5 A
Current range • Current range up to +60 °C • Derating	0 2.5 A (up to +55°C) 0 1.75 A (up to +70°C)
Parallel switching for enhanced performance	Yes, 2 units

Power supply, type Order No	24 V/2.5 A 6EP1 332-1SH43	
Efficiency	<u> </u>	
Efficiency at <i>U</i> _{out rated} , <i>I</i> _{out rated}	Approx. 88%	
Power loss at $U_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 8 W	
Closed-loop control		
Dyn. mains compensation (<i>U</i> _{In rated} ±15%)	< 0,2 % <i>U</i> _{out}	
Dynamic load smoothing (I _{out} : 50/100/50 %)	Typ. ±2% <i>U</i> _{out} (<i>I</i> _{out} : 10/90/10 %)	
Load step settling time • 50 to 100% • 100 to 50%	Typ. 1 ms (10 to 90%) Typ. 1 ms (90 to 10%)	
Protection and monitoring		
Output overvoltage protection	Yes, according to EN 60950	
Current limitation	Typ. 3.3 A	
Short-circuit protection	Constant current character- istic	
Sustained short-circuit current rms value	Approx. 3.5 A	
Safety		
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178	
Safety class	Class II (without protective conductor)	
Leakage current	-	
Safety test	Yes; CB scheme	
CE marking	Yes	
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA	
. , ,	C22.2 No. 107.1), cURus- recognized (UL 60950, CSA C22.2 No. 60950)	
Protection against explosion	recognized (UL 60950,	
	recognized (UL 60950, CSA C22.2 No. 60950)	
Protection against explosion	recognized (UL 60950, CSA C22.2 No. 60950) ATEX EX II 3G Ex nA IIC T3 Class I Div. 2, Group A, B,	

LOGO!Power

Technical specifications LOGO!Power 24 V/2.5 A (continued)

Power supply, type	24 V/2.5 A
Order No	6EP1 332-1SH43
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	Not applicable
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	-20 +55 °C with natural convection
Transport and storage temperature range	-40 +70 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation

Power supply, type	24 V/2.5 A
Order No	6EP1 332-1SH43
Mechanics	
Connections	
 Supply input L, N, PE DC input: L+1, M1, PE 	Solid/finely-stranded per screw-type terminal (L, N) for 0.5 mm 2.5 mm ²
• Output +	2 screw-type terminals for 0.5 2.5 mm ²
• Output -	2 screw-type terminals for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	72 x 90 x 55
Weight, approx.	Approx. 0.25 kg
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15
Accessories	-

Technical specifications LOGO!Power 24 V/4 A

Technical specifications LOGO: Fower 24 V/4 A			
Power supply, type	24 V/4 A		
Order No.	6EP1 332-1SH52		
Input	1-phase AC or DC		
Rated voltage U _{in rated}	100-240 V AC Wide-range input		
Voltage range	85 264 V AC		
	110 300 V DC		
Overvoltage strength	2.3 x <i>U</i> _{in rated} , 1.3 ms		
Mains buffering at I _{out rated}	$>$ 40 ms at U_{in} = 187 V		
Rated line frequency, rated line-frequency range	50/60 Hz; 47 63 Hz		
Rated current I _{in rated}	1.95 to 0.97 A		
Switch-on current limitation (+25 °C)	< 30 A		
Pt .	$< 2.5 A^2 s$		
Built-in incoming fuse	Internal		
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C		
Output	Controlled, isolated DC voltage		
Rated voltage U _{out rated}	24 V DC		
Total tolerance	±3 %		
Static mains compensation	Approx. 0.1%		
Static load smoothing	Approx. 1.5%		
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 30 mV}_{pp})$		
Spikes (bandwidth approx. 20 MHz)	$< 300 \text{ mV}_{pp} \text{ (typ. 60 mV}_{pp})$		
Adjustment range	22.2 26.4 V		
Status indicator	24 V OK = green LED		
On/Off behavior	No overshoot of U_{out} (soft start)		
Startup delay / voltage rise	< 0.5 s/typ. 15 ms		

Power supply, type	24 V/4 A
Order No.	6EP1 332-1SH52
Rated current I _{out rated}	4 A
Current range	
• Current range up to +60 °C	0 4 A (up to +55°C)
Derating	0 2.8 A (up to +70°C)
Parallel switching for enhanced performance	Yes, 2 units
Efficiency	
Efficiency at Uout rated, Iout rated	Approx. 89%
Power loss at Uout rated, Iout rated	Approx. 12 W
Closed-loop control	
Dyn. mains compensation (<i>U</i> _{in rated} ±15%)	< 0,2 % <i>U</i> _{out}
Dynamic load smoothing (I _{out} : 50/100/50 %)	Typ. ±1.5% <i>U</i> _{out} (<i>I</i> _{out} : 10/90/10 %)
Load step settling time	
• 50 to 100%	Typ. 1 ms (10 to 90%)
• 100 to 50%	Typ. 1 ms (90 to 10%)
Protection and monitoring	
Output overvoltage protection	Yes, according to EN 60950
Current limitation	Typ. 5.2 A
Short-circuit protection	Constant current characteristic
Sustained short-circuit current rms value	< 10 A
Overload/short-circuit indicator	-
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178
Safety class	Class II (without protective conductor)

LOGO!Power

Technical specifications LOGO!Power 24 V/4 A (continued)

Power supply, type	24 V/4 A	Power supply,
Order No.	6EP1 332-1SH52	Order No.
Leakage current	-	Operating data
Safety test	Yes; CB scheme	Ambient tempe
CE marking	Yes	
UL/cUL (CSA) approval	cULus-listed (UL 508,	Transport and
	CSA C22.2 No. 107.1), cURus-recognized (UL 60950, CSA C22.2	Humidity class
	No. 60950)	Mechanics
Protection against explosion	ATEX EX II 3G Ex nA IIC T3	Connections
FM approval	Class I Div. 2, Group A, B, C, D T4	 Supply input DC input: L+
Marine approval	GL, ABS	- 0
Degree of protection (EN 60529)	IP20	• Output +
EMC		• Output -
Emitted interference	EN 55022 Class B	D:
Supply harmonics limitation	EN 61000-3-2	Dimensions (W
Noise immunity	EN 61000-6-2	Weight, approx Mounting
		Accessories

Power supply, type	24 V/4 A	
Order No.	6EP1 332-1SH52	
Operating data		
Ambient temperature range	-20 +70 °C with natural convection	
Transport and storage temperature range	-40 +85 °C	
Humidity class	Climate class 3K3 according to EN 60721, no condensation	
Mechanics		
Connections		
 Supply input L, N, PE DC input: L+1, M1, PE 	Solid/finely-stranded per screw-type terminal (L, N) for 0.5 mm 2.5 mm ²	
• Output +	2 screw terminals each for 0.5 2.5 mm ²	
• Output -	2 screw terminals each for 0.5 2.5 mm ²	
Dimensions (W x H x D) in mm	90 x 90 x 55	
Weight, approx.	Approx. 0.34 kg	
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15	
Accessories	-	

LOGO!Power

Ordering data	Order No.		Order No.
LOGO!Power 5 V		LOGO!Power 24 V/1.3 A	
Stabilized power supply; Output: 5 V DC/3 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 311-1SH03	Stabilized power supply; Output: 24 V DC/1.3 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 331-1SH03
Stabilized power supply; Output: 5 V DC/6.3 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 311-1SH13	LOGO!Power 24 V/2.5 A Stabilized power supply; Output: 24 V DC/2.5 A Input: 110 300 V AC; extended operating temperature	6EP1 332-1SH43
LOGO!Power 12 V		range: up to +70°C	
Stabilized power supply; Output: 12 V DC/1.9 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C Stabilized power supply;	6EP1 321-1SH03	LOGO!Power 24 V/4 A Stabilized power supply; Output: 24 V DC/4 A Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 332-1SH52
Output: 12 V DC/4.5 A Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 322-1SH03	range. up to +70 C	
LOGO!Power 15 V			
Stabilized power supply; Output: 15 V DC/1.9 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 351-1SH03		
Stabilized power supply; Output: 15 V DC/4 A • Input: 110 300 V AC; extended operating temperature range: up to +70°C	6EP1 352-1SH03		

More information

In addition to various power supply product lines, the perfectly coordinated complete SITOP range offers a unique range of add-on modules with which the 24 V power supply can be additionally protected against interference on the primary and secondary side – right up to all-round protection:

- Redundancy module for setting up a redundant power supply
- Uninterruptible 24 V power supplies with batteries or maintenance-free capacitors for continued operation in the event of a power failure
- Selectivity modules for electronic protection of 24 V branches from overload and short-circuit

You can find more information in Catalog KT 10.1 and in the Internet at $\,$

www.siemens.com/sitop

SIPLUS LOGO!Power

Overview

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 931-1SH02-2AA0	
Order No. based on	6EP1 331-1SH02	
Ambient temperature range	-25 °C to +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies exce for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA- S71.04 severity level G1; G2; G3; GX ^(1) 2)	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm
Threshold / limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Technical specifications

Technical specifications			
Power supply, type	24 V/1.3 A		
Order number	6EP1 331-1SH02		
Input	1-phase AC		
Rated voltage U _{in rated}	100 240 V AC Wide-range input		
Voltage range	85 264 V AC		
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms		
Mains buffering at I _{out rated}	$>$ 40 ms at U_{in} = 187 V		
Rated line frequency, rated line frequency range	50/60 Hz; 47 63 Hz		
Rated current I _{in rated}	0.7-0.35 A		
Switch-on current limitation (+25 °C)	< 35 A		
\mathcal{L}_t	$< 0.8 A^2 s$		
Built-in incoming fuse	Internal		
Recommended miniature circuit breaker (IEC 898) in the mains power input	16 A or higher, Characteristic B or 10 A or higher, Characteristic C		
Output	Controlled, isolated DC voltage		
Rated voltage Uout rated	24 V DC		
Total tolerance • Static mains compensation • Static load smoothing	±3 % Approx. 0.1% Approx. 1.5%		
Residual ripple	$< 200 \text{ mV}_{pp} \text{ (typ. 10 mV}_{pp})$		
Spikes (bandwidth approx. 20 MHz)	< 300 mV _{pp} (typ. 20 mV _{pp})		
Setting range	22.2 26.4 V		
Status indicator	24 V OK = green LED		
On/Off behavior	No overshoot of U_{out} (soft start)		
Startup delay / voltage rise	< 0.5 s/typ. 15 ms		
Rated current I _{out rated}	1.3 A		
Current range • Current range up to +60 °C • Derating	0 1.3 A (up to 55 °C)		
Parallel switching for enhanced performance	Yes, 2 units		
Efficiency			
Efficiency at Uout rated, Iout rated	Approx. 82%		
Heat loss at Uout rated, Iout rated	Approx. 7 W		
Closed-loop control			
Dyn. mains compensation (<i>U</i> _{in rated} ±15%)	< 0,2 % <i>U</i> _{out}		
Dynamic load smoothing (I _{out} : 50/100/50 %)	Typ. ±1.5 % <i>U</i> _{out} (<i>I</i> _{out} : 10/90/10 %)		
Load step settling time	T 00 (40) 000()		
• 50 to 100% • 100 to 50%	Typ. 20 ms (10 to 90%) Typ. 20 ms (90 to 10%)		
Protection and monitoring	130. 20 113 (30 to 10/0)		
Output overvoltage protection	Yes, according to EN 60950		
Current limitation	-		
Short-circuit protection	Typ. 2 A Constant current characteristic		
Sustained short-circuit current rms	< 4 A		
value Overload/short-circuit indicator	-		
S + S ISGG S ISG S ISGG S ISGG			

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS LOGO!Power

Technical specifications (continued)		
Power supply, type	24 V/1.3 A	
Safety		
Primary/secondary isolation	Yes, safety extra low output voltage <i>U</i> out according to EN 60950 and EN 50178	
Protection class	Class II (without protective conductor)	
Leakage current	-	
Safety test	Yes; CB scheme	
CE marking	Yes	
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus- recognized (UL 60950, CSA C22.2 No. 60950), File E151273	
Explosion protection	ATEX EX II 3G Ex nA IIC T3	
FM approval	Class I Div. 2, Group A, B, C, D T4	
Marine approval	GL, ABS	
Degree of protection (EN 60529)	IP20	
EMC		
Emitted interference	EN 55022 Class B	
Supply harmonics limitation	Not applicable	
Noise immunity	EN 61000-6-2	
Operating data		
Range of ambient temperature	-20 +55 °C with natural convection	
Transport and storage temperature range	-40 +70 °C	
Humidity class	Climate class 3K3 according to EN 60721, no condensation	
Mechanics		
Connections • Supply input L, N, PE DC input: L+1, M1, PE	One solid/finely-stranded screw- type terminal each (L, N) for 0.5 mm 2.5 mm ²	
• Output +	2 screw-type terminals for 0.5 2.5 mm ²	
• Output -	2 screw-type terminals for 0.5 2.5 mm ²	
Dimensions (W x H x D) in mm	54 x 90 x 55	
Weight, approx.	Approx. 0.17 kg	
Installation	Can be snapped onto standard mounting rail EN 60715 35x7.5/15	
Accessories	-	

Ordering data	Order No.
SIPLUS LOGO!Power 24 V 1.3 A L	6AG1 931-1SH02-2AA0
(extended temperature range and medial exposure)	
Input 100 240 V AC Output 24 V DC, 1.3 A	

L: Subject to export regulations AL: 91999 and ECCN: N

LOGO! logic module LOGO!Contact

LOGO!Contact

Overview



 Switching module for the direct switching of resistive loads and motors

Technical specifications

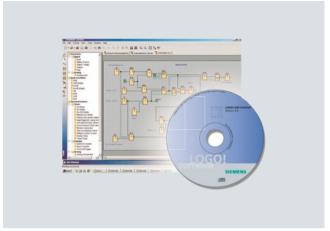
	6ED1 057-4CA00- 0AA0	6ED1 057-4EA00- 0AA0
Dimensions and veight Veight Veight, approx.	160 g	160 g

Ordering data	Order No.
LOGO!Contact	
Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW	
Switching voltage 24 V	6ED1 057-4CA00-0AA0
Switching voltage 230 V	6FD1 057-4FA00-0AA0

LOGO! logic module LOGO! software

LOGO! software

Overview



- The user-friendly software for creating control programs on a
- Creation of control programs in Function Block Diagram (FBD) or Ladder Diagram (LAD)
- Plus testing, simulation, online testing and archiving of control programs
- Professional documentation via numerous comment and print functions

The connection between LOGO! and the PC is made using the LOGO! PC cable (serial interface) or the LOGO! USB PC cable (USB interface).

Minimum system requirements

Windows 98 SE, NT 4.0, ME, 2000, XP or Vista (not 64 bit)

- PC Pentium.
- 90 MB free disk capacity.
- 64 MB RAM.
- SVGA graphics card with minimum resolution 800x600 (256 colors).

Mac OS X

• PowerMac G3, G4, G4 Cube, IMac, PowerBook G3, G4 or iBook.

Linux (tested with Caldera OpenLinux 2.4)

- Runs on all Linux distributions on which the Java 2 SDK Version 1.3.1 runs.
- Please refer to your relevant Linux distribution for the necessary hardware requirements.

Ordering data		Order No.
LOGO!Soft Comfort V6.0	J	6ED1 058-0BA02-0YA0
For programming on the PC in LAD/FBD; executes under Windows 98 SE and higher, Linux, MAC OSX; on CD-ROM		
LOGO!Soft Comfort V6.0 upgrade	J	6ED1 058-0CA02-0YE0
Upgrade from V1.0 to V6.0		

J: Subject to export regulations AL: N and ECCN: EAR99S

3

SIMATIC S7-200



3/2	Introduction
3/4 3/4 3/4 3/4 3/4 3/4	Central processing units CPU 221 CPU 222 CPU 224 CPU 224 XP, CPU 224 XPsi CPU 226
3/24 3/25 3/26 3/27 3/28	SIPLUS central processing units SIPLUS CPU 221 SIPLUS CPU 222 SIPLUS CPU 224 SIPLUS CPU 224 XP SIPLUS CPU 226
3/30 3/30 3/30 3/30	Digital modules EM 221 EM 222 EM 223
3/38 3/38 3/38 3/38	SIPLUS digital modules SIPLUS EM 221 SIPLUS EM 222 SIPLUS EM 223
3/42 3/42 3/42 3/42 3/47 3/49	Analog modules EM 231 EM 232 EM 235 EM 231 thermocouple module EM 231 RTD module
3/51 3/51 3/51 3/51 3/55	SIPLUS analog modules SIPLUS EM 231 SIPLUS EM 232 SIPLUS EM 235 SIPLUS EM 231 RTD module
3/57 3/57 3/59 3/61	Function modules EM 253 positioning module SIWAREX MS SIPLUS DCF 77 radio clock module
3/62 3/63 3/64 3/65 3/68 3/70 3/72	Communication EM 241 modem EM 277 PROFIBUS DP module CP 243-2 CP 243-1 MD720-3 GSM/GPRS modem MD741-1 EGPRS router Telecontrol Server Basic

3/74 **SIPLUS** communication 3/74 SIPLUS PROFIBUS DP EM 277 3/75 SIPLUS MD720-3 GSM/GPRS modem 3/76 SIPLUS MD741-1 EGPRS routers 3/77 **Power supplies** The S7-200 version 3/79 **SIPLUS** power supplies 3/79 SIPLUS S7-200 PS 203 3/80 Operator control and monitoring 3/80 TD 200 text display TD 400C text display SIMATIC OP 73micro 3/84 SIMATIC TP 177micro 3/86 SIPLUS operator control and monitoring SIPLUS S7-200 TD 200 3/86 SIPLUS S7-200 TD 400C 3/88 Software 3/88 Software 3/89 S7-200 PC Access 3/90 Accessories 3/90 PPI cable 3/91 **SIPLUS** accessories 3/91 SIPLUS cables 901

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

Introduction

S7-200

Overview



SIMATIC S7-200

- The micro PLC that offers maximum automation at minimum cost
- Extremely simple installation, programming and operation.
- · Large-scale integration, space-saving, powerful.
- Can be used both for simple controls and for complex automation tasks.
- All CPUs can be used in stand-alone mode, in networks and within distributed structures.
- Suitable for applications where programmable controllers would not have been economically viable in the past.
- With outstanding real-time performance and powerful communication options (PPI, PROFIBUS DP, AS-Interface)

SIPLUS S7-200

- The PLC for use under extremely harsh ambient conditions
- With extended temperature range from -25 °C to +70 °C
- Use in environments with pollutant gases (corrosive gas atmospheres)
- · Condensation and enhanced mechanical stress permissible
- With the proven PLC technology of the S7-200
- Easy handling, programming, maintenance and service
- Ideal for use in automobile construction, environmental technology, mining, chemical plants, conveying technology, food & beverages industry etc.
- The substitute for expensive special solutions

You will find more information at:

www.siemens.com/siplus-extreme

For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

SIMATIC S7-200 Introduction

S7-200

Technical specifications

General technical specifications S	IMATIC S7-200
Degree of protection	IP20 according to IEC 529
Ambient temperature	
Operation	
(95 % relative humidity)	
- With horizontal mounting	0 55°C
 With vertical mounting Transport and storage 	0 45 °C -40 +70 °C
- with 95 % relative humidity	25 55 °C
Isolation	20 00 0
• 5/24 V DC circuits	Test voltage 500 V AC
• 115/230 V AC circuits to ground	Test voltage 1500 V AC
115/230 V AC circuits to 115/230 V AC circuits	Test voltage 1500 V AC
 230 V AC circuits to 5/24 V DC circuits 	Test voltage 1500 V AC
 115 V AC circuits to 5/24 V DC circuits 	Test voltage 1500 V AC
Electromagnetic compatibility	Requirements of EMC law
 Noise immunity according to EN 50082-2 	Tested according to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
Emitted interference according to EN 50081-1 and EN 50081-2	Tested according to EN 55011, Class A, Group 1 and EN 55011, Class B, Group 1
Mechanical rating	
Vibrations, tested according to/ tested with	IEC 68, Part 2-6: 10 to 57 Hz; constant amplitude 0.3 mm; 58 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in control cabinet); type of vibration: frequency cycles with a rate of change of 1 octave/minute; vibration duration: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes
Shock, tested according to/tested with	IEC 68, Part 2-27/half-sine: shock strength 15 g (peak value), duration 11 ms, 6 shocks on each of the 3 mutually perpendicular

axes

Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 +70 °C
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions:	
 Relative humidity Biologically active substances 	5 100%, condensation allowed Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa
	(+2000 + 3500 m)
	Derating 10K
	658 540 hPa (+3500 +5000 m) derating 20 K
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1)	Yes ³⁾

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!
- 3) Does not apply to:
 6AG1 214-2AD23-2XB0
 6AG1 214-2BD23-2XB0
 6AG1 232-0HB22-2XB0
 6AG1 235-0KD22-2XB0
 6AG1 231-7PB22-2XA0
 6AG1 901-3CB30-2XA0

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

Overview CPU 221



- The smart compact solution
- With 10 inputs/outputs on board
- Not expandable

Overview CPU 222



- The superior compact solution
- With 14 inputs/outputs on board
- Expandable with up to 2 expansion modules

Overview CPU 224



- The compact high-performance CPU
- With 24 inputs/outputs on board
- Expandable with up to 7 expansion modules

Overview CPU 224 XP/224 XPsi



- The power CPU
- With 24 digital and 3 analog inputs/outputs onboard
- Expandable with up to 7 expansion modules

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

Overview CPU 226



- The high-performance package for complex technical tasks
- With additional PPI port for more flexibility and communication options
- With 40 inputs/outputs on board
- Expansion capability for max. 7 expansion racks

Technical specifications

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Supply voltages				
Rated value				
24 V DC	Yes		Yes	
permissible range, lower limit (DC)	20.4 V		20.4 V	
permissible range, upper limit (DC)	28.8 V		28.8 V	
120 V AC		Yes		Yes
230 V AC		Yes		Yes
permissible range, lower limit (AC)		85 V		85 V
permissible range, upper limit (AC)		264 V		264 V
permissible frequency range, lower limit		47 Hz		47 Hz
permissible frequency range, upper limit		63 Hz		63 Hz
oad voltage L+				
Rated value (DC)	24 V	24 V	24 V	24 V
permissible range, lower limit (DC)	20.4 V	5 V	20.4 V	5 V
permissible range, upper limit (DC)	28.8 V	30 V	28.8 V	30 V
oad voltage L1				
Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC
permissible range, lower limit (AC)		5 V		5 V
permissible range, upper limit (AC)		250 V		250 V
permissible frequency range, lower limit		47 Hz		47 Hz
permissible frequency range, upper limit		63 Hz		63 Hz
Current consumption				
nrush current, max.	10 A; at 28.8 V	20 A; at 264 V	10 A; at 28.8 V	20 A; at 264 V
rom supply voltage L+, max.	450 mA; 80 to 450 mA		500 mA; 85 to 500 mA, output current for expansion modules (DC 5 V) 340 mA	
rom supply voltage L1, max.		120 mA; 15 to 60 mA (240 V); 30 to 120 mA (120 V); output current for expansion modules (5 V DC) 340 mA		140 mA; 20 to 70 mA (240 V); 40 to 140 mA (120 V); output current for expansion modules (5 V DC) 340 mA

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Backup battery				
Battery operation				
Backup time, max.	50 h; (min. 8 h at 40 °C);	50 h; (min. 8 h at 40 °C);	50 h; (min. 8 h at 40 °C);	50 h; (min. 8 h at 40 °C);
- Backap time, max.	200 days (typ.) with			
	optional battery module	optional battery module	optional battery module	optional battery module
Memory		.,,	.,,	.,,
Number of memory modules	1; pluggable memory	1; pluggable memory	1; pluggable memory	1; pluggable memory
(optional)	module, content identical	module, content identical	module, content identical	module, content identical
(optional)	with integral EEPROM; can	with integral EEPROM; can	with integral EEPROM; can	with integral EEPROM; car
	additionally store recipes,	additionally store recipes,	additionally store recipes,	additionally store recipes,
	data logs and other files			
Data and program memory				
Data memory, max.	2 Kibyte	2 Kibyte	2 Kibyte	2 Kibyte
 Program memory, max. 	4 Kibyte	4 Kibyte	4 Kibyte	4 Kibyte
Backup			····	
• present	Yes; Program: Entire	Yes; Program: Entire	Yes; Program: Entire	Yes; Program: Entire
- present	program maintenance-free	program maintenance-free	program maintenance-free	program maintenance-free
	on integral EEPROM,	on integral EEPROM,	on integral EEPROM,	on integral EEPROM,
	programmable via CPU;	programmable via CPU;	programmable via CPU;	programmable via CPU;
	data: Entire DB 1 loaded			
	from PG/PC maintenance-	from PG/PC maintenance-	from PG/PC maintenance-	from PG/PC maintenance-
	free on integral EEPROM,			
	current values of DB 1 in			
	RAM, retentive memory	RAM, retentive memory	RAM, retentive memory	RAM, retentive memory
	bits, timers, counters, etc.			
	maintenance-free via high-	maintenance-free via high-	maintenance-free via high-	maintenance-free via high
	performance capacitor;	performance capacitor;	performance capacitor;	performance capacitor;
	optional battery for long-			
	term buffering	term buffering	term buffering	term buffering
CPU processing times	0.00	0.00	0.00	0.00
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs
Counters, timers and their				
retentivity				
S7 counter	050	050	050	050
Number	256	256	256	256
of which retentive with				
battery	Var. da biada a anfansa a a	V i- bi-b f	V i- bi-b f	V de biede e estamana
- adjustable	Yes; via high-performance capacitor or battery			
- lower limit	1	1	1	1
- upper limit	256	256	256	256
• • • • • • • • • • • • • • • • • • • •	200	200	200	200
Counting range lower limit	0	0	0	0
- lower limit	0	0	0	0
- upper limit	32 767	32 767	32 767	32 767
S7 times				
Number	256	256	256	256
 of which retentive with 				
battery				
- adjustable	Yes; via high-performance	Yes; via high-performance	Yes; via high-performance	Yes; via high-performance
-	capacitor or battery	capacitor or battery	capacitor or battery	capacitor or battery
	64	64	64	64
- upper limit				
Time range	1 me	1 me	1 me	1 me
• Time range - lower limit	1 ms	1 ms	1 ms	1 ms
Time range	54 min; 4 timers: 1 ms to			
• Time range - lower limit	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to
• Time range - lower limit	54 min; 4 timers: 1 ms to			

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Data areas and their retentivity				
Number, max. Retentivity available of which retentive with battery of which retentive without battery	32 byte Yes; M 0.0 to M 31.7 0 to 255, via high- performance capacitor or battery, adjustable 0 to 112 in EEPROM, adjustable	32 byte Yes; M 0.0 to M 31.7 0 to 255, via high- performance capacitor or battery, adjustable 0 to 112 in EEPROM, adjustable	32 byte Yes; M 0.0 to M 31.7 0 to 255, via high- performance capacitor or battery, adjustable 0 to 112 in EEPROM, adjustable	32 byte Yes; M 0.0 to M 31.7 0 to 255, via high- performance capacitor or battery, adjustable 0 to 112 in EEPROM, adjustable
Hardware configuration Connectable programming devices/PCs	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, tandard PC
Expansion devices, max.			2; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	2; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.
Extension of distributed I/O				
Analog inputs/outputs, max.			10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)	10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)
 Digital inputs/outputs, max. AS-Interface inputs/outputs max. 			78; max. 40 inputs and 38 outputs (CPU + EM) 62; AS-Interface A/B slaves (CP 243-2)	78; max. 40 inputs and 38 outputs (CPU + EM) 62; AS-Interface A/B slaves (CP 243-2)
Connection method Plug-in I/O terminals	No	No	No	No
1st interface Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
Functionality • MPI	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s
• PPI	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
• Serial data exchange	interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used	for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 /	interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used	interface with interrupt facility for serial data exchange with third-party devices with ASCI protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used
MPI	107 E khit/a	107 E l/bit/o	107 E kbit/a	107 E khit/o
Transmission rate, max.Transmission rate, min.	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s
Programming Programming language • LAD • FBD • STL	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Command set	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, integer maths, floating-point math instructions, numerical functions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions	instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and commutations, interrupt and commutations, interrupt and commutations.	instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions conversion instructions, program control instruc-
Program processing	free cycle (OB 1), interrupt- controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt- controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt- controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt controller, time-controlled (1 to 255 ms)
Program organization	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer
Number of subroutines, max. • User program protection/ password protection	64 Yes; 3-stage password protection	64 Yes; 3-stage password protection	64 Yes; 3-stage password protection	64 Yes; 3-stage password protection
Digital inputs Number of digital inputs	6; Integrated	6; Integrated	8	8
m/p-reading	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V 0 to 5 V min. 15 V	24 V 0 to 5 V min. 15 V	24 V 0 to 5 V min. 15 V	24 V 0 to 5 V min. 15 V
Input current • for signal "1", typ.	2.5 mA	2.5 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage) • for standard inputs - parameterizable - at "0" to "1", min. - at "0" to "1", max. • for interrupt inputs - parameterizable • for counter/technological functions	Yes; all 0.2 ms 12.8 ms Yes; I 0.0 to I 0.3	Yes; all 0.2 ms 12.8 ms Yes; I 0.0 to I 0.3	Yes; all 0.2 ms 12.8 ms Yes; I 0.0 to I 0.3	Yes; all 0.2 ms 12.8 ms Yes; I 0.0 to I 0.3
 parameterizable 	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Cable length				
 Cable length, shielded, max. 	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m
Cable length unshielded, max.	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals
Digital outputs Number of digital outputs	4; Transistor	4; Relay	6; Transistor	6; Relay
Short-circuit protection	No; to be provided exter- nally	No; to be provided exter- nally	No; to be provided exter- nally	No; to be provided externally
Limitation of inductive shutdown voltage to	1 W		1 W	
Switching capacity of the				
utputswith resistive load, max.	0.75 A	2 A	0.75 A	2 A
• on lamp load, max.	5 W	30 W DC; 200 W AC	5 W	30 W DC; 200 W AC
Output voltage • for signal "1", min.	20 V DC	L+/L1	20 V DC	L+/L1
Output current				
 for signal "1" rated value for signal "0" residual current, max. 	750 mA 0.1 mA	2 A 0 mA	750 mA 10 μA	2 A 0 mA
Output delay with resistive load				
• 0 to "1", max.	15 µs; of the standard outputs, max. (Q 0.2 to Q 0.3) 15 µs; of the pulse outputs, max. (Q 0.0 to Q 0.1) 2 µs	10 ms; all outputs	15 µs; of the standard outputs, max. (Q 0.2 to Q 0.5) 15 µs; of the pulse outputs, max. (Q 0.0 to Q 0.1) 2 µs	10 ms; all outputs
• 1 to "0", max.	130 μ s; of the standard outputs, max. (Q 0.2 to Q 0.3) 100 μ s; of the pulse outputs, max. (Q 0.0 to Q 0.1) 10 μ s	10 ms; all outputs	130 μ s; of the standard outputs, max. (Q 0.2 to Q 0.5) 100 μ s; of the pulse outputs, max. (Q 0.0 to Q 0.1) 10 μ s	10 ms; all outputs
Parallel switching of 2 outputs • for increased power	Yes	No	Yes	No
Switching frequency • of the pulse outputs, with resistive load, max.	20 kHz; Q 0.0 to Q 0.1		20 kHz; Q 0.0 to Q 0.1	
Aggregate current of outputs (per group)				
 horizontal installation up to 55 °C, max. 	3 A	6 A	4.5 A	6 A
• up to 40 °C, max.	3 A	6 A	4.5 A	6 A
Cable length Cable length, shielded,	500 m	500 m	500 m	500 m
max.Cable length unshielded, max.	150 m	150 m	150 m	150 m
Relay outputs				
Number of operating cycles		10 000 000; mechanically 10 million, at rated load voltage 100,000		10 000 000; mechanically 10 million, at rated load voltage 100,000
Analog inputs Number of analog potentiometers	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit
Encoder supply				
24 V encoder supply • 24 V	Yes; permissible range:	Yes; permissible range:	Yes; permissible range:	Yes; permissible range:
Short-circuit protectionOutput current, max.	15.4 to 28.8 V Yes; electronic at 600 mA 180 mA	20.4 bis 28.8 V Yes; electronic at 600 mA 180 mA	15.4 to 28.8 V Yes; electronic at 600 mA 180 mA	20.4 bis 28.8 V Yes; electronic at 600 mA 180 mA

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Encoder				
Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA
Integrated Functions Number of counters	4; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	4; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	4; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	4; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.
Counter frequency (counter) max.	30 kHz	30 kHz	30 kHz	30 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges			
Number of pulse outputs	2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option	
Limit frequency (pulse)	20 kHz		20 kHz	
Galvanic isolation Galvanic isolation digital inputs • between the channels • between the channels, in groups of	Yes 2 and 4	Yes 2 and 4	Yes 4	Yes 4
Galvanic isolation digital outputs • between the channels • between the channels, in groups of	Yes; Optocoupler	Yes; Relay 1 and 3	Yes; Optocoupler	Yes; Relay
Permissible potential difference between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC
Environmental require-				
ments Ambient conditions	For further ambient conditions, see "Automation System S7200, System Manual"	For further ambient conditions, see "Automation System S7-200, System Manual"	For further ambient conditions, see "Automation System S7-200, System Manual"	For further ambient conditions, see "Automation System S7-200, System Manual"
Operating temperature • vertical installation, min. • vertical installation, max. • horizontal installation, min. • horizontal installation, max.	0 °C 45 °C 0 °C 55 °C			
Air pressure • permissible range, min. • permissible range, max.	860 hPa 1 080 hPa			
Relative humidity Operation, min. Operation, max.	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Degree of protection	Yes	Yes	Yes	Yes
Dimensions and weight	165	165	165	165
Dimensions				
 Width 	90 mm	90 mm	90 mm	90 mm
 Height 	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm
Weight				
 Weight, approx. 	270 g	310 g	270 g	310 g

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Supply voltages							
Rated value							
• 24 V DC	Yes		Yes		Yes	Yes	
 permissible range, lower limit (DC) 	20.4 V		20.4 V		20.4 V	20.4 V	
 permissible range, upper limit (DC) 	28.8 V		28.8 V		28.8 V	28.8 V	
• 120 V AC		Yes		Yes			Yes
• 230 V AC		Yes		Yes			Yes
 permissible range, lower limit (AC) 		85 V		85 V			85 V
 permissible range, upper limit (AC) 		264 V		264 V			264 V
 permissible frequency range, lower limit 		47 Hz		47 Hz			47 Hz
 permissible frequency range, upper limit 		63 Hz		63 Hz			63 Hz
Load voltage L+							
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V	24 V
 permissible range, lower limit (DC) 	20.4 V	5 V	20.4 V	5 V	20.4 V	20.4 V	5 V
 permissible range, upper limit (DC) 	28.8 V	30 V	28.8 V	30 V	28.8 V	28.8 V	30 V
Load voltage L1							
Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC			100 V; 100 to 230 V AC
 permissible range, lower limit (AC) 		5 V		5 V			5 V
 permissible range, upper limit (AC) 		250 V		250 V			250 V
 permissible frequency range, lower limit 		47 Hz		47 Hz			47 Hz
 permissible frequency range, upper limit 		63 Hz		63 Hz			63 Hz
Current consumption							
Inrush current, max.	12 A; at 28.8 V	20 A; at 264 V	12 A; at 28.8 V	20 A; at 264 V	12 A; at 28.8 V	10 A; at 28.8 V	20 A; at 264 V
from supply voltage L+, max.	700 mA; 110 to 700 mA, output current for expansion modules (5 V DC) 660 mA		900 mA; 120 to 900 mA, output current for expansion modules (5 V DC) 660 mA		900 mA; 120 to 900 mA, output current for expansion modules (5 V DC) 660 mA	1 050 mA; 150 to 1050 mA output current for expansion modules (D5 V DC) 1000 mA	

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
from supply voltage L1, max.		200 mA; 30 to 100 mA (240 V); 60 to 200 mA (120 V); output current for expansion modules (5 V DC) 600 mA		220 mA; 35 to 100 mA (240 V); 70 to 220 mA (120 V); output current for expansion modules (5 V DC) 600 mA			320 mA; 40 to 160 mA (240 V); 80 to 320 mA (120 V); output current for expansion modules (5 V DC) 1000 mA
Backup battery							
Battery operation Backup time, max.	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module
Memory							
Number of memory modules (optional)	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files
Data and program memory							
Data memory, max.Program memory, max.	8 Kibyte 12 Kibyte; 8 KB with active run-time edit	8 Kibyte 12 Kibyte; 8 KB with active run-time edit	10 Kibyte 16 Kibyte; 12 KB with active run-time edit	10 Kibyte 16 Kibyte; 12 KB with active run-time edit	10 Kibyte 16 Kibyte; 12 KB with active run-time edit	10 Kibyte 24 Kibyte; 16 KB with active run-time edit	10 Kibyte 24 Kibyte; 16 KB with active run-time edit
Backup							
• present	Yes; Program: Entire program maintenance- free on integral EEPROM, program- mable via CPU; data: Entire DB 1 loaded from PG/PC mainte- nance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance- free via high- performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance- free on integral EEPROM, program- mable via CPU; data: Entire DB 1 loaded from PG/PC mainte- nance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance- free via high- performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance- free on integral EEPROM, program- mable via CPU; data: Entire DB 1 loaded from PG/PC mainte- nance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance- free via high- performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance- free on integral EEPROM, program- mable via CPU; data: Entire DB 1 loaded from PG/PC mainte- nance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance- free via high- performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, program-mable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, program-mable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, program-mable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
CPU processing times							
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs
Counters, timers and their retentivity S7 counter							
Numberof which retentive with battery	256	256	256	256	256	256	256
- adjustable	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery
- lower limit	1	1	1	1	1	1	1
- upper limit	256	256	256	256	256	256	256
Counting range							
- lower limit	0	0	0	0	0	0	0
- upper limit	32 767	32 767	32 767	32 767	32 767	32 767	32 767
S7 times	050	050	050	050	050	0.50	050
Numberof which retentive with battery	256	256	256	256	256	256	256
- adjustable	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery	Yes; via high- performance capacitor or battery
- upper limit	64	64	64	64	64	64	64
Time range							
- lower limit - upper limit	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	1 ms 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min
Data areas and their retentivity							
Flag	00	00 1-1-	00 +-	00 +-	00 - +-	00 - +-	00 +-
Number, max.Retentivity available	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7	32 byte Yes; M 0.0 to M 31.7
of which retentive with battery	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable	0 to 255, via high-perform- ance capacitor or battery, adjustable
of which retentive without battery	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable
Hardware configuration Connectable programming devices/PCs	SIMATIC PG/ PC, standard PC	SIMATIC PG/ PC, standard PC	SIMATIC PG/ PC, standard PC	SIMATIC PG/ PC, standard PC	SIMATIC PG/ PC, standard	SIMATIC PG/ PC, standard	SIMATIC PG/ PC, standard PC
	1-0	10	10	10	PC	PC	1.0

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Expansion devices, max.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.
Extension of distributed I/O							
 Analog inputs/outputs, max. 	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)
Digital inputs/outputs, max.	168; max. 94 inputs and 74 outputs (CPU + EM)	148; max. 128 inputs and 120 outputs (CPU+EM)	148; max. 128 inputs and 120 outputs (CPU+EM)				
AS-Interface inputs/outputs max.	62; AS- Interface A/B slaves (CP 243-2)						
Connection method Plug-in I/O terminals	Yes						
1st interface							
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485						
Functionality • MPI	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

(continuea)						
6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s
Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter
187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s
				2.42		
		Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
		RS 485	RS 485	RS 485	RS 485	RS 485
		Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communications is possible in the MPI network with restrictions; transmission rates: 19.2 / 187.5 kbit/s
	GES7 214-1AD23-0XB0 Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Fest vith PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter 187.5 kbit/s Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	Fes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 187.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 Converter 187.5 kbit/s 187.5 kb	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200- internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s vse; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 3.8 4 / 5.7 6 / 3.	Sess 214- IAD23-0XB0 Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200- internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 9.6 / 19.2 / 9.6 / 19.2 / 9.8 / 9.6 / 19.2 / 3.8 4 / 57.6 /	GES7 214- AD23-0XB0 GES7

SIMATIC S7-200
Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
PPI serial data exchange			Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/ CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol	Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communications; transmission rates 9.6 / 19.2 / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol	Yes; with PPI protocol for programming functions, HM functions (TD 200, OP) S7-200-internal CPU, CPU communications; transmission rates 9.6 / 19. / 187.5 kbit/s Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol
			transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can also be used as RS232 / RS485 converter	transfer rates 1.2 / 2.4 / 4.8 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC / PPI cable can als be used as RS232 / RS485 converter
MPI Transmission rate, max. Transmission rates, min.			187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s	187.5 kbit/s 19.2 kbit/s
Programming Programming language LAD FBD	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
STL Command set	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, table instructions, table instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, interrupt instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, transmissions instructions, logic instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, transmissions instructions, table instructions, table instructions, logic instructions, logic instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, transmissions instructions, logic instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, transmissions instructions, table instructions, table instructions, logic instructions, logic instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, transmissions instructions, logic instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, integer maths, floating-point math instructions, numerical	Bit logic instructions, compare instructions, timer instructions, clock instructions, clock instructions, table instructions, table instructions, logic instructions, shift and rotat instructions, conversion instructions, program control instructions, intergrand communications instructions, integer maths floating-point math instructions, integer maths floating-point math instructions, numerical

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Program processing	free cycle (OB 1), interrupt- controller, time-controlled (1 to 255 ms)						
Program organization	1 OB, 1 DB, 1 SDB subrou- tines with/ without parameter transfer						
Number of subroutines, max. • User program protection/ password protection	64 Yes; 3-stage password protection						
Digital inputs							
Number of digital inputs	14	14	14	14	14	24	24
m/p-reading	Yes; optionally, per group						
Input voltage • Rated value, DC • for signal "0"	24 V 0 to 5 V	24 V 0 to 5 V	24 V 0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	24 V 0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	24 V 0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	24 V 0 to 5 V	24 V 0 to 5 V
• for signal "1"	min. 15 V	min. 15 V	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V	min. 15 V
Input current • for signal "1", typ.	2.5 mA	2.5 mA	2.5 mA; 8 mA for I0.3 to I0.5	2.5 mA; 8 mA for I0.3 to I0.5	2.5 mA; 8 mA for I0.3 to I0.5	2.5 mA	2.5 mA
Input delay (for rated value of input voltage) • for standard inputs							
- parameterizable	Yes; all						
- at "0" to "1", min.	0.2 ms						
- at "0" to "1", max.	12.8 ms						
for interrupt inputsparameterizable	Yes; I 0.0 to						
 for counter/technological functions 							
- parameterizable	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) 30 kHz
Cable length Cable length, shielded, max.	500 m; Standard input: 500 m, high-speed counters: 50 m						
Cable length unshielded, max.	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Digital outputs Number of digital outputs	10; Transistor	10; Relay	10; Transistor	10; Relay	10; Transistor current sinking	16; Transistor	16; Relay
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	1 W		1 W		1 W	1 W	
Switching capacity of the outputs with resistive load, max. on lamp load, max.	0.75 A 5 W	2 A 200 W; 30 W DC; 200 W AC	0.75 A 5 W	2 A 200 W; 30 W DC; 200 W AC	0.75 A 5 W	0.75 A 5 W	2 A 200 W; 30 W DC; 200 W AC
Output voltage • for signal "1", min.	20 V DC	L+/L1	L+ (-0.4 V (5 V / 20.4 V for A 0.0 to A 0.4; 20.4 V A 0.5 to A1.1))	L+/L1	1M -0.4 V	20 V DC	L+/L1
Output current • for signal "1" rated value • for signal "0" residual current, max.	750 mA 10 μA	2 A 0 mA	750 mA 10 μA	2 A 0 mA	750 mA 10 μA	750 mA 10 μA	2 A 0 mA
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 2 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 µs 130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 10 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 µs	10 ms; all outputs 10 ms; all outputs	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 0.5 µs 130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 130 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 1.5 µs	10 ms; all outputs 10 ms; all outputs	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 0.5 µs 130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 130 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 1.5 µs	15 μs; of the standard outputs, max. (Q0.2 to Q1.1) 2 μs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 μs 130 μs; of the standard outputs, max. (Q0.2 to Q1.1) 10 μs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 μs	10 ms; all outputs 10 ms; all outputs
Parallel switching of 2 outputs • for increased power	Yes	No	Yes	No	Yes	Yes	No
Switching frequency • of the pulse outputs, with resistive load, max.	20 kHz; Q 0.0 to Q 0.1	1 Hz	100 kHz; Q 0.0 to Q 0.1	1 Hz	100 kHz; Q 0.0 to Q 0.1	20 kHz; Q 0.0 to Q 0.1	1 kHz
Aggregate current of outputs (per group) • horizontal installation - up to 55 °C, max. • up to 40 °C, max.	6 A 6 A	10 A 10 A	3.75 A 3.75 A	10 A 10 A	3.75 A 3.75 A	6 A 6 A	10 A 10 A
Cable length Cable length, shielded, max. Cable length unshielded,	500 m 150 m	500 m 150 m	500 m 150 m	500 m 150 m	500 m 150 m	500 m 150 m	500 m 150 m

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 214-	6ES7 214-	6ES7 214-	6ES7 214-	6ES7 214-	6ES7 216-	6ES7 216-
	1AD23-0XB0	1BD23-0XB0	2AD23-0XB0	2BD23-0XB0	2AS23-0XB0	2AD23-0XB0	2BD23-0XB0
Relay outputs Number of operating cycles		10 000 000; mechanically 10 million, at rated load voltage 100,000		10 000 000; mechanically 10 million, at rated load voltage 100,000			10 000 000; mechanically 10 million, at rated load voltage 100,000
Analog inputs Number of analog potentiometers	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit	2; Analog potenti- ometer; resolution 8 bit
Encoder supply 24 V encoder supply • 24 V • Short-circuit protection • Output current, max.	Yes; permissible range: 15.4 to 28.8 V Yes; electronic at 280 mA 280 mA	Yes; permissible range: 20.4 bis 28.8 V Yes; electronic at 280 mA 280 mA	Yes; permissible range: 15.4 to 28.8 V Yes; electronic at 280 mA 280 mA	Yes; permissible range: 20.4 bis 28.8 V Yes; electronic at 280 mA 280 mA	Yes; permissible range: 15.4 to 28.8 V Yes; electronic at 280 mA 280 mA	Yes; permissible range: 15.4 to 28.8 V Yes; electronic at 400 mA 400 mA	Yes; permissible range: 20.4 bis 28.8 V Yes; electronic at 400 mA 400 mA
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA
Integrated Functions							
Number of counters	6; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/ down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bit (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bit (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bit (incl. sign), can be used as up/ down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/ down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bit (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Counter frequency (counter) max.	30 kHz	30 kHz	200 kHz	200 kHz	200 kHz	30 kHz	30 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges
Number of pulse outputs	2; high-speed outputs, 20 kHz, with interrupt option; pulse- width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse- width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse- width and frequency modulation option	2; high-speed outputs, 20 kHz, with interrupt option; pulse- width and frequency modulation option	
Limit frequency (pulse)	20 kHz		20 kHz		20 kHz	20 kHz	
Galvanic isolation Galvanic isolation digital inputs							
between the channels	Yes	Yes	Yes	Yes	Yes	Yes	Yes; Optocoupler
• between the channels, in groups of	6 and 8	6 and 8	6 and 8	6 and 8	6 and 8	13 and 11	13 and 11
Galvanic isolation digital outputs							
between the channels	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Optocoupler	Yes; Relay
• between the channels, in groups of	5	3 and 4	5	3 and 4	10	8 and 8	4, 5 and 7
Permissible potential difference							
between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC
Environmental requirements							
Environmental conditions	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"	For further ambient conditions, see "Automation System S7- 200, System Manual"
Operating temperature • vertical installation, min. • vertical installation, max. • horizontal installation, min. • horizontal installation, max.	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C	0 °C 45 °C 0 °C 55 °C
Air pressure • permissible range, min. • permissible range, max.	860 hPa 1 080 hPa	860 hPa 1 080 hPa	860 hPa 1 080 hPa	860 hPa 1 080 hPa	860 hPa 1 080 hPa	860 hPa 1 080 hPa	860 hPa 1 080 hPa
Relative humidity Operation, min. Operation, max.	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

	6ES7 214- 1AD23-0XB0	6ES7 214- 1BD23-0XB0	6ES7 214- 2AD23-0XB0	6ES7 214- 2BD23-0XB0	6ES7 214- 2AS23-0XB0	6ES7 216- 2AD23-0XB0	6ES7 216- 2BD23-0XB0
Degree of protection							
IP20	Yes						
Dimensions and weight							
Dimensions							
Width	120.5 mm	120.5 mm	140 mm	140 mm	140 mm	196 mm	196 mm
Height	80 mm						
• Depth	62 mm						
Weight							
Weight, approx.	360 g	410 g	390 g	440 g	390 g	550 g	660 g

Central processing units
CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 224 XPsi, CPU 226

Ordering data	Order No.		Order No.
CPU 221		S7-200 True Power Box	
Compact CPU, work memory 4 KB, power supply 24 V DC, 6 DI/4 DO integrated	6ES7 211-0AA23-0XB0	Complete package, comprising CPU 222, STEP 7 Micro/WIN V4, simulator, intelligent USB/PPI	
Compact CPU, work memory 4 KB, power supply 100 V to 230 V AC, 6 DI/4 DO integrated,	6ES7 211-0BA23-0XB0	multi-master cable, manual; delivered in a practical box German J	6ES7 298-0AA20-0AA3
relay outputs		English J	6ES7 298-0AA20-0BA3
CPU 222 Compact CPU, expandable, work	6ES7 212-1AB23-0XB0	MC 291 memory module, EEPROM	
memory 4 KB, power supply 24 V DC, 8 DI/6 DO integrated		for CPU 221/222//224/224 XP/226	
Compact CPU, expandable, work	6ES7 212-1BB23-0XB0	64 KB	6ES7 291-8GF23-0XA0
memory 4 KB, power supply 100 V to 230 V AC, 8 DI/6 DO		256 KB	6ES7 291-8GH23-0XA0
integrated, relay outputs		Ground terminal	6ES5 728-8MA11
CPU 224		10 units	
Compact CPU, expandable, work	6ES7 214-1AD23-0XB0	Front flap set	6ES7 291-3AX20-0XA0
memory 8/12 KB program, 8 KB data, power supply 24 V DC, 14 DI/10 DO integrated		contains various cover flaps for CPUs and EMs; spare part	
Compact CPU, expandable, work	6ES7 214-1BD23-0XB0	SIM 274 simulator (optional)	
memory 8/12 KB program, 8 KB	0207 214 18820 0X80	with 8 terminals for CPU 221/222	6ES7 274-1XF00-0XA0
data, power supply 100 V to 230 V AC, 14 DI/10 DO integrated, relay outputs		with 14 terminals for CPU 224/ 224 XP	6ES7 274-1XH00-0XA0
CPU 224 XP		with 24 terminals for CPU 226	6ES7 274-1XK00-0XA0
Compact CPU, expandable, work memory 12/16 KB program,	6ES7 214-2AD23-0XB0	Pluggable terminal block (spare part)	
10 KB data, power supply		With 12 terminals (for CPU 22x)	6ES7 292-1AE20-0AA0
24 V DC, 14 DI/10 DO/ 2 AI/1 AO integrated		With 18 terminals (for CPU 224/ I 224 XP)	6ES7 292-1AG20-0AA0
Compact CPU, expandable, work memory 12/16 KB program,	6ES7 214-2BD23-0XB0	With 14 terminals (for CPU 226)	6ES7 292-1AF20-0AA0
10 KB data, power supply 100 V to 230 V AC, 14 DI/10 DO (relay outputs)/ 2 AI/1 AO integrated		Intelligent RS 232/PPI multi-master cable	6ES7 901-3CB30-0XA0
CPU 224 XPsi	6ES7 214-2AS23-0XB0	For connecting devices with an RS 232 interface to SIMATIC S7-	
Compact CPU, with current- sinking outputs, expandable,		200 or the PPI network; master in the multi-master PPI network	
work memory 12/16 KB program, 10 KB data, power supply 24 V DC,		Intelligent USB/PPI multi-master cable	6ES7 901-3DB30-0XA0
14 DI/10 DO/ 2 AI/1 AO integrated		For connecting devices with an	
CPU 226		USB interface to SIMATIC S7-200 or the PPI network; master in the	
Compact CPU, expandable, work	6ES7 216-2AD23-0XB0	multi-master PPI network	
memory 16/24 KB program, 10 KB data, power supply		MPI cable	6ES7 901-0BF00-0AA0
24 V DC, 24 DI/16 DO integrated		5 m; for connecting the S7-200 to MPI	
Compact CPU, expandable, work memory 16/24 KB program,	6ES7 216-2BD23-0XB0	Backplane bus expansion cable	6ES7 290-6AA20-0XA0
10 KB data, power supply 100 V to 230 V AC, 24 DI/16 DO integrated, relay outputs		for connecting two rows of modules with double-tier configu- ration, for CPU 222/224/224 XP/ 226	

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Central processing units CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 224 XPsi, CPU 226

Ordering data	Order No.		Order No.
Optional battery module Optional combined clock and	6ES7 291-8BA20-0XA0 6ES7 297-1AA23-0XA0	STEP 7 Micro/WIN32 V4 programming software	
battery module only for CPU 221/222		Target system: All CPUs of the SIMATIC S7-200 Requirements:	
S7-200 programmable controller, system manual		Windows 2000/XP on PG or PC Type of delivery:	
for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4		German, English, French, Spanish, Italian, Chinese; with online documentation	
German	6ES7 298-8FA24-8AH0	Single license J	6ES7 810-2CC03-0YX0
English	6ES7 298-8FA24-8BH0	Upgrade Single License ¹⁾ J	6ES7 810-2CC03-0YX3
French	6ES7 298-8FA24-8CH0	PROFIBUS bus connector,	
Spanish	6ES7 298-8FA24-8DH0	Without PG connection	
Italian	6ES7 298-8FA24-8EH0		6ES7 972-0BA12-0XA0
Chinese	6ES7 298-8FA24-8FH0	With PG connection	6ES7 972-0BB12-0XA0
SIMATIC manual collection J	6ES7 998-8XC01-8YE0	PROFIBUS bus connector, IP20 with 35° cable outlet	
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN,		 Without PG connection 	6ES7 972-0BA42-0XA0
SIMATIC bus components,		• with PG connection	6ES7 972-0BB42-0XA0
SIMATIC C7, SIMATIC distributed I/O,		PROFIBUS FC standard cable	6XV1 830-0EH10
SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		For connection to PPI; standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2	RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0
Current Manual Collection DVD and the three subsequent updates			

Upgrade for all previous STEP 7-Micro/WIN and STEP 7-Micro/DOS versions

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS central processing units SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,

CPU 226

Overview SIPLUS CPU 221



- The clever compact solution
- With 10 inputs/outputs on board
- · Cannot be expanded

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 221	
Order number	6AG1 211-0AA23- 2XB0	6AG1 211-0BA23- 2XB0
Order No. based on	6ES7 211-0AA23- 0XB0	6ES7 211-0BA23- 0XB0
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)	
Conformal coating	Coating of the printed the electronic compo	
Technical data	The technical data of the standard product applies except for the ambient conditions	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60 mold and fungal spor	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m)	
	derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

SIPLUS central processing units SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,

CPU 226

Overview SIPLUS CPU 222



- The superior compact solution
- With 14 input/outputs on board
- Expandable with up to 2 expansion modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 222		
Order number	6AG1 212-1AB23- 2XB0	6AG1 212-1BB23- 2XB0	
Order No. based on	6ES7 212-1AB23- 0XB0	6ES7 212-1BB23- 0XB0	
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	
Approvals	CE, cUL		
Ambient conditions			
Rolativo humidity	5 100 %		

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K
specified)	658 540 hPa (+3500 +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

SIPLUS central processing units
SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 226

Overview SIPLUS CPU 224



- The compact high-performance CPU
- With 24 input/outputs on board
- Expandable with up to 7 expansion modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 224				
Order number	6AG1 214-1AD23- 2XB0 6AG1 214-1BD23- 2XB0			
Order No. based on	6ES7 214-1AD23- 0XB0	6ES7 214-1BD23- 0XB0		
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)			
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions			
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes		
Approvals	CE, cUL			

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K
opcomoa)	658 540 hPa (+3500 +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here:

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS central processing units SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,

CPU 226

Overview SIPLUS CPU 224 XP



- The power CPU
- With 24 digital and 3 analog I/Os onboard
- Expandable with up to 7 expansion modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 224 XP	
Order number	6AG1 214-2AD23- 2XB0	6AG1 214-2BD23- 2XB0
Order No. based on	6ES7 214-2AD23- 0XB0	6ES7 214-2BD23- 0XB0
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	No
Approvals	CE	

Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) (2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive	1080 795 hPa (-1000 +2000 m) see ambient temperature range
the highest positive temperature range specified)	795 658 hPa (+2000 +3500 m) derating 10 K
specified)	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

SIPLUS central processing units
SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 226

Overview SIPLUS CPU 226



- The power pack for larger technical tasks
- With additional PPI connection for even more flexibility and communication facilities
- With 40 input/outputs on board
- Expandable with up to 7 expansion modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 226		
Order number	6AG1 216-2AD23- 2XB0	6AG1 216-2BD23- 2XB0	
Order No. based on	6ES7 216-2AD23- 0XB0	6ES7 216-2BD23- 0XB0	
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	
Approvals	CE, cUL		
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}		

derating 10 K

derating 20 K

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Conformity with EN 60721-3-3, Class 3S4

including conductive sand, dust 2) 1080 ... 795 hPa (-1000 ... +2000 m)

see ambient temperature range

795 ... 658 hPa (+2000 ... +3500 m)

658 ... 540 hPa (+3500 ... +5000 m)

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Mechanically active substances

(depending on the highest positive

temperature range

Air pressure

specified)

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

SIMATIC S7-200
SIPLUS central processing units
SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,
CPU 226

Ordering data	Order No.	Order No.	
SIPLUS CPU 221		SIPLUS CPU 224 XP	
(extended temperature and mediale exposure)		(extended temperature range and medial exposure)	
Compact-CPU, work memory H 4 KByte, power supply DC 24 V, 6 DE/4 DA integrated	6AG1 211-0AA23-2XB0	Compact CPU, expandable, work L memory 12/16 KB for program, 10 KB for data, 24 V DC supply	6AG1 214-2AD23-2XB0
Compact-CPU, work memory H 4 KByte, power supply AC 100 to	6AG1 211-0BA23-2XB0	voltage, 14 DI/10 DO/2 AI/1 AO integrated	
230 V, 6 DE/4 DA integrated, relay outputs		Compact CPU, expandable, work H memory 12/16 KB for program,	6AG1 214-2BD23-2XB0
SIPLUS CPU 222		10 KB for data, 100 to 230 V AC supply voltage, 14 DI/10 DO	
(extended temperature range and H medial exposure)	6AG1 212-1AB23-2XB0		
Compact CPU, expandable, 4 KB H	6AG1 212-1BB23-2XB0	SIPLUS CPU 226	
work memory, 24 V DC supply voltage, 8 DI/6 DO integrated		(extended temperature range and medial exposure)	
SIPLUS CPU 224		Compact CPU, expandable, work H	6AG1 216-2AD23-2XB0
(extended temperature range and medial exposure)		memory 16/24 KB for program, 10 KB for data, 24 V DC supply voltage, 24 DI/16 DO integrated	
Compact CPU, expandable, work H memory 8/12 KB for program and 8 KB for data, 24 V DC supply voltage, 14 DI/10 DO integrated	6AG1 214-1AD23-2XB0	Compact CPU, expandable, work H memory 16/24 KB for program, 10 KB for data, 100-230 V AC	6AG1 216-2BD23-2XB0
Compact CPU, expandable, work H	6AG1 214-1BD23-2XB0 supply voltage, 24 DI/16 DO integrated, relay outputs		
memory 8/12 KB for program, 8 KB for data, 100-230 V AC		Accessories	
supply voltage, 14 DI/10 DO integrated, relay outputs		SIPLUS Upmiter upstream L device	6AG1 203-1AA00-2AA0
		for reliable operation at the battery of combustion engines	
		Additional accessories	See SIMATIC S7-200 CPU 222 central processing unit, page 3/22

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

Digital modules

EM 221, EM 222, EM 223

Overview



- Digital inputs/outputs to supplement the onboard I/Os of the CPUs
- For flexible adaptation of PLC to respective task
- For subsequent upgrading of the system with additional inputs and outputs

Technical specifications EM 221

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Current consumption			
from backplane bus 5 V DC, max.	70 mA	30 mA	30 mA
Power losses			
Power loss, typ.	3 W	2 W	3 W
Connection method			
Plug-in I/O terminals	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	16	8	8
m/p-reading	Yes	Yes	
Input characteristic curve acc. to IEC 1131, Type 1	Yes		Yes
Input voltage			
Rated value, AC	0.414	2414	230 V; 220/230 V AC (47 to 63 Hz)
Rated value, DC	24 V	24 V	
for signal "0"for signal "1"	0 to 5 V 15 to 30 V	0 to 5 V 15 to 30 V	up to 20 V AC 79 V AC or more
	15 to 30 V	15 to 30 V	79 V AC OF More
Input current			0.5
• for signal "1", typ.	4 mA	4 mA	2.5 mA
Input delay (for rated value of input voltage)			
• for standard inputs	4.6	4.5	46
- at "0" to "1", max.	4.5 ms	4.5 ms	15 ms
Cable length			
Cable length, shielded, max.	500 m	500 m	500 m
Cable length unshielded, max.	300 m	300 m	300 m
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
 permissible quiescent current (2-wire BEROS), max. 	1 mA	1 mA	1 mA

EM 221, EM 222, EM 223

Technical specifications EM 221 (continued)

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Galvanic isolation Galvanic isolation digital inputs			
 Galvanic isolation digital inputs 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
 between the channels, in groups of 	4	4	1; (8 groups)
Dimensions and weight			
Dimensions			
• Width	71.2 mm	46 mm	71.2 mm
Height	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm
Weight			
 Weight, approx. 	160 g	150 g	160 g

Technical specifications EM 222

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
 permissible range, lower limit (DC) 	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from backplane bus 5 V DC, max.	40 mA	50 mA
Power losses		
Power loss, typ.	3 W	2 W
Connection method		
Plug-in I/O terminals	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Short-circuit protection	No	No; to be provided externally (see manual package "Setting up an S7-200")
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)
Output voltage		
• for signal "1", min.	20 V DC	20 V
Output current		
• for signal "1" permissible range for 0 to 55 °C, max.	5 A	750 mA
• for signal "0" residual current, max.	30 μΑ	10 μΑ
Parallel switching of 2 outputs		
 for increased power 		Yes
Aggregate current of outputs (per group)		
horizontal installation		
- up to 55 °C, max.	20 A	3 A
• up to 40 °C, max.	20 A	3 A
 maximum current per conductor/ group 	5 A	3 A
Cable length		
 Cable length, shielded, max. 	500 m	500 m
 Cable length unshielded, max. 	150 m	150 m

EM 221, EM 222, EM 223

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
Relay outputs		
Switching capacity of contacts		
 with inductive load, max. 	5 A	0.75 A
 on lamp load, max. 	50 W	5 W
 with resistive load, max. 	5 A	0.75 A
Galvanic isolation		
Galvanic isolation digital outputs		
 Galvanic isolation digital outputs 	Yes	Yes; Optocoupler
 Between the channels, in groups of 	1	4
Dimensions and weight		
Dimensions		
• Width	45 mm	45 mm
Height	80 mm	80 mm
• Depth	62 mm	62 mm
Weight		
 Weight, approx. 	120 g	150 g

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
Supply voltages			
Load voltage L+			
Rated value (DC)	24 V	24 V	
• Permissible range, lower limit (DC)	12 V	5 V	
• Permissible range, upper limit (DC)	30 V	30 V	
Load voltage L1			
 Rated value (AC) 	24 V; 24 to 230 V AC	24 V; 24 to 230 V AC	230 V; 220/230 V AC
• Permissible range, lower limit (AC)	12 V	5 V	65 V
• Permissible range, upper limit (AC)	250 V	250 V	264 V
 Ppermissible frequency range, lower limit 		47 Hz	47 Hz
 Permissible frequency range, upper limit 		63 Hz	63 Hz
Current consumption			
from backplane bus 5 V DC, max.	30 mA	40 mA	110 mA
Digital outputs			
• from load voltage L+, max.	80 mA; 20 mA per switched output	72 mA; 9 mA per switched output	
Power losses			
Power loss, typ.	4 W	2 W	4 W
Connection method			
Plug-in I/O terminals	Yes	Yes	Yes
Digital outputs			
Number of digital outputs	4; Relay	8; Relay	8
Short-circuit protection	No; to be provided externally (see manual package "Setting up an S7-200")	No; to be provided externally (see manual package "Setting up an S7-200")	No; to be provided externally (see manual package "Setting up an S7-200")
Limitation of inductive shutdown voltage to	to be provided externally (see manual package "Setting up an S7-200")	to be provided externally (see manual package "Setting up an S7-200")	to be provided externally (see manual package "Setting up an S7-200")
Output voltage			
• for signal "1", min.			L1 (-0.9 V)

EM 221, EM 222, EM 223

Technical specifications EM 222 (continued)

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
Output current			
 for signal "1" permissible range for 0 to 55 °C, max. 	10 A	2 A	500 mA; AC
• for signal "1" minimum load current			50 mA
• for signal "0" residual current, max.	0 mA	0 mA	1.8 mA; at 264 V AC
Aggregate current of outputs (per group)			
 Horizontal installation 			
- up to 55 °C, max.	20 A	8 A	0.5 A
 Up to 40 °C, max. 	40 A	8 A	0.5 A
 Maximum current per conductor/ group 	10 A	8 A	0.5 A
Cable length			
 Cable length, shielded, max. 	500 m	500 m	500 m
 Cable length unshielded, max. 	150 m	150 m	150 m
Relay outputs			
Number of operating cycles	30 000 000; mechanically 30 million, at rated load voltage 30,000	10 000 000; mechanically 10 million, at rated load voltage 100,000	
Switching capacity of contacts			
 with inductive load, max. 	3 A; 2 A (DC), 3 A (AC)	2 A	0.5 A
on lamp load, max.	1 000 W; 100/1000 W (DC/AC)	200 W; 30 W DC; 200 W AC	60 W
 with resistive load, max. 	10 A	2 A	0.5 A
Galvanic isolation			
Galvanic isolation digital outputs			
Galvanic isolation digital outputs	Yes; Relay	Yes; Relay	Yes; Optocoupler
• Between the channels, in groups of	1; 4 groups	4	1; 8 groups
Dimensions and weight			
Dimensions			
Width	45 mm	45 mm	71.2 mm
Height	80 mm	80 mm	80 mm
Depth	62 mm	62 mm	62 mm
Weight			
Weight, approx.	150 g	170 g	170 g

Technical specifications EM 223

	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0	6ES7 223-1BM22-0XA0
Supply voltages				
Load voltage L+				
 Rated value (DC) 	24 V	24 V	24 V	24 V
 Permissible range, lower limit (DC) 	20.4 V	20.4 V	20.4 V	20.4 V
 Permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V	28.8 V
Current consumption				
from backplane bus 5 V DC, max.	40 mA	80 mA	160 mA	240 mA
from sensor current supply or external current supply (24 V DC), max.				128 mA; ON: 4ma/Input
Power losses				
Power loss, typ.	2 W	3 W	6 W	9 W
Connection method				
Plug-in I/O terminals	Yes	Yes	Yes	Yes

EM 221, EM 222, EM 223

	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0	6ES7 223-1BM22-0XA0
Digital inputs				
Number of digital inputs	4	8	16	32
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V 0 to 5 V 15 to 30 V DC	24 V 0 to 5 V 15 to 30 V DC	24 V 0 to 5 V 15 to 30 V DC	24 V 0 to 5 V 15 to 30 V DC
Input current • for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", max.	4.5 ms	4.5 ms	4.5 ms	4.5 ms
Digital outputs				
Number of digital outputs	4	8	16	32
Short-circuit protection	No; to be provided externally			
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)
Output voltage • for signal "0" (DC), max. • for signal "1", min.	0.1 V 20 V	0.1 V 20 V	0.1 V 20 V	0.1 V 20 V
Output current • for signal "1" rated value	750 mA	750 mA	750 mA	750 mA
Aggregate current of outputs (per group) • Maximum current per conductor/ group	3 A	3 A	3 A; 3/3/6	0.75 A; 10 A per group
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 150 m	500 m 150 m	500 m 150 m	500 m 150 m
Relay outputs Switching capacity of contacts with inductive load, max. on lamp load, max. with resistive load, max.	0.75 A; each output 5 W 0.75 A; each output	0.75 A; each output 5 W 0.75 A; each output	0.75 A; each output 5 W 0.75 A; each output	0.75 A; each output 5 W 0.75 A; each output
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA
Isolation Isolation checked with	500 V AC	500 V AC	500 V AC	500 V AC
Galvanic isolation Galvanic isolation digital inputs Galvanic isolation digital inputs Between the channels, in groups of	Yes; Optocoupler 4	Yes; Optocoupler 4	Yes; Optocoupler 4	Yes; Optocoupler 16; 2 groups with 16 inputs each
Galvanic isolation digital outputs • Galvanic isolation digital outputs • Between the channels, in groups of	Yes; Optocoupler 4	Yes; Optocoupler 4	Yes; Optocoupler 4; 4 / 4 / 8	Yes; Optocoupler 16; 2 groups with 16 outputs each
Dimensions and weight Dimensions • Width • Height • Depth	46 mm 80 mm 62 mm	71.2 mm 80 mm 62 mm	137.5 mm 80 mm 62 mm	196 mm 80 mm 62 mm
Weight • Weight, approx.	160 g	200 g	360 g	500 g

EM 221, EM 222, EM 223

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0	6ES7 223-1PM22-0XA0
Supply voltages				
Load voltage L+				
Rated value (DC)	24 V	24 V	24 V	24 V
Permissible range, lower limit (DC)	5 V	5 V	5 V	5 V
Permissible range, upper limit (DC)	30 V	30 V	30 V	30 V
_oad voltage L1				
Rated value (AC) Permissible range,	230 V; 24 to 230 V AC 5 V	230 V; 24 to 230 V AC 5 V	230 V; 24 to 230 V AC 5 V	230 V; 24 to 230 V AC 5 V
lower limit (AC) Permissible range,	250 V	250 V	250 V	250 V
upper limit (AC)				
Current consumption rom backplane bus 5 V DC,	40 mA	80 mA	150 mA	205 mA
nax.	10 110 1	00 11.0 1	100 1111	200 11,, 1
rom coil current, max.	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"
rom sensor current supply or external current supply 24 V DC), max.	72 mA	72 mA	72 mA	128 mA
Power losses Power loss, typ.	2 W	3 W	6 W	13 W
Connection method	Z VV	5 VV	OVV	10 **
Plug-in I/O terminals	Yes	Yes	Yes	Yes
Digital inputs Number of digital inputs	4	8	16	32
nput voltage				
Rated value, DC	24 V	24 V	24 V	24 V
for signal "0"	0 to 5 V			
for signal "1"	15 to 30 V DC			
nput current for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
nput delay (for rated value of				
nput voltage)				
for standard inputs	4.5	4.5 ms	4.5 ms	4.5 ms
- at "0" to "1", max.	4.5 ms	4.5 ms	4.5 ITIS	4.5 1118
Digital outputs Number of digital outputs	4; Relay	8; Relay	16; Relay	32; Relay
Short-circuit protection	No; to be provided externally			
Output voltage				
for signal "0" (DC), max.	0.1 V; with 10 kOhm load			
for signal "1", min.	L+/L1	L+/L1	L+/L1	L+/L1
Output current • for signal "1" rated value	2 000 mA	2 000 mA	2 000 mA	2 000 mA
Aggregate current of outputs				
per group) Maximum current per conductor/group	8 A	8 A	8 A	2 A; 10 A per group
Cable length				
Cable length, shielded, max.	500 m	500 m	500 m	500 m
Cable length unshielded, max.	150 m	150 m	150 m	150 m

EM 221, EM 222, EM 223

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0	6ES7 223-1PM22-0XA0
Relay outputs				
Number of operating cycles	10 000 000; mechanically 10 million, at rated load voltage 100,000	10 000 000; mechanically 10 million, at rated load voltage 100,000	10 000 000; mechanically 10 million, at rated load voltage 100,000	10 000 000; mechanically 10 million, at rated load voltage 100,000
Switching capacity of contacts				
 with inductive load, max. 	0.75 A; each output			
 on lamp load, max. 		200 W; 30 W DC; 200 W AC	200 W; 30 W DC; 200 W AC	200 W; 30 W DC; 200 W AC
 with resistive load, max. 	0.75 A; each output	0.75 A; each output	0.75 A; each output	2 A; each output
Encoder				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
 permissible quiescent current (2-wire BEROS), max. 	1 mA	1 mA	1 mA	1 mA
Isolation				
Isolation checked with	500 V AC	500 V AC	500 V AC	500 V AC
Galvanic isolation				
Galvanic isolation digital inputs				
 Galvanic isolation digital inputs 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
 between the channels, in groups of 	4	4	8	16
Galvanic isolation digital outputs				
 Galvanic isolation digital outputs 	Yes; Relay	Yes; Relay	Yes; Relay	Yes; Relay
 between the channels, in groups of 	4	4	4	11; 11/11/10
Dimensions and weight				
Dimensions				
• Width	46 mm	71.2 mm	137.5 mm	196 mm
Height	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm
Weight				
 Weight, approx. 	160 g	300 g	400 g	580 g

EM 221, EM 222, EM 223

Ordering data	Order No.		Order No.
Digital input module EM 221		Front flap set	
for CPU 221/222/224/224 XP/226 • 8 inputs, 24 V DC, isolated,	6ES7 221-1BF22-0XA0	contains various cover flaps for CPUs and EMs; spare part	6ES7 291-3AX20-0XA0
current sourcing/sinking16 inputs, 24 V DC, isolated,	6ES7 221-1BH22-0XA0	Pluggable terminal block (spare part)	
current sourcing/sinking8 inputs, 120/230 V AC, isolated,	6ES7 221-1EF22-0XA0	• With 7 terminals (for EM 221/222)	6ES7 292-1AD20-0AA0
current sourcing/sinking		 With 12 terminals (for EM 223) 	6ES7 292-1AE20-0AA0
Digital output module EM 222		SIM 274 simulator (optional)	
for CPU 221/222/224/224 XP/226 • 4 outputs, 24 V DC; 5A, isolated	6ES7 222-1BD22-0XA0	with 8 terminals for EM 221 and EM 223	6ES7 274-1XF00-0XA0
 8 outputs, 24 V DC; 0.75 A, isolated 	6ES7 222-1BF22-0XA0	S7-200 programmable controller, System Manual	
 4 outputs, 24 V DC, 24 to 230 V AC; 10 A, isolated, relay outputs 	6ES7 222-1HD22-0XA0	for CPU 221/222/224/224 XP/226	
8 outputs, 24 V DC, 24 to 230 V AC; 2 A, isolated, relay outputs	6ES7 222-1HF22-0XA0	and STEP 7 Micro/Win V4 German	6ES7 298-8FA24-8AH0
 8 outputs, 120/230 V AC; 0.5 A, isolated 	6ES7 222-1EF22-0XA0	English	6ES7 298-8FA24-8BH0
Digital input/output module EM 223		French Spanish	6ES7 298-8FA24-8CH0 6ES7 298-8FA24-8DH0
for CPU 221/222/224/224 XP/226		Italian	6ES7 298-8FA24-8EH0
• 4 inputs 24 V DC, 4 outputs 24 V DC; 0.75 A, isolated	6ES7 223-1BF22-0XA0	Chinese	6ES7 298-8FA24-8FH0
8 inputs, 24 V DC, 8 outputs 24 V DC; 0.75 A, isolated	6ES7 223-1BH22-0XA0		
 16 inputs, 24 V DC, 16 outputs 24 V DC; 0.75 A, isolated 	6ES7 223-1BL22-0XA0		
 32 inputs, 24 V DC, 32 outputs 24 V DC; 0.75 A, isolated 	6ES7 223-1BM22-0XA0		
 4 inputs, 24 V DC; 4 outputs, relays 	6ES7 223-1HF22-0XA0		
 8 inputs, 24 V DC; 8 outputs, relays 	6ES7 223-1PH22-0XA0		
 16 inputs, 24 V DC; 16 outputs, relays 	6ES7 223-1PL22-0XA0		
 32 inputs, 24 V DC; 32 outputs, relays 	6ES7 223-1PM22-0XA0		

I: Subject to export regulations AL: N and ECCN: EAR99H

SIPLUS EM 221, EM 222, EM 223

Overview SIPLUS EM 221



• Digital inputs as supplement to the integral I/O of the CPUs

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 221 digital input modules for CPU 22x				
	8 DI	16 DI		
Order number	6AG1 221-1BF22- 2XA0	6AG1 221-1BH22- 2XB0		
Order No. based on	6ES7 221-1BF22- 0XA0	6ES7 221-1BH22- 0XA0		
Ambient temperature range	-25 +70 °C; -25 +55 °C (for app approval)	lications with cUL		
Conformal coating	Coating of the printed electronic component	circuit boards and the		
Technical data	The technical data of applies except for the			
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes		
Approvals	CE, cUL			
Ambient conditions				
Relative humidity	5 100 % Condensation permiss	sible		
Biologically active substances	Conformity with EN 60 mold and fungal spore			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ¹⁾²⁾			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K			

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

SIPLUS EM 221, EM 222, EM 223

Overview SIPLUS EM 222



• Digital outputs as a supplement to the integral I/O of the CPUs

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	8 DO	16 RO	
Order number	6AG1 222-1BF22- 2XB0	6AG1 222-1HF22- 2XB0	
Order No. based on	6ES7 222-1BF22- 0XB0	6ES7 222-1HF22- 0XB0	
Ambient temperature range	-25 +70 °C; -25 +55 °C (for app approval)	lications with cUL	
Conformal coating	Coating of the printed electronic component	circuit boards and the s	
Technical data	The technical data of applies except for the		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	
Approvals	CE, cUL		
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K		

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H2S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H2S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here:

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS EM 221, EM 222, EM 223

Overview SIPLUS EM 223



 Digital inputs and outputs as supplement to the integral I/O of the CPUs

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 223 digital inpu	ut/output modules for CPU 22x					
	4 DI/4 O 8 DI/8 DO 16 DI/16 DO					
Order number	6AG1 223-1BF22-2XB0	6AG1 223-1BH22-2XB0	6AG1 223-1BL22-2XB0			
Order No. based on	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0			
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications	s with cUL approval)				
Conformal coating	Coating of the printed circuit I	poards and the electronic components				
Technical data	The technical data of the stan	The technical data of the standard product applies except for the ambient conditions				
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes			
Approvals	CE, cUL					

	4 DI/4 O 8 DI/8 DO 16 DI/16 DO				
Order number	6AG1 223-1HF22-2XB0	6AG1 223-1PH22-2XB0	6AG1 223-1PL22-2XB0		
Order No. based on	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0		
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applicatio	ns with cUL approval)			
Conformal coating	Coating of the printed circui	t boards and the electronic compone	nts		
Technical data	The technical data of the sta	andard product applies except for the	ambient conditions		
Compliant with the standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes		
	CE, cUL				

SIPLUS EM 221, EM 222, EM 223

Overview SIPLUS EM 223 (continued)

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	

Ambient conditions	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS EM 221 digital input module		SIPLUS EM 223 digital input/ output module	
(extended temperature range and medial exposure)		(extended temperature range and medial exposure)	
for CPU 222/224/224XP/226		for CPU 222/224/224XP/226	
• 8 inputs, 24 V DC, isolated, current sourcing/sinking	6AG1 221-1BF22-2XB0	 4 inputs, 24 V DC, 4 outputs, 24 V DC; 0.75 A, isolated 	6AG1 223-1BF22-2XB0
• 16 inputs, 24 V DC, isolated, current sourcing/sinking	6AG1 221-1BH22-2XA0	 8 inputs, 24 V DC, 8 outputs, 24 V DC; 0.75 A, isolated 	071G1 220 131122 2730
SIPLUS EM 222 digital output module		 16 inputs, 24 V DC, 16 outputs, H 24 V DC; 0.75 A, isolated 	6AG1 223-1BL22-2XB0
(extended temperature range and		 4 inputs, 24 V DC, 4 outputs, relay 	6AG1 223-1HF22-2XB0
medial exposure) for CPU 222/224/224XP/226		 8 inputs, 24 V DC, 8 outputs, relay 	6AG1 223-1PH22-2XB0
• 8 outputs, 24 V DC; 0.75 A, isolated	6AG1 222-1BF22-2XB0	 16 inputs, 24 V DC, 16 outputs, H 24 V DC; 0.75 A, relay 	6AG1 223-1PL22-2XB0
8 outputs, 24 V DC / 24 to 230 V AC, 2 A, electrically isolated, relay outputs	6AG1 222-1HF22-2XB0	Accessories	See SIMATIC S7-200 EM 221 digital input modules, page 3/37

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Analog modules

EM 231, EM 232, EM 235

Overview



- Analog inputs and outputs for the SIMATIC S7-200
- With extremely short conversion times
- For connections of analog sensors and actuators without additional amplifier
- For solving the more complex automation tasks

Technical specifications EM 231

Current consumption Form load voltage L+ (without load), max. 60 mA 60	
from load voltage L+ (without load), max. 60 mA 60 mA from backplane bus 5 V DC, max. 20 mA 20 mA Power loss. typ. 2 W 2 W Connection method Plug-in I/O terminals No No Analog inputs No No Number of analog inputs 4; Difference 8; Difference Cable length, shielded, max. 100 m; to the sensor 100 m; to the sensor Input ranges (rated values), voltages Yes Yes • 0 to +10 V Yes Yes • 2.5 V to +2.5 V Yes Yes • -2.5 V to +5 V Yes Yes • 80 mV to +80 mV No No Input ranges (rated values), currents Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements No No • Type E No No • Type B No No • Type B No No • Type T No No Input ranges (rated values), resistance thermometers No No	
From backplane bus 5 V DC, max. 20 mA 20	
Power losses Power loss, typ. 2 W 2 W 2 W	
Power loss, typ. 2 W	
Connection method No No Plug-in I/O terminals No No Analog inputs 4; Difference 8; Difference Cable length, shielded, max. 100 m; to the sensor 100 m; to the sensor Input ranges (rated values), voltages 0 to +5 V Yes Yes • 0 to +10 V Yes Yes Yes • 2.5 V to +2.5 V Yes Yes Yes • 5 V to +5 V Yes Yes Yes • 80 mV to +80 mV No No Input ranges (rated values), currents No No • 0 to 20 mA Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements No No • Type E No No • Type J No No • Type N No No • Type B No No • Type S No No • Type T No No Input ranges (rated values), resistance thermometers No No • Cu 10<	
Plug-in I/O terminals	
Analog inputs Number of analog inputs 4; Difference 8; Difference Cable length, shielded, max. 100 m; to the sensor Input ranges (rated values), voltages • 0 to +5 V Yes • 0 to +10 V Yes • 2.5 V to +2.5 V • 80 MV to +80 mV Input ranges (rated values), currents • 0 to 20 mA Yes • 1yes • 1	
Number of analog inputs 4; Difference 8; Difference Cable length, shielded, max. 100 m; to the sensor Input ranges (rated values), voltages -0 to +5 V Yes • 0 to +10 V Yes Yes • -2.5 V to +2.5 V Yes Yes • 5 V to +5 V Yes Yes • -80 mV to +80 mV No No Input ranges (rated values), currents Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements No No • Type E No No • Type N No No • Type N No No • Type S No No • Type T No No Input ranges (rated values), resistance thermometers No No • Cu 10 No No • Ni 10 No No	
Cable length, shielded, max. Input ranges (rated values), voltages • 0 to +5 V • 0 to +10 V • 2.5 V to +2.5 V • -2.5 V to +2.5 V • 8 MY to +80 mV Input ranges (rated values), currents • 0 to 20 mA Input ranges (rated values), thermoelements • Type E • Type J • Type N • Type R • Type T Input ranges (rated values), resistance thermometers • Cu 10 • No No 100 m; to the sensor	
Input ranges (rated values), voltages • 0 to +5 V	
• 0 to +5 V	
• 0 to +10 V Yes Yes • -2.5 V to +2.5 V Yes Yes • -5 V to +5 V Yes Yes • -80 mV to +80 mV No No Input ranges (rated values), currents Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements No No • Type E No No • Type K No No • Type R No No • Type S No No • Type T No No Input ranges (rated values), resistance thermometers No No • Cu 10 No No • Ni 10 No No	
• -2.5 V to +2.5 V • -5 V to +5 V • -80 mV to +80 mV Input ranges (rated values), currents • 0 to 20 mA Yes Yes Yes Yes Yes Yes Yes Ye	
• -5 ∨ to +5 ∨	
• -80 mV to +80 mV No Input ranges (rated values), currents Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements No No • Type E No No • Type K No No • Type N No No • Type R No No • Type S No No • Type T No No Input ranges (rated values), resistance thermometers No No • Cu 10 No No • Ni 10 No No	
Input ranges (rated values), currents • 0 to 20 mA Yes Yes Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements • Type E • Type J • Type K • Type N • Type N • Type R • Type S • Type T Input ranges (rated values), resistance thermometers • Cu 10 • Ni 10	
Ves Yes; for channels 6 and 7 only Input ranges (rated values), thermoelements Type E No Type J No Type K No Type N No Type R No Type S No Type T No Input ranges (rated values), resistance thermometers Cu 10 No	
Input ranges (rated values), thermoelements No • Type E No • Type J No • Type K No • Type N No • Type R No • Type S No • Type T No Input ranges (rated values), resistance thermometers No • Cu 10 No • Ni 10 No	
 Type E Type J No Type K No Type N No Type R No Type S Type T Input ranges (rated values), resistance thermometers Cu 10 No 	
• Type J No • Type K No • Type N No • Type R No • Type S No • Type T No Input ranges (rated values), resistance thermometers Cu 10 • Cu 10 No • Ni 10 No	
• Type K No • Type N No • Type R No • Type S No • Type T No Input ranges (rated values), resistance thermometers Cu 10 • Cu 10 No • Ni 10 No	
• Type N No • Type R No • Type S No • Type T No Input ranges (rated values), resistance thermometers Vo • Cu 10 No • Ni 10 No	
• Type R No • Type S No • Type T No Input ranges (rated values), resistance thermometers • Cu 10 • Cu 10 No • Ni 10 No	
• Type S No • Type T No Input ranges (rated values), resistance thermometers • Cu 10 • Cu 10 No • Ni 10 No	
• Type T No Input ranges (rated values), resistance thermometers • Cu 10 • Cu 10 No • Ni 10 No	
Input ranges (rated values), resistance thermometers • Cu 10 • No • Ni 10	
eters	
• Cu 10 • Ni 10	
• Ni 10	
111 1000	
• Ni 120	
• Pt 100 No	
• Pt 1000	
• Pt 10000	
• Pt 200 No	
● Pt 500 No	
Input ranges (rated values), resistors	
• 0 to 150 Ohm No	
• 0 to 300 Ohm No	
• 0 to 600 Ohm No	

EM 231, EM 232, EM 235

	6ES7 231-0HC22-0XA0	6ES7 231-0HF22-0XA0
Voltage input • permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
Current input • permissible input current for current input (destruction limit), max.	32 mA	40 mA
Characteristic linearization • for voltage measurement • for current measurement	No No	No No
Temperature compensation • Temperature compensation parameterizable	No	No
Analog value creation Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	12 bit	12 bit
 Interference voltage suppression for inter- ference frequency f1 in Hz 	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC up to 60 V for interference frequency
Conversion time (per channel)	250 µs	250 µs
Displayable conversion value range • bipolar signals • unipolar signals	-32000 to +32000 0 to 32000	-32000 to +32000 0 to 32000
Errors/accuracies Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • common mode voltage, max.	12 V	12 V
Galvanic isolation Galvanic isolation analog inputs • Galvanic isolation analog inputs	No	No
Dimensions and weight Dimensions		
WidthHeightDepth	71.2 mm 80 mm 62 mm	71.2 mm 80 mm 62 mm
Weight • Weight, approx.	183 g	190 g

EM 231, EM 232, EM 235

Technical specifications EM 232

	6ES7 232-0HB22-0XA0	6ES7 232-0HD22-0XA0
Current consumption		
from backplane bus 5 V DC, max.	20 mA	20 mA
from sensor current supply or external current supply (24 V DC), max.	70 mA	70 mA
Power losses		
Power loss, typ.	2 W	2 W
Connection method		
Plug-in I/O terminals	No	No
Analog outputs Number of analog outputs	2	4
Output ranges, voltage • -10 to +10 V	Yes	Yes
Output ranges, current	V	Ver
• 4 to 20 mA	Yes	Yes
Load impedance (in rated range of output)	5 kΩ	5 kΩ
with voltage outputs, min.with current outputs, max.	5 KΩ 0.5 kΩ	$0.5 \text{ k}\Omega$
Analog value creation		
Integrations and conversion time/ resolution per channel		
• Resolution (incl. overrange)	U/12 bit, I/11 bit	U/12 bit, I/11 bit
Settling time		
• for voltage output	100 µs	100 μs
for current output	2 ms	2 ms
Displayable conversion value range		
bipolar signals unipolar signals	-32000 to +32000 0 to 32000	-32000 to +32000 0 to 32000
• unipolar signals	0 10 32000	0 10 32000
Errors/accuracies Operational limit in overall temperature range		
Voltage, relative to output area	+/- 2 %	+/- 2 %
Current, relative to output area	+/- 2 %	+/- 2 %
Basic error limit (operational limit at 25 °C)		
Voltage, relative to output area	+/- 0,5 %	+/- 0,5 %
 Current, relative to output area 	+/- 0,5 %	+/- 0,5 %
Galvanic isolation		
Galvanic isolation analog outputs		
Galvanic isolation analog outputs	No	No
Dimensions and weight		
Dimensions	40 0000	71.0
WidthHeight	46 mm 80 mm	71.2 mm 80 mm
• Depth	62 mm	62 mm
Weight	OL IIIII	OL IIIII
Weight, approx.	148 g	190 g
9.14, app. 07.1	9	.00 9

EM 231, EM 232, EM 235

Technical specifications EM 235

	6ES7 235-0KD22-0XA0
Current consumption	
from backplane bus 5 V DC, max.	30 mA
from sensor current supply or external current supply (24 V DC), max.	60 mA
Power losses	
Power loss, typ.	2 W
Connection method Plug-in I/O terminals	No
Analog inputs Number of analog inputs Voltage Current	4; Difference Yes Yes
Input ranges (rated values), voltages • 0 to +50 mV • 0 to +100 mV • 0 to +500 mV • 0 to +50 v • 0 to +5 V • 0 to +10 V • -1 V to +1 V • -10 V to +10 V • -10 mV to +100 mV • -2.5 V to +2.5 V • -25 mV to +25 mV • -50 mV to +50 mV • -50 mV to +50 mV • -500 mV to +500 mV Input ranges (rated values), currents • 0 to 20 mA	Yes
Voltage input • permissible input voltage for voltage input (destruction limit), max.	30 V
Current input • permissible input current for current input (destruction limit), max.	32 mA
Characteristic linearization • for voltage measurement • for current measurement	No No
Temperature compensation • Temperature compensation parameterizable	No

	6ES7 235-0KD22-0XA0
Analog outputs	
Number of analog outputs	1
Output ranges, voltage	
• -10 to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
Load impedance (in rated range of output)	
with voltage outputs, min.	5 kΩ
with current outputs, max.	0.5 kΩ
Analog value creation	
Integrations and conversion time/	
resolution per channel Resolution with overrange	12 bit; 11 bit for current output
(bit including sign), max.	12 bit, 11 bit for current output
Basic conversion time, ms	< 0.25 ms
 Interference voltage suppression for interference frequency f1 in Hz 	40 dB, DC to 60 Hz
Settling time • for voltage output	100 μs
• for current output	2 ms
Displayable conversion value range	
bipolar signals	-32000 to +32000
unipolar signals	0 to 32000
Errors/accuracies	
Operational limit in overall temperature range	
Voltage, relative to output area	+/- 2 %
Current, relative to output area	+/- 2 %
Basic error limit (operational limit at 25 °C)	
Voltage, relative to output area	+/- 0.5 %
Current, relative to output area	+/- 0.5 %
Interference voltage suppression for	
$f = n \times (fl + /- 1\%)$, $fl = interference$ frequency	
• common mode voltage, max.	12 V
Galvanic isolation	
Galvanic isolation analog inputs	
Galvanic isolation analog inputs	No
Galvanic isolation analog outputs	
Galvanic isolation analog outputs	No
Dimensions and weight	
Dimensions • Width	71.2 mm
Height	80 mm
• Depth	62 mm
Weight	
Weight, approx.	186 g

EM 231, EM 232, EM 235

Ordering data	Order No.		Order No.
EM 231 analog input module		Ground terminal	6ES5 728-8MA11
for CPU 221/222/224/224 XP/226		10 units	
4 inputs, 0 to 10 V, 12 bit resolution	6ES7 231-0HC22-0XA0	Front flap set	
8 inputs, 0 to 10 V, of which max.	6ES7 231-0HF22-0XA0	contains various cover flaps for CPUs and EMs; spare part	6ES7 291-3AX20-0XA0
2 inputs also 0 to 20 mA, 11/12 bit resolution		S7-200 programmable controller, system manual	
EM 232 analog output module		for CPU 221/222/224/224 XP/226	
for CPU 221/222/224/224 XP/226		and STEP 7 Micro/Win V4	
2 outputs, ±10 V, 12 bit resolution	6ES7 232-0HB22-0XA0	German	6ES7 298-8FA24-8AH0
4 outputs, ±10 V, 12-bit resolution	6ES7 232-0HD22-0XA0	English	6ES7 298-8FA24-8BH0
EM 235 analog input/output	6ES7 235-0KD22-0XA0	French	6ES7 298-8FA24-8CH0
module		Spanish	6ES7 298-8FA24-8DH0
for CPU 222/224/224 XP/226; 4 inputs, 1 output, ±10 V DC, 12 bit		Italian	6ES7 298-8FA24-8EH0
resolution		Chinese	6ES7 298-8FA24-8FH0

EM 231 thermocouple module

Overview



- For user-friendly, high precision temperature detection
- 7 standard types of thermocouple can be used
- For measuring low-level analog signals (±80 mV), as well
- Easy to install in an existing system

	6ES7 231-7PD22- 0XA0	6ES7 231-7PF22- 0XA0
Current consumption		
from load voltage L+ (without load), max.	60 mA	60 mA
from backplane bus 5 V DC, max.	87 mA	87 mA
Power losses Power loss, typ.	1.8 W	1.8 W
Connection method Plug-in I/O terminals	No	No
Analog inputs Number of analog inputs	4	8
Cable length, shielded, max.	100 m; to the sensor	100 m; to the sensor
Loop resistance cable	100 Ω	100 Ω
Updating time (all channels)	405 ms	810 ms
Input ranges (rated values), voltages • -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermoelements		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
Type RType S	Yes Yes	Yes Yes
• Type T	Yes	Yes
Voltage input Permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
Analog value creation Measurement principle	Sigma Delta	Sigma Delta
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max.	16 bit; Temperature 0.1 °C / 0.1 °F	16 bit; Temperature 0.1 °C / 0.1 °F

	6ES7 231-7PD22- 0XA0	6ES7 231-7PF22- 0XA0
Interference voltage suppression for inter- ference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Displayable conversion value range • Bipolar signals	07 640 to 107 640	27 640 to 1 27 640
Errors/accuracies	-27,648 to +27,648	-27,648 to +27,648
cold connection point	+/-1.5 °C	+/-1.5 °C
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.05 %
Operational limit in overall temperature range • Voltage, relative to output area	+/- 0.1 %	+/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency		
 Common mode voltage, max. 	120 V; AC	120 V; AC
Common mode interference, min.	120 dB; at 120 V AC	120 dB; at 120 V AC
Galvanic isolation Galvanic isolation		
analog inputs Galvanic isolation analog inputs	Yes	Yes
Dimensions and weight		
Dimensions • Width • Height • Depth	71.2 mm 80 mm 62 mm	71.2 mm 80 mm 62 mm
Weight • Weight, approx.	210 g	210 g

EM 231 thermocouple module

Ordering data	Order No.		Order No.
EM 231 thermocouple module		S7-200 programmable	
Inputs +/- 80 mV, resolution 15 bit + sign, thermocouples J, K, S, T, R, E, N		controller, system manual for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4	
4 inputs	6ES7 231-7PD22-0XA0	German	6ES7 298-8FA24-8AH0
8 inputs	6ES7 231-7PF22-0XA0	English	6ES7 298-8FA24-8BH0
Ground terminal	6ES5 728-8MA11	French	6ES7 298-8FA24-8CH0
10 units		Spanish	6ES7 298-8FA24-8DH0
Backplane bus expansion cable	6ES7 290-6AA20-0XA0		6ES7 298-8FA24-8EH0
for connecting two rows of modules with double-tier configu- ration, for CPU 222/224/224 XP/ 226		Chinese	6ES7 298-8FA24-8FH0

I: Subject to export regulations AL: N and ECCN: EAR99H

EM 231 RTD module

Overview



- To measure temperatures easily and with high accuracy
- 2 versions with 2 or 4 inputs
- The latest resistance temperature detectors can be used
- Easy to retrofit in existing systems

	6ES7 231-7PB22- 0XA0	6ES7 231-7PC22- 0XA0
Current consumption from load voltage L+ (without load), max.	60 mA	60 mA
from backplane bus 5 V DC, max.	87 mA	87 mA
Power losses Power loss, typ.	1.8 W; Sensor: 1 mW	1.8 W; Sensor: 1 mW
Connection method Plug-in I/O terminals	No	No
Analog inputs Number of analog inputs	2	4
Cable length, shielded, max.	100 m; to the sensor	100 m; to the sensor
Loop resistance cable	20 Ω; max. 2.7 Ohm for Cu	20 Ω ; max. 2.7 Ohm for Cu
Updating time (all channels)	405 ms; 700 ms with Pt10000	810 ms; 1400 ms with Pt10000
Input ranges (rated values), resistance thermometers • Cu 10 • Ni 10 • Ni 1000 • Ni 120 • Pt 100 • Pt 1000 • Pt 10000 • Pt 200 • Pt 500	Yes	Yes
Input ranges (rated values), resistors • 0 to 150 Ohm • 0 to 300 Ohm • 0 to 600 Ohm Voltage input • permissible input voltage for voltage input (destruction limit), max.	Yes Yes Yes 30 V; 30 V DC (probe), 5 V DC (source)	Yes Yes Yes 30 V; 30 V DC (probe), 5 V DC (source)

	6ES7 231-7PB22- 0XA0	6ES7 231-7PC22- 0XA0
Analog value creation Measurement principle	Sigma Delta	Sigma Delta
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Interference voltage suppression for interference frequency f1	16 bit; Temperature 0.1 °C / 0.1 °F 85 dB at 50 / 60 / 400 Hz	16 bit; Temperature 0.1 °C / 0.1 °F 85 dB at 50 / 60 / 400 Hz
in Hz Displayable conversion value range		
bipolar signals	-27,648 to +27,648	-27,648 to +27,648
Errors/accuracies Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.05 %
Operational limit in overall temperature range • Voltage, relative to output area	+/- 0.1 %	+/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • common mode voltage, max. • Common mode interference, min.	0 V 120 dB; at 120 V AC	0 V 120 dB; at 120 V AC
Galvanic isolation Galvanic isolation analog inputs Galvanic isolation analog inputs	Yes	Yes
Dimensions and weight Dimensions • Width • Height • Depth	71.2 mm 80 mm 62 mm	71.2 mm 80 mm 62 mm
Weight • Weight, approx.	210 g	210 g

EM 231 RTD module

Ordering data	Order No.		Order No.
EM 231 RTD module	0007 004 7DD00 0VA0	S7-200 programmable controller, system manual	
2 inputs for resistance temper- ature detector Pt100/200/500/ 1000/10000, Ni100/120/1000,	6ES7 231-7PB22-0XA0	for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4	
Cu10; resistor 150/300/600 Ohm, resolution 15 bit + sign		German	6ES7 298-8FA24-8AH0
4 inputs for resistance temper-	6ES7 231-7PC22-0XA0	English	6ES7 298-8FA24-8BH0
ature detector Pt100/200/500/		French	6ES7 298-8FA24-8CH0
1000/10000, Ni100/120/1000, Cu10; 14 GOST temperature		Spanish	6ES7 298-8FA24-8DH0
resistance sensor, resistor 150/300/600 Ohm, resolution		Italian	6ES7 298-8FA24-8EH0
15 bit + sign		Chinese	6ES7 298-8FA24-8FH0
Ground terminal	6ES5 728-8MA11		
10 units			
Backplane bus expansion cable	6ES7 290-6AA20-0XA0		
for connecting two rows of modules with double-tier configu- ration, for CPU 222/224/224 XP/ 226			

I: Subject to export regulations AL: N and ECCN: EAR99H

SIPLUS EM 231, EM 232, EM 235

Overview SIPLUS EM 231



• Analog inputs for SIPLUS S7-200

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 231 analog input module for CPU 22x	4 AI
Order number	6AG1 231-0HC22-2XB0
Order No. based on	6ES7 231-0HC22-0XA0
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes
Approvals	CE, cUL
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. } 30 \text{ min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ O_3 < 1.0 \text{ ppm; } \text{NOX} < 10.4 \text{ ppm} \\ \end{array}$

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS EM 231, EM 232, EM 235

Overview SIPLUS EM 232



• Analog outputs for SIPLUS S7-200

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 232 analog output modules for CPU 22x	2 AO
Order number	6AG1 232-0HB22-2XB0
Order No. based on	6ES7 232-0HB22-0XA0
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. } 30 \text{ min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ O_3 < 1.0 \text{ ppm; } \text{NOX} < 10.4 \text{ ppm} \\ \end{array}$

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS EM 231, EM 232, EM 235

Overview SIPLUS EM 235



• Analog inputs and outputs for SIPLUS S7-200

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 235 analog input/ output modules for CPU 22x	4 AI/1 AO
Order number	6AG1 235-0KD22-2XB0
Order No. based on	6ES7 235-0KD22-0XA0
Ambient temperature range	-25 +70 °C; -25 +55 °C (for applications with cUL approval)
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

 $[\]begin{array}{ll} \text{1)} & \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ & \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ & \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOX} < 5.2 \text{ ppm} \\ & \text{Limit value (max. } 30 \text{ min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ & \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ & O_3 < 1.0 \text{ ppm; } \text{NOX} < 10.4 \text{ ppm} \\ \end{array}$

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS EM 231, EM 232, EM 235

Ordering data	Order No.		Order No.
SIPLUS EM 231 analog input H module	6AG1 231-0HC22-2XB0	SIPLUS EM 235 analog input/ H output module	6AG1 235-0KD22-2XB0
(extended temperature range and medial exposure)		(extended temperature range and medial exposure)	
for CPU 222/224/224 XP/226; 4 inputs, 0-10 V, resolution 12 bit		for CPU 222/224/224 XP/226; 4 inputs, 1 output, ±10 V DC,	
SIPLUS EM 232 analog output H module	6AG1 232-0HB22-2XB0	resolution 12 bit Accessories	See SIMATIC S7-200 EM 231
(extended temperature range and medial exposure)			analog output modules, page 3/46
for CPU 222/224/224 XP/226; 2 outputs, ± 10 V, resolution 12 bit			

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

SIPLUS EM 231 RTD module

Overview



- For the convenient recording of temperatures with great accuracy
- 31 common resistance temperature detectors can be used
- · Can easily be retrofitted to existing plant

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 231 RTD module for CPU 22x	2 Al Thermo	2 Al Thermo
Order number	6AG1 231-7PB22- 2XA0	6AG1 231-7PB22- 2XY0
Order No. based on	6ES7 231-7PB22- 0XA0	6ES7 231-7PB22- 0XA0
Ambient temperature range	-25 +70 °C; -25 +55 °C (for app approval)	lications with cUL
Conformal coating	Coating of the printed electronic component	circuit boards and the s
Technical data	The technical data of applies except for the	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Approvals	CE, cUL	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX 1) 2)	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
highest positive temperature range specified)	795 658 hPa (+2000 +3500 m) derating 10 K	
opes.iiou)	658 540 hPa (+350 derating 20 K	0 +5000 m)

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: $\underline{www.siemens.com/siplus-extreme}$

SIPLUS EM 231 RTD module

Ordering data	Order No.		Order No.
SIPLUS EM 231 RTD module		Accessories	See SIMATIC S7-200 EM 231 RTD
(extended temperature range and medial exposure)			module, page 3/50
2 inputs for resistance temper- ature detector Pt100/200/500/ 1000/10000, Ni100/120/1000, Cu10; resistor 150/300/600 Ohm, resolution 15 bit + sign	H 6AG1 231-7PB22-2XA0		
Conforms to EN 50155;	H 6AG1 231-7PB22-2XY0		
2 inputs for resistance temper- ature detectors Pt100/200/500/ 1000/10000, Ni100/120/1000, Cu10; resistors 150/300/ 600 Ohm, resolution 15 bit + sign			

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Function modules

EM 253 positioning module

Overview



- Function modules for simple positioning tasks (1 axis)
- Stepper motors and servo motors from the Micro Stepper to the high-performance servo drive can be connected
- Flexible connection possibilities
- Full support from STEP 7-Micro/WIN with parameterization and startup

	6ES7 253-1AA22-0XA0
Supply voltages Rated value • permissible range, lower limit (DC) • permissible range, upper limit (DC)	11 V 30 V
Current consumption from backplane bus 5 V DC, max.	190 mA
from supply voltage L+, max.	300 mA; from 12 V DC, 130 mA from 24 V DC
Hardware configuration Number of modules per CPU	max. 5 with CPU 226/226XM, max. 3 with CPU 224, max. 1 with CPU 222
Digital inputs Number of digital inputs	5
Type	IEC Type 1, active-high
Functions	Stop (STP), reference point switch (RPS), upper limit switch (LMT+), lower limit switch (LMT-), zero point (ZP)
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V STP, RPS, LMT+, LMT- 5 V DC; ZP 1 V DC STP, RPS, LMT+, LMT- 15 V DC; ZP 3 V DC
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	Yes; STP, RPS, LMT+, LMT- 0.2 to 12.8 ms; ZP min 2 µs
Cable length Cable length, shielded, max. Cable length unshielded, max.	100 m; STP, RPS, LMT+, LMT- 100 m, ZP 10 m 30 m; STP, RPS, LMT+, LMT- 30 m, ZP not recommended

	6ES7 253-1AA22-0XA0
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA
Drive interface Signal output I Number Type Differential output voltage, min. Pulse frequency Cable length, max.	4; optionally RS 422/RS 485 or 5 V DC RS 422 / RS 485 (P0+, P0-, P1+, P1-) 2.8 V; RL = 200 Ohm 200 kHz; (P0+, P0-, P1+, P1-, P0, P1) 10 m; shielded; 1 m unshielded
Signal output III Type Output voltage Output current	5 V DC(P0, P1, DIS, CLR) 30 V DC 50 mA; output delay (DIS, CLR) max. 30 µs
Galvanic isolation Galvanic isolation digital inputs • between the channels • between the channels, in groups of	Yes 1 (STP, RPS, ZP), 2 (LMT-, LMT+)
Dimensions and weight Dimensions • Width • Height • Depth	71.2 mm 80 mm 62 mm
Weight • Weight, approx.	190 g

SIMATIC S7-200 Function modules

EM 253 positioning module

Ordering data	Order No.		Order No.
EM 253 positioning module	6ES7 253-1AA22-0XA0		
For controlling stepper motors or servo drives		controller, system manual for CPU 221/222/224/224 XP/226	
Ground terminal	6ES5 728-8MA11	and STEP 7 Micro/Win V4	
10 units		German	6ES7 298-8FA24-8AH0
Backplane bus expansion cable	6ES7 290-6AA20-0XA0	English	6ES7 298-8FA24-8BH0
for connecting two rows of		French	6ES7 298-8FA24-8CH0
modules with double-tier configu-		Spanish	6ES7 298-8FA24-8DH0
ion, for CPU 221/222/224/ 4 XP/226		Italian	6ES7 298-8FA24-8EH0
•		Chinese	6ES7 298-8FA24-8FH0

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-200 Function modules

SIWAREX MS

Overview

SIWAREX MS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-200 automation systems.

The data for the actual weight can be accessed directly in the SIMATIC CPU without the need for any additional interfaces.

recimical specifications			
SIWAREX MS			
Integration in S7-200 automation systems			
	 CPU 222 (6ES7212-1*B23-0XB0) CPU 224 (6ES7214-1*D23-0XB0) CPU 224XP (6ES7214-2*D23-0XB0) CPU226 (6ES7216-2*D23-0XB0) 		
Communication interfaces	SIMATIC S7 Bus, RS 232, TTY		
Connection of remote displays (through TTY interface)	Weight value (gross, net)		
Adjustment of scales settings	Using PC parameterization software SIWATOOL MS (RS 232)		
Measuring properties • Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K • Internal resolution Data format of weight values	0.05 % 65535 2 byte (fixed-point)		
Number of measurements/second	50 or 30		
Digital filter	0.05 - 5 Hz (in 7 steps), mean-value filter		
Weighing functions • Weight values • Limit values • Zero setting function • Tare function • Tare specification	Gross, net 2 (min./max.) Per command Per command Per command		
Load cells	Strain gages in 4-wire or 6-wire system		
Load cell powering • Supply voltage $U_{\rm S}$ (rated value) • Max. supply current • Permissible load impedance - $R_{\rm Lmin}$ - $R_{\rm Lmin}$	6 V DC typical ≤ 150 mA > 40 Ω < 4010 Ω With SIWAREX IS Ex interface or SIWAREX Pi: > 87 Ω		
- R _{Lmax}	< 4010 Ω		

SIWAREX MS	
Load cell characteristic	1 mV/V 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-2.4 +26.4 mV
Max. distance of load cells	500 m
Intrinsically-safe load cell powering	
Connection to load cells in Ex zone 1	Optionally over SIWAREX IS Ex interface or SIWAREX Pi:
Ex approvals and safety	CE, ATEX 95, FM, cUL _{US} Haz. Loc.
Power supply Rated voltage Max. current consumption Rated voltage (from CPU) Max. current consumption	24 V DC 30 mA 5 V DC 140 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements T _{min (IND)} to T _{max (IND)} (operating temperature) • Vertical installation • Horizontal installation	0 +55 °C 0 +40 °C
EMC requirements according to	EN 61326, EN 45501 NAMUR NE21, Part 1
Dimensions	71.2 x 80 x 62 mm

SIMATIC S7-200 Function modules

SIWAREX MS

Ordering data	Order No.		Order No.
SIWAREX MS	7MH4 930-0AA01	SIWAREX JB junction box, stainless steel housing	7MH4 710-1EA
Weighing electronics for scales in SIMATIC S7-200 for applications without obligation of verification		for connecting up to 4 load cells in parallel	
SIWAREX MS manual		Ex interface, type SIWAREX Pi	7MH4 710-5AA
available in a range of languages		With UL and FM approvals, but	
Free download on the Internet at: www.siemens.com/weighing- technology		without ATEX approval for intrinsically safe connection of load cells, suitable for weighing modules SIWAREX U, CS, MS,	
SIWAREX MS onfiguration package on CD-ROM for STEP7 Micro/WIN.	7MH4 930-0AK01	FTA, FTC and M. Not approved for use in the EU.	
version 4.0 SP2 or higher • Software for SIWATOOL MS		Manual for Ex interface type SIWAREX Pi	C71000-T5974-C29
scale adjustment (in a range of		Ex interface, type SIWAREX IS	
languages) • Manuals available on CD (in a range of languages)		With ATEX approval, but without UL and FM approvals	
Micro/WIN Library MicroScale for communication with SIWAREX MS		for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF	
SIWAREX MS "Getting started"		weighing modules.	
Sample software show beginners how to program the scales.		Approved for use in the EU. • With short-circuit current	7MH4 710-5BA
Free download on the Internet at: www.siemens.com/weighing- technology		< 199 mA DC • With short-circuit current < 137 mA DC	7MH4 710-5CA
SIWATOOL cable		Cable (optional)	
from SIWAREX M, FTA, FTC, MS with serial PC interface, for 9-pin PC interfaces (RS 232)		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath	7MH4 702-8AG
• 2 m long	7MH4 702-8CA	to connect SIWAREX U, CS, MS,	
• 5 m long	7MH4 702-8CB	FTA, FTC, M and CF to the	
Shield clamps for shield termination	6ES5 728-8MA11	junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying,	
Pack of 10; 1 unit required for each shielded cable		occasional bending permitted, 10.8 mm outer diameter, for	
Remote displays (option)		ambient temperature	
The digital remote displays can be connected directly to the SIWAREX MS through the TTY interface.		-40 +80 °C Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath	7MH4 702-8AF
The following remote display can be used: S102		to connect the junction box (JB) or extension box (EB) in a poten-	
Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: www.siebert.de		tially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 +80 °C	
Detailed information available from manufacturer.		Cable LiYCY 4 x 2 x 0.25 mm ²	7MH4 407-8BD0
Accessories		for TTY (connect 2 pairs of	
SIWAREX JB junction box, aluminium housing	7MH4 710-1BA	conductors in parallel), for connection of a remote display	
for connecting up to 4 load cells in parallel, and for connecting several junction boxes			

I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

SIPLUS DCF 77 radio clock module

Overview



This module can be used to synchronize the real-time clock of the SIMATIC S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC and SIPLUS together with a software driver included in the scope of delivery (function block FB). The function blocks are available on the Internet for downloading.

www.siemens.com/siplus - Support - Tools and Downloads!

Technical specifications

SIPLUS DCF 77 radio clock module

Radio frequency 77.5 Hz

Power supply 24 V DC (20.4 to 28.8 DC)

Power consumption, typ. 50 mA

Dimensions (W x H x D) 75 mm x 125 mm¹⁾ x 75 mm

Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

Ordering data

Order No.

SIPLUS DCF 77 radio clock module

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig

H 6AG1 057-1AA03-0AA0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Communication

EM 241 modem

Overview



- Modem expansion module for SIMATIC S7-200
- The Plug&Play solution for all classical modem tasks in the PLC field
- Used for remote maintenance/remote diagnostics, CPU-to-CPU/PC communication or SMS/pager messaging
- Minimal engineering outlay required
- Replaces external modems connected via the communication interface of the CPU
- Easy to retrofit

Technical specifications

- recommon opecanionio	
	6ES7 241-1AA22-0XA0
Supply voltages Load voltage L+	
Rated value (DC)	24 V
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Current consumption	
from load voltage L+ (without load), max.	70 mA
from backplane bus 5 V DC, max.	80 mA; from expansion bus
Power losses	
Power loss, typ.	2.1 W
Communication functions	
Bus protocol/transmission protocol	PPI, Modbus
Interfaces	
Number of RS 485 interfaces	0
Connection method	
Telephone lines	RJ11 (4 cables, 6 contacts)
Modem	
Physics	Bell 103, Bell 212, V. 21, V. 22, V. 22 bis, V. 23c, V. 32, V. 32 to, V. 34 (preset)
Tone dialing	Yes
Pulse dialing	Yes
Dimensions and weight	
Dimensions	
• Width	71.2 mm
• Height	80 mm
Depth	62 mm
Weight	
 Weight, approx. 	190 g

Ordering data	Order No.
EM 241 modem	6ES7 241-1AA22-0XA0
Analog modem for remote maintenance/diagnostics; CPU-CPU/PC communication, SMS/pager message transmission	
Grounding terminal	6ES5 728-8MA11
10 units	
Front door set	
contains different cover flaps for CPU and EM; spare part	6ES7 291-3AX20-0XA0
S7-200 automation system, system manual	
for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4	
German	6ES7 298-8FA24-8AH0
English	6ES7 298-8FA24-8BH0
French	6ES7 298-8FA24-8CH0
Spanish	6ES7 298-8FA24-8DH0
Italian	6ES7 298-8FA24-8EH0
Chinese	6ES7 298-8FA24-8FH0

I: Subject to export regulations AL: N and ECCN: EAR99H

Communication

EM 277 PROFIBUS DP module

Overview



- For connecting S7-22x to PROFIBUS DP (as a slave) and MPI
- Simultaneous operation as MPI slave and DP slave is possible
- Transmission rate max. 12 Mbit/s
- Version 6ES7 2xx-xxx21-xxxx and higher can be used with CPU

	6ES7 277-0AA22-0XA0
Connection method	
Plug-in I/O terminals	No
PROFIBUS DP	
Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1 / 1.5 / 3 / 6 / 12 Mbit/s
Node addresses	0 to 99, adjustable
Cable length, max.	1 200 m; 100 to 1200 m, depending on transmission speed
Number of stations in network, max.	126; of which max. 99 EM 277
Number of stations per segment, max.	32
Automatic detection of transmission speed	Yes
Dimensions and weight Dimensions	
Width	71.2 mm
Height	80 mm
• Depth	62 mm
Weight	
Weight, approx.	175 g

Technical specifications

·	
	6ES7 277-0AA22-0XA0
Supply voltages Load voltage L+	
Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Current consumption	
from backplane bus 5 V DC, max.	150 mA
from sensor current supply or external current supply (24 V DC), max.	180 mA; 30 to 180 mA
Power losses	
Power loss, typ.	2.5 W
Hardware configuration	
Connectable nodes	TD 200 as of V2.0, OP, TP, PG/PC, S7-300/400, PROFIBUS DP master
Communication functions	
Bus protocol/transmission protocol	PROFIBUS DP (slave), MPI (slave)
Number of connections	
MPI connections, max.	6
 number of which are reserved for OP communication 	1
of which reserved for PG communication	1
Interfaces	
Number of RS 485 interfaces	1
5 V DC	
Output current, max.	90 mA
24 V DC	
Voltage range	20.4 to 28.8 V
Output current, max.	120 mA
Current limiting	0.7 to 2.4 A

Ordering data Order No.

EM 277 PROFIBUS DP input module

For CPU 222/224/224 XP/226; for connecting to PROFIBUS DP (slave) and MPI 6ES7 277-0AA22-0XA0

Communication

CP 243-2

Overview



The CP 243-2 is the AS-Interface master for the SIMATIC S7-200 and has the following features:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- (Analog profiles 7.3 and 7.4)
- Supports all AS-Interface master functions according to the extended AS-Interface specification V2.1
- Indication of the operating state and readiness for operation of connected slaves by means of LEDs in the front plate
- Indication of faults (e.g. AS-Interface voltage fault, configuration fault) by means of LEDs in the front plate
- Compact enclosure in the design of the SIMATIC S7-200

The CP 243-2 is connected like an expansion module to the S7-200. It has:

- two screw connections for direct connection of the AS-Interface cable
- LEDs in the front plate for indicating the operating state and functional readiness of all connected and activated slaves
- two pushbuttons for indicating the status information of the slaves, for switching over the operating state and for adopting the existing ACTUAL configuration as the DESIRED configuration

The CP 243-2 supports all the specified functions of extended version 2.1 of AS-Interface specification.

In the process image of the S7-200 the CP 243-2 occupies one digital input byte (status byte), one digital output byte (control byte), as well as 8 analog input and 8 analog output words. The CP 243-2 thus occupies two (logic) slots. The operating mode of the CP 243-2 can be set with the status byte and the control byte using the user program. Depending on the operating mode the CP 243-2 saves either the digital or analog I/O data of the AS-Interface slaves or diagnostic values in the analog address area of the S7-200, or it enables master calls (e.g. re-addressing of the slaves).

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

Ordering data

CP 243-2 communication processors

For connection of the SIMATIC S7-200 to AS-Interface; corresponds to AS-Interface Specification V2.1;

dimensions (W \times H \times D / mm): 71 \times 80 \times 62

(dimensions without fixing lugs)

Order No.

6GK7 243-2AX01-0XA0

3/64

Communication

CP 243-1

Overview



ISO	TCP	PN	MRP	IT	IP-R	PG/OP	5
				•		•	- - - - - - - - - - - - - - - - - - -

- Connection of S7-200 to Industrial Ethernet
 - 1 x RJ45 interface for 10/100 Mbit/s full/half duplex connection with autosensing/autonegotiation and autocrossover function
- Communication services:
 - PG/OP communication
 - S7 communication
- Configuration, remote programming and service with STEP 7 Micro/WIN over Industrial Ethernet possible (program upload and program download, status)
- CPU/CPU communication over Industrial Ethernet possible (client + server, eight S7 connections + one PG connection)
- IT communication
 - Web function
 - E-mail function
 - FTP client function for program-controlled data communication (e.g. DOS, UNIX, Linux, embedded systems)
- FTP serve
- An S7 OPC server (e.g. SOFTNET-S7 or S7-1613) allows PLC data to be further processed in PC applications

Technical specifications

• Wall mounting

lechnical specifications		
Order No.	6GK7 243-1EX01-0XE0	
Product type designation	CP 243-1	
Transmission rate		
Transmission rate at interface 1	10 100 Mbit/s	
Interfaces		
Number of electrical connections		
 at interface 1 in accordance with Industrial Ethernet 	1	
• for power supply	1	
Design of electrical connection		
• at interface 1 in accordance with	RJ45 port	
Industrial Ethernet • for power supply	3-pin terminal strip	
Supply voltage, current	5-pin terminal strip	
consumption, power loss		
Type of power supply	DC	
Power supply		
1 from backplane bus	5 V	
• External	24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	15 %	
Current consumed		
 from backplane bus at 5 V DC, typical 	0.06 A	
 from external power supply with 		
24 V DC - Typical	0.053 A	
- Maximum	0.06 A	
Effective power loss	1.5 W	
Permitted ambient conditions		
Ambient temperature		
With vertical installation during	0 45 °C	
operating phaseWith horizontal installation during	0 55 °C	
operating phase		
During storage During transport	-40 +70 °C -40 +70 °C	
During transport Palative hypridity at 95 90 without.		
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %	
IP degree of protection	IP 20	
Design, dimensions and weights		
Module format	S7-200 compact module, double-width	
Width	71.2 mm	
Height	80 mm	
Depth	62 mm	
Net weight	0.15 kg	
Type of mounting • 35 mm DIN rail mounting	_	
W II PICTURE IN TOURING		

SIMATIC S7-200 Communication

CP 243-1

Technical specifications (continued)

Order No.	6GK7 243-1EX01-0XE0
Product type designation	CP 243-1
Product properties, functions, components General	
Maximum number of modules per CPU	1
Performance data	
Performance data S7 communication	
Maximum number of possible connections for S7 communication	8
Number of possible connections for S7 communication - Note	-
Performance data IT functions	
Number of possible connections • as client with FTP, maximum • as server with HTTP, maximum • as e-mail client, maximum	1 4 1
Number of e-mails with 1024 characters of e-mail client, maximum	32
Number of access privileges of access protection function	8
Storage capacity of user memory as FLASH memory file system	8 Mibyte
Number of possible write cycles of flash memory cells	100000

Order No.	6GK7 243-1EX01-0XE0
Product type designation	CP 243-1
Product functions Management, configuration, programming	
Product function: MIB support	No
Protocol is supported SNMP v1	No
Configuration software required	STEP 7-Micro/WIN V4.0 SP8 and higher
Product functions Diagnostics	
Product function: Web-based diagnostics	Yes
Product functions Switch	
Product feature: Switch	No

SIMATIC S7-200 Communication

CP 243-1

Ordering data	Order No.		Order No.
CP 243-1 communication processor	6GK7 243-1EX01-0XE0	SOFTNET S7 Lean Edition 2008 for Industrial Ethernet	
for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication, E-mail and WWW server; with electronic manual on CD-ROM		up to 8 connections Single license for 1 installation 1-year Software Update Service, with automatic extension; requirement: Current software version Upgrade from Edition 2006 to	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0 6GK1 704-1LW00-3AE0
German, English, French, Italian, Spanish		V8.0 • Upgrade from V6.0, V6.1, V6.2	6GK1 704-1LW00-3AE1
SOFTNET S7 for Industrial Ethernet		or V6.3 to V8.0	
Software for S7 and open commu- nication, including OPC server, PG/OP communication and NCM		STEP 7-Micro/WIN V4 programming software Target system: All CPUs of the	
PC, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A		SIMATIC S7-200 Requirements: Windows 2000/XP on PG or PC, Type of delivery: German, English, French,	
SOFTNET V8.0 for Industrial Ethernet		Spanish, Italian, Chinese; with online documentation	
for 32-bit Windows 7 Professional/ Ultimate; German/English		 Single license Upgrade Single license J 	6ES7 810-2CC03-0YX0 6ES7 810-2CC03-0YX3
up to 64 connections • Single license for 1 installation	6GK1 704-1CW80-3AA0	IE TP Cord RJ45/RJ45	
SOFTNET Edition 2008 for Industrial Ethernet	3411701101100001010	TP cable 4 x 2 with 2 RJ45 connectors • 0.5 m	6XV1 870-3QE50
for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English		• 1 m • 2 m • 6 m SCALANCE X005	6XV1 870-3QH10 6XV1 870-3QH20 6XV1 870-3QH60 6GK5 005-0BA00-1AA3
up to 64 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0	Industrial Ethernet Switch for 10/100 Mbit/s; with five 10/100 Mbit/s RJ45 ports for configuring small star and line structures	
 Upgrade from Edition 2006 to V8.0 	6GK1 704-1CW00-3AE0		
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE1		
SOFTNET S7 Lean Edition V8 for Industrial Ethernet			
up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0		

Upgrade for all previous STEP 7-Micro/WIN and STEP 7-Micro/DOS versions

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

Communication

MD720-3 GSM/GPRS modem

Overview



- SINAUT mobile radio modem with RS232 interface
- DIN rail mounting
- 24 V DC power supply
- Supports the GSM services CSD*), SMS and GPRS
- Use with SINAUT MICRO: Data transmission via tunnelled GPRS connection with SIMATIC S7
- Use with SINAUT ST7: Data transmission via CSD, GPRS, transmission of SMS
- AT command interface: for remote maintenance via CSD with TS adapter II or for transmission of SMS
- *) CSD **C**ircuit **S**witched **D**ata (data transmission via GSM dialup connection)

Transfer rate RS232 GSM data calls	300 bit/s to 57,600 bit/s CSD 9,600 bit/s
• GPRS	C3D 9,000 biys
- Up to 2 uplinks	13.4 Kbit/s to 27 Kbit/s gross upload (modem to Internet); net approx. 30 % lower
- Up to 4 downlinks	40 Kbit/s to 54 Kbit/s gross download (Internet to modem); net is approx. 30 % lower
Interfaces	
• RS232	1 x 9-pin Sub-D socket
Antenna connection	1 x SMA antenna socket (50 Ohm)
Frequency ranges	850, 900, 1800, 1900 MHz
Transmitted output power	2 W at 850, 900 MHz 1 W at 1800, 1900 MHz
Current consumption	
Send mode	
• at 12 V • at 24 V	430 mA 140 mA
Receive mode	
at 12 Vat 24 V	90 mA 50 mA
Supply voltage	12 30 V DC
Power loss	typ. 5 W max. 6.2 W
Permissible ambient conditions	
Operating temperature	- 20 °C +60 °C
Transport/storage temperatureRelative humidity	- 25 °C +85 °C Max. 95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	22.5 x 99 x 114
Weight	Approx. 150 g
Assembly	Standard rail
Degree of protection	IP40
Configuration	AT commands using S7-200 program blocks; MC45-compatible AT commands for use with SINAUT ST7 modules
National approvals	Current approvals can be found in the Internet at www.siemens.com/simatic-net/ik-info

SIMATIC S7-200 Communication

MD720-3 GSM/GPRS modem

Ordering data	Order No.		Order No.
GSM/GPRS modem MD720-3	6NH9 720-3AA00	ANT794-4MR antenna	6NH9 860-1AA00
GPRS modem for IP-based data trans- mission over GSM networks, quad band, AT command interface.		Quad band antenna, omnidirectional with 5 m cable	
automatic establishment of GPRS		ANT794-3M antenna	6NH9 870-1AA00
connection, switchable to CSD mode, RS232; manual on CD-ROM in German,		Tri-band flat antenna, in enclosure with 1.2 m cable	
English, Chinese, Russian		SIMATIC S7-200 PPI modem cable	6NH9 701-0AD
Accessories Telecontrol Server Basic		For connecting the S7-200 to the GSM/ GPRS modern SINAUT MD720-3	
Software for 8 to 5000 stations; Single		Connecting cable	6NH7 701-5AN
License for one installation; OPC server for GPRS communication with SIMATICS7-1200 and SIMATIC S7-200; connection management to 8 remote GPRS stations; routing for connections between S7 GPRS stations; English		For connecting a TIM3V-IE/TIM4 (RS232) with the GSM modem MD720-3 (access to GSM network). Also suitable for third-party modems or radio equipment with RS232 standard; cable length 2.5 m.	
and German user interface; for Windows 7 Professional, Windows 7		SITOP compact 24 V/ 0.6 A	6EP1 331-5BA00
Enterprise, Windows 7 Ultimate, and Windows Server 2008 (32-bit); documentation on CD-ROM in German and English		1-phase power supply with wide-range input 85 264 V AC/110 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	
Telecontrol Server Basic 8 Connection management for eight SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AA0		
Telecontrol Server Basic 64 Connection management for 64 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AB0		
Telecontrol Server Basic 256 Connection management for 256 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AC0		
Telecontrol Server Basic 1000 Connection management for 1000 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AD0		
Telecontrol Server Basic 5000 Connection management for 5000 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AE0		

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-200 Communication

MD741-1 EGPRS router

Overview



- EGPRS (GPRS with Edge) and GPRS router for wireless IP communication from Ethernet-based automation devices over GSM mobile radio networks
- Four times the transmission speed by means of EGPRS
- Integrated security functions with firewall and VPN (IPsec)

	MD741-1
Transfer rate • GPRS/EGPRS Multislot Class 12	
- Up to 2 uplinks - Up to 4 downlinks	GPRS: 13.4 27 Kbit/s upload EGPRS: 53.5 108 Kbit/s upload (modem to Internet); net rate approx. 30 % lower EGPRS: 40 54 Kbit/s download gross EGPRS: 160 208 Kbit/s download gross (Internet to modem); net rate approx. 30 % lower
Interfaces	
Communication connection, electrical	RJ45 socket; (10/100 Mbit/s; TP; auto-crossover)
Antenna connection	1 x SMA antenna socket (50 Ohm)
Frequency ranges	Quad band: 850, 900, 1800, 1900 MHz
Transmitted output power	2 W at 850, 900 MHz; 1 W at 1800, 1900 MHz
EGPRS connection set-up	Automatically when supply voltage is switched on; fallback to GPRS if EGPRS is not available
Virtual Private Network (VPN) • Protocol	IPsec (tunnel and transport mode)
Encryption mechanisms	IPsec 3DES with 168 bit; IPsec AES with 128, 192 and 256 bit
Packet authentication	MD5; SHA-1
Internet Key Exchange (IKE) Authentication	with Main and Quick Mode Pre-Shared Key (PSK); X.509v3 certificates

	MD741-1
Firewall	Stateful Packet Inspection; Anti-Spoofing
Router functions	NAT-Traversel; NAT (IP Masquerading); Port Forwarding; Dead Peer Detection (DPD); DynDNS; DNS Cache; NTP; Remote Logging
Current consumption	
Send mode • For existing EGPRS connection with data exchange	182 mA at 24 V (_{IBurst} 550 mA); 4.62 ms burst repetition frequency
Supply voltage	24 V DC (12 V 30 V)
Power loss	typ. 5 W
Permissible ambient conditions Operating temperature Transport/storage temperature Relative humidity Design Dimensions (W x H x D) in mm	-20 °C +60 °C -40 °C +70 °C max. 95% at +25 °C, no dewing
Weight Assembly	approx. 280 g Standard rail
Degree of protection	IP20
Configuration	Over Internet browser
National approvals	Current approvals can be found in the Internet at www.siemens.com/simatic-net/ik-info

SIMATIC S7-200 Communication

MD741-1 EGPRS router

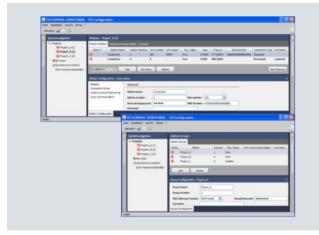
Ordering data	Order No.		Order No.
MD741-1 EGPRS router	6NH9 741-1AA00	SCALANCE S Industrial Security	
For wireless IP communication by industrial Ethernet-based programmable controllers via GSM mobile radio networks; integrated firewall and VPN router (IPsec); quad band GSM; EGPRS Multislot Class 12		For protection of programmable controllers and automation networks, and for safeguarding of industrial communication; configuring tool and electronic manual on	
Accessories		CD-ROM; German, English, French, Italian,	
IE FC RJ45 Plug 180		Spanish	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 50 units	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0	SCALANCE S612 uses the Stateful Inspection Firewall to protect network segments against unauthorized access; protects up to 32 devices up to 64 VPN tunnels simultaneously SCALANCE S613 uses Stateful Inspection Firewall to protect network segments against unauthorized access; protects up to 64 devices, up to 128 VPN tunnels simultane-	Ga. 10 5.2 5.2 10 2.1 10
ANT794-4MR antenna	6NH9 860-1AA00	ously;	
Quad band antenna for MD720-3 and MD741-1, omnidirectional with 5 m cable		enhanced temperature range (-20 +70 °C)	
ANT794-3M antenna	6NH9 870-1AA00	IE TP Cord RJ45/RJ45	
Tri-band flat antenna, in enclosure with 1.2 m cable	3.0.0	TP cable 4 x 2 with 2 RJ45 connectors • 0.5 m • 1 m • 2 m	6XV1 870-3QE50 6XV1 870-3QH10 6XV1 870-3QH20
		• 6 m	6XV1 870-3QH60
		• 10 m	6XV1 870-3QN10

B: Subject to export regulations AL: 5A002A1A2 and ECCN: 5A002ENCU

Communication

Telecontrol Server Basic

Overview



- Software package for the PC, comprising:
 - OPC server and connection manager for telecontrol and teleservice tasks (diagnostics with STEP 7 for the S7-1200)
 OPC configuring software for the S7-1200 and S7-200
- PLC block library for the S7-200
- GPRS operation
- of the SIMATIC S7-1200 with CP 1242-7 via dynamic IP addresses with a standard mobile phone flat-rate contract of the SIMATIC S7-200 with SINAUT modem MD720-3 via
- dynamic IP addresses with a standard mobile phone flat-rate contract
- of the S7-1200 with CP 1242-7 via fixed IP addresses
- Connection of up to 5000 telecontrol stations to the control center via the OPC interface
- Operation and diagnostics of S7-1200 and S7-200 stations on an OPC server with different STEP 7 projects and separate users with user administration
- Integral teleservice gateway for diagnostics of S7-1200 stations via the CP 1242-7 with STEP 7 via the Internet, also with dynamic IP addresses. This works on every PC with STEP 7 and standard Internet access without parameterizing firewalls or routers.
- GPRS communication between S7-1200 or S7-200 stations by means of routing function (also when using dynamic IP
- Encrypted transmission for protection against data manipulation and tapping
- Import of SINAUT MICRO SC projects

	Telecontrol Server Basic
Supported controllers	S7-1200 with CP1242-7 S7-200/S7-1200 with MD720-3 modem (block library included in the scope of supply)
Number of connections (stations) that can be operated (depending on the order version)	8, 64, 256, 1000, or 5000 connections
Number of STEP 7 projects that can be operated in parallel	2000 projects (structured representation, separation of the projects via programmable user rights)
Number of STEP 7 Teleservice connections that can be operated in parallel	5 connections per project (separation of the projects via programmable user rights)
Interfaces to the OPC Client	DCOM protocol
	OPC interface "Data Access Interface 3.0"
	 Synchronous and asynchronous reading of variables
Interfaces and functions between the OPC server and SIMATIC S7	Writing of variables in the SIMATIC S7 in the case of value changes to OPC variables
	Transfer of SIMATIC S7 data to OPC variables (for event-driven communication from the SIMATIC S7)
	 Activatable cyclic reading of variables; adjustable time interval
	Monitoring of connected SIMATIC S7 with time-of-day synchronization
	 Routing of data packets between connected SIMATIC S7-1200 stations or between S7-200 stations
	Permanent GPRS connection; the tunnel is established from the GPRS modem
	Temporary GPRS connection (as required); the tunnel is established from the GPRS modem and can be initiated by a text message sent automatically by the OPC server ("wake-up"). Manual "wake-up" using a mobile phone is also possible.
	 Via Internet access as server with public IP address (recommendation: fixed public Internet address)
Operating systems	Microsoft Windows 7 Professional Microsoft Windows 7 Enterprise Microsoft Windows 7 Ultimate Microsoft Windows Server 2008 (32-bit)
Diagnostics	Station group monitoring Station monitoring Connection monitoring STEP 7 Teleservice across Internet and router boundaries – S7-1200 only
Configuration	Integral configuration tool Multi-project-capable Multi-user-capable with user management Configurations can be expanded at runtime

SIMATIC S7-200 Communication

Telecontrol Server Basic

Ordering data	Order No.		Order No.
Telecontrol Server Basic		Accessories	
Software for 8 to 5000 stations; Single License for one installation;		CP 1242-7 communication processor	6GK7 242-7KX30-0XE0
OPC server for GPRS communication with SIMATIC S7-1200 and SIMATIC S7-200; connection management to remote GPRS stations; routing for connections		Communication processor for connecting SIMATIC S7-1200 to GSM/GPRS mobile wireless network	
between S7 GPRS stations;		MD720-3 GSM/GPRS modem	6NH9 720-3AA00
German and English operator interface; for Windows 7 Professional, Windows 7 Enterprise, Windows 7 Ultimate and Windows Server 2008 (32-bit); documentation on CD-ROM, German and English • Telecontrol Server Basic 8 Connection management for eight SIMATIC S7-1200 or	6NH9 910-0AA20-0AA0	GPRS modem for IP-based data transmission over GSM networks, quad band, AT command interface, automatic establishment of GPRS connection, switchable to CSD mode, RS232, including gender changer for RS232/PPI adapter; manual on CD-ROM in German,	
S7-200 stations • Telecontrol Server Basic 64 J	6NH9 910-0AA20-0AB0	English, Chinese, Russian ANT794-4MR antenna	6NH9 860-1AA00
Connection management for 64 SIMATIC S7-1200 or S7-200 stations	ONTI 9 10-0AAZU-0ADU	Quad band antenna, omnidirectional with 5 m cable	UNITS 000-TAA00
• Telecontrol Server Basic 256 J	6NH9 910-0AA20-0AC0	ANT794-3M antenna	6NH9 870-1AA00
Connection management for 256 SIMATIC S7-1200 or S7-200 stations		Triband flat antenna, in enclosure with 1.2 m cable	
• Telecontrol Server Basic 1000 J Connection management for 1000 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AD0		
Telecontrol Server Basic 5000 J Connection management for 5000 SIMATIC S7-1200 or S7-200 stations	6NH9 910-0AA20-0AE0		

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS communication

SIPLUS PROFIBUS DP EM 277

Overview



- For connecting the S7-22x to PROFIBUS DP (as slave) and MPI
- Simultaneous operation as MPI slave and DP slave possible
- Max. transmission rate 12 Mbit/s
- Can be used with CPU version 6ES7 2xx-xxx21-xxxx and higher

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS EM 277 PROFIBUS DP module		
Order number	6AG1 277-0AA22-2XA0	
Order No. based on	6ES7 277-0AA22-0XA0	
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- $\begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. } 30 \text{ min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ O_3 < 1.0 \text{ ppm; } \text{NOX} < 10.4 \text{ ppm} \\ \end{array}$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS EM 277 input module for PROFIBUS DP	
(extended temperature range and medial exposure)	
For CPU 222/224/224 XP/226; for connecting to PROFIBUS DP (slave) and MPI	6AG1 277-0AA22-0XA0

SIMATIC S7-200 SIPLUS communication

SIPLUS MD720-3 GSM/GPRS modem

Overview



- SINAUT mobile radio modem with RS232 interface
- DIN rail mounting:
- 24 V DC power supply
- Supports the GSM services CSD*), SMS and GPRS
- Use with SINAUT MICRO: Data transmission via GPRS; switchable to CSD for remote maintenance (incoming call only)
- Use with SINAUT ST7: Data transmission via CSD, transmission of SMS
- *) CSD Circuit Switched Data (data transmission via GSM dialup connection)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 720-3AA00-7AA0	
Order No. based on	6NH9 720-3AA00	
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) SA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
---------------	-----------

SIPLUS MD720-3 GSM/GPRS modem	6AG1 720-3AA00-7AA0
(extended temperature range and medial exposure) GPRS modem for IP-based data transmission over GSM networks, quad-band, AT command interface, automatic establishment of GPRS connection, switchable to CSD operation, RS232; manual on CD-ROM in German, English, Chinese, Russian	
Accessories	see GSM/GPRS modem MD720-3, page 3/69

SIPLUS communication

SIPLUS MD741-1 EGPRS routers

Overview



- EGPRS (Edge GPRS) and GPRS router for wireless IP communication of Industrial Ethernet-based automation devices over GSM mobile networks
- · EGPRS offers four times the transfer speed
- Integrated security features with firewall and VPN (IPsec)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS MD741-1 EGPRS ROUTER		
Order number	6AG1 741-1AA00-2AA0	
Order No. based on	6NH9 741-1AA00	
Ambient temperature range	-25 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹)2)	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS MD741-1 EGPRS router	6AG1 741-1AA00-2AA0
(extended temperature range and medial exposure) For wireless IP communication by industrial Ethernet-based programmable controllers via GSM mobile radio networks; integrated firewall and VPN router (IPsec); quad band GSM; EGPRS Multislot Class 12	
Accessories	see EGPRS router MD741-1, page 3/71

Power supplies

The S7-200 version

Overview



Optimally matched in design and functionality to the SIMATIC S7-200 micro PLC; flat design, particularly suitable for low cabinet depths.

Power supplies, type	3.5 A
Order No.	6EP1 332-1SH31 ¹⁾
Input	1-phase AC
Rated voltage $U_{\text{in rated}}$	120/230 V AC Set via wire jumper
Voltage range	93 132 V/187 264 V
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
Mains buffering at Iout rated	$>$ 20 ms at $U_{\rm in}$ = 187 V
Rated line frequency; rated line frequency range	50/60 Hz, 47 63 Hz
Rated current Iin rated	1.65/0.95 A
Switch-on current limitation (+25 °C)	$< 33 \text{ A}, < 3 \text{ ms} (U_{in} = 230 \text{ V})$
₽t	< 1.0 A ² s
Built-in incoming fuse	T 2.5 A/250 V (not accessible
Recommended miniature circuit breaker (IEC 898) in the mains power input	Two-pole miniature circuit breaker, 10 A or higher, Characteristic C or 6 A or higher, Characteristic D
Output	Controlled, isolated DC voltage
Rated voltage Uout rated	24 V DC
Total tolerance Static line compensation Static load compensation	±5% (typ. ±2%) Approx. ±0.1% Approx. ±0.2%
Residual ripple	$< 150 \text{ mV}_{pp} \text{ (typ. 30 mV}_{pp})$
Spikes (bandwidth: 20 MHz)	$< 240 \text{ mV}_{pp} \text{ (typ. } 110 \text{ mV}_{pp} \text{)}$
Adjustment range	-
Status indicator	-
On/Off behavior	No overshoot of U_{out} (soft start)
Startup delay/voltage rise	< 1 s/typ. 80 ms
Rated current Iout rated	3.5 A

Power supplies, type	3.5 A
Order No.	6EP1 332-1SH31 ¹⁾
Current range • Up to +60°C • Derating	0 3.5 A
Dynamic overcurrent on Power-up on short-circuit Short-circuit during operation Parallel switching for enhanced performance	Typ. 5 A for 100 ms Typ. 5 A for 100 ms Yes, up to 5 units
Efficiency	
Efficiency at Uout rated, Iout rated	Approx. 84%
Power loss at Uout rated, Iout rated	Approx. 16 W
Closed-loop control	
Dyn. line compensation $(U_{\text{in rated}} \pm 15\%)$	Typ. ±0.3% <i>U</i> _{out}
Dynamic load compensation (I _{out} : 50/100/50 %)	Typ. ±3% U _{out}
Load step settling time • 50 to 100% • 100 to 50 %	< 5 ms < 5 ms
Protection and monitoring	
Output overvoltage protection	Yes, according to EN 60950
Current limitation	3.8 A
Short-circuit protection	Constant current characteristic up to typ.14 V, electronic shutdown below that, automatic restart
Sustained short-circuit current rms value	< 4 A
Overload/short-circuit indicator	-

Power supplies

The S7-200 version

Technical specifications (continued)	
Power supplies, type	3.5 A
Order No.	6EP1 332-1SH31 ¹⁾
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage <i>U</i> _{out} according to EN 60950-1
Safety class	Class I
Leakage current	< 3.5 mA
Safety test	Yes
CE marking	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Protection against explosion	-
FM approval	-
Marine approval	-
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	0 +60°C with natural convection
Transport and storage temperature range	-40 +85°C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections • Supply input L, N, PE	One screw terminal each for
• Output +	0.5 1 mm ² solid/finely stranded 1 screw terminal for
• Output -	0.5 1 mm ² 2 screw terminals for
	0.5 1 mm ²
Dimensions (W x H x D) in mm	160 x 80 x 62
Weight, approx.	0.5 kg
Mounting	Can be snapped onto standard mounting rail EN 60715 35x7.5/15, wall mounting
Accessories	Mounting bracket

¹⁾ SIPLUS module 6AG1 203-1SH31-2AA0 for extended temperature range -25 °C to +70 °C and use under medial load (e.g. chlorine-sulfur atmosphere).

Ordering data	Order No.
SIPLUS S7-200 PS203	6AG1203-1SH31-2AA0
-25 +70°C with conformal coating based on 6EP1332-1SH31 S7-200 style, stabilized power supply Input: 120/230 V AC Output: 24 V DC/3.5 A S7-200 design	
SITOP power 3.5	6EP1332-1SH31
Universal Line stabilized power supply Input: 120/230 V AC, Output: 24 V DC/3.5 A S7-200 design	
Accessories	
SITOP power mounting bracket	6EP1971-1AA01
90 degree 35 mm DIN rail, M5 fixing screws, for Special Line flat	

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

More information

In addition to various power supply product lines, the perfectly coordinated complete SITOP range offers a unique range of add-on modules with which the 24 V power supply can be additionally protected against interference on the primary and secondary side - right up to all-round protection:

- Redundancy module for setting up a redundant power supply
- Uninterruptible 24 V power supplies with batteries or maintenance-free capacitors for continued operation in the event of a power failure
- Selectivity modules for electronic protection of 24 V branches from overload and short-circuit

You can find more information in Catalog KT 10.1 and in the Internet at

www.siemens.com/sitop

SIMATIC S7-200 SIPLUS power supplies

SIPLUS S7-200 PS 203

Overview



- Design and functionality of the power supply are optimally adapted to the SIPLUS S7-200 micro PLC
- Slim design
- Particularly suitable for low cabinet depths

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-200 PS 203		
Order number	6AG1 203-1SH31-2AA0	
Order No. based on	6EP1 332-1SH31	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Ambient temperature range	-25 +70 °C	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100%, condensation allowed	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS S7-200 PS 203 H stabilized load current supply	6AG1 203-1SH31-2AA0
(extended temperature range and medial exposure)	
120/230 V AC, 24 V DC/3.5 A	
Accessories	See SIMATIC S7-200 power supplies, page 3/78

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Operator control and monitoring

TD 200 text display

Overview



- The user-friendly text display for the S7-200
- For control and monitoring: Message text display, intervention in PLC program, setting of inputs and outputs
- Direct connection to CPU interface using a supplied cable or incorporation into network (also via EM 277)
- No separate power supply required
- No separate parameterization software required
- Addressing and setting of contrast in supplied menu

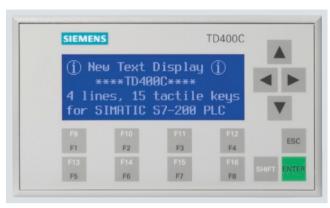
	6ES7 272-0AA30-0YA1
Product type designation	TD 200 text display
Power supply Input voltage • Rated value	24 V; Power supplied over the S7-200 communications interface or optional external power supply unit; the CPU sensor power supply (24 V DC) is not subjected to load
Input current • Rated value at 24 V DC	120 mA
MPI Transmission speed (PPI), max.	187.5 kbit/s
1st interface Physics	RS 485
Functionality • PPI	Yes
PPI • Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC
Operator control and monitoring Display • Design of display	LCD backlit
Operating Number of lines Number of characters per line	2 20; Characters/line: ASCII, cyrillic; 10 characters/line: Chinese
• Character size	5 mm
Environmental requirements Operating temperature • Min. • max.	0 °C 60 °C
Storage/transport temperature • Min. • max.	-40 °C 70 °C
Degree of protection	Yes; at front
Dimensions Cabinet/switchboard strength	0.3 mm; 0.3 to 4 mm
Dimensions and weight Dimensions • Width • Height • Depth • Mounting cutout, width • Mounting cutout, height Weight	148 mm 76 mm 27 mm 138 mm 68 mm
 Weight, approx. 	250 g

Ordering data	Order No.
TD 200 text display	
for connection to SIMATIC S7-200; can be used with STEP 7-Micro/WIN V3.2 SP4 or higher, incl. connecting cable	6ES7 272-0AA30-0YA1
Connecting cables	
For connecting TD 200C or TD 400C to S7-200	6ES7 901-3EB10-0XA0
Accessories	
Accessories for supplementary ordering	See Catalog ST 80/ST PC

Operator control and monitoring

TD 400C text display

Overview



- More screen space and extremely good readability thanks to backlit four-line display
- Customizable operator interface with 15 tactile keys
- Acoustic and visual feedback from key operation
- Optimal support of the S7-200:
 - Direct connection to the S7-200 interface via supplied cable
 - No separate power supply required
 - Parameterization with STEP 7-Micro/WIN V4 SP6

	6AV6 640-0AA00-0AX1
Product type designation	Text Display TD 400C
Supply voltage Supply voltage	24 V DC
permissible range	DC
Memory Usable memory for user data	No info
Configuration Configuration tool	MicroWin (to be ordered separately)
Display Display type	STN, Black/White
Size	3.7"
Resolution (WxH in pixel)	192 x 64
Backlighting • MTBF backlighting (at 25 °C)	about 20,000 hours
Operating mode Control elements	Membrane keyboard
Function keys, programmable	15 function keys
Membrane keyboard	Yes
Ambient conditions Temperature Operation Transport, storage	0 °C to +50 °C -20 °C to +60 °C
Degree of protection Front	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)
Rear	IP20
Certifications & standards Certifications	CE, FM Class I Div. 2, UL, C-TICK NEMA 4, NEMA 4x, NEMA 12

6AV6 640-0AA00-0AX1
1 x RS485 (max. 187.5 Mbit/s)
1
0.33 kg

Ordering data	Order No.
TD 400C text display	6AV6 640-0AA00-0AX1
with customized operator interface on the device front; for connecting to SIMATIC S7-200; can be used from STEP 7-Micro/ WIN V4 SP6, incl. connecting cable	
Promotion package	J 6ES7 298-1AA20-0YA3
Consisting of: • TD 400C • SIMATIC S7-200	
SIMATIC STEP 7 Micro/WIN V4.0	
Simulator module	
Memory module	
• PPI cable	
CD-ROM with documentation	
• TANOS Box	
Connecting cables	6ES7 901-3EB10-0XA0
for connecting TD 100C/TD 200C or TD 400C to S7-200	
Blank foils	6AV6 671-0AP00-0AX0
for printing customized keyboard layouts; 2 perforated films per sheet; 10 sheets per pack	
Accessories	
Accessories for supplementary ordering	See Catalog ST 80/ST PC

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Operator control and monitoring

SIMATIC OP 73micro

Overview



- Operator Panel for controlling and monitoring machines and systems
- Graphics in a new dimension: small and smart
- Pixel-graphics 3" LCD, monochrome
- 8 system keys, 4 user-configurable function keys
- Specific to the SIMATIC S7-200:Communication with the controller takes place via the integrated interface (point-topoint)
- Connection to the controller via MPI or PROFIBUS DP cable

	6AV6 640-0BA11-0AX0
Product type designation	OP 73micro
Supply voltage	
Supply voltage	24 V DC
Permissible range	+20.4 V to +28.8 V DC
Memory	
Туре	Flash
Usable memory for user data	128 KB usable memory for user data
Time	
Clock	
• Type	Software clock, not battery backed
Configuration	
Configuration tool	WinCC flexible Micro Version 2004 SP1, HSP or higher (to be ordered separately)
Display	
Display type	STN, Black/White
Size	3"
Resolution (WxH in pixel)	160 x 48
Backlighting	
MTBF backlighting (at 25 °C)	about 100,000 hours
Operating mode	
Control elements	Membrane keyboard
Function keys, programmable	4 function keys

	6AV6 640-0BA11-0AX0
Connection for mouse/keyboard/ barcode reader	-/-/-
Touch operation Touch screen System keys	No 8
Numeric/alphabetical input	Yes / Yes
Ambient conditions Mounting position	vertical
Maximum permissible angle of inclination without external ventilation	
Max. relative humidity	90 %
Temperature Operation (vertical installation) Operation (max. tilt angle) Transport, storage	0 °C to +50 °C 0 °C to +40 °C -20 °C to +60 °C
Degree of protection Front	IP65, NEMA 4x, (when installed)
Rear	IP20
Certifications & standards Certifications	CE, GL, ABS, BV, DNV, LRS, UL, CSA, cULus, C-TICK, NEMA 4x
Interfaces Interfaces	1 x RS485 (max. 187.5 Mbit/s)
Operating systems Operating system	LINUX
Processor Processor	ARM
Functionality under WinCC flexible Task planner	Yes
Help system	Yes
Status/control	Not possible
With alarm logging system (incl. buffer and acknowledgment) Number of messages Bit messages Analog messages Message buffer	250 Yes Yes Ring buffer (n x 100 entries)
Number of process images • Process images • Variables • Limit values • Multiplexing	250 500 Yes Yes
Image elements • Text objects • Graphics object • dynamic objects	1,000 text elements Bit maps, icons, icon (full-screen) Bar graphs
Lists • Text lists • Graphics list • Libraries	150 0 Yes
Security Number of user groups Passwords exportable Number of users	1 Yes 1

SIMATIC S7-200 Operator control and monitoring

SIMATIC OP 73micro

	6AV6 640-0BA11-0AX0
Data carrier support	
Multi Media Card	No
Recording	
Printer driver	-
Fonts	
 Keyboard fonts 	US American (English)
Languages	
 Online languages 	5
Configuration languages	D, GB, F, I, E, CHN "traditional", CHN "simplified", DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ / SK, TR, H
Character sets	WinCC flexible Standard, symbol languages
Transfer (upload/download)	
 Transfer of configuration 	serial

	0.41/0.040.004.44.0.41/0
	6AV6 640-0BA11-0AX0
Process coupling	
Connection to controller	for S7-200, see section on "System interfaces"
Expandability/openness Open Platform Program	No
Dimensions	
Front of enclosure (W x H)	154 mm x 84 mm
Mounting cutout/ device depth (W x H)	138 mm x 68 mm / 28.5 mm device depth
Dimensions and weight	
Weight	
Weight	0.25 kg

Ordering data	Order No.
SIMATIC OP 73micro	6AV6 640-0BA11-0AX0
Operator panel for connection to the SIMATIC S7-200, with 3" display, monochrome incl. mounting accessories	
OP 73micro starter package C	6AV6 650-0BA01-0AA0
Consisting of: OP 73micro Operator Panel SIMATIC WinCC flexible Micro engineering software SIMATIC HMI Manual Collection, 5 languages (English, French, German, Italian, Spanish), comprising: all currently available user manuals, manuals and communication manuals for SIMATIC HMI MPI cable (5 m) (for test purposes)	
Configuration with SIMATIC WinCC flexible	
Documentation (to be ordered separately)	
OP 73micro/TP 177micro operating instructions • German • English • French • Italian • Spanish	6AV6 691-1DF01-0AA0 6AV6 691-1DF01-0AB0 6AV6 691-1DF01-0AC0 6AV6 691-1DF01-0AD0 6AV6 691-1DF01-0AE0

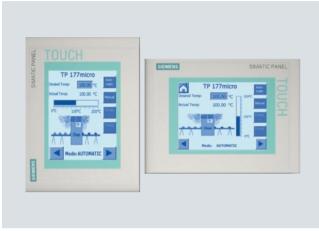
	Order No.
WinCC flexible Micro user manual • German	6AV6 691-1AA01-3AA0
• English	6AV6 691-1AA01-3AB0
• French	6AV6 691-1AA01-3AC0
• Italian	6AV6 691-1AA01-3AD0
Spanish	6AV6 691-1AA01-3AE0
SIMATIC HMI manual collection $\ \ J$	6AV6 691-1SA01-0AX0
Electronic documentation, on DVD	
5 languages (English, French, German, Italian and Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
Accessories	
Accessories for supplementary ordering	see catalog ST 80/ST PC

- C: Subject to export regulations AL: N and ECCN: 5D002ENCU
- J: Subject to export regulations AL: N and ECCN: EAR99S

Operator control and monitoring

SIMATIC TP 177micro

Overview



- Touch Panel for operator control and monitoring of small machines and plants
- Low-cost entry-level product in the category of touch panels with graphics capability and all the basic functions required for simple tasks
- Pixel graphics 5.7" STN touch screen (analog/resistive), Bluemode (4 levels)
- Specially for SIMATIC S7-200: Communication to the PLC through the integrated interface over a point-to-point link
- Connection to the PLC over MPI or PROFIBUS DP cable
- SIMATIC TP 177micro is the innovative successor to the Touch Panels SIMATIC TP 070/TP 170micro

Technical specifications

	6AV6 640-0CA11-0AX1
Product type designation	TP 177micro
Supply voltage	
Supply voltage	24 V DC
Permissible range	+20.4 V to +28.8 V DC
Rated current	0.24 A
Memory	
Type	Flash
Usable memory for user data	256 KB usable memory for user data
Time	
Clock	
• Type	Software clock, not battery backed
Configuration	
Configuration tool	WinCC flexible Micro Version 2004 SP1, HSP or higher (to be ordered separately)
Display	
Display type	STN, 4 Blue mode, 4 levels
Size	5.7"
Resolution (WxH in pixel)	320 x 240

	6AV6 640-0CA11-0AX1
Backlighting	
MTBF backlighting (at 25 °C)	about 50,000 hours
Operating mode Control elements	Touch screen
Function keys, programmable	None
Touch operation	
Touch screen	analog, resistive
System keysNumeric/alphabetical input	0 Yes / Yes
Ambient conditions	1007100
Mounting position	vertical
maximum permissible angle of inclination without external ventilation	+/- 35 °
max. relative humidity	90 %
Temperature • Operation (vertical installation) • Operation (max. tilt angle) • Transport, storage	0 °C to +50 °C 0 °C to +40 °C -20 °C to +60 °C
Degree of protection Front	IP65, NEMA 4x, (when installed)
Rear	IP20
Certifications & standards Certifications	CE, GL, ABS, BV, DNV, LRS, FM Class I Div. 2, UL, CSA, cULus, EX-Zone 2 (available soon), EX-Zone 22 (available soon), C-TICK, NEMA 4x
Interfaces Interfaces	1 x RS485 (max. 187.5 Mbit/s)
Operating systems	<u> </u>
Operating system	LINUX
Processor Processor	ARM
Functionality under WinCC	Anivi
flexible	
Task planner	Yes
Help system	Yes
Status/control With alarm logging system (incl. buffer and acknowledgment) Number of messages Bit messages Analog messages Message buffer	Not possible 500 Yes Yes Ring buffer (n x 128 entries)
Number of process images • Process images • Variables • Limit values • Multiplexing	250 250 Yes Yes
Image elements • Text objects • Graphics object • dynamic objects	500 text elements Bit maps, icons, icon (full-screen), vector graphics Diagrams, bar graphs

Operator control and monitoring

SIMATIC TP 177micro

Technical specifications (co	ntinued)	Ordering data	Order No.
	6AV6 640-0CA11-0AX1	SIMATIC TP 177micro	6AV6 640-0CA11-0AX1
Lists Text lists	150	Touch Panel for connection to the SIMATIC S7-200, 5.7" STN display	
Graphics listLibraries	100 Yes	TP 177micro starter package C	6AV6 650-0DA01-0AA0
Security	165	Consisting of: TP 177micro Touch Panel	
Number of user groups Passwords exportable Number of users	1 Yes 1	 SIMATIC WinCC flexible Micro engineering software SIMATIC HMI Manual Collection 	
Data carrier support • Multi Media Card	No	(DVD), 5 languages (English, French, German, Italian, Spanish),	
Recording • Printer driver	-	comprising: all currently available user manuals, manuals and communication manuals for	
Fonts • Keyboard fonts	US American (English)	SIMATIC HMI MPI cable (5m) (for test purposes)	
Languages Online languages	5	Configuration	
Configuration languages	D, GB, F, I, E, CHN "traditional",	with SIMATIC WinCC flexible	
	CHN "simplified", DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ / SK, TR, H	Documentation (to be ordered separately)	
Character sets	WinCC flexible Standard, symbol languages	OP 73micro, TP 177micro operating instructions	
Transfer (upload/download) Transfer of configuration	serial	German English	6AV6 691-1DF01-0AA0 6AV6 691-1DF01-0AB0
Process coupling Connection to controller	for S7-200, see section on "System interfaces"	FrenchItalianSpanish	6AV6 691-1DF01-0AC0 6AV6 691-1DF01-0AD0 6AV6 691-1DF01-0AE0
Expandability/openness Open Platform Program	No	WinCC flexible Micro user manual • German	6AV6 691-1AA01-3AA0
Dimensions Front of enclosure (W x H)	212 mm x 156 mm	English French	6AV6 691-1AA01-3AB0 6AV6 691-1AA01-3AC0
Mounting cutout/device depth (W x H)	198 mm x 142 mm / 45 mm device depth	ItalianSpanish	6AV6 691-1AA01-3AD0 6AV6 691-1AA01-3AE0
Dimensions and weight		SIMATIC HMI manual collection J	6AV6 691-1SA01-0AX0
Weight	0.75 kg	Electronic documentation, on DVD	
- vvoignt U.73 kg	5 languages (English, French, German, Italian, Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI		
		Accessories	
		Accessories for supplementary ordering	see catalog ST 80/ST PC

C: Subject to export regulations AL: N and ECCN: 5D002ENCU

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS operator control and monitoring

SIPLUS S7-200 TD 200

Overview



- The user-friendly text display for the S7-200
- For operation and monitoring: display of message texts, interventions in the control program, setting of inputs and outputs
- Direct connection to CPU interface via included cable, or integration into network (also via EM 277)
- No separate power supply required
- No separate configuration software required
- · Addressing and contrast adjustment via provided menu

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-200 TD 200	
Order number	6AG1 272-0AA30-2YA1
Order No. based on	6ES7 272-0AA30-0YA1
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS S7-200 TD 200 text display	
(extended temperature range and medial exposure)	
for connection to SIMATIC H S7-200, used from STEP 7 Micro / WIN V3.2 SP4, including cable	6AG1 272-0AA30-2YA1
Connection cable	
for connection of TD 200C or TD 400C to S7-200	6ES7 901-3EB10-0XA0
Accessories for re-ordering	See HMI accessories, ST 80 / ST PC Catalog

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

SIPLUS operator control and monitoring

SIPLUS S7-200 TD 400C

Overview



- Additional screen space and high readability via backlit four-line display
- Customizable user interface with 15 tactile keys
- Audible and visual feedback upon pressing of key
- Optimal support of the S7-200:
 - Direct connection to the S7-200 interface via included cable
 - No separate power supply required
 - Configuration with STEP 7 Micro / WIN V4 SP6

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-200 TD 400C	
Order number	6AG1 640-0AA00-2AX1
Order No. based on	6AV6 640-0AA00-0AX1
Ambient temperature range	-10 + 60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

SIPLUS S7-200 TD 400C		
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: SO₂ <4.8 ppm H₂S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O3 <0.1 ppm; NO x <5.2 ppm Threshold/ limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O3 < 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS S7-200 TD 400C	Н	6AG1 640-0AA00-2AX1
(extended temperature range and medial exposure)		
with individually adaptable user interface on the front plate; for connection to SIMATIC S7-200; usable from STEP 7 Micro/ WIN V4 SP6, including cable		
Connection cable		6ES7 901-3EB10-0XA0
for connection of TD 100C/ TD 200C or TD 400C to S7-200		
Empty sheets		6AV6 671-0AP00-0AX0
for printing customized keyboard layouts; 2 perforated sheets per document; 10 sheets per packing unit		
Accessories for re-ordering		See HMI accessories, ST 80 / ST PC Catalog

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Software

Software

Overview

- Software for the SIMATIC S7-200
- Functions for all phases of an automation project:
 - Planning, configuring and parameterization of hardware and communication
 - Creation of a user program
 - Documentation
 - Testing, commissioning and service
 - Process control Archiving

The following are available:

- STEP 7- Micro/Win
- STEP 7 Micro/Win command library
- WinCC flexible micro
- S7-200 PC-Access

You will find more information in catalog part 11.

SIMATIC S7-200 Software

S7-200 PC Access

Overview

- OPC server as the bridge between the SIMATIC S7-200 and the PC world
- For processing and visualizing data from the S7-200 with standard Windows applications
- Database applications, human/machine interfaces (HMI), tools for statistical evaluations with Excel, for instance, or calculation modules for complex requirements are examples of what can be created.

Ordering data	Order No.
S7-200 PC Access V1.0	
Task: OPC server for SIMATIC S7-200. Target system: SIMATIC S7-22x. Requirements: Windows 2000/XP; on PG or PC; STEP 7-Micro/Win V4. Type of delivery: German, English, French, Spanish, Italian, Chinese; with electronic documentation	
Single license	6ES7 840-2CC01-0YX0
Multi Copy License for 15 installations	6ES7 840-2CC01-0YX1
Intelligent RS 232/PPI multi-master cable	6ES7 901-3CB30-0XA0
For connecting devices with an RS 232 interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network	
Intelligent USB/PPI multi-master cable	6ES7 901-3DB30-0XA0
For connecting devices with an USB interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network	
CP 5512	6GK1 551-2AA00
PC card (CardBus, 32-bit) for connecting a programming device or Notebook computer to PROFIBUS or MPI, with 32-bit Windows XP Professional (Windows 2000 Professional available soon), executable under 32-bit Windows 2000 Professional and Windows XP Professional in conjunction with STEP 7 V5.2 German/English	
CP 5611	6GK1 561-1AA01
PCI card for connecting a PC to the CPU interface or PROFIBUS DP module (187.5 Kbit/s or 12 Mbit/s) over an MPI cable	

J: Subject to export regulations AL: N and ECCN: EAR99S

Accessories

PPI cable

Overview

- For connecting devices with RS 232 or USB interface to SIMATIC S7-200 or PPI network (RS 485)
- The following are available:
 Intelligent RS 232/PPI multimaster cable: For connecting devices with RS 232 interface to the RS 485 interface of the SIMATIC S7-200 or to the PPI network; can be used as
 - master on a multimaster PPI network.

 Intelligent USB/PPI multimaster cable: For connecting devices with USB interface to the RS 485 interface on SIMATIC S7-200 or to the PPI network; can be used as master on a multimaster PPI network.

Technical specifications

	6ES7 901-3CB30- 0XA0	6ES7 901-3DB30- 0XA0
Power supply		
Description	from CPU	from USB interface
Protocols		
PPI	Yes; 10/11 bit	Yes; 10/11 bit
ASCII	Yes; Freeport	
MPI		
Transmission speed (PPI), max.	187.5 kbit/s; 9.6/19.3/ 187.5 Kbit/s; setting: DIP switch; RS232 not required	187.5 kbit/s; 9.6/19.2/ 187.5 Kbit/s; setting: not necessary
Alarms/diagnostics/		
Diagnostics indication LED		
Description	Tx (green): RS-232- transmit indication; Rx (green): RS-232- receive indication; PPI (green): RS-485- transmit indication	Tx (green): USB transmit indication; Rx (green): USB receive indication; PPI (green): RS-485- transmit indication
Galvanic isolation	,	
Galvanic isolation	1	1
Software requirement	0.750 7.14	0.750 7.40 44
Software required	STEP 7 Micro/WIN V3.2 SP4 or higher	STEP 7 Micro/WIN V3.2 SP4 or higher
Dimensions and weight Weight		
Weight, approx.	300 g	300 g

Ordering data	Order No.
Intelligent RS 232/PPI multi-master cable	6ES7 901-3CB30-0XA0
For connecting devices with an RS 232 interface to SIMATIC S7-200 or PPI network Master in multi-master PPI network	
Intelligent USB/PPI multi-master cable	6ES7 901-3DB30-0XA0
For connecting devices with a USB interface to SIMATIC S7-200 or PPI network; Master in multi-master PPI network	

SIMATIC S7-200 SIPLUS accessories

6AG1 901-3CB30-2XA0

SIPLUS cables 901

Overview

 Intelligent RS 232/PPI multi-master cable; for connecting devices with RS 232 interface to the RS 485 interface of SIPLUS S7-200 modules or the PPI network; can be used as master in a multi-master PPI network

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS cable 901
Order No.	6AG1 901-3CB30-2XA0
Order No. based on	6ES7 901-3CB30-0XA0
Ambient temperature range	- 25 + 70 °C; - 25 + 55 °C (for applications with cUL approval)
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Compliant with the standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL
Technical data	The technical data is identical to those based on modules.

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data Order No.

Intelligent SIPLUS RS 232/ PPI multi-master cable

(extended temperature range and medial exposure)

For connecting devices with RS 232 interface to SIMATIC S7-200 or PPI network; master in multi-master PPI network

L: Subject to export regulations AL: 91999 and ECCN: N

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4

SIMATIC S7-1200

module



4/2	Introduction	4/95 4/95	Special modules SIM 1274 simulator
/4 /4 /13 /22	Central processing units CPU 1211C CPU 1212C CPU 1214C	4/96 4/96 4/98	Communication CM 1241 communication module RS485 CB 1241 communication board
/31 /31 /34 /37	SIPLUS central processing units SIPLUS CPU 1211C SIPLUS CPU 1212C SIPLUS CPU 1214C	4/100 4/102 4/104 4/106 4/107	CM 1242-5 CM 1243-5 CSM 1277 unmanaged SIPLUS NET CSM 1277 CP 1242-7
0	Digital modules SM 1221 digital input module	Ch. 3 4/109	Telecontrol Server Basic SIPLUS CM 1241 communication module
/43 /46 /50	SB 1221 digital input module SM 1222 digital output module SB 1222 digital output module	4/110 4/110	Power supplies SIMATIC S7-1200 PM 1207
/53 /58	SM 1223 digital input/output module SB 1223 digital input/output module	4/112 4/112	SIPLUS power supplies SIPLUS PM 1207 power supplies
/62 /62	SIPLUS digital modules SIPLUS SM 1221 digital input module	4/113 4/113	Operator control and monitoring Basic panels - Standard
·/63 ·/65	SIPLUS SM 1222 digital output module SIPLUS SM 1223 digital input/output	4/120 4/120	SIPLUS operator control and monitoring SIPLUS basic panels
/67	module SIPLUS SB 1223 digital input/output module	4/122	Software
68 68 71 73 76 78 81 84 86 89	Analog modules SM 1231 analog input module SB 1231 analog input module SM 1232 analog output module SB 1232 analog output module SM 1234 analog input/output module SM 1231 thermocouple module SB 1231 thermocouple signal board SM 1231 RTD signal module SB 1231 RTD signal board		
4/91 4/91	SIPLUS analog modules SIPLUS SM 1231 analog input module		
1/92	SIPLUS SM 1232 analog output module		
4/93 4/94	SIPLUS SB 1232 analog output module SIPLUS SM 1234 analog input/output		

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/ printmaterial

Siemens ST 70 · 2011

Introduction

S7-1200

Overview



- The new modular miniature controller from the SIMATIC S7 family
- Comprising:
- Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
- Communication module with PROFIBUS DP master interface
- Communication module PROFIBUS DP slave interface
- GPRS module for connection to GSM/GPRS mobile phone networks
- Integrated web server with standard and user-specific web pages
- Data logging functionality for archiving of data at runtime from the user program
- Powerful, integrated technology functions such as counting, measuring, closed-loop control, and motion control
- Integrated digital and analog inputs/outputs
- Signal boards for direct use in a controller
- Signal modules for expansion of controllers by input/output channels
- Communication modules for expansion of controllers with additional communications interfaces
- Accessories, e.g. power supply, switch module or SIMATIC Memory Card
- The miniature controller that offers maximum automation at minimum cost.
- Extremely simple installation, programming and operation.
- · Large-scale integration, space-saving, powerful.
- Suitable for small to medium-size automation engineering applications.
- Can be used both for simple controls and for complex automation tasks.
- All CPUs can be used in stand-alone mode, in networks and within distributed structures.
- Suitable for applications where programmable controllers would not have been economically viable in the past.
- With exceptional real-time performance and powerful communication options.

Technical specifications

General technical specifications SIMATIC S7-1200			
Degree of protection	IP20 acc. to IEC 529		
Ambient temperature Operation (95% humidity) horizontal installation vertical installation Transportation and storage with 95% humidity	0 55 °C 0 45 °C -40 +70 °C 25 55 °C		
Insulation • 5/24 V DC circuits • 115/230 V AC circuits to ground • 115/230 V AC circuits to 115/230 V AC circuits • 230 V AC circuits to 5/24 V DC circuits • 115 V AC circuits to 5/24 V DC circuits	500 V AC test voltage 1500 V AC test voltage 1500 V AC test voltage 1500 V AC test voltage 1500 V AC test voltage		
Noise immunity acc. to EN 50082-2 Emitted interference acc. to EN 50081-1 and EN 50081-2	Requirements of the EMC directive Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160 Test according to EN 55011, Class A, Group 1		
Mechanical strength • Vibrations, test acc. to / tested with • Shocks, test acc. to / tested with	IEC 68, Part 2-6: 10 57 Hz; constant amplitude 0.3 mm; 58 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes		

SIMATIC S7-1200 Introduction

S7-1200

General technical specifications S	IPLUS S7-1200
Ambient temperature range	-25 +55/70 °C
Conformal coating	Coating of the PCB and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions
Ambient conditions	
Relative humidity	5 100 %, condensation permitted
Biologically active substances	Conformity with EN 60721-3-3, class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, class 3C4 incl. salt mist and ISA –S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, class 3S4 incl. conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) See ambient temperature range 795658 hPa (+2000 + 3500m) Derating 10K 658 540 hPa (+3500 +5000 m) Derating 20 K

ISA –S71.04 severity level GX: long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm limit value (max 30 min): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm
 The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

CPU 1211C

Overview



- The clever compact solution
- With 10 integral input/outputs
- Expandable by:
 1 signal board (SB) or communication board (CB)
 max. 3 communication modules (CM)

Technical specifications

	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Product type designation	CPU 1211C AC/DC/Relay	CPU 1211C DC/DC/Relay	CPU 1211C DC/DC/DC
Product version			
associated programming package	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Supply voltages			
Rated value			
• 24 V DC		Yes	Yes
 permissible range, lower limit (DC) 		20.4 V	20.4 V
 permissible range, upper limit (DC) 		28.8 V	28.8 V
• 120 V AC	Yes		
• 230 V AC	Yes		
 permissible range, lower limit (AC) 	85 V		
 permissible range, upper limit (AC) 	264 V		
 permissible frequency range, lower limit 	47 Hz		
 permissible frequency range, upper limit 	63 Hz		
Load voltage L+			
 Rated value (DC) 		24 V	24 V
 permissible range, lower limit (DC) 		20.4 V	20.4 V
 permissible range, upper limit (DC) 		28.8 V	28.8 V
Current consumption			
Current consumption (rated value)	60 mA at 120 V AC; 30 mA at 240 V AC	300 mA; Typical	300 mA; Typical
Current consumption, max.	180 mA at 120 V AC; 90 mA at 240 V AC	0.9 A; 24 V DC	0.9 A; 24 V DC
Inrush current, max.	20 A; At 264 V	12 A; at 28.8 V DC	12 A; at 28.8 V DC
Current output to backplane bus (DC 5 V), max.	750 mA; Max. 5 V DC for SM and CM	750 mA; Max. 5 V DC for SM and CM	750 mA; Max. 5 V DC for SM and CM
Power losses			
Power loss, typ.	10 W	8 W	8 W

CPU 1211C

	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Memory			
Usable memory for user data	25 kbyte	25 kbyte	25 kbyte
Work memory			
integrated	25 kbyte	25 kbyte	25 kbyte
 expandable 	No	No	No
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
expandable, max.	24 Mbyte; with SIMATIC memory card	24 Mbyte; with SIMATIC memory card	24 Mbyte; with SIMATIC memory card
Backup			
• present	Yes; entire project maintenance- free in the integral EEPROM	Yes; entire project maintenance- free in the integral EEPROM	Yes; entire project maintenance- free in the integral EEPROM
 without battery 	Yes	Yes	Yes
CPU-blocks			
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
OB			
Number, max.	Limited only by RAM for code	Limited only by RAM for code	Limited only by RAM for code
CPU processing times for bit operations, min.	0.1 μs; / Operation	0.1 μs; / Operation	0.1 μs; / Operation
for word operations, min.	12 μs; / Operation	12 µs; / Operation	12 µs; / Operation
for floating point arithmetic, min.	18 µs; / Operation	18 µs; / Operation	18 µs; / Operation
Data areas and their retentivity	- F	- F - / / - F	- 1
retentive data area in total (incl. times, counters, flags), max.	2 048 byte	2 048 byte	2 048 byte
Flag			
Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Address area			
I/O address area			
I/O address area, overall	1024 byte for inputs / 1024 byte for outputs	1024 byte for inputs / 1024 byte for outputs	1024 byte for inputs / 1024 byte for outputs
Overall	1 024 byte	1 024 byte	1 024 byte
• Outputs	1 024 byte	1 024 byte	1 024 byte
Process image			
Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
 Outputs, adjustable 	1 kbyte	1 kbyte	1 kbyte
Digital channels			
 Integrated channels (DI) 	6	6	6
Integrated channels (DO)	4	4	4
Analog channels			
Integrated channels (AI)	2	2	2
 Integrated channels (AO) 	0	0	0

CPU 1211C

	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Hardware configuration			
Number of modules per system, max.	3 communication modules, 1 signal board	3 communication modules, 1 signal board	3 communication modules, 1 signal board
Time			
Clock	V		V
Hardware clock (real-time clock)Backup time	Yes 240 h; typical	Yes 240 h; typical	Yes 240 h; typical
Deviation per day, max.	+/- 60s/month at 25°C	+/- 60s/month at 25°C	+/- 60s/month at 25°C
Test commissioning functions	,,	,,	,
Status/control			
Status/control variable	Yes	Yes	Yes
• Variables	Inputs/outputs, memory bit, DB, distributed I/Os, timers, counters	Inputs/outputs, memory bit, DB, distributed I/Os, timers, counters	Inputs/outputs, memory bit, DB, distributed I/Os, timers, counters
Forcing			
• Forcing	Yes	Yes	Yes
Communication functions			
S7 communication	Voc	Voo	Voc
supportedas server	Yes Yes	Yes Yes	Yes Yes
Web server	103	103	163
• supported	Yes	Yes	Yes
 User-defined websites 	Yes	Yes	Yes
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
Number of connections			
• overall	15; dynamically	15; dynamically	15; dynamically
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Isolated	Yes	Yes	Yes
Automatic detection of transmission speed	Yes	Yes	Yes
Autonegotiation	Yes	Yes	Yes
Autocrossing	Yes	Yes	Yes
Functionality • PROFINET IO controller	Yes	Yes	Yes
Programming			
Configuration software			
• STEP 7	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Programming language			
• LAD	Yes	Yes	Yes
• FBD	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
Cycle time monitoring • adjustable	Yes	Yes	Yes

CPU 1211C

	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Digital inputs Number of digital inputs • of which, inputs usable for technological functions	6; Integrated 3; HSC (High Speed Counting)	6; Integrated 3; HSC (High Speed Counting)	6; Integrated 3; HSC (High Speed Counting)
m/p-reading	Yes	Yes	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V	24 V	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA
Input current • for signal "1", typ.	1 mA	1 mA	1 mA
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in 4 groups	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in 4 groups	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
 at "0" to "1", min. at "0" to "1", max. for interrupt inputs parameterizable for counter/technological functions parameterizable 	0.2 ms 12.8 ms Yes Single phase : 3 at 100 kHz, differential: 3 at 80 kHz	0.2 ms 12.8 ms Yes Single phase: 3 at 100 kHz, differential: 3 at 80 kHz	0.2 ms 12.8 ms Yes Single phase: 3 at 100 kHz, differential: 3 at 80 kHz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m; 50 m for technological functions 300 m; For technological functions: No	500 m; 50 m for technological functions 300 m; For technological functions: No	500 m; 50 m for technological functions 300 m; For technological functions: No
Digital outputs Number of digital outputs of which high-speed outputs	4	4	4 2; 100 kHz Pulse Train Output
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to			L+ (-48 V)
Switching capacity of the outputs with resistive load, max. on lamp load, max.	2 A 30 W DC; 200 W AC	2 A 30 W DC; 200 W AC	0.5 A 5 W
Output voltage • for signal "0" (DC), max. • for signal "1", min.			0.1 V; with 10 kOhm load 20 V
Output current • for signal "1" rated value • for signal "0" residual current, max.			0.5 A 0.1 mA
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	10 ms; max. 10 ms; max.	10 ms; max. 10 ms; max.	1 μs; max. 5 μs; max.
Parallel switching of 2 outputs • for increased power	No	No	
Switching frequency of the pulse outputs, with resistive load, max.	1 Hz	1 Hz	100 kHz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 150 m	500 m 150 m	500 m 150 m

CPU 1211C

	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Relay outputs			
Number of relay outputs	4	4	
Number of operating cycles	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	
Analog inputs Number of analog inputs	2	2	2
Number of analog inputs for voltage/ current measurement	2	2	
Cable length, shielded, max.	100 m; twisted and shielded	100 m; twisted and shielded	100 m; twisted and shielded
Input ranges • Voltage	Yes	Yes	Yes
Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V)	Yes ≥100 kOhm	Yes ≥100 kOhm	Yes ≥100 kOhm
Analog outputs Cable length Cable length, shielded, max.	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair
Analog value creation Integrations and conversion time/ resolution per channel			
 Resolution with overrange (bit including sign), max. 	10 bit	10 bit	10 bit
Integration time, parameterizableConversion time (per channel)	Yes 625 µs	Yes 625 µs	Yes 625 µs
Encoder supply 24 V encoder supply • 24 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V
Encoder	20.0 V	20.0 V	20.0 V
Connectable encoders • 2-wire BEROS	Yes	Yes	Yes
Integrated Functions Number of counters	3	3	3
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
Controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs			2
Limit frequency (pulse)			100 kHz
Operator control and monitoring Display			
• Integrated	No	No	No

CPU 1211C

recnnical specifications (continued	<u> </u>		
	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Galvanic isolation			
Galvanic isolation digital inputs			
Galvanic isolation digital inputs	No	No	No
Between the channels, in groups of	1	1	1
Galvanic isolation digital outputs			
 Galvanic isolation digital outputs 	Yes; Relays	Relays	Yes
Between the channels	No	No	No
Between the channels, in groups of	1	1	1
Permissible potential difference			
Between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC
EMC			
Interference immunity against discharge of static electricity			
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes	Yes	Yes
- Test voltage at air discharge	8 kV	8 kV	8 kV
- Test voltage at contact discharge	6 kV	6 kV	6 kV
Interference immunity to cable-borne interference			
• on the supply lines acc. to IEC 61000-4-4	Yes	Yes	Yes
 Interference immunity on signal lines acc. to IEC 61000-4-4 	Yes	Yes	Yes
Surge immunity			
• on the supply lines acc. to IEC 61000-4-5	Yes	Yes	Yes
Immunity against conducted interference induced by high-frequency fields			
Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes	Yes	Yes
Emission of radio interference acc. to EN 55 011			
 Emission of radio interferences acc. to EN 55 011 (limit value class A) 	Yes; Group 1	Yes; Group 1	Yes; Group 1
 Emission of radio interference acc. to EN 55 011 (limit value class B) 	Yes	Yes	Yes
Climatic and mechanical conditions			
for storage and transport			
Climatic conditions for storage and			
• Free fall			
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
Temperature	package	package	package
Permissible temperature rangeRelative humidity	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Permissible range (without condensation) at 25 °C	95%	95%	95%
(

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	6ES7 211-1BD30-0XB0	6ES7 211-1HD30-0XB0	6ES7 211-1AD30-0XB0
Mechanical and climatic conditions			
during operation			
Climatic conditions in operation			
TemperaturePermissible temperature range	0°C to 55°C horizontal mounting,	0°C to 55°C horizontal mounting,	0°C to 55°C horizontal mounting.
- Fermissible temperature range	0°C to 45°C vertical mounting	0°C to 45°C vertical mounting	0°C to 45°C vertical mounting
- Permissible temperature change	5° C to 55°, 3° C/minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
• Air pressure acc. to IEC 60068-2-13			
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa	1080 to 795 hPa
 Permissible operating height 	-1000 to 2000 m	-1000 to 2000 m	-1000 to 2000 m
Pollutant concentrations			
 SO₂ at RH < 60% without condensation 	S02: < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm RH < 60% condensation-free
Environmental requirements			
Operating temperature			
• Min.	0 °C	0 °C	0 °C
• Max.	55 °C	55 °C	55 °C
Vertical installation, min.	0 °C	0 °C	0 °C
Vertical installation, max.	45 °C	45 °C	45 °C
Horizontal installation, min.	0 °C	0 °C	0 °C
Horizontal installation, max.	55 °C	55 °C	55 °C
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
Max.	70 °C	70 °C	70 °C
Air pressure			
Operation, min.	795 hPa	795 hPa	795 hPa
Operation, max.	1 080 hPa	1 080 hPa	1 080 hPa
Storage/transport, min.	660 hPa	660 hPa	660 hPa
Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
Relative humidity	OF 9/ . no condensation	OF 9/1 no condensation	OF C/ . no condensation
Operation, max.	95 %; no condensation	95 %; no condensation	95 %; no condensation
Vibrations			
Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
 Operation, checked according to IEC 60068-2-6 	Yes	Yes	Yes
Shock test			
 checked according to IEC 60068-2-27 	Yes; IEC 68, Part 2-27 half-sine:	Yes; IEC 68, Part 2-27 half-sine:	Yes; IEC 68, Part 2-27 half-sine:
	Strength of the shock 15 g (peak value), duration 11 ms	Strength of the shock 15 g (peak value), duration 11 ms	Strength of the shock 15 g (peak value), duration 11 ms
Danna of muchastics	(peak value), duration in ms	(peak value), duration in ms	(peak value), duration in ms
Degree of protection	Yes	Yes	Yes
	165	163	165
Standards, approvals, certificates CE mark	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Dimensions and weight			
Dimensions	00	00	00
• Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	420 g	380 g	370 g

CPU 1211C

Ordering data	Order No.		Order No.
CPU 1211C		SB 1223 signal board	
Compact CPU, AC/DC/relay; integral program/data memory 25 KB, load memory 1 MB; wide-range power supply 85 264 V AC; Boolean execution times 0.1 µs	6ES7 211-1BD30-0XB0	2 inputs, 24 V DC, IEC type 1 active high; 2 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	6ES7 223-0BD30-0XB0
per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs;		2 inputs, 5 V DC, 200 kHz I 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7 223-3AD30-0XB0
expandable by up to 3 communication modules and 1 signal board/communication		2 inputs, 24 V DC, 200 kHz I 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7 223-3BD30-0XB0
board;		SB 1231 signal board	6ES7 231-4HA30-0XB0
digital inputs can be used as HSC at 100 kHz		1 analog input, ±10 V with 12 bit or 0 20 mA with 11 bit	
Compact CPU, DC/DC/DC; integrated program/data memory 25 KB, load memory 1 MB;	6ES7 211-1AD30-0XB0	SB 1231 thermocouple signal board	6ES7 231-5QA30-0XB0
power supply 24 V DC; Boolean execution times 0.1 μs per operation;		1 input +/- 80 mV, resolution 15 bit + sign, thermocouples type J, K	
6 digital inputs, 4 digital outputs, 2 analog inputs;		SB 1231 RTD signal board	6ES7 231-5PA30-0XB0
expandable by up to 3 communication modules and 1 signal board/communication		1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bit + sign	
board; digital inputs can be used as HSC		SB 1232 signal board	6ES7 232-4HA30-0XB0
at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or		1 analog output, ±10 V with 12 bit or 0 to 20 mA with 11 bit	
pulse-width modulated outputs (PWM) at 100 kHz		CB 1241 RS485 communication board	6ES7 241-1CH30-1XB0
Compact CPU, DC/DC/relay; Integrated program/data memory	6ES7 211-1HD30-0XB0	for point-to-point connection, with 1 RS485 interface	
25 KB, load memory 1 MB; power supply 24 V DC;		Simulator (optional)	
Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs		8 input switches, for CPU 1211C / I CPU 1212C	6ES7 274-1XF30-0XA0
(relays), 2 analog inputs; expandable by up to		SIMATIC memory card (optional)	
3 communication modules and 1 signal board/communication		2 MB	6ES7 954 -8LB01-0AA0
board; digital inputs can be used as HSC		24 MB	6ES7 954 -8LF01-0AA0
at 100 kHz		Terminal block (spare part)	
SB 1221 signal board		for CPU 1211C/1212C	CEO7 000 4 ALION 0VA 0
4 inputs, 5 V DC, 200 kHz	6ES7 221-3AD30-0XB0	For DI, with 14 screws, tin-plated; 1 4 units	6ES7 292-1AH30-0XA0
4 inputs, 24 V DC, 200 kHz	6ES7 221-3BD30-0XB0	For DO, with 8 screws, tin-plated;	6ES7 292-1AP30-0XA0
SB 1222 signal board		4 units	
4 outputs, 5 V DC, 0.1 A, 200 kHz I	6ES7 222-1AD30-0XB0	For AI, with 3 screws, tin-plated; I 4 units	6ES7 292-1BC30-0XA0
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7 222-1BD30-0XB0		

I: Subject to export regulations AL: N and ECCN: EAR99H

CPU 1211C

Ordering data	Order No.		Order No.
Front flap set (spare part)	CEC7 201 1 A A 20 0 V A 0	STEP 7 Basic V11 engineering software	
for CPU 1211C/1212C S7-1200 automation system, system manual For SIMATIC S7-1200 and STEP 7 Basic German K English K French K Spanish K Italian K Chinese K S7-1200 automation system,	6ES7 298-8FA30-8BH0 6ES7 298-8FA30-8CH0 6ES7 298-8FA30-8DH0	Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Home Premium, Windows 7 Forfessional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery:	
Easy Book Brief instructions		German, English, Chinese, Italian, French, Spanish	
German K	6ES7 298-8FA30-8AQ0	Single license	6ES7 822-0AA01-0YA0
English K	6ES7 298-8FA30-8BQ0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
French K	6ES7 298-8FA30-8CQ0	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
Spanish K	6ES7 298-8FA30-8DQ0	STEP 7 Prof. V11, floating license	
Italian K	020. 200 0.7.00 0240	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
Chinese K	6ES7 298-8FA30-8KQ0	STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 K: Subject to export regulations AL: N and ECCN: EAR99T

CPU 1212C

Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable by:
 1 signal board (SB) or communication board (CB)
 2 signal modules (SM)
 Max. 3 communication modules (CM)

Technical specifications

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Product type designation	CPU 1212C AC/DC/Relay	CPU 1212C DC/DC/DC	CPU 1212C DC/DC/Relay
Product version associated programming package	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Supply voltages Rated value • 24 V DC • Permissible range, lower limit (DC) • Permissible range, upper limit (DC) • 120 V AC • 230 V AC • Permissible range, lower limit (AC) • Permissible range, upper limit (AC) • Permissible frequency range, lower limit • Permissible frequency range, upper limit	Yes Yes 85 V 264 V 47 Hz	Yes 20.4 V 28.8 V	Yes 20.4 V 28.8 V
Load voltage L+ • Rated value (DC) • Permissible range, lower limit (DC) • Permissible range, upper limit (DC)	24 V 5 V 250 V	24 V 20.4 V 28.8 V	24 V 5 V 250 V
Current consumption Current consumption (rated value)	80 mA at 120 V AC; 40 mA at 240 V AC		175 mA; typical
Current consumption, max.	240 mA at 120 V AC; 120 mA at 240 V AC	1.2 A; 24 V DC	1.2 A; 24 V DC
Inrush current, max.	20 A; at 264 V	12 A; at 28.8 V DC	12 A; at 28.8 V DC
Current output to backplane bus (DC 5 V), max.	1 000 mA; max. 5 V DC for SM and CM	1 000 mA; max. 5 V DC for SM and CM	1 000 mA; max. 5 V DC for SM and CM
Power losses Power loss, typ.	11 W	9 W	9 W

CPU 1212C

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Memory			
Usable memory for user data	25 kbyte	25 kbyte	25 kbyte
Work memory			
• integrated	25 kbyte	25 kbyte	25 kbyte
• expandable	No	No	No
Load memory • integrated	1 Mbyte	1 Mbyte	1 Mbyte
expandable, max.	24 Mbyte; with SIMATIC memory	24 Mbyte; with SIMATIC memory	24 Mbyte; with SIMATIC memory
одранацыю, тах.	card	card	card
Backup			
• present	Yes; entire project maintenance-	Yes; entire project maintenance-	Yes; entire project maintenance-
without battery	free in the integral EEPROM Yes	free in the integral EEPROM Yes	free in the integral EEPROM Yes
	165	165	165
CPU-blocks Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
ОВ			
Number, max.	Limited only by RAM for code	Limited only by RAM for code	Limited only by RAM for code
CPU processing times for bit operations, min.	0.1 µs; / Operation	0.1 μs; / Operation	0.1 μs; / Operation
for word operations, min.	12 μs; / Operation	12 µs; / Operation	12 µs; / Operation
for floating point arithmetic, min.	18 μs; / Operation	18 μs; / Operation	18 µs; / Operation
Data areas and their retentivity			
retentive data area in total (incl. times, counters, flags), max.	2 048 byte	2 048 byte	2 048 byte
Flag			
Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Address area			
I/O address area	4004 buts for bounts /	1004 buts for insute /	1004 buts for insute /
 I/O address area, overall 	1024 byte for inputs / 1024 byte for outputs	1024 byte for inputs / 1024 byte for outputs	1024 byte for inputs / 1024 byte for outputs
Overall	1 024 byte	1 024 byte	1 024 byte
Outputs	1 024 byte	1 024 byte	1 024 byte
Process image			
 Inputs, adjustable 	1 kbyte	1 kbyte	1 kbyte
Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Digital channels			
Integrated channels (DI) Integrated channels (DO)	8	8	8
• Integrated channels (DO)	6	6	6
Analog channels • Integrated channels (AI)	2	2	2
Integrated channels (AI) Integrated channels (AO)	0	0	0

CPU 1212C

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Hardware configuration			
Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules	3 comm. modules, 1 signal board, 2 signal modules	3 comm. modules, 1 signal board, 2 signal modules
Time			
Clock			
Hardware clock (real-time clock)	Yes	Yes	Yes
Backup time	240 h; typical	240 h; typical	240 h; typical
Deviation per day, max.	+/- 60s/month at 25°C	+/- 60s/month at 25°C	+/- 60s/month at 25°C
Test commissioning functions			
Status/control • Status/control variable	Yes	Yes	Yes
Variables	Inputs/outputs, memory bit, DB,	Inputs/outputs, memory bit, DB,	Inputs/outputs, memory bit, DB,
Variables	distributed I/Os, timers, counters	distributed I/Os, timers, counters	distributed I/Os, timers, counters
Forcing			
• Forcing	Yes	Yes	Yes
Communication functions			
S7 communication			
Supported	Yes	Yes	Yes
As server	Yes	Yes	Yes
Web server			
 Supported 	Yes	Yes	Yes
User-defined websites	Yes	Yes	Yes
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
Number of connections			
• overall	15; dynamically	15; dynamically	15; dynamically
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Isolated	Yes	Yes	Yes
Automatic detection of transmission speed	Yes	Yes	Yes
Autonegotiation	Yes	Yes	Yes
Autocrossing	Yes	Yes	Yes
Functionality			
PROFINET IO controller	Yes	Yes	Yes
Programming			
Configuration software			
• STEP 7	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Programming language			
• LAD	Yes	Yes	Yes
• FBD	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
Cycle time monitoring			
 adjustable 	Yes	Yes	Yes

CPU 1212C

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Digital inputs Number of digital inputs of which, inputs usable for technological functions	8; Integrated 4; HSC (High Speed Counting)	8; Integrated 4; HSC (High Speed Counting)	8; Integrated 4; HSC (High Speed Counting)
m/p-reading	Yes	Yes	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V
Input current • for signal "1", typ.	1 mA	1 mA	1 mA
Input delay (for rated value of input voltage)			
 for standard inputs parameterizable at "0" to "1", min. 	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four 0.2 ms	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four 0.2 ms	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four 0.2 ms
- at "0" to "1", max. • for interrupt inputs	12.8 ms	12.8 ms	12.8 ms
parameterizablefor counter/technological functions	Yes	Yes	Yes
- parameterizable	Single phase: 3 at 100 kHz & 1 at 30 kHz, differential: 3 at 80 kHz & 1 at 30 kHz	Single phase: 3 at 100 kHz & 1 with 30 kHz, differential: 3 at 80 kHz & 1 at 30 kHz	Single phase: 3 at 100 kHz & 1 at 30 kHz, differential: 3 at 80 kHz & 1 at 30 kHz
Cable length Cable length, shielded, max.	500 m; 50 m for technological functions	500 m; 50 m for technological functions	500 m; 50 m for technological functions
Cable length unshielded, max.	300 m; for technological functions: No	300 m; for technological functions: No	300 m; for technological functions: No
Digital outputs Number of digital outputs of which high-speed outputs	6	6 2; 100 kHz Pulse Train Output	6
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to		L+ (-48 V)	
Switching capacity of the outputs • with resistive load, max. • on lamp load, max.	2 A 30 W DC; 200 W AC	0.5 A 5 W	2 A 30 W DC; 200 W AC
Output voltage • for signal "0" (DC), max. • for signal "1", min.		0.1 V; with 10 kOhm load 20 V	
Output current • for signal "1" rated value • for signal "0" residual current, max.		0.5 A 0.1 mA	
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	10 ms; max. 10 ms; max.	1 μs 5 μs	10 ms; max. 10 ms; max.
Switching frequency • of the pulse outputs, with resistive load, max.	1 Hz	100 kHz	1 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 150 m	500 m 150 m	500 m 150 m

CPU 1212C

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Relay outputs			
Number of relay outputs	6		6
Number of operating cycles	mechanically 10 million, at rated load voltage 100,000		mechanically 10 million, at rated load voltage 100,000
Analog inputs Number of analog inputs	2	2	2
Cable length, shielded, max.	100 m; twisted and shielded	100 m; twisted and shielded	100 m; twisted and shielded
Input ranges • Voltage	Yes	Yes	Yes
Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V)	Yes ≥100 kOhm	Yes ≥100 kOhm	Yes ≥100 kOhm
Analog outputs Cable length			
Cable length, shielded, max.	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair
Analog value creation Integrations and conversion time/ resolution per channel	40 15	40 %	40 %
 Resolution with overrange (bit including sign), max. Integration time, parameterizable Conversion time (per channel) 	10 bit Yes 625 µs	10 bit Yes 625 µs	10 bit Yes 625 µs
Encoder supply 24 V encoder supply • 24 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V
Encoder Connectable encoders • 2-wire BEROS	Yes	Yes	Yes
Integrated Functions Number of counters	4	4	4
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
Controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		2	
Limit frequency (pulse)		100 kHz	
Operator control and monitoring Display			
Integrated	No	No	No
Galvanic isolation Galvanic isolation digital inputs Galvanic isolation digital inputs Between the channels, in groups of	No 1	No 1	No 1
Galvanic isolation digital outputs Galvanic isolation digital outputs Between the channels Between the channels, in groups of	Yes; Relays No	Yes No 2	Relays No 1

CPU 1212C

Technical specifications (contin	lued)		
	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Permissible potential difference			
between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC
EMC			
Interference immunity against discharge of static electricity			
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes	Yes	Yes
- Test voltage at air discharge	8 kV	8 kV	8 kV
- Test voltage at contact discharge	6 kV	6 kV	6 kV
Interference immunity to cable-borne interference			
• on the supply lines acc. to IEC 61000-4-4	Yes	Yes	Yes
 Interference immunity on signal lines acc. to IEC 61000-4-4 	Yes	Yes	Yes
Surge immunity • on the supply lines acc. to IEC 61000-4-5	Yes	Yes	Yes
Immunity against conducted inter- ference induced by high-frequency fields			
Interference immunity against high- frequency radiation acc. to IEC 61000-4-6	Yes	Yes	Yes
Emission of radio interference acc. to EN 55 011			
• Emission of radio interferences acc. to EN 55 011 (limit value class A)	Yes; Group 1	Yes; Group 1	Yes; Group 1
Emission of radio interference acc. to EN 55 011 (limit value class B)	Yes	Yes	Yes
Climatic and mechanical conditions for storage and transport			
Climatic conditions for storage and transport			
• Free fall			
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
 Temperature Permissible temperature range 	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Relative humidity	40 0 10 170 0	40 0 10 170 0	40 0 10 170 0
- Permissible range (without condensation) at 25 °C	95%	95%	95%
Mechanical and climatic			
conditions during operation			
Climatic conditions in operation			
Temperature Permissible temperature range	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting
 permissible temperature change Air pressure acc. to IEC 60068-2-13 	5° C to 55°, 3° C/minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa	1080 to 795 hPa
Permissible operating heightPollutant concentrations	-1000 to 2000 m	-1000 to 2000 m	-1000 to 2000 m
- SO ₂ at RH < 60% without condensation	$S0_2$: < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free	SO_2 : < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free	SO_2 : < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free

CPU 1212C

Technical specifications (continued)

	6ES7 212-1BD30-0XB0	6ES7 212-1AD30-0XB0	6ES7 212-1HD30-0XB0
Environmental requirements			
Operating temperature			
• Min.	0 °C	0 °C	0 °C
• Max.	55 °C	55 °C	55 °C
 Vertical installation, min. 	0 °C	0 °C	0 °C
 Vertical installation, max. 	45 °C	45 °C	45 °C
 Horizontal installation, min. 	0 °C	0 °C	0 °C
 Horizontal installation, max. 	55 °C	55 °C	55 °C
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
• Max.	70 °C	70 °C	70 °C
Air pressure			
 Operation, min. 	795 hPa	795 hPa	795 hPa
 Operation, max. 	1 080 hPa	1 080 hPa	1 080 hPa
 Storage/transport, min. 	660 hPa	660 hPa	660 hPa
Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
Relative humidity			
Operation, max.	95 %; no condensation	95 %; no condensation	95 %; no condensation
Vibrations			
 Vibrations 	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
 Operation, checked according to IEC 60068-2-6 	Yes	Yes	Yes
Shock test			
 checked according to 	Yes; IEC 68, Part 2-27 half-sine:	Yes; IEC 68, Part 2-27 half-sine:	Yes; IEC 68, Part 2-27 half-sine:
IEC 60068-2-27	Strength of the shock 15 g (peak value), duration 11 ms	Strength of the shock 15 g (peak value), duration 11 ms	Strength of the shock 15 g (peak value), duration 11 ms
Degree of protection			
P20	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Dimensions and weight			
Dimensions			
Width	90 mm	90 mm	90 mm
▶ Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	425 g	370 g	385 g

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CPU 1212C

Ordering data	Order No.		Order No.
CPU 1212C		SB 1223 signal board	
Compact CPU, AC/DC/relay; integral program/data memory 25 KB, load memory 1 MB; wide-range power supply 85 264 V AC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs	6ES7 212-1BD30-0XB0	2 inputs, 24 V DC, IEC type 1 active high; 2 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz 2 inputs, 5 V DC, 200 kHz	6ES7 223-0BD30-0XB0 6ES7 223-3AD30-0XB0
(relays), 2 analog inputs; expandable by up to 3 communication modules.		2 outputs 5 V DC, 0.1 A, 200 kHz 2 inputs, 24 V DC, 200 kHz	6ES7 223-3BD30-0XB0
2 signal modules and 1 signal		2 outputs 24 V DC, 0.1 A, 200 kHz SB 1231 signal board	6ES7 231-4HA30-0XB0
board/communication board; digital inputs can be used as HSC		1 analog input, ±10 V with 12 bit	0L37 231-411A30-0AD0
at 100 kHz		or 0 20 mA with 11 bit	
Compact CPU, DC/DC/DC; integrated program/data memory 25 KB, load memory 1 MB;	6ES7 212-1AD30-0XB0	SB 1231 thermocouple signal board	6ES7 231-5QA30-0XB0
power supply 24 V DC; Boolean execution times 0.1 μs per operation;		1 input +/- 80 mV, resolution 15 bit + sign, thermocouples type J, K	
8 digital inputs, 6 digital outputs, 2 analog inputs;		SB 1231 RTD signal board	6ES7 231-5PA30-0XB0
expandable by up to 3 communication modules, 2 signal modules, and 1 signal		1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bit + sign	
board/communication board; digital inputs can be used as HSC		SB 1232 signal board	6ES7 232-4HA30-0XB0
at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or		1 analog output, ±10 V with 12 bit or 0 to 20 mA with 11 bit	
pulse-width modulated outputs (PWM) at 100 kHz		CB 1241 RS485 communication board	6ES7 241-1CH30-1XB0
Compact CPU, DC/DC/relay; integrated program/data memory	6ES7 212-1HD30-0XB0	for point-to-point connection, with 1 RS485 interface	
25 KB, load memory 2 MB; power supply 24 V DC;		Simulator (optional)	
Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs		8 input switches, for CPU 1211C / I CPU 1212C	6ES7 274-1XF30-0XA0
(relays), 2 analog inputs; expandable by up to		SIMATIC Memory Card (optional)	
3 communication modules, 2 signal modules, and 1 signal		2 MB	6ES7 954 -8LB01-0AA0
board/communication board;		24 MB	6ES7 954 -8LF01-0AA0
digital inputs can be used as HSC at 100 kHz		Extension cable for two-tier configuration	6ES7 290-6AA30-0XA0
SB 1221 signal board		for connecting digital/analog	
4 inputs, 5 V DC, 200 kHz	6ES7 221-3AD30-0XB0	signal modules; length 2 m	
4 inputs, 24 V DC, 200 kHz	6ES7 221-3BD30-0XB0	Starter box CPU 1212C AC/DC/ D	6ES7 212-1BD30-4YB0
SB 1222 signal board		relay	
4 outputs, 5 V DC, 0.1 A, 200 kHz I	6ES7 222-1AD30-0XB0	Complete offer SIMATIC S7-1200,	
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7 222-1BD30-0XB0	starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, info material, in Systainer	

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CPU 1212C

Ordering data	Order No.		Order No.
Terminal block (spare part)		STEP 7 Basic V11 engineering	
for CPU 1211C/1212C		software	
For DI, with 14 screws, tin-plated; 4 units	6ES7 292-1AH30-0XA0	Target system: SIMATIC S7-1200 controllers and the associated I/O.	
For DO, with 8 screws, tin-plated; 4 units	6ES7 292-1AP30-0XA0	Requirements: Windows XP Home SP3, Windows XP Professional SP3	
For AI, with 3 screws, tin-plated; 4 units	6ES7 292-1BC30-0XA0	(32 bit), Windows 7 Home Premium,	
Front flap set (spare part)		Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit),	
for CPU 1211C/1212C	6ES7 291-1AA30-0XA0	Windows 7 Ultimate (32 bit),	
S7-1200 automation system, system manual		Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
For SIMATIC S7-1200 and STEP 7 Basic		(32 bit) Type of delivery:	
German	6ES7 298-8FA30-8AH0	German, English, Chinese, Italian, French, Spanish	
English	6ES7 298-8FA30-8BH0	Single license	6ES7 822-0AA01-0YA0
French	6ES7 298-8FA30-8CH0	Upgrade STEP 7 Basic V10.5 to	6ES7 822-0AA01-0YE0
Spanish	6ES7 298-8FA30-8DH0	STEP 7 Basic V11, single license	
Italian	6ES7 298-8FA30-8EH0	Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
Chinese	6ES7 298-8FA30-8KH0	- STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
S7-1200 automation system, Easy Book		,	6ES7 822-0AA00-0YL0
Brief instructions		Corvice, Tyour	
German	6ES7 298-8FA30-8AQ0		
English	6ES7 298-8FA30-8BQ0		
French	6ES7 298-8FA30-8CQ0		
Spanish	6ES7 298-8FA30-8DQ0		
Italian	6ES7 298-8FA30-8EQ0		
Chinese	6ES7 298-8FA30-8KQ0		

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CPU 1214C

Overview



- The compact high-performance CPU
- With 24 integral input/outputs
- Expandable by:
 1 signal board (SB) or communication board (CB)
 8 signal modules (SM)
 Max. 3 communication modules (CM)

Technical specifications

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Product type designation	CPU 1214C AC/DC/Relay	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/Relay
Product version associated programming package	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Supply voltages Rated value • 24 V DC • permissible range, lower limit (DC) • permissible range, upper limit (DC) • 120 V AC • 230 V AC • permissible range, lower limit (AC) • permissible range, upper limit (AC) • permissible frequency range, lower limit • permissible frequency range, upper limit	Yes Yes 85 V 264 V 47 Hz	Yes 20.4 V 28.8 V	Yes 20.4 V 28.8 V
Load voltage L+ • Rated value (DC) • permissible range, lower limit (DC) • permissible range, upper limit (DC)	24 V 5 V 250 V	24 V 20.4 V 28.8 V	24 V 5 V 250 V
Current consumption Current consumption (rated value)	100 mA at 120 V AC; 50 mA at 240 V AC		500 mA; Typical
Current consumption, max.	300 mA at 120 V AC; 150 mA at 240 V AC	1.5 A; 24 V DC	1.2 A; 24 V DC
Inrush current, max.	20 A; At 264 V	12 A; at 28.8 V DC	12 A; at 28.8 V DC
Current output to backplane bus (DC 5 V), max.	1 600 mA; Max. 5 V DC for SM and CM	1 600 mA; Max. 5 V DC for SM and CM	1 600 mA; Max. 5 V DC for SM and CM
Power losses Power loss, typ.	14 W	12 W	12 W

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Memory			
Usable memory for user data	50 kbyte	50 kbyte	50 kbyte
Work memory • integrated • expandable	50 kbyte No	50 kbyte No	50 kbyte No
Load memory • integrated • expandable, max.	2 Mbyte 24 Mbyte; with SIMATIC memory card	2 Mbyte 24 Mbyte; with SIMATIC memory card	2 Mbyte 24 Mbyte; with SIMATIC memory card
Backup • present • without battery	Yes; entire project maintenance- free in the integral EEPROM Yes	Yes; entire project maintenance- free in the integral EEPROM Yes	Yes; entire project maintenance- free in the integral EEPROM Yes
CPU-blocks			
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
ОВ			
Number, max.	Limited only by RAM for code	Limited only by RAM for code	Limited only by RAM for code
CPU processing times for bit operations, min.	0.1 µs; / Operation	0.1 μs; / Operation	0.1 μs; / Operation
for word operations, min.	12 μs; / Operation	12 μs; / Operation	12 µs; / Operation
for floating point arithmetic, min.	18 μs; / Operation	18 μs; / Operation	18 μs; / Operation
Data areas and their retentivity retentive data area in total (incl. times, counters, flags), max.	2 048 byte	2 048 byte	2 048 byte
Flag • Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area I/O address area I/O address area, overall overall Outputs	1024 byte for inputs / 1024 byte for outputs 1 024 byte 1 024 byte	1024 byte for inputs / 1024 byte for outputs 1 024 byte 1 024 byte	1024 byte for inputs / 1024 byte for outputs 1 024 byte 1 024 byte
Process image • Inputs, adjustable • Outputs, adjustable	1 kbyte 1 kbyte	1 kbyte 1 kbyte	1 kbyte 1 kbyte
Digital channels • integrated channels (DI) • integrated channels (DO)	14 10	14 10	14 10
Analog channels Integrated channels (AI) Integrated channels (AO)	2 0	2 0	2 0
Hardware configuration Number of modules per system, max.	3 comm. modules, 1 signal board, 8 signal modules	3 comm. modules, 1 signal board, 8 signal modules	3 comm. modules, 1 signal board, 8 signal modules

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Time			
Clock	Van	Van	Van
Hardware clock (real-time clock)	Yes	Yes	Yes
Backup timeDeviation per day, max.	240 h; typical +/- 60s/month at 25°C	240 h; typical +/- 60s/month at 25°C	240 h; typical +/- 60s/month at 25°C
· · · · · · · · · · · · · · · · · · ·	+/- 608/11011(11 at 25 C	+/- 60\$/MONUTAL 25 C	+/- 608/MONUTAL 25 C
Test commissioning functions Status/control			
Status/control variable	Yes	Yes	Yes
Variables	Inputs/outputs, memory bit, DB,	Inputs/outputs, memory bit, DB,	Inputs/outputs, memory bit, DB,
Va.142.150	distributed I/Os, timers, counters	distributed I/Os, timers, counters	distributed I/Os, timers, counters
Forcing			
• Forcing	Yes	Yes	Yes
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
as server	Yes	Yes	Yes
Web server			
supported	Yes	Yes	Yes
user-defined websites	Yes	Yes	Yes
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
Number of connections			
• overall	15; dynamically	15; dynamically	15; dynamically
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Isolated	Yes	Yes	Yes
Automatic detection of transmission speed	Yes	Yes	Yes
Autonegotiation	Yes	Yes	Yes
Autocrossing	Yes	Yes	Yes
Functionality			
PROFINET IO controller	Yes	Yes	Yes
Programming			
Configuration software			
• STEP 7	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher	STEP 7 V10.5 or higher
Programming language			
• LAD	Yes	Yes	Yes
• FBD	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
Cycle time monitoring			
adjustable	Yes	Yes	Yes

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Digital inputs Number of digital inputs of which, inputs usable for technological functions	14; Integrated 6; HSC (High Speed Counting)	14; Integrated 6; HSC (High Speed Counting)	14; Integrated 6; HSC (High Speed Counting)
m/p-reading	Yes	Yes	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V
Input current • for signal "1", typ.	1 mA	1 mA	1 mA
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
 at "0" to "1", min. at "0" to "1", max. for interrupt inputs parameterizable 	0.2 ms 12.8 ms Yes	0.2 ms 12.8 ms	0.2 ms 12.8 ms Yes
for counter/technological functions parameterizable	Single phase: 3 at 100 kHz & 1 at 30 kHz, differential: 3 at 80 kHz & 1 at 30 kHz	Single phase : 3 at 100 kHz & 1 at 30 kHz, differential: 3 at 80 kHz & 1 at 30 kHz	Single phase: 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m; 50 m for technological functions 300 m; For technological functions: No	500 m; 50 m for technological functions 300 m; For technological functions: No	500 m; 50 m for technological functions 300 m; For technological functions.
Digital outputs Number of digital outputs of which high-speed outputs	10	10 2; 100 kHz Pulse Train Output	10
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to		L+ (-48 V)	
Switching capacity of the outputs • with resistive load, max. • on lamp load, max.	2 A 30 W DC; 200 W AC	0.5 A 5 W	2 A 30 W DC; 200 W AC
Output voltage • for signal "1", min.		20 V	
Output current • for signal "1" rated value • for signal "0" residual current, max.		0.5 A 0.1 mA	
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	10 ms; max. 10 ms; max.	1 μs 5 μs	10 ms; max. 10 ms; max.
Switching frequency • of the pulse outputs, with resistive load, max.	1 Hz	100 kHz	1 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 150 m	500 m 150 m	500 m 150 m

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Relay outputs Number of relay outputs	10		10
Number of operating cycles	mechanically 10 million, at rated load voltage 100,000		mechanically 10 million, at rated load voltage 100,000
Analog inputs Number of analog inputs	2	2	2
Cable length, shielded, max.	100 m; twisted and shielded	100 m; twisted and shielded	100 m; twisted and shielded
Input ranges • Voltage	Yes	Yes	Yes
Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V)	Yes ≥100 kOhm	Yes ≥100 kOhm	Yes ≥100 kOhm
Analog outputs Cable length Cable length, shielded, max.	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair	100 m; Shielded, twisted wire pair
Analog value creation Integrations and conversion time/ resolution per channel Resolution with overrange (bit	10 bit	10 bit	10 bit
 nesolution with overlarge (bit including sign), max. Integration time, parameterizable Conversion time (per channel) 	Yes 625 µs	Yes 625 µs	Yes 625 µs
Encoder supply 24 V encoder supply • 24 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V	permissible range: 20.4 to 28.8 V
Encoder Connectable encoders • 2-wire BEROS	Yes	Yes	Yes
Integrated Functions Number of counters	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		2	
Limit frequency (pulse)		100 kHz	
Operator control and monitoring Display			
Integrated	No	No	No
Galvanic isolation Galvanic isolation digital inputs • Galvanic isolation digital inputs • between the channels, in groups of	No 1	No 1	No 1
Galvanic isolation digital outputs • Galvanic isolation digital outputs • between the channels • between the channels, in groups of	Yes; Relays No 2	Yes No 2	Relays No 1

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Permissible potential difference			
between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC
EMC			
Interference immunity against discharge of static electricity			
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes	Yes	Yes
- Test voltage at air discharge	8 kV	8 kV	8 kV
- Test voltage at contact discharge	6 kV	6 kV	6 kV
Interference immunity to cable-borne interference			
on the supply lines acc. to IEC 61000-4-4	Yes	Yes	Yes
Interference immunity on signal lines acc. to IEC 61000-4-4	Yes	Yes	Yes
Surge immunity			
on the supply lines acc. to IEC 61000-4-5	Yes	Yes	Yes
Immunity against conducted inter- ference induced by high-frequency fields			
 Interference immunity against high- frequency radiation acc. to IEC 61000-4-6 	Yes	Yes	Yes
Emission of radio interference acc. to EN 55 011			
 Emission of radio interferences acc. to EN 55 011 (limit value class A) 	Yes; Group 1	Yes; Group 1	Yes; Group 1
 Emission of radio interference acc. to EN 55 011 (limit value class B) 	Yes	Yes	Yes
Climatic and mechanical conditions for storage and transport			
Climatic conditions for storage and transport			
Free fall			
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
Temperature	10.00	10.00	10.00
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Relative humidity	95%	95%	95%

CPU 1214C

	6ES7 214-1BE30-0XB0	6ES7 214-1AE30-0XB0	6ES7 214-1HE30-0XB0
Mechanical and climatic			
conditions during operation			
Climatic conditions in operation			
Temperature			
- Permissible temperature range	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting		0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting
 Permissible temperature change Air pressure acc. to IEC 60068-2-13 	5° C to 55°, 3° C/minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa	1080 to 795 hPa
- Permissible operating height	-1000 to 2000 m	-1000 to 2000 m	-1000 to 2000 m
Pollutant concentrations	1000 to 2000	1000 to 2000	1000 10 2000 111
- SO ₂ at RH < 60% without condensation	S0 ₂ : < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free
Environmental requirements			
Operating temperature			
• Min.	0 °C	0 °C	0 °C
• Max.	55 °C	55 °C	55 °C
Vertical installation, min.	0 °C	0 °C	0 °C
Vertical installation, max.	45 °C	45 °C	45 °C
 Horizontal installation, min. 	0 °C	0 °C	0 °C
Horizontal installation, max.	55 °C	55 °C	55 °C
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
• Max.	70 °C	70 °C	70 °C
Air pressure			
Operation, min.	795 hPa	795 hPa	795 hPa
Operation, max.	1 080 hPa	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
Relative humidity			
Operation, max.	95 %; no condensation	95 %; no condensation	95 %; no condensation
Vibrations			
 Vibrations 	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
 Operation, checked according to IEC 60068-2-6 	Yes	Yes	Yes
Shock test			
checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: Strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: Strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: Strength of the shock 15 g (peak value), duration 11 ms
Degree of protection	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Dimensions and weight			
Dimensions			
• Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	455 g	415 g	435 g

CPU 1214C

Ordering data	Order No.		Order No.
CPU 1214C		SB 1223 signal board	
Compact CPU, AC/DC/relay; integral program/data memory 50 KB, load memory 2 MB; wide-range power supply 85 264 V AC; Boolean execution times 0.1 µs	6ES7 214-1BE30-0XB0	2 inputs, 24 V DC, IEC type 1 active high; 2 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	6ES7 223-0BD30-0XB0
per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs;		2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7 223-3AD30-0XB0
expandable by up to 3 communication modules,		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7 223-3BD30-0XB0
8 signal modules and 1 signal board/communication board;		SB 1231 signal board	6ES7 231-4HA30-0XB0
digital inputs can be used as HSC at 100 kHz		1 analog input, ±10 V with 12 bit or 0 20 mA with 11 bit	
Compact CPU, DC/DC/DC; integrated program/data memory 50 KB, load memory 2 MB;	6ES7 214-1AE30-0XB0	SB 1231 thermocouple signal board	6ES7 231-5QA30-0XB0
power supply 24 V DC; Boolean execution times 0.1 μs per operation;		1 input +/- 80 mV, resolution 15 bit + sign, thermocouples type J, K	
14 digital inputs, 10 digital outputs, 2 analog inputs;		SB 1231 RTD signal board	6ES7 231-5PA30-0XB0
expandable by up to 3 communication modules, 8 signal modules, and 1 signal		1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bit + sign	
board/communication board; digital inputs can be used as		SB 1232 signal board	6ES7 232-4HA30-0XB0
HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or		1 analog output, ±10 V with 12 bit or 0 to 20 mA with 11 bit	
pulse-width modulated outputs (PWM) at 100 kHz		CB 1241 RS485 communication board	6ES7 241-1CH30-1XB0
Compact CPU, DC/DC/relay; integrated program/data memory	6ES7 214-1HE30-0XB0	for point-to-point connection, with 1 RS485 interface	
50 KB, load memory 2 MB; power supply 24 V DC;		Simulator (optional)	
Boolean execution times 0.1 μs		14 input switches, for CPU 1214C I	6ES7 274-1XH30-0XA0
per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs;		SIMATIC memory card (optional)	
expandable by up to 3 communication modules,		2 MB	6ES7 954 -8LB01-0AA0
8 signal modules, and 1 signal		24 MB	6ES7 954 -8LF01-0AA0
board/communication board; digital inputs can be used as HSC at 100 kHz		Extension cable for two-tier configuration	6ES7 290-6AA30-0XA0
SB 1221 signal board		for connecting digital/analog signal modules;	
4 inputs, 5 V DC, 200 kHz	6ES7 221-3AD30-0XB0	length 2 m	
4 inputs, 24 V DC, 200 kHz	6ES7 221-3BD30-0XB0	Terminal block (spare part)	
SB 1222 signal board		for CPU 1214C	
4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A,		For DI, with 20 screws, tin-plated; 4 units	6ES7 292-1AV30-0XA0
4 outputs, 24 v DC, 0.1 A, 1 200 kHz	6ES7 222-1BD30-0XB0	For DO, with 12 screws, tin-plated; 4 units	6ES7 292-1AM30-0XA0
		For AI, with 3 screws, tin-plated; I 4 units	6ES7 292-1BC30-0XA0

I: Subject to export regulations AL: N and ECCN: EAR99H

CPU 1214C

Ordering data	Order No.		Order No.
Front flap set (spare part) for CPU 1214C	6ES7 291-1AB30-0XA0	STEP 7 Basic V11 engineering software	
S7-1200 automation system, system manual For SIMATIC S7-1200 and STEP 7		Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements:	
Basic		Windows XP Home SP3, Windows XP Professional SP3	
German k	6ES7 298-8FA30-8AH0	(32 bit),	
English k	6ES7 298-8FA30-8BH0	Windows 7 Home Premium, Windows 7Professional (32 bit),	
French	6ES7 298-8FA30-8CH0	Windows 7 Enterprise (32 bit),	
Spanish	6ES7 298-8FA30-8DH0	Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std.	
Italian k	6ES7 298-8FA30-8EH0	SP2 (32 bit),	
Chinese	6ES7 298-8FA30-8KH0	Microsoft Server 2008 Std. SP2 (32 bit)	
S7-1200 automation system, Easy Book		Type of delivery: German, English, Chinese, Italian, French, Spanish	
Brief instructions		Single license	6ES7 822-0AA01-0YA0
German k	6ES7 298-8FA30-8AQ0	ŭ	
English k	6ES7 298-8FA30-8BQ0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
French	6ES7 298-8FA30-8CQ0	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
Spanish	6ES7 298-8FA30-8DQ0	STEP 7 Prof. V11, floating license	
Italian k	6ES7 298-8FA30-8EQ0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
Chinese	6ES7 298-8FA30-8KQ0	STEP 7 Basic Software Update D Service, 1 year	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 K: Subject to export regulations AL: N and ECCN: EAR99T

SIPLUS central processing units

SIPLUS CPU 1211C

Overview



- The clever compact solution
- With 10 integrated I/Os
- Expandable with:
 - 1 signal board (SB)
 - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 1211C DC/DC/DC				
Order number	6AG1 211-1AD30-2XB0	6AG1 211-1AD30-4XB0	6AG1 211-1AD30-5XB0	
Order No. based on	6ES7 211-1AD30-0XB0			
Ambient temperature range	-25 + 70 °C ³⁾	0 +55 °C	-25 + 55 °C	
Conformal coating	Coating of the printed circuit be	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	ard product applies except for the ar	mbient conditions.	

SIPLUS CPU 1211C AC/DC/RLY				
Order number	6AG1 211-1BD30-2XB0	6AG1 211-1BD30-4XB0	6AG1 211-1BD30-5XB0	
Order No. based on	6ES7 211-1BD30-0XB0			
Ambient temperature range	-25 + 70 °C ³⁾	0 +55 °C	-25 +55 °C	
Conformal coating	Coating of the printed circuit be	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	ard product applies except for the a	mbient conditions.	

SIPLUS CPU 1211C DC/DC/RLY				
Order number	6AG1 211-1HD30-2XB0	6AG1 211-1HD30-4XB0	6AG1 211-1HD30-5XB0	
Order No. based on	6ES7 211-1HD30-0XB0			
Ambient temperature range	-25 + 70 °C ³⁾	0 +55 °C	-25 +55 °C	
Conformal coating	Coating of the printed circuit b	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	dard product applies except for the a	mbient conditions.	

 $^{^{3)}}$ From +60 °C to +70 °C, the number of simultaneously enabled inputs and outputs is max. 50%; no SB module permitted

SIPLUS central processing units

SIPLUS CPU 1211C

Overview (continued)

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; CI < 4.9 ppm; CI < 0.12 ppm;
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: $\underline{\text{www.siemens.com/siplus-extreme}}$

Ordering data

Order No.

Order No.

SIPLUS CPU 1211C compact CPU, AC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; wide-range alternating voltage

supply 85 ... 264 V AC; Boolean execution times of 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board; digital inputs usable as HSC with

 Suitable for areas with extraordinary medial exposure (conformal coating)

100 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature
 -25 ... +55 °C; without restrictions; SB module can be used
- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 212-1BD30-4XB0

6AG1 212-1BD30-5XB0

6AG1 212-1BD30-2XB0

SIPLUS CPU 1211C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB;

power supply 24 V DC; boolean execution times of 0.1 μ s per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs;

expandable with up to 3 communication modules and 1 signal board; digital inputs usable as HSC with

100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulsewidth-modulated outputs (PWM) with 100 kHz

 Suitable for areas with extraordinary medial exposure (conformal coating)

- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 ... +55 °C; without restrictions; SB module can be used
- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature
 -25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 212-1AD30-4XB0

6AG1 212-1AD30-5XB0

6AG1 212-1AD30-2XB0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-1200 SIPLUS central processing units

SIPLUS CPU 1211C

Ordering data	Order No.		Order No.
SIPLUS CPU 1211C compact CPU, DC/DC/relay		Accessories	see SIMATIC S7-1200 CPU 1211C, page 4/11
(extended temperature range and medial exposure)			
Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board; digital inputs usable as HSC with 100 kHz			
 Suitable for areas with extraor- dinary medial exposure (conformal coating) 	6AG1 211-1HD30-4XB0		
Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 +55 °C; without restrictions; SB module can be used	6AG1 211-1HD30-5XB0		
Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature -25 +70 °C; from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible	6AG1 212-1HD30-2XB0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

SIPLUS central processing units

SIPLUS CPU 1212C

Overview



- The superior compact solution
- With 14 integrated I/Os
- Expandable with:

 - 1 signal board (SB)
 2 signal modules (SM)
 Max. 3 communication modules (CM)

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 1212C DC/DC/DC			
Order number	6AG1 212-1AD30-2XB0	6AG1 212-1AD30-4XB0	6AG1 212-1AD30-5XB0
Order number based on	6ES7 212-1AD30-0XB0		
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard	product applies except for the ambie	nt conditions.

SIPLUS CPU 1212C AC/DC/RLY				
Order number	6AG1 212-1BD30-2XB0	6AG1 212-1BD30-4XB0	6AG1 212-1BD30-5XB0	
Order number based on	6ES7 212-1BD30-0XB0			
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C	
Conformal coating	Coating of the printed circuit be	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	ard product applies except for the ar	mbient conditions.	

SIPLUS CPU 1212C DC/DC/RLY				
Order number	6AG1 212-1HD30-2XB0	6AG1 212-1HD30-4XB0	6AG1 212-1HD30-5XB0	
Order number based on	6ES7 212-1HD30-0XB0			
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C	
Conformal coating	Coating of the printed circuit b	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	dard product applies except for the a	mbient conditions.	

³⁾ From +60 °C to +70 °C, the number of simultaneously enabled inputs and outputs is max. 50%; no SB module permitted

SIPLUS central processing units

SIPLUS CPU 1212C

Overview (continued)

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K
	<u> </u>

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8 \ ppm;$ $H_2S < 9.9 \ ppm;$ CI $< 0.2 \ ppm;$ HCI $< 0.66 \ ppm;$ HF $< 0.12 \ ppm;$ NH $< 49 \ ppm;$ O $_3 < 0.1 \ ppm;$ NOX $< 5.2 \ ppm$ Limit value (max. 30 min/d): SO $_2 < 17.8 \ ppm;$ H $_2S < 49.7 \ ppm;$ CI $< 1.0 \ ppm;$ HCI $< 3.3 \ ppm;$ HF $< 2.4 \ ppm;$ NH $< 247 \ ppm;$ O $_3 < 1.0 \ ppm;$ NOX $< 10.4 \ ppm$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Order No.

Technical documentation on SIPLUS is available under: www.siemens.com/siplus-extreme

Ordering data Order No.

SIPLUS CPU 1212C compact CPU, AC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; wide-range alternating voltage supply 85 ... 264 V AC; Boolean execution times of 0.1 μ s

Boolean execution times of 0.1 μs per operation; 8 digital inputs, 6 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules, and 1 signal board; digital inputs usable as HSC with

 Suitable for areas with extraordinary medial exposure (conformal coating)

100 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature
 -25 ... +55 °C; without restrictions; SB module can be used
- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature
 -25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 212-1BD30-4XB0

6AG1 212-1BD30-5XB0

6AG1 212-1BD30-2XB0

SIPLUS CPU 1212C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory of 25 kbyte, load memory of 1 MB;

power supply 24 V DC; Boolean execution times of 0.1 μs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules and 1 signal board;

digital inputs usable as HSC with 100 kHz; 24 V DC digital outputs usable as pulse outputs (PTO) or pulsewidth-modulated outputs (PWM) with 100 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 ... +55 °C; without restrictions; SB module can be used
- Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature
 -25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 212-1AD30-4XB0

6AG1 212-1AD30-5XB0

6AG1 212-1AD30-2XB0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

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SIMATIC S7-1200 SIPLUS central processing units

SIPLUS CPU 1212C

Ordering data	Order No.		Order No.
SIPLUS CPU 1212C compact CPU, DC/DC/relay		Accessories	See SIMATIC S7-1200 CPU 1212C, page 4/20
(extended temperature range and medial exposure)			
Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC;			
Boolean execution times of 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules and 1 signal board; digital inputs usable as HSC with			
100 kHzSuitable for areas with extra-H	6AG1 212-1HD30-4XB0		
ordinary medial exposure (conformal coating)			
Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature -25 +55 °C; without restrictions; SB module can be used	6AG1 212-1HD30-5XB0		
Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature -25 +70 °C; from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible	6AG1 212-1HD30-2XB0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

SIPLUS central processing units

SIPLUS CPU 1214C

Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
- 1 signal board (SB)
- 8 signal modules (SM)
 Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 1214C DC/DC/DC			
Order No.	6AG1 214-1AE30-2XB0	6AG1 214-1AE30-4XB0	6AG1 214-1AE30-5XB0
Order No. based on	6ES7 214-1AE30-0XB0		
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	dard product applies except for the a	mbient conditions.

SIPLUS CPU 1214C AC/DC/RLY			
Order No.	6AG1 214-1BE30-2XB0	6AG1 214-1BE30-4XB0	6AG1 214-1BE30-5XB0
Order No. based on	6ES7 214-1BE30-0XB0		
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C
Conformal coating	Coating of the printed circuit b	poards and the electronic components	S
Technical data	The technical data of the stand	dard product applies except for the a	mbient conditions.

SIPLUS CPU 1214C DC/DC/RLY				
Order No.	6AG1 214-1HE30-2XB0	6AG1 214-1HE30-4XB0	6AG1 214-1HE30-5XB0	
Order No. based on	6ES7 214-1HE30-0XB0			
Ambient temperature range	-25 +70 °C ³⁾	0 +55 °C	-25 +55 °C	
Conformal coating	Coating of the printed circuit b	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the stand	The technical data of the standard product applies except for the ambient conditions.		

 $^{^{3)}}$ From +60 °C to +70 °C, the number of simultaneously enabled inputs and outputs is max. 50%; no SB module permitted

SIPLUS central processing units

SIPLUS CPU 1214C

Overview (continued)

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾ ²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; No. 1.04 severity level GA. Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- ²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Order No.

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data

CPU, AC/DC/relay

medial exposure)

per operation;

board;

100 kHz

SIPLUS CPU 1214C compact

Integrated program and data memory of 50 kbyte, load memory of 2 MB;

wide-range alternating voltage supply 85 ... 264 V AC;

Boolean execution times of 0.1 μ s

14 digital inputs, 10 digital outputs (relay), 2 analog inputs;

digital inputs usable as HSC with

· Suitable for areas with extra-

Suitable for areas with extra-

ordinary medial exposure

ordinary medial exposure

(conformal coating)

(conformal coating);

ambient temperature

-25 ... +55 °C

can be used

expandable with up to

3 communication modules, 8 signal modules, and 1 signal

(extended temperature range and

Order No.

SIPLUS CPU 1214C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory of 50 kbyte, load memory of 2 MB; voltage supply 24 V DC;

Boolean execution times of 0.1 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable with up to 3 communication modules,

8 signal modules and 1 signal digital inputs usable as HSC with

24 V DC digital outputs usable as pulse outputs (PTO) or pulsewidth-modulated outputs (PWM) with 100 kHz

- · Suitable for areas with extraordinary medial exposure (conformal coating) · Suitable for areas with extra-
- ordinary medial exposure (conformal coating); ambient temperature -25 ... +55 °C without restrictions; SB module can be used
- · Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 214-1AE30-4XB0

6AG1 214-1AE30-5XB0

6AG1 214-1AE30-2XB0

· Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature

without restrictions; SB module

-25 ... +70 °C; from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible

6AG1 214-1BE30-4XB0

6AG1 214-1BE30-5XB0

6AG1 214-1BE30-2XB0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-1200 SIPLUS central processing units

SIPLUS CPU 1214C

Ordering data	Order No.		Order No.
SIPLUS CPU 1214C compact CPU, DC/DC/relay		Accessories	See SIMATIC S7-1200 CPU 1214C, page 4/29
(extended temperature range and medial exposure)			
Integrated program and data memory of 50 KB, load memory of 2 MB; power supply 24 V DC; Boolean execution times of 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 8 signal modules and 1 signal board; digital inputs usable as HSC with 100 kHz • Suitable for areas with extraordinary medial exposure (conformal coating) • Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 +55 °C; without restrictions; SB module	6AG1 214-1HE30-4XB0 6AG1 214-1HE30-5XB0		
can be used • Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature -25 +70 °C; from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%; no SB module possible	6AG1 214-1HE30-2XB0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

Digital modules

SM 1221 digital input module

Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs

Technical specifications

	6ES7 221-1BF30-0XB0	6ES7 221-1BH30-0XB0
Product type designation	SM 1221 DI 8x24 V DC	SM 1221 DI 16x24 V DC
Supply voltages Rated value • 24 V DC • Permissible range, lower limit (DC) • Permissible range, upper limit (DC)	Yes 20.4 V 28.8 V	Yes 20.4 V 28.8 V
Power supply to the transmitters • present	Yes	Yes
Current consumption from backplane bus 5 V DC, max.	105 mA	130 mA
Digital inputs • from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
Power losses Power loss, typ.	1.5 W	2.5 W
Connection method Required front connector	Yes	Yes
Digital inputs Number of digital inputs • in groups of	8 2	16 4
Number of simultaneously controllable inputs • All mounting positions - concurrently controllable inputs, up to 40 °C • Horizontal installation - up to 40 °C, max. - up to 50 °C, max. • Vertical installation - up to 40 °C, max.	8 8 8	16 16 16
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes
Input voltage • rated value, DC • for signal "0" • for signal "1"	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min. • for signal "1", typ.	1 mA 2.5 mA 4 mA; Typical	1 mA 2.5 mA 4 mA; Typical

SM 1221 digital input module

	6ES7 221-1BF30-0XB0	6ES7 221-1BH30-0XB0
Input delay (for rated value of input voltage)		
for standard inputs	V	V
- parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
for interrupt inputs	ociociable in groupe or loar	colocitable in groupe of four
- parameterizable	Yes	Yes
Cable length		
 Cable length, shielded, max. 	500 m	500 m
Cable length unshielded, max.	300 m	300 m
Digital outputs		
Number of digital outputs	0	0
Alarms/diagnostics/status information		
Alarms ◆ Alarms	Yes	Yes
Diagnostic alarm	Yes	Yes
Diagnostics	100	100
Diagnostics Diagnostic functions	Yes	Yes
Diagnostic indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
 Status indicator digital input (green) 	Yes	Yes
Galvanic isolation		
Galvanic isolation digital inputs		
between the channels, in groups of	2	4
Climatic and mechanical conditions for		
storage and transport Climatic conditions for storage and transport		
Free fall		
- Drop height, max. (in packaging)	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package
Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
 Air pressure acc. to IEC 60068-2-13 Permissible air pressure 	1080 to 660 hPa	1080 to 660 hPa
Relative humidity	1000 to 660 fira	1000 to 600 HPa
- Permissible range (without condensation) at	95%	95%
25 °C		
Mechanical and climatic conditions during		
operation		
Climatic conditions in operation • Temperature		
- permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
Degree of protection	· ·	, .
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Mechanics/material		
Type of housing (front)		
Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	45 mm	45 mm
• Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight	470	010
 Weight, approx. 	170 g	210 g

Digital modules

SM 1221 digital input module

Ordering data	Order No.		Order No.
SM 1221 digital input signal module		S7-1200 automation system, Easy Book	
8 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7 221-1BF30-0XB0	Brief instructions	
16 inputs, 24 V DC, isolated,	6ES7 221-1BH30-0XB0	German K English K	5_51 _55 511 55 511 55
current sourcing/sinking Extension cable for two-tier	6ES7 290-6AA30-0XA0	French K	
configuration		Spanish K	6ES7 298-8FA30-8DQ0
or connecting digital/analog		Italian K	6ES7 298-8FA30-8EQ0
signal modules; ength 2 m		Chinese K	6ES7 298-8FA30-8KQ0
Terminal block (spare part)		STEP 7 Basic V11 engineering software	
or 8/16-channel digital signal		Target system:	
nodules vith 7 screws, zinc-plated; 4 uni	ts 6ES7 292-1AG30-0XA0	SIMATIC S7-1200 controllers and the associated I/O.	
Front flap set (spare part)		Requirements:	
or 8/16-channel signal modules	6ES7 291-1BA30-0XA0	Windows XP Home SP3, Windows XP Professional SP3	
67-1200 automation system, system manual		(32 bit), Windows 7 Home Premium, Windows 7Professional (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
German	K 6ES7 298-8FA30-8AH0	Microsoft Server 2003 R2 Std. SP2 (32 bit),	
English	K 6ES7 298-8FA30-8BH0	Microsoft Server 2008 Std. SP2	
French	K 6ES7 298-8FA30-8CH0	(32 bit) Type of delivery:	
Spanish	K 6ES7 298-8FA30-8DH0	German, English, Chinese, Italian, French, Spanish	
talian	K 6ES7 298-8FA30-8EH0	Single license	6ES7 822-0AA01-0YA0
Chinese	K 6ES7 298-8FA30-8KH0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
		Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
		STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
		STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

SB 1221 digital input module

Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Technical specifications

	6ES7 221-3AD30-0XB0	6ES7 221-3BD30-0XB0
Product type designation	SB 1221 4xDl 5 V DC 200 kHz	SB 1221 4xDI 24 V DC 200 kHz
Supply voltages Power supply to the transmitters • Supply current, max.	4 mA; per channel	4 mA; per channel
Current consumption from backplane bus 5 V DC, typ.	50 mA	50 mA
Power losses Power loss, typ.	1 W	1 W
Digital inputs Number of digital inputs • in groups of	4; Current-sourcing	4; Current-sourcing 1
Number of simultaneously controllable inputs • all mounting positions - Concurrently controllable inputs, up to 40 °C	4	4
Input characteristic curve acc. to IEC 1131, Type 1	Yes	
Input characteristic curve acc. to IEC 1131, Type 2		Yes
Input voltage Rated value, DC for signal "0" for signal "1"	5 V 0 to 1 V 2 to 6 V	24 V 0 to 5 V 15 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min.	3 mA 6 mA	2 mA 5.8 mA
• for signal "1", trim.	6 IIIA	14 mA
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
- at "0" to "1", max. • for interrupt inputs	2 μs	2.5 μs
parameterizablefor counter/technological functionsparameterizable	Yes	Yes
Cable length Cable length, shielded, max.	50 m; Shielded, twisted wire pair	50 m; Standard input: 500 m, high-speed counters: 50 m

SB 1221 digital input module

	6ES7 221-3AD30-0XB0	6ES7 221-3BD30-0XB0
Alarms/diagnostics/status information		
Alarms		
• Alarms	Yes	Yes
Diagnostics		
Diagnostic functions	Yes	Yes
Diagnostic indication LED		
 for status of the inputs 	Yes	Yes
Climatic and mechanical conditions for		
storage and transport		
Climatic conditions for storage and transport • Free fall		
Free fall Drop height, max. (in packaging)	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package
Temperature	0.5 m, rive times, in dispatch package	0.5 m, rive times, in dispatch package
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
Relative humidity		
 Permissible range (without condensation) at 25 °C 	95%	95%
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
Marine approval according to Germanischer Lloyd	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	38 mm	38 mm
• Height	62 mm	62 mm
• Depth	21 mm	21 mm
Weight		
 Weight, approx. 	40 g	40 g

SB 1221 digital input module

Ordering data	Order No.		Order No.
SB 1221 signal board digital input modules		STEP 7 Basic V11 engineering software	
4 inputs, 5 V DC, 200 kHz	6ES7 221-3AD30-0XB0	Target system:	
4 inputs, 24 V DC, 200 kHz	6ES7 221-3BD30-0XB0	SIMATIC S7-1200 controllers and the associated I/O.	
Terminal block (spare part)		Requirements: Windows XP Home SP3.	
for Signal Board		Windows XP Professional SP3	
with 6 screws, gold-plated; 4 units	6ES7 292-1BF30-0XA0	(32 bit), Windows 7 Home Premium,	
S7-1200 automation system, system manual		Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit),	
German k	6ES7 298-8FA30-8AH0	Microsoft Server 2008 Std. SP2	
English	6ES7 298-8FA30-8BH0	(32 bit) Type of delivery:	
French	6ES7 298-8FA30-8CH0	German, English, Chinese, Italian, French, Spanish	
Spanish k	6ES7 298-8FA30-8DH0	Single license	6ES7 822-0AA01-0YA0
Italian K	6ES7 298-8FA30-8EH0	Upgrade STEP 7 Basic V10.5 to	6ES7 822-0AA01-0YE0
Chinese	6ES7 298-8FA30-8KH0	STEP 7 Basic V10.5 to	0ES/ 022-0AA01-01E0
S7-1200 automation system, Easy Book		Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11,	6ES7 822-1AA01-0YC5
Brief instructions		floating license	0505 000 04 404 0745
German k	6ES7 298-8FA30-8AQ0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
English K	6ES7 298-8FA30-8BQ0	STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0
French	6ES7 298-8FA30-8CQ0	zzimare epadae ee. nee, i your	
Spanish k	6ES7 298-8FA30-8DQ0		
Italian k	6ES7 298-8FA30-8EQ0		
Chinese	6ES7 298-8FA30-8KQ0		

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Digital modules

SM 1222 digital output module

Overview



- Digital outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional outputs

Technical specifications

	6ES7 222-1BF30-0XB0	6ES7 222-1BH30-0XB0	6ES7 222-1HF30-0XB0	6ES7 222-1HH30-0XB0
Product type designation	SM1222 DQ 8x24 V DC	SM1222 DQ 16x24 V DC	SM 1222 DQ 8xRelay	SM1222 DQ 16xRelay
Supply voltages Rated value				
 permissible range, lower limit (DC) 	20.4 V	20.4 V	5 V	5 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V	30 V	30 V
Current consumption				
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA
Digital inputs • from load voltage L+ (without load), max.			11 mA / relay coil	11 mA / relay coil
Power losses				
Power loss, typ.	1.5 W	2.5 W	4.5 W	8.5 W
Connection method required front connector	Yes	Yes	Yes	Yes
Digital inputs Number of digital inputs	0	0	0	0
Digital outputs				
Number of digital outputs • in groups of	8 1	16 1	8	16 1
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V		
Switching capacity of the outputs				
with resistive load, max.	0.5 A	0.5 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W DC ; 200 W AC	30 W DC ; 200 W AC
Output voltage Rated value (AC) Rated value (DC) for signal "0" (DC), max.	24 V 0.1 V; with 10 kOhm load	24 V 0.1 V; with 10 kOhm load	5 to 250 V AC 5 to 30 V DC	5 to 250 V AC 5 to 30 V DC
• for signal "1", min.	20 V DC	20 V DC		

SM 1222 digital output module

	6ES7 222-1BF30-0XB0	6ES7 222-1BH30-0XB0	6ES7 222-1HF30-0XB0	6ES7 222-1HH30-0XB0
Output current				
 for signal "1" rated value for signal "1" permissible range, max. 	0.5 A	0.5 A	2 A	2 A
 for signal "0" residual current, max. 	10 μΑ	10 μΑ		
Output delay with resistive load				
• 0 to "1", max. • 1 to "0", max.	50 μs 200 μs	50 μs 200 μs	10 ms 10 ms	10 ms 10 ms
Aggregate current of outputs (per group) • horizontal installation				
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	10 A; Current per mass
Cable lengthCable length, shielded, max.	500 m	500 m	500 m	500 m
 Cable length unshielded, max. 	150 m	150 m	150 m	150 m
Relay outputs Number of relay outputs			8	16
Rated input voltage of relay L+ (DC)			24 V	24 V
Number of operating cycles			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
Switching capacity of contacts				
• with inductive load, max.	0.5 A	0.5 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W DC ; 200 W AC	30 W DC ; 200 W AC
with resistive load, max.	0.5 A	0.5 A	2 A	2 A
Alarms/diagnostics/status information				
Alarms • Alarms	Yes	Yes	Yes	Yes
Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostics	V	V	V	V
Diagnostic functions	Yes	Yes	Yes	Yes
Diagnostic indication LED For status of the outputs	Yes	Yes	Yes	Yes
for maintenance	Yes	Yes	Yes	Yes
Status indicator digital output (green)	Yes	Yes	Yes	Yes
Galvanic isolation Galvanic isolation digital outputs				
between the channels			Relays	Relays
• between the channels, in groups of	1	1	2	4
between the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute

SM 1222 digital output module

	6ES7 222-1BF30-0XB0	6ES7 222-1BH30-0XB0	6ES7 222-1HF30-0XB0	6ES7 222-1HH30-0XB0
Climatic and mechanical conditions for storage and transport				
Climatic conditions for storage and transport • Free fall				
Drop height, max. (in packaging)Temperature	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package
Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13	<u>-</u>			
Permissible air pressureRelative humidity	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
- Permissible range (without condensation) at 25 °C	95%	95%	95%	95%
Mechanical and climatic conditions during operation Climatic conditions in operation				
Temperature				
- Permissible temperature range	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting 95% non-condensing humidity	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting
 permissible temperature change 	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
Degree of protection	Yes	Yes	Yes	Yes
Standards, approvals, certificates CE mark	Yes	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Mechanics/material Type of housing (front) • Plastic	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions				
• Width	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weight • Weight, approx.	180 g	220 g	190 g	260 g

SM 1222 digital output module

Ordering data	Order No.		Order No.
SM 1222 digital output signal module		S7-1200 automation system, Easy Book	
8 outputs, 24 V DC; 0.5 A, 5 W, I isolated	6ES7 222-1BF30-0XB0	Brief instructions	
16 outputs, 24 V DC; 0.5 A, 5 W, I isolated	6ES7 222-1BH30-0XB0	German K English K	0201 200 017100 07100
8 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/	6ES7 222-1HF30-0XB0	French K Spanish K	
200 W AC 16 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/	6ES7 222-1HH30-0XB0	Italian K Chinese K	
200 W AC Extension cable for two-tier configuration	6ES7 290-6AA30-0XA0	STEP 7 Basic V11 engineering software Target system:	
for connecting digital/analog signal modules; length 2 m		SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3.	
Terminal block (spare part)		Windows XP Professional SP3	
for 8/16-channel digital signal modules		(32 bit), Windows 7 Home Premium, Windows 7Professional (32 bit),	
with 7 screws, zinc-plated; 4 units I	6ES7 292-1AG30-0XA0	Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit).	
Front flap set (spare part)		Microsoft Server 2003 R2 Std.	
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	SP2 (32 bit), Microsoft Server 2008 Std. SP2	
S7-1200 automation system, system manual		(32 bit) Type of delivery:	
For SIMATIC S7-1200 and STEP 7 Basic		German, English, Chinese, Italian, French, Spanish	
German K	6ES7 298-8FA30-8AH0	Single license	6ES7 822-0AA01-0YA0
English K	6ES7 298-8FA30-8BH0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
French K Spanish K		Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
Spanish K Italian K		STEP 7 Prof. V11, floating license	
Chinese K	6ES7 298-8FA30-8KH0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
	222. 200 01/100 01/10	STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

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K: Subject to export regulations AL: N and ECCN: EAR99T

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Digital modules

SB 1222 digital output module

Overview



- Digital outputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Technical specifications

	6ES7 222-1AD30-0XB0	6ES7 222-1BD30-0XB0
Product type designation	SB 1222 4xDQ 5 V DC 200kHz	SB 1222 4xDQ 24 V DC 200kHz
Supply voltages Power supply to the transmitters • Supply current, max.	4 mA; per channel	4 mA; per channel
Current consumption from backplane bus 5 V DC, typ.	50 mA	50 mA
Power losses Power loss, typ.	1 W	1 W
Digital outputs Number of digital outputs • in groups of	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
Short-circuit protection	No	No
Switching capacity of the outputs • with resistive load, max.	0.1 A	0.1 A
Output voltage Rated value (DC) for signal "0" (DC), max. for signal "1", min. for signal "1" (DC), max.	5 V 0.4 V L+ (-0.5 V) 6 V	24 V 0.1 V; with 10 kOhm load 20 V
Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "0" residual current, max.	0.1 A 0.11 A	0.1 A 10 μA
Load resistance range • upper limit	5 Ω	10 Ω
Cable length • Cable length, shielded, max.	50 m	50 m
Alarms/diagnostics/status information Alarms • Alarms Diagnostics	Yes	Yes
Diagnostic functions	Yes	Yes
Diagnostic indication LED • For status of the outputs	Yes	Yes

SB 1222 digital output module

	6ES7 222-1AD30-0XB0	6ES7 222-1BD30-0XB0
Climatic and mechanical conditions for storage and transport		
Climatic conditions for storage and transport		
Free fall		
- Drop height, max. (in packaging)	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package
Temperature	o.o m, moo, m diopaton paonage	o.o m, moo, m dispaton pashago
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
Relative humidity		
 Permissible range (without condensation) at 25 °C 	95%	95%
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
Marine approval according to Germanischer	Yes	Yes
Lloyd		
Mechanics/material		
Type of housing (front)		
Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	38 mm	38 mm
Height	62 mm	62 mm
• Depth	21 mm	21 mm
Weight		
 Weight, approx. 	40 g	40 g

Digital modules

SB 1222 digital output module

Ordering data	Order No.		Order No.
SB 1222 signal board digital output modules		STEP 7 Basic V11 engineering software	
4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7 222-1AD30-0XB0	Target system:	
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7 222-1BD30-0XB0	SIMATIC S7-1200 controllers and the associated I/O. Requirements:	
Terminal block (spare part)		Windows XP Home SP3, Windows XP Professional SP3	
for Signal Board		(32 bit),	
with 6 screws, gold-plated; 4 units	6ES7 292-1BF30-0XA0	Windows 7 Home Premium, Windows 7Professional (32 bit),	
S7-1200 automation system, system manual		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
German	K 6ES7 298-8FA30-8AH0	(32 bit)	
English	K 6ES7 298-8FA30-8BH0	Type of delivery: German, English, Chinese, Italian,	
French	K 6ES7 298-8FA30-8CH0	French, Spanish	
Spanish	K 6ES7 298-8FA30-8DH0	Single license	6ES7 822-0AA01-0YA0
Italian	K 6ES7 298-8FA30-8EH0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Chinese	K 6ES7 298-8FA30-8KH0	— Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
S7-1200 automation system,		STEP 7 Prof. V11,	0E37 022-TAAUT-01C3
Easy Book		floating license	
Brief instructions	V 0707 000 07100 0100	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
German	K 6ES7 298-8FA30-8AQ0	STEP 7 Basic D	6ES7 822-0AA00-0YL0
English	K 6ES7 298-8FA30-8BQ0	Software Update Service, 1 year	
French	K 6ES7 298-8FA30-8CQ0		
Spanish	K 6ES7 298-8FA30-8DQ0		
Italian	K 6ES7 298-8FA30-8EQ0		
Chinese	K 6ES7 298-8FA30-8KQ0		

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SM 1223 digital input/output module

Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs and outputs

Technical specifications

	6ES7 223-1BH30- 0XB0	6ES7 223-1BL30- 0XB0	6ES7 223-1PH30- 0XB0	6ES7 223-1PL30- 0XB0	6ES7 223-1QH30- 0XB0
Product type designation	SM 1223 DI 8x24 V DC, DQ 8x24 V DC	SM 1223 DI 16x24 V DC, DQ 16x24 V DC	SM 1223 DI 8x24 V DC, DQ 8xRelay	SM 1223 DI 16x24 V DC, DQ 16xRelay	120/230 V AC SM223 DIx8/DQx8 RLY
Supply voltages					
Rated value					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
 permissible range, lower limit (DC) 	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
Power supply to the transmitters					
present	Yes	Yes	Yes	Yes	Yes
Current consumption from backplane bus 5 V DC, max.	145 mA	185 mA	145 mA	180 mA	120 mA
Digital inputs					
 from load voltage L+ (without load), max. 	4 mA; per channel	4 mA; per channel			
Power losses					
Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	
Connection method required front connector	Yes	Yes	Yes	Yes	Yes
Digital inputs					
Number of digital inputs	8	16	8	16	8
• in groups of	2	2	2	2	4
Number of simultane- ously controllable inputs • all mounting positions - Concurrently control- lable inputs, up to 40 °C	8	16	8	16	8
horizontal installation					
- up to 40 °C, max.	8	16	8	16	8
- up to 50 °C, max.	8	16	8	16	8
 vertical installation 					
- up to 40 °C, max.	8	16	8	16	8

SM 1223 digital input/output module

	6ES7 223-1BH30- 0XB0	6ES7 223-1BL30- 0XB0	6ES7 223-1PH30- 0XB0	6ES7 223-1PL30- 0XB0	6ES7 223-1QH30- 0XB0
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes	Yes	Yes	Yes
Input voltage Rated value, AC Rated value, DC for signal "0" for signal "1"	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	230 V 20 V AC at 1 mA 79 V AC at 2.5 mA
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min.	1 mA 2.5 mA				
• for signal "1", typ.	4 mA; typical	4 mA; typical	4 mA; typical	4 mA; typical	9 mA; typical
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
for interrupt inputsparameterizable	Yes	Yes	Yes	Yes	Yes
Cable length Cable length, shielded, max.	500 m				
Cable length unshielded, max.	300 m				
Digital outputs					
Number of digital outputs	8	16	8	16	8
• in groups of	1	1	2	4	2
Short-circuit protection	No; to be provided externally				
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)			
Switching capacity of the outputs					
 with resistive load, max. 	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W DC ; 200 W AC	30 W DC ; 200 W AC	30 W DC ; 200 W AC
Output voltage Rated value (AC) Rated value (DC) for signal "0" (DC), max. for signal "1", min.	24 V 0.1 V; with 10 kOhm load 20 V DC	24 V 0.1 V; with 10 kOhm load 20 V DC	5 to 250 V AC 5 to 30 V AC	5 to 250 V AC 5 to 30 V AC	5 to 250 V AC 5 to 30 V DC
Output current • for signal "1" permissible range, max. • for signal "0" residual current, max.	0.5 A 10 μA	0.5 A 10 μA	2 A	2 A	2 A
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	50 μs 200 μs	50 μs 200 μs	10 ms 10 ms	10 ms 10 ms	10 ms 10 ms

SM 1223 digital input/output module

	6ES7 223-1BH30- 0XB0	6ES7 223-1BL30- 0XB0	6ES7 223-1PH30- 0XB0	6ES7 223-1PL30- 0XB0	6ES7 223-1QH30- 0XB0
Aggregate current of outputs (per group) • Horizontal installation					
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	10 A; Current per mass
Cable length	500	500	500	500	500
 Cable length, shielded, max. 	500 m	500 m	500 m	500 m	500 m
 Cable length unshielded, max. 	150 m	150 m	150 m	150 m	150 m
Relay outputs Number of relay outputs			8	16	8
Rated input voltage of relay L+ (DC)			24 V	24 V	24 V
Number of operating cycles			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
Switching capacity of contacts					
 with inductive load, max. 	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W DC ; 200 W AC	30 W DC; 200 W AC	30 W DC ; 200 W AC
 with resistive load, max. 	0.5 A	0.5 A	2 A	2 A	2 A
Alarms/diagnostics/ status information Alarms					
Alarms	Yes	Yes	Yes	Yes	Yes
Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics					
Diagnostic functions	Yes	Yes	Yes	Yes	Yes
Diagnostic indication LED					
• for status of the inputs	Yes	Yes	Yes	Yes	Yes
 for status of the outputs 	Yes	Yes	Yes	Yes	Yes
for maintenance	Yes	Yes	Yes	Yes	Yes
 Status indicator digital output (green) 	Yes	Yes	Yes	Yes	Yes
 Status indicator digital input (green) 	Yes	Yes	Yes	Yes	Yes
Galvanic isolation Galvanic isolation digital inputs					
 between the channels, in groups of 	2	2	2	2	2
Galvanic isolation digital outputs					
between the channelsbetween the channels,	1	1	Relays 2	Relays 4	Relays 2
in groups ofbetween the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute

SM 1223 digital input/output module

	6ES7 223-1BH30- 0XB0	6ES7 223-1BL30- 0XB0	6ES7 223-1PH30- 0XB0	6ES7 223-1PL30- 0XB0	6ES7 223-1QH30- 0XB0
Climatic and mechanical conditions for storage and transport					
Climatic conditions for storage and transport • Free fall					
 Drop height, max. (in packaging) 	0.3 m; five times, in dispatch package				
 Temperature Permissible temperature range 	-40 °C to +70 °C				
• Air pressure acc. to IEC 60068-2-13					
- Permissible air pressure	1080 to 660 hPa				
 Relative humidity Permissible range (without condensation) at 25 °C 	95%	95%	95%	95%	95%
Mechanical and climatic conditions during operation Climatic conditions in operation • Temperature - permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
Degree of protection	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
Mechanics/material Type of housing (front) • Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions • Width • Height • Depth	45 mm 100 mm 75 mm	70 mm 100 mm 75 mm	45 mm 100 mm 75 mm	70 mm 100 mm 75 mm	45 mm 100 mm 75 mm
Weight • Weight, approx.	210 g	310 g	230 g	350 g	230 g

SM 1223 digital input/output module

Ordering data	Order No.		Order No.
SM 1223 digital input/output signal module		S7-1200 automation system, Easy Book	
8 inputs, 24 V DC, IEC type 1	6ES7 223-1BH30-0XB0	Brief instructions	
current sinking; 8 24 V DC transistor outputs,		German K	6ES7 298-8FA30-8AQ0
0.5 A, 5 W		English K	6ES7 298-8FA30-8BQ0
16 inputs, 24 V DC, IEC type 1	6ES7 223-1BL30-0XB0	French K	6ES7 298-8FA30-8CQ0
current sinking; 16 24 V DC transistor outputs,		Spanish K	6ES7 298-8FA30-8DQ0
0.5 A, 5 W		Italian K	6ES7 298-8FA30-8EQ0
8 inputs, 24 V DC, IEC type 1 current sinking;	6ES7 223-1PH30-0XB0	Chinese K	6ES7 298-8FA30-8KQ0
8 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/ 200 W AC		STEP 7 Basic V11 engineering software	
	6ES7 223-1PL30-0XB0	Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3	
8 inputs, 120/230 V AC; 8 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/ 200 W AC	6ES7 223-1QH30-0XB0	(32 bit), Windows 7 Home Premium, Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
Extension cable for two-tier configuration	6ES7 290-6AA30-0XA0	Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
for connecting digital/analog signal modules; length 2 m		(32 bit) Type of delivery: German, English, Chinese, Italian,	
Terminal block (spare part)		French, Spanish	0F07 000 04 404 0V40
for 8/16-channel digital signal modules		Single license Upgrade STEP 7 Basic V10.5 to	6ES7 822-0AA01-0YA0 6ES7 822-0AA01-0YE0
with 7 screws, zinc-plated; 4 units	6ES7 292-1AG30-0XA0	STEP 7 Basic V11, single license	0L37 022-0AA01-01L0
Terminal block (spare part)	0_01_02_01_000_0100	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	STEP 7 Prof. V11, floating license	
for 32-channel signal modules	6ES7 291-1BB30-0XA0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
S7-1200 automation system,		STEP 7 Basic D	6ES7 822-0AA00-0YL0
system manual		Software Update Service, 1 year	
For SIMATIC S7-1200 and STEP 7 Basic			
German K	6ES7 298-8FA30-8AH0		
English K	6ES7 298-8FA30-8BH0		
French K	6ES7 298-8FA30-8CH0		
Spanish K	6ES7 298-8FA30-8DH0		
Italian K	6ES7 298-8FA30-8EH0		
Chinese	6ES7 298-8FA30-8KH0		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

Digital modules

SB 1223 digital input/output module

Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged direct into the CPU

Technical specifications

	6ES7 223-0BD30-0XB0	6ES7 223-3AD30-0XB0	6ES7 223-3BD30-0XB0
Product type designation	SB 1223 DI2x24 V DC, DQ 2x24 V DC	SB 1223 2xDI / 2xDQ 5 V DC 200kHz	SB 1223 2xDI / 2xDQ 24 V DC 200kHz
Supply voltages Rated value • Permissible range, lower limit (DC) • Permissible range, upper limit (DC)	20.4 V 30 V		
Power supply to the transmitters • Supply current, max.	4 mA; per channel	4 mA; per channel	4 mA; per channel
Current consumption from backplane bus 5 V DC, typ.	50 mA	50 mA	50 mA
Power losses Power loss, typ.	1 W	1 W	1 W
Digital inputs Number of digital inputs • in groups of	2; current-sinking 1	2; current-sourcing	2; current-sourcing
Number of simultaneously control- lable inputs Illustration all mounting positions Concurrently controllable inputs, up to 40 °C	2	2	2
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V 0 to 5 V 15 to 30 V	5 V 0 to 1 V 2 to 6 V	24 V 0 to 5 V 15 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min. • for signal "1", typ.	1 mA	3 mA 6 mA	2 mA 5.8 mA 14 mA

SB 1223 digital input/output module

	6ES7 223-0BD30-0XB0	6ES7 223-3AD30-0XB0	6ES7 223-3BD30-0XB0
Input delay (for rated value of input voltage)			
• for standard inputs			
- parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
at "0" to "1", max.	2 µs	2 µs	2.5 µs
- at "1" to "0", max.	10 μs		
 for interrupt inputs 			
- parameterizable	Yes	Yes	Yes
• for counter/technological functions			
- parameterizable	Yes	Yes	Yes
Cable length Cable length, shielded, max.	500 m	50 m	Standard input: 500 m, high-speed counters: 50 m
Cable length unshielded, max.	300 m		
Digital outputs			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	1	1
Short-circuit protection	No	No	No
Switching capacity of the outputs • with resistive load, max. • on lamp load, max.	0.5 A 5 W	0.1 A	0.1 A
Output voltage • Rated value (DC) • for signal "0" (DC), max. • for signal "1", min. • for signal "1" (DC), max.	24 V 0.1 V; with 10 kOhm load 20 V	5 V 0.4 V L+ (-0.5 V) 6 V	24 V 0.1 V; with 10 kOhm load 20 V
Output current • for signal "1" rated value • for signal "1" permissible range, max.	0.5 A	0.1 A 0.11 A	0.1 A
• for signal "0" residual current, max.	10 μΑ		10 μΑ
Load resistance range • upper limit	0.6 Ω	5 Ω	10 Ω
Cable length			
Cable length, shielded, max.	500 m	50 m	50 m
Cable length unshielded, max.	150 m		
Alarms/diagnostics/status information			
Alarms • Alarms	Yes	Yes	Yes
Diagnostics			
Diagnostic functions	Yes	Yes	Yes
Diagnostic indication LED			
• for status of the inputs	Yes	Yes	Yes
 for status of the outputs 	Yes	Yes	Yes

SB 1223 digital input/output module

	6ES7 223-0BD30-0XB0	6ES7 223-3AD30-0XB0	6ES7 223-3BD30-0XB0
Climatic and mechanical condi-			
tions for storage and transport			
Climatic conditions for storage and transport			
• Free fall			
- Drop height, max. (in packaging)	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package	0.3 m; Five times, in dispatch package
Temperature			
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13			
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
Relative humidity	0504	050/	9504
 Permissible range (without condensation) at 25 °C 	95%	95%	95%
Degree of protection			
IP20	Yes	Yes	Yes
Standards, approvals, certificates			
Marine approval according to Germanischer Lloyd	Yes	Yes	Yes
Mechanics/material			
Type of housing (front)			
Plastic	Yes	Yes	Yes
Dimensions and weight			
Dimensions			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
• Depth	21 mm	21 mm	21 mm
Weight			
Weight, approx.	40 g	40 g	40 g

SB 1223 digital input/output module

Ordering data	Order No.		Order No.
SB 1223 digital input/output signal board		S7-1200 automation system, Easy Book	
2 inputs, 24 V DC, IEC type 1	6ES7 223-0BD30-0XB0	Brief instructions	
current sinking; 2 24 V DC transistor outputs,		German K	6ES7 298-8FA30-8AQ0
0.5 A, 5 W; can be used as HSC at up to		English K	6ES7 298-8FA30-8BQ0
30 kHz		French K	6ES7 298-8FA30-8CQ0
2 inputs, 5 V DC, 200 kHz	6ES7 223-3AD30-0XB0	Spanish K	6ES7 298-8FA30-8DQ0
2 outputs 5 V DC, 0.1 A, 200 kHz		Italian K	6ES7 298-8FA30-8EQ0
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7 223-3BD30-0XB0	Chinese K	6ES7 298-8FA30-8KQ0
Terminal block (spare part)		STEP 7 Basic V11 engineering software	
for signal board		Target system:	
with 6 screws, gold-plated; 4 units I	6ES7 292-1BF30-0XA0	SIMATIC S7-1200 controllers and the associated I/O.	
S7-1200 automation system, system manual		Requirements: Windows XP Home SP3,	
For SIMATIC S7-1200 and STEP 7 Basic		Windows XP Professional SP3 (32 bit), Windows 7 Home Premium,	
German K	6ES7 298-8FA30-8AH0	Windows 7Professional (32 bit),	
English K	6ES7 298-8FA30-8BH0	Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
French K	6ES7 298-8FA30-8CH0	Microsoft Server 2003 R2 Std.	
Spanish K	6ES7 298-8FA30-8DH0	SP2 (32 bit), Microsoft Server 2008 Std. SP2	
Italian K	6ES7 298-8FA30-8EH0	(32 bit) Type of delivery:	
Chinese K	6ES7 298-8FA30-8KH0	German, English, Chinese, Italian, French, Spanish	
		Single license	6ES7 822-0AA01-0YA0
		Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
		Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11,	6ES7 822-1AA01-0YC5
		floating license	
		STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
		STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

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SIPLUS digital modules

SIPLUS SM 1221 digital input module

Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 1221		
Order number	6AG1 221-1BF30- 2XB0	6AG1 211-1BF30- 4XB0
Order No. based on	6ES7 221-1BF30-0XB0	
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for ambient conditions.	

SIPLUS SM 1221			
Order number	6AG1 221-1BH30- 2XB0	6AG1 221-1BH30- 4XB0	
Order No. based on	6ES7 221-1BH30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for ambient conditions.		

Ambient conditions	·
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾ ²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
Digital input SIPLUS SM 1221 signal module	
(extended temperature range and medial exposure)	
8 inputs, 24 V DC, isolated, current sourcing/sinking • Suitable for areas with extraordinary medial exposure (conformal coating) • -25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	6AG1 221-1BF30-4XB0 6AG1 221-1BF30-2XB0
16 inputs, 24 V DC, isolated, current sourcing/sinking • Suitable for areas with extraordinary medial exposure (conformal coating) • -25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	6AG1 221-1BH30-4XB0 6AG1 221-1BH30-2XB0
Accessories	See SIMATIC S7-1200 SM 1221 digital input, page 4/42

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SIMATIC S7-1200 SIPLUS digital modules

SIPLUS SM 1222 digital output module

Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 1222			
Order number	6AG1 222-1BF30-2XB0	6AG1 222-1BF30-4XB0	
Order No. based on	6ES7 222-1BF30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard p	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1222			
Order number	6AG1 222-1BH30-2XB0	6AG1 222-1BH30-4XB0	
Order No. based on	6ES7 222-1BH30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit boar	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1222			
Order number	6AG1 222-1HF30-2XB0	6AG1 222-1HF30-4XB0	
Order No. based on	6ES7 222-1HF30-0XB0		
Ambient temperature range	-25 +70 °C	-25 +70 °C 0 +55 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1222			
Order number	6AG1 222-1HH30-2XB0	6AG1 222-1HH30-4XB0	
Order No. based on	6ES7 222-1HH30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS digital modules

SIPLUS SM 1222 digital output module

Overview (continued)

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m)
	derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

defating 20 K
Order No.
H 6AG1 222-1BF30-4XB0
6AG1 222-1BF30-2XB0
H 6AG1 222-1BH30-4XB0
6AG1 222-1BH30-2XB0

		Order No.
8 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/ 200 W AC • Suitable for areas with extra- ordinary medial exposure (conformal coating) • -25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	Н	6AG1 222-1HF30-4XB0 6AG1 222-1HF30-2XB0
16 relay outputs, 5 30 V DC/ 5 250 V AC, 2 A, 30 W DC/ 200 W AC		
Suitable for areas with extra- ordinary medial exposure (conformal coating)	Н	6AG1 222-1HH30-4XB0
-25 +70 °C, from +60 +70°C number of simultaneously controllable inputs and outputs max. 50 %	1	6AG1 222-1HH30-2XB0
Accessories		See SIMATIC S7-1200 SM 1222 digital output, page 4/49

SIMATIC S7-1200 SIPLUS digital modules

SIPLUS SM 1223 digital input/output module

Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 1223			
Order number	6AG1 223-1BH30-2XB0	6AG1 223-1BH30-4XB0	
Order No. based on	6ES7 223-1BH30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit boards	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1223			
Order number	6AG1 223-1PH30-2XB0	6AG1 223-1PH30-4XB0	
Order No. based on	6ES7 223-1PH30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit boar	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1223			
Order number	6AG1 223-1PL30-2XB0	6AG1 223-1PL30-4XB0	
Order No. based on	6ES7 223-1PL30-0XB0		
Ambient temperature range	-25 +70 °C	-25 +70 °C 0 +55 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS SM 1223			
Order number	6AG1 223-1BL30-2XB0	6AG1 223-1BL30-4XB0	
Order No. based on	6ES7 223-1BL30-0XB0		
Ambient temperature range	-25 +70 °C	0 +55 °C	
Conformal coating	Coating of the printed circuit board	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS digital modules

SIPLUS SM 1223 digital input/output module

Overview (continued)

5 100 % Condensation permissible
Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
1080 795 hPa (-1000 +2000 m) see ambient temperature range
795 658 hPa (+2000 +3500 m) derating 10 K
658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
Digital input/output SIPLUS SM 1223 signal module		8 inputs, 24 V DC, IEC type 1 current sinking;	
(extended temperature range and medial exposure)		8 relay outputs, 5 30 V DC / 5 250 V AC, 2 A, 30 W DC / 200 W AC	
8 inputs, 24 V DC, IEC type 1 current sinking; 8 transistor outputs, 24 V DC,		Suitable for areas with extra- ordinary medial exposure (conformal coating)	57G 1 225 11 1165 1725
Suitable for areas with extra- ordinary medial exposure (conformal coating)	6AG1 223-1BH30-4XB0	• -25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	6AG1 223-1PH30-2XB0
-25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	6AG1 223-1BH30-2XB0	16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs, 5 30 V DC / 5 250 V AC, 2 A, 30 W DC /	
16 inputs, 24 V DC, IEC type 1 current sinking; 16 transistor outputs, 24 V DC, 0.5 A, 5 W		200 W AC Suitable for areas with extra- ordinary medial exposure (conformal coating)	6AG1 223-1PL30-4XB0
Suitable for areas with extra- ordinary medial exposure (conformal coating) -25 +70 °C.	6AG1 223-1BL30-4XB0 6AG1 223-1BL30-2XB0	-25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	6AG1 223-1PL30-2XB0
from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	VAG 1 220-15200-2AB0	Accessories	See SIMATIC S7-1200 SM 1223 digital input/output, page 4/57

SIMATIC S7-1200 SIPLUS digital modules

SIPLUS SB 1223 digital input/output module

Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200-CPUs
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SB 1223		
Order number	6AG1 223-0BD30-4XB0	6AG1 223-0BD30-5XB0
Order No. based on	6ES7 223-0BD30-0XB0	
Ambient temperature range	0 +55 °C	-25 +55 °C
Conformal coating	Coating of the printed circuit boar	ds and the electronic components
Technical data	The technical data of the standard	d product applies except for the ambient conditions.
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust	
Air pressure (depending on the highest positive temperature range specified) 1080 795 hPa (-1000 +2000 m) see ambient temperature range		m)
	795 658 hPa (+2000 +3500 l derating 10 K	m)
	658 540 hPa (+3500 +5000 i derating 20 K	m)

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; HCI < 4.9 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; HCI < 4.9 ppm; HCI < 4.9 ppm; HCI < 4.0 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
Digital input/output SIPLUS SM 1223 signal board		Accessories	See SIMATIC S7-1200 SB 1223 digital input/output, page 4/61
(extended temperature range and medial exposure)			
2 inputs, 24 V DC, IEC type 1 current sinking; 2 transistor outputs, 24 V DC, 0.5 A, 5 W; usable as HSC up to 30 kHz			
 Suitable for areas with extra- ordinary medial exposure (conformal coating) 	6AG1 223-0BD30-4XB0		
 Ambient temperature -25 +55 °C 	6AG1 223-0BD30-5XB0		

Analog modules

SM 1231 analog input module

Overview



- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog sensors without additional amplifiers
- For solving even more complex automation tasks

	6ES7 231-4HD30-0XB0	6ES7 231-4HF30-0XB0
Product type designation	SM 1231 AI 4x13 bit	SM 1231 AI 8 x 13 bit
Supply voltages Rated value • 24 V DC	Yes	Yes
	res	res
Current consumption Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA
Power losses Power loss, typ.	1.5 W	1.5 W
Connection method required front connector	Yes	Yes
Analog inputs Number of analog inputs	4; current or voltage differential inputs	8; current or voltage differential inputs
Permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V
Permissible input current for voltage input (destruction limit), max.	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs
Input ranges • Voltage • Current • Thermocouple • Resistance thermometer • Resistance	Yes; ±10 V, ±5 V, ±2.5 V Yes; 0 to 20 mA No No No	Yes; ±10 V, ±5 V, ±2.5 V Yes; 0 to 20 mA No No
Input ranges (rated values), voltages • -10 V to +10 V • Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V • Input resistance (-2.5 V to +2.5 V) • -5 V to +5 V • Input resistance (-5 V to +5 V)	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm
Input ranges (rated values), currents • 0 to 20 mA • Input resistance (0 to 20 mA)	Yes ≥ 250 Ohm	Yes ≥ 250 Ohm
Voltage input • permissible input voltage for voltage input (destruction limit), max.	35 V	35 V

SM 1231 analog input module

Technical specifications (continued)

	6ES7 231-4HD30-0XB0	6ES7 231-4HF30-0XB0
Current input		
permissible input current for current input (destruction limit), max.	40 mA	40 mA
Temperature compensation • Temperature compensation parameterizable	No	No
Analog outputs Number of analog outputs	0	0
Analog value creation		
Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	12 bit; + sign	12 bit; + sign
 Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz 	Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz	Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values • Parameterizable • Step: None	Yes Yes	Yes Yes
Step: LowStep: MediumStep: High	Yes Yes Yes	Yes Yes Yes
Errors/accuracies	100	100
Temperature error (relative to input area)	25°C $\pm 0.1\%$ to 55°C $\pm 0.2\%$ total measurement range	25°C ±0.1% to 55°C ±0.2% total measurement range
Basic error limit (operational limit at 25 °C) • Voltage, relative to input area • Current, relative to input area	+/- 0.1 % +/- 0.1 %	+/- 0.1 % +/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • Common mode voltage, max.	12 V	12 V
Alarms/diagnostics/status information		
Alarms		
• Alarms	Yes	Yes
Diagnostic alarm	Yes	Yes
Diagnostics Diagnostic functions Monitoring the supply voltage to the electronics	Yes Yes	Yes Yes
Wire break	No	No
Diagnostic indication LED • for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
 Galvanic isolation Galvanic isolation analog outputs between the channels and the power supply of the electronics 	No	No
Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport		
Free fallDrop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
Temperature Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
 Air pressure acc. to IEC 60068-2-13 Permissible air pressure Relative humidity 	1080 to 660 hPa	1080 to 660 hPa
Relative numidity Permissible range (without condensation) at 25 °C	95%	95%

Analog modules

SM 1231 analog input module

	6ES7 231-4HD30-0XB0	6ES7 231-4HF30-0XB0
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
 Air pressure acc. to IEC 60068-2-13 		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
 Pollutant concentrations 		
- SO ₂ at RH < 60% without condensation	SO_2 : < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free	$S0_2$: < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	45 mm	45 mm
Height	100 mm	100 mm
• Depth	75 mm	75 mm
Weight		
 Weight, approx. 	180 g	180 g

Ordering data	Order No.		Order No.
SM 1231 analog input signal module		S7-1200 automation system, Easy Book	
4 analog inputs ±10 V,	6ES7 231-4HD30-0XB0	Brief instructions	
±5 V, ±2.5 V, or 0 20 mA 12 bit + sign		German K	6ES7 298-8FA30-8AQ0
8 analog inputs ±10 V, ±5 V,	6ES7 231-4HF30-0XB0	English K	6ES7 298-8FA30-8BQ0
±2.5 V, or 0 20 mA 12 bit + sign		French K	6ES7 298-8FA30-8CQ0
Extension cable for two-tier	6ES7 290-6AA30-0XA0	Spanish K	6ES7 298-8FA30-8DQ0
configuration	0L37 290-0AA30-0AA0	Italian K	6ES7 298-8FA30-8EQ0
for connecting digital/analog		Chinese K	6ES7 298-8FA30-8KQ0
signal modules; length 2 m		STEP 7 Basic V11 engineering software	
Terminal block (spare part)		Single license	6ES7 822-0AA01-0YA0
for 8/16-channel analog signal modules		Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
with 7 screws, gold-plated; 4 units	6ES7 292-1BG30-0XA0	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
Front flap set (spare part)		STEP 7 Prof. V11, floating license	
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
S7-1200 automation system, system manual		STEP 7 Basic D	
For SIMATIC S7-1200 and STEP 7 Basic		Software Update Service, 1 year	
German k	6ES7 298-8FA30-8AH0		
English K			
French K			
Spanish K	6ES7 298-8FA30-8DH0		
Italian K	6ES7 298-8FA30-8EH0		
Chinese K	6ES7 298-8FA30-8KH0		
		D: Subject to export regulations Al :	N and ECCN: 5D992

 $[\]mathsf{K} \text{:} \ \mathsf{Subject} \ \mathsf{to} \ \mathsf{export} \ \mathsf{regulations} \ \mathsf{AL} \text{:} \ \mathsf{N} \ \mathsf{and} \ \mathsf{ECCN} \text{:} \ \mathsf{EAR99T}$

SB 1231 analog input module

Overview

- Analog input module for the SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For the solution of more complex automation tasks as well
- Can be plugged directly into the CPU

Product type designation	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Supply voltages Rated value • 24 V DC	Yes
	res
Connection method required front connector	Yes
Analog inputs Number of analog inputs	1; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression
Input ranges Voltage Current Thermocouple Resistance thermometer Resistance	Yes; ±10 V, ±5 V, ±2.5 V Yes; 0 to 20 mA No No No
Input ranges (rated values), voltages • -10 V to +10 V • Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V • Input resistance (-2.5 V to +2.5 V) • -5 V to +5 V • Input resistance (-5 V to +5 V)	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm
Input ranges (rated values), currents • 0 to 20 mA • Input resistance (0 to 20 mA)	Yes ≥ 250 Ohm
Voltage input • permissible input voltage for voltage input (destruction limit), max.	35 V
Cable length Cable length, shielded, max.	Twisted and shielded in pairs

Product type designation	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Analog value creation Measurement principle	Integrating
Integrations and conversion time/resolution per channel • Resolution with overrange	11 bit; + sign
(bit including sign), max.Integration time, parameterizableInterference voltage suppression for interference frequency f1 in Hz	Yes 40 dB, DC to 60 Hz
Smoothing of measured values • parameterizable • Step: None • Step: Low • Step: Medium • Step: High	Yes Yes Yes Yes Yes
Errors/accuracies Temperature error (relative to input area)	25 °C ±0.3% to 55 °C ±0.6% total measurement range
Alarms/diagnostics/status information Alarms • Alarms • Diagnostic alarm	Yes Yes
Diagnostics • Diagnostic functions • Wire break	Yes No
Diagnostic indication LED • for status of the inputs • for maintenance	Yes Yes
Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
 Temperature Permissible temperature range Air pressure acc. to IEC 60068-2-13 	-40 °C to +70 °C
 Permissible air pressure Relative humidity Permissible range (without condensation) at 25 °C 	1080 to 660 hPa 95%
Mechanical and climatic conditions during operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO ₂ at RH < 60% without condensation	1080 to 795 hPa S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free

Analog modules

SB 1231 analog input module

Technical	specifications	(continued)

	CEO7 004 4114 00 0VD0
Product type designation	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Froduct type designation	SB1231 AI IX12 BII
Degree of protection	1.
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Mechanics/material	
Type of housing (front)	
Plastic	Yes
Dimensions and weight	
Dimensions	
• Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
 Weight, approx. 	35 g

Ordering data	Order No.
SB 1231 signal board analog	
input module	
1 analog input, ±10 V with 12 bit or 0 20 mA with 11 bit	6ES7 231-4HA30-0XB0
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 units I	6ES7 292-1BF30-0XA0
S7-1200 automation system, system manual	
For SIMATIC S7-1200 and STEP 7 Basic	
German K	6ES7 298-8FA30-8AH0
English K	6ES7 298-8FA30-8BH0
French K	6ES7 298-8FA30-8CH0
Spanish K	6ES7 298-8FA30-8DH0
Italian K	6ES7 298-8FA30-8EH0
Chinese K	6ES7 298-8FA30-8KH0
S7-1200 automation system, Easy Book	
Brief instructions	
German K	6ES7 298-8FA30-8AQ0
English K	6ES7 298-8FA30-8BQ0
French K	6ES7 298-8FA30-8CQ0
Spanish K	6ES7 298-8FA30-8DQ0
Italian K	6ES7 298-8FA30-8EQ0
Chinese K	6ES7 298-8FA30-8KQ0
STEP 7 Basic V11 engineering software	
Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Frofessional (32 bit), Windows 7 Fnerprise (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery: German, English, Chinese, Italian, French, Spanish	
Single license	6ES7 822-0AA01-0YA0
Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11,	6ES7 822-1AA01-0YC5

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

STEP 7 Basic Software Update D 6ES7 822-0AA00-0YL0

6ES7 822-0AA01-0YA7

floating license

Service, 1 year

STEP 7 Basic V11, trial license

SM 1232 analog output module

Overview



- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

	6ES7 232-4HB30-0XB0	6ES7 232-4HD30-0XB0
Product type designation	SM 1232 AQ 2x14 bit	SM 1232 AQ 4 x14 bit
Supply voltages Rated value		
• 24 V DC	Yes	Yes
Current consumption Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses Power loss, typ.	1.5 W	1.5 W
Connection method required front connector	Yes	Yes
Analog inputs Number of analog inputs	0	
Temperature compensation • Temperature compensation parameterizable	No	No
Analog outputs Number of analog outputs	2; current or voltage	4; current or voltage
Output ranges, voltage • -10 to +10 V	Yes	Yes
Output ranges, current • 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with current outputs, max.	1 000 Ω 600 Ω	1 000 Ω 600 Ω
Analog value creation Measurement principle	Differential	Differential
Integrations and conversion time/ resolution per channel Resolution (incl. overrange) Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz	Voltage: 14 bit; Current: 13 bit Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz	Voltage: 14 bit; Current : 13 bit Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz

Analog modules

SM 1232 analog output module

Technical specifications (continued)

	6ES7 232-4HB30-0XB0	6ES7 232-4HD30-0XB0
Errors/accuracies		
Temperature error (relative to output area)	$25^{\circ}\text{C} \pm 0.3\%$ to $55^{\circ}\text{C} \pm 0.6\%$ total measurement range	25°C ±0.3% to 55°C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C) • Voltage, relative to output area • Current, relative to output area	+/- 0.3 % +/- 0.3 %	+/- 0.3 % +/- 0.3 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • common mode voltage, max.	12 V	12 V
Alarms/diagnostics/status information		
Alarms • Alarms	Yes	Yes
Diagnostic alarm	Yes	Yes
Diagnostics • Diagnostic functions • Monitoring the supply voltage to the electronics • Wire break • Short circuit	Yes Yes Yes Yes	Yes Yes Yes Yes
Diagnostic indication LED • for status of the outputs • for maintenance	Yes Yes	Yes Yes
Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport • Free fall		
Drop height, max. (in packaging)TemperaturePermissible temperature range	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
 Air pressure acc. to IEC 60068-2-13 Permissible air pressure Relative humidity 	1080 to 660 hPa	1080 to 660 hPa
- Permissible range (without condensation) at 25 °C	95%	95%
Mechanical and climatic conditions during operation		
Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
 Pollutant concentrations SO₂ at RH < 60% without condensation 	$S0_2$: < 0.5 ppm; H_2S : < 0.1 ppm; RH < 60% condensation-free	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free
Degree of protection IP20	Yes	Yes
Standards, approvals, certificates CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Mechanics/material		
Type of housing (front) • Plastic	Yes	Yes
Dimensions and weight Dimensions • Width • Height	45 mm 100 mm	45 mm 100 mm
• Depth	75 mm	75 mm
Weight • Weight, approx.	180 g	180 g

SM 1232 analog output module

Ordering data		Order No.		Order No.
SM 1232 analog output signal module			STEP 7 Basic V11 engineering software	
2 analog outputs, ±10 V with 14 bit or 0 20 mA with 13 bit	ı	6ES7 232-4HB30-0XB0	Target system: SIMATIC S7-1200 controllers and	
4 analog outputs, ±10 V with 14 bit or 0 20 mA with 13 bit	ı	6ES7 232-4HD30-0XB0	the associated I/O. Requirements: Windows XP Home SP3,	
Extension cable for two-tier configuration	ı	6ES7 290-6AA30-0XA0	Windows XP Professional SP3 (32 bit),	
for connecting digital/analog signal modules; length 2 m			Windows 7 Home Premium, Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
Terminal block (spare part)			Microsoft Server 2003 R2 Std. SP2 (32 bit),	
for 8/16-channel analog signal modules			Microsoft Server 2008 Std. SP2 (32 bit)	
with 7 screws, gold-plated; 4 units	I	6ES7 292-1BG30-0XA0	Type of delivery: German, English, Chinese, Italian, French, Spanish	
S7-1200 automation system, system manual			Single license	6ES7 822-0AA01-0YA0
For SIMATIC S7-1200 and STEP 7 Basic	,		Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
German	K	6ES7 298-8FA30-8AH0	Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11,	6ES7 822-1AA01-0YC5
English	K	6ES7 298-8FA30-8BH0	floating license	
French	K	6ES7 298-8FA30-8CH0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
Spanish	K	6ES7 298-8FA30-8DH0	STEP 7 Basic D	6ES7 822-0AA00-0YL0
Italian	K	6ES7 298-8FA30-8EH0	Software Update Service, 1 year	
Chinese	K	6ES7 298-8FA30-8KH0		
S7-1200 automation system, Easy Book				
Brief instructions				
German	K	6ES7 298-8FA30-8AQ0		
English	K	6ES7 298-8FA30-8BQ0		
French	K	6ES7 298-8FA30-8CQ0		
Spanish	K	6ES7 298-8FA30-8DQ0		
Italian	K	6ES7 298-8FA30-8EQ0		
Chinese	K	6ES7 298-8FA30-8KQ0		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

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Analog modules

SB 1232 analog output module

Overview



- Analog output for the SIMATIC S7-1200
- Can be plugged direct into the CPU

	6ES7 232-4HA30-0XB0
Product type designation	SB 1232 1x AO
Supply voltages	
Power supply to the transmitters	
Supply current, max.	25 mA
Current consumption	
from backplane bus 5 V DC, typ.	15 mA
Power losses	4.5.44
Power loss, typ.	1.5 W
Analog outputs Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 μ S (R), 750 μ S (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)
Output ranges, voltage • -10 to +10 V	Yes
Output ranges, current • 0 to 20 mA	Yes
Load impedance (in rated range of	
output)	4.000.0
with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length Cable length, shielded, max.	Shielded, twisted wire pair
Analog value creation	
Measurement principle	Differential
Integrations and conversion time/	
resolution per channel • Resolution (incl. overrange)	U / 12 bit, I / 11 bit
	0 / 12 Sit, 1 / 1 / Sit
Smoothing of measured values • parameterizable	Yes
Errors/accuracies	
Temperature error	25°C ±0.5% bis 55°C ±1%
(relative to output area)	
Alarms/diagnostics/status information	
Alarms	
• Alarms	Yes
Diagnostics	
Diagnostic functions	Yes
Diagnostic indication LED • For status of the outputs	Yes
Climatic and mechanical condi-	
tions for storage and transport	
Climatic conditions for storage and transport	
• Free fall	0.0 - 10 1
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
Temperature	
- Permissible temperature range	-40 °C to +70 °C
Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 660 hPa
Relative humidity	
 Permissible range (without condensation) at 25 °C 	95%

SB 1232 analog output module

Technical specifications (continued)

	6ES7 232-4HA30-0XB0
Mechanical and climatic conditions during operation	
Climatic conditions in operation	
 Pollutant concentrations 	
 SO₂ at RH < 60% without condensation 	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Degree of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions and weight	
Dimensions	
Width	38 mm
 Height 	62 mm
• Depth	21 mm
Weight	
 Weight, approx. 	40 g

Ordering data	Order No.
SB 1232 analog output signal board	
1 analog output, ±10 V with 12 bit or 0 20 mA with 11 bit	6ES7 232-4HA30-0XB0
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 units I	6ES7 292-1BF30-0XA0
S7-1200 automation system, system manual	
For SIMATIC S7-1200 and STEP 7 Basic	
German K	6ES7 298-8FA30-8AH0
English K	6ES7 298-8FA30-8BH0
French K	6ES7 298-8FA30-8CH0
Spanish K	6ES7 298-8FA30-8DH0
Italian K	6ES7 298-8FA30-8EH0
Chinese K	6ES7 298-8FA30-8KH0
S7-1200 automation system, Easy Book	
Brief instructions	
German K	6ES7 298-8FA30-8AQ0
English K	6ES7 298-8FA30-8BQ0
French K	6ES7 298-8FA30-8CQ0
Spanish K	6ES7 298-8FA30-8DQ0
Italian K	6ES7 298-8FA30-8EQ0
Chinese K	6ES7 298-8FA30-8KQ0
STEP 7 Basic V11 engineering software	
Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Home Premium, Windows 7 Frofessional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery: German, English, Chinese, Italian, French, Spanish	
Single license	6ES7 822-0AA01-0YA0
Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

D

STEP 7 Basic

Software Update Service, 1 year

6ES7 822-0AA00-0YL0

Analog modules

SM 1234 analog input/output module

Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

	6ES7 234-4HE30-0XB0
Product type designation	SM 1234 A I4x13 bit AQ 2x14 bit
Supply voltages	
Rated value	Voo
• 24 V DC	Yes
Current consumption Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
	80 IIIA
Power losses Power loss, typ.	2 W
Connection method	Z VV
Required front connector	Yes
Analog inputs	
Number of analog inputs	4; current or voltage differential inputs
Permissible input frequency for current input (destruction limit), max.	± 35 V
Permissible input current for voltage input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
Input ranges	
• Voltage	Yes; ±10 V, ±5 V, ±2.5 V
• Current	Yes; 0 to 20 mA
ThermocoupleResistance thermometer	No No
Resistance	No
Input ranges (rated values),	
voltages	
• -10 V to +10 V	Yes ≥9 MOhm
Input resistance (-10 V to +10 V)	29 MOHIII
• -2.5 V to +2.5 V	Yes
Input resistance	≥9 MOhm
(-2.5 V to +2.5 V)	Voc
-5 V to +5 VInput resistance	Yes ≥9 MOhm
(-5 V to +5 V)	25 MOTHT
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Input resistance (0 to 20 mA)	≥ 250 Ohm
Voltage input	
 Permissible input voltage for voltage input (destruction limit), max. 	35 V
Current input	
 Permissible input current for current input (destruction limit), max. 	40 mA
Temperature compensation • Temperature compensation parameterizable	No

SM 1234 analog input/output module

Technical specifications (continued)

Technical specifications (conti	nued)
	6ES7 234-4HE30-0XB0
Analog outputs Number of analog outputs	2; current or voltage
Output ranges, voltage • -10 to +10 V	Yes
Output ranges, current • 0 to 20 mA	Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with current outputs, max.	1 000 Ω 600 Ω
Analog value creation Measurement principle	Differential
Integrations and conversion time/ resolution per channel • Resolution (incl. overrange) • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz	Voltage: 14 bit; Current: 13 bit 12 bit; + sign Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values • Parameterizable • Step: None • Step: Low • Step: Medium • Step: High	Yes Yes Yes Yes Yes
Errors/accuracies Temperature error (relative to input area)	25°C ±0.1% to 55°C ±0.2% total measurement range
Temperature error (relative to output area)	25°C ±0.3% to 55°C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)	
 Voltage, relative to input area Current, relative to input area Voltage, relative to output area Current, relative to output area 	+/- 0,1 % +/- 0,1 % +/- 0,3 % +/- 0,3 %
Interference voltage suppression for $f = n \times (fl + /- 1\%)$, $fl = interference$ frequency	
• common mode voltage, max.	12 V
Alarms/diagnostics/status information Alarms • Alarms • Diagnostic alarm	Yes Yes
Diagnostics • Diagnostic functions • Monitoring the supply voltage to the electronics • Wire break • Short circuit	Yes Yes Yes
Diagnostic indication LED • for status of the inputs • For status of the outputs • for maintenance	Yes Yes Yes

condensation RH < 60% condensation-free Degree of protection IP20 Yes Standards, approvals, certificates CE mark Yes C-TICK Yes FM approval Yes Mechanics/material Type of housing (front) • Plastic Yes Dimensions and weight Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm		6ES7 234-4HE30-0XB0
between the channels and the power supply of the electronics Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport Free fall - Drop height, max. (in packaging) • Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Relative humidity - Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollulant concentrations - SO ₂ at RH < 60% without condensation Pogree of protection IP20 Standards, approvals, certificates CE mark C-TICK Yes Mechanics/material Type of housing (front) • Plastic Pimensions and weight Dimensions and weight Dimensions • Width • Height • Depth No 0.3 m; five times, in dispatch package -40 °C to +70 °C -40 °C	Galvanic isolation	
conditions for storage and transport Free fall Drop height, max. (in packaging) Temperature Permissible temperature range Air pressure acc. to IEC 60068-2-13 Permissible air pressure Relative humidity Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Air pressure acc. to IEC 60068-2-13 Permissible air pressure Relative humidity Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation Air pressure acc. to IEC 60068-2-13 Permissible air pressure Pollutant concentrations SO ₂ at RH < 60% without condensation Pogree of protection IP20 Standards, approvals, certificates CE mark C-TICK Yes Mechanics/material Type of housing (front) Plastic Plastic Pimensions and weight Dimensions Width Height Height Depth To mm	between the channels and the	No
Climatic conditions for storage and transport Free fall Drop height, max. (in packaging) Temperature Permissible temperature range Air pressure acc. to IEC 60068-2-13 Permissible air pressure Relative humidity Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation Air pressure acc. to IEC 60068-2-13 Permissible air pressure Pollutant concentrations SO ₂ at RH < 60% without condensation P20 Standards, approvals, certificates CE mark C-TICK Yes Mechanics/material Type of housing (front) Plastic Dimensions and weight Dimensions Width Height Depth O 3 m; five times, in dispatch package 0 0.3 m; five times, in dispatch package 0 0.3 m; five times, in dispatch package 0 0.3 m; five times, in dispatch package 0 0.4 m; five times, in dispatch package -40 °C to +70 °C -40 °C to +70 °C -40 °C to +70 °C 1080 to 660 hPa 1080 to 660 hPa 1080 to 795 hPa 1080 to 795 hPa 1080 to 795 hPa 90; < 0.5 ppm; H ₂ S; < 0.1 ppr RH < 60% condensation-free Yes Standards, approvals, certificates CE mark Yes C-TICK Yes Mechanics/material Type of housing (front) Plastic Yes Dimensions and weight Dimensions Width Height Dipper Depth To make times, in dispatch package -40 °C to +70 °C -40 °C to +7	conditions for storage and	
- Drop height, max. (in packaging) - Temperature - Permissible temperature range - Air pressure acc. to IEC 60068-2-13 - Permissible air pressure - Relative humidity - Permissible range (without condensation) at 25 °C - Mechanical and climatic conditions during operation Climatic conditions in operation Climatic conditions in operation - Air pressure acc. to IEC 60068-2-13 - Permissible air pressure - Pollutant concentrations - SO ₂ at RH < 60% without condensation - Permissible air pressure - Pollutant concentrations - SO ₂ at RH < 60% without condensation - Pergree of protection IP20 - Tick - Tick - Yes - Tick - Yes - Tick - Yes - Mechanics/material - Type of housing (front) - Plastic - Pinatic - Air pressure acc. to - 1080 to 795 hPa - 1080 to 660 hPa - 1080	Climatic conditions for storage and transport	
- Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Relative humidity - Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO ₂ at RH < 60% without condensation P20 Pegree of protection IP20 Yes Standards, approvals, certificates CE mark C-TICK FM approval Mechanics/material Type of housing (front) • Plastic Pimensions • Width • Height • Depth -40 °C to +70 °C -40 °C to +40 °C		
- Permissible air pressure Relative humidity - Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO ₂ at RH < 60% without condensation Pegree of protection IP20 Standards, approvals, certificates CE mark C-TICK FM approval Mechanics/material Type of housing (front) • Plastic Dimensions and weight Dimensions • Width • Height • Depth 1080 to 660 hPa 95% 95% 95% 95% 95% 95% 95% 95	 Permissible temperature range Air pressure acc. to 	-40 °C to +70 °C
- Permissible range (without condensation) at 25 °C Mechanical and climatic conditions during operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO ₂ at RH < 60% without condensation Pegree of protection IP20 Standards, approvals, certificates CE mark C-TICK Yes Mechanics/material Type of housing (front) • Plastic Pimensions • Width • Height • Depth Mechanical and climatic 1080 to 795 hPa 1080 to 795	- Permissible air pressure	1080 to 660 hPa
conditions during operation Climatic conditions in operation • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO ₂ at RH < 60% without condensation RH < 60% condensation-free Degree of protection IP20 Pes Standards, approvals, certificates CE mark C-TICK FM approval Mechanics/material Type of housing (front) • Plastic Pimensions • Width • Height • Depth 1080 to 795 hPa 1080 to 795 hP	- Permissible range (without	95%
IEC 60068-2-13 - Permissible air pressure • Pollutant concentrations - SO₂ at RH < 60% without condensation • Pegree of protection IP20 Pegree of protection IP20 Standards, approvals, certificates CE mark C-TICK FM approval Mechanics/material Type of housing (front) • Plastic Dimensions and weight Dimensions • Width • Height • Depth 1080 to 795 hPa 1	conditions during operation Climatic conditions in operation	
- SO ₂ at RH < 60% without condensation Pegree of protection P20 Standards, approvals, certificates CE mark C-TICK Yes Mechanics/material Type of housing (front) Plastic Plastic Pimensions and weight Dimensions Width Height Depth SO ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppr RH < 60% condensation-free Yes Yes Yes Yes Yes Mechanics/material Type of housing (front) Yes Final Particle And Particle Yes To mm 100 mm 75 mm	IEC 60068-2-13 - Permissible air pressure	1080 to 795 hPa
IP20 Yes Standards, approvals, certificates CE mark Yes C-TICK Yes FM approval Yes Mechanics/material Type of housing (front) • Plastic Yes Dimensions and weight Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm	- SO ₂ at RH < 60% without	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free
CE mark Yes C-TICK Yes FM approval Yes Mechanics/material Type of housing (front) • Plastic Yes Dimensions and weight Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm		Yes
FM approval Mechanics/material Type of housing (front) Plastic Pimensions and weight Dimensions Width Height Depth Depth Yes Yes		Yes
Mechanics/material Type of housing (front) • Plastic Yes Dimensions and weight Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm	C-TICK	Yes
Type of housing (front) • Plastic Yes Dimensions and weight Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm	FM approval	Yes
Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm	Type of housing (front)	Yes
Dimensions • Width 45 mm • Height 100 mm • Depth 75 mm	Dimensions and weight	
 Height 100 mm Depth 75 mm	-	
• Depth 75 mm		
- tra-		
Woight	·	75 mm
• Weight, approx. 220 g	Weight ◆ Weight, approx.	220 g

Analog modules

SM 1234 analog input/output module

Ordering data	Order No.		Order No.
SM 1234 analog input/output signal module		STEP 7 Basic V11 engineering software	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 20 mA, 12 bit + sign; 2 analog outputs, ±10 V with 14 bit or 0 20 mA with 13 bit	6ES7 234-4HE30-0XB0	Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3,	
Extension cable for two-tier configuration	6ES7 290-6AA30-0XA0	Windows XP Professional SP3 (32 bit),	
for connecting digital/analog signal modules; length 2 m		Windows 7 Home Premium, Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
Terminal block (spare part)		Microsoft Server 2003 R2 Std. SP2 (32 bit),	
for 8/16-channel analog signal modules		Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery:	
with 7 screws, gold-plated; 4 units	6ES7 292-1BG30-0XA0	German, English, Chinese, Italian,	
Front flap set (spare part)		French, Spanish Single license	6ES7 822-0AA01-0YA0
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	Upgrade STEP 7 Basic V10.5 to	6ES7 822-0AA01-0YE0
S7-1200 automation system, system manual		STEP 7 Basic V11, single license	0E37 022-UAAUT-UTEU
For SIMATIC S7-1200 and STEP 7 Basic		Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
German	6ES7 298-8FA30-8AH0	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
English	6ES7 298-8FA30-8BH0	STEP 7 Basic D	6ES7 822-0AA00-0YL0
French	6ES7 298-8FA30-8CH0	Software Update Service, 1 year	
Spanish	6ES7 298-8FA30-8DH0		
Italian	6ES7 298-8FA30-8EH0		
Chinese	6ES7 298-8FA30-8KH0		
S7-1200 automation system, Easy Book			
Brief instructions			
German	6ES7 298-8FA30-8AQ0		
English	6ES7 298-8FA30-8BQ0		
French	6ES7 298-8FA30-8CQ0		
Spanish	6ES7 298-8FA30-8DQ0		
Italian	6ES7 298-8FA30-8EQ0		
Chinese	6ES7 298-8FA30-8KQ0		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

SM 1231 thermocouple module

Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

	6ES7 231-5QD30-0XB0	6ES7 231-5QF30-0XB0
Product type designation	SM1231 TC 4x16 bit	SM 1231 TC 8x16 bit
Supply voltages		
Rated value		
• 24 V DC	Yes	Yes
Current consumption		
Current consumption, typ.	40 mA	
From backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses		
Power loss, typ.	1.5 W	1.5 W
Connection method		
Required front connector	Yes	Yes
Analog inputs		
Number of analog inputs	4; Thermocouples	8; Thermocouples
Permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V
Technical unit for temperature measurement	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
adjustable		
Input ranges		
Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: +/-80 mV	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: +/-80 mV
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
 Input resistance (-80 mV to +80 mV) 	>=1MOhm	>=1MOhm
Input ranges (rated values), thermoelements		
Type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
Type K	Yes	Yes
Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
Type TXK/TXK(L) to GOST	Yes	Yes
Thermocouple (TC)		
 permissible input voltage for voltage input (destruction limit), max. 	+-35V	+-35V
Temperature compensation		
 Temperature compensation parameterizable 	No	No

Analog modules

SM 1231 thermocouple module

Technical specifications (continued)

Technical specifications (continued)		
	6ES7 231-5QD30-0XB0	6ES7 231-5QF30-0XB0
Analog value creation		
Measurement principle	Integrating	Integrating
Integrations and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
 Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz 	No 85 dB at 50/60/400 Hz	No 85 dB at 50/60/400 Hz
Analog value generation (in isochronous mode)		
Smoothing of measured values • Parameterizable	Yes	Yes
-	165	165
Errors/accuracies Cold connection point		+/-1.5 °C
Temperature error (relative to input area)	$25^{\circ}\text{C} \pm 0.1\%$ to $55^{\circ}\text{C} \pm 0.2\%$ total measurement range	25°C ±0.1% to 55°C ±0.2% total measurement range
Interference voltage suppression for $f = n \times (fl + /- 1\%)$, $fl = interference$ frequency		
 Common mode interference, min. 	120 dB	120 dB
Alarms/diagnostics/status information		
Alarms		
Alarms	Yes	Yes
Diagnostic alarm	Yes	Yes
Diagnostics		
 Diagnostic functions 	Yes; can be read out	Yes; can be read out
 Monitoring the supply voltage to the electronics 	Yes	Yes
Wire break	Yes	Yes
Diagnostic indication LED		
 for status of the inputs 	Yes	Yes
• for maintenance	Yes	Yes
Climatic and mechanical conditions for		
storage and transport		
Climatic conditions for storage and transport • Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature	o.o m, mo umos, m diopaton pashags	o.o m, mo umos, m alopatom pashago
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
Relative humidity		
- Permissible range (without condensation) at 25 $^{\circ}\mathrm{C}$	95%	95%
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
Temperature		
- Permissible temperature range	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting	0° C to 55° C horizontal mounting 0° C to 45° C vertical mounting
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
Pollutant concentrationsSO₂ at RH < 60% without condensation	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60%	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60%
	condensation-free	condensation-free

SM 1231 thermocouple module

	6ES7 231-5QD30-0XB0	6ES7 231-5QF30-0XB0
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	45 mm	45 mm
Height	100 mm	100 mm
• Depth	75 mm	75 mm
Weight		
 Weight, approx. 	180 g	220 g

Ordering data	Order No.		Order No.
SM 1231 thermocouple modu	le	STEP 7 Basic V11 engineering	
4 inputs +/- 80 mV, resolution 15 bit + sign, thermocouple types J, K, S, T, R, E, N	6ES7 231-5QD30-0XB0	software Target system: SIMATIC S7-1200 controllers and	
8 inputs +/- 80 mV, resolution 15 bit + sign, thermocouple typ J, K, T, E, R, S, N, C, TXK/XK(L)		the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3	
Accessories		(32 bit), Windows 7 Home Premium,	
Terminal block (spare part)		Windows 7 Home Premium, Windows 7Professional (32 bit),	
for 8/16-channel analog signal modules		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std.	
with 7 screws, gold-plated; 4 ur	nits 6ES7 292-1BG30-0XA0	SP2 (32 bit),	
Front flap set (spare part)		Microsoft Server 2008 Std. SP2 (32 bit)	
for 8/16-channel signal module	6ES7 291-1BA30-0XA0	Type of delivery: German, English, Chinese, Italian,	
S7-1200 automation system, system manual		French, Spanish	
For SIMATIC S7-1200 and STEF	7	Single license	6ES7 822-0AA01-0YA0
Basic		Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
German	K 6ES7 298-8FA30-8AH0	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
English	K 6ES7 298-8FA30-8BH0	STEP 7 Prof. V11,	
French	K 6ES7 298-8FA30-8CH0	floating license	CEO7 000 04 404 0V47
Spanish	K 6ES7 298-8FA30-8DH0	STEP 7 Basic V11, trial license STEP 7 Basic D	6ES7 822-0AA01-0YA7
Italian	K 6ES7 298-8FA30-8EH0	STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0
Chinese	K 6ES7 298-8FA30-8KH0		
S7-1200 automation system, Easy Book			
Brief instructions			
German	K 6ES7 298-8FA30-8AQ0		
English	K 6ES7 298-8FA30-8BQ0		
French	K 6ES7 298-8FA30-8CQ0		
Spanish	K 6ES7 298-8FA30-8DQ0		
Italian	K 6ES7 298-8FA30-8EQ0		
Chinese	K 6ES7 298-8FA30-8KQ0		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

Analog modules

SB 1231 thermocouple signal board

Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

	6ES7 231-5QA30-0XB0
Product type designation	SB1231 AI 1xTC
Supply voltages	
Rated value	
• 24 V DC	Yes
Current consumption	
Current consumption, typ.	5 mA
Connection method	
required front connector	Yes
Analog inputs	
Number of analog inputs	1; Thermocouples
Permissible input frequency for current input (destruction limit), max.	± 35 V
	Dograda Calaiua/dagrada
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
Thermocouple	Yes; J, K; voltage range ±80 MV
Input ranges (rated values),	
voltages -80 mV to +80 mV	Yes
• Input resistance	>=1 MOhm
(-80 mV to +80 mV)	
Input ranges (rated values), thermoelements	
• Type J	Yes
Input resistance (type J)	1200°C
• Type K	Yes
• Input resistance (Type K)	1372°C
Thermocouple (TC)	
Permissible input voltage for	+-35V
voltage input (destruction limit), max.	
Temperature compensation	
 Temperature compensation parameterizable 	No
Analog value creation	
Measurement principle	Integrating
Integrations and conversion time/	
resolution per channel	
 Resolution with overrange (bit including sign), max. 	15 bit; + sign
 Integration time, parameterizable 	No
Interference voltage suppression	85 dB at 10 / 50 / 60 / 400 Hz
for interference frequency f1 in Hz	

	6ES7 231-5QA30-0XB0
Product type designation	SB1231 AI 1xTC
Analog value generation	
(in isochronous mode) Smoothing of measured values	
parameterizable	Yes
Errors/accuracies	
Temperature error	25°C ±0.1% to 55°C ±0.2% total
(relative to input area)	measurement range
Interference voltage suppression for	
f = n x (fl +/- 1%), fl = interference frequency	
• Common mode interference, min.	120 dB
Alarms/diagnostics/status infor-	
mation	
Alarms • Alarms	Yes
Diagnostic alarm	Yes
Diagnostics	
Diagnostic functions	Yes; Can be read out
Wire break	Yes
Diagnostic indication LED	
• for status of the inputs	Yes
for maintenance	Yes
Climatic and mechanical conditions for storage and	
transport	
Climatic conditions for storage and	
• Free fall	
- Drop height, max.	0.3 m; Five times, in dispatch
(in packaging)	package
Temperature	
- Permissible temperature range	-40°C to +70°C
 Air pressure acc. to IEC 60068-2-13 	
- Permissible air pressure	1080 to 660 hPa
Relative humidity	
 Permissible range (without condensation) at 25 °C 	95%
Mechanical and climatic	
conditions during operation	
Climatic conditions in operation	
Temperature Permissible temperature range	0°C to EE°C harizantal mounting
- Permissible temperature range	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting
Air pressure acc. to	
IEC 60068-2-13	1090 to 705 hPc
Permissible air pressurePollutant concentrations	1080 to 795 hPa
- SO ₂ at RH < 60% without	S0 ₂ : < 0.5 ppm;
condensation	$H_2\bar{S}$: < 0.1 ppm;
	RH < 60% condensation-free

SB 1231 thermocouple signal board

Technical specifications (continued)

• ` `	,	
	6ES7 231-5QA30-0XB0	
Product type designation	SB1231 AI 1xTC	
Degree of protection IP20	Yes	
Standards, approvals, certificates CE mark	s Yes	
C-TICK	Yes	
FM approval	Yes	
Mechanics/material Type of housing (front) ◆ Plastic	Yes	
Dimensions and weight Dimensions • Width • Height • Depth	38 mm 62 mm 21 mm	
Weight • Weight, approx.	35 g	

·	
Ordering data	Order No.
	6ES7 231-5QA30-0XB0
board	
1 input +/- 80 mV, resolution 15 bit + sign, thermocouples type J, K	
Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 units I	6ES7 292-1BF30-0XA0
S7-1200 automation system, system manual	
For SIMATIC S7-1200 and STEP 7 Basic	
German K	6ES7 298-8FA30-8AH0
English K	6ES7 298-8FA30-8BH0
French K	6ES7 298-8FA30-8CH0
Spanish K	6ES7 298-8FA30-8DH0
Italian K	6ES7 298-8FA30-8EH0
Chinese K	6ES7 298-8FA30-8KH0
S7-1200 automation system, Easy Book	
Brief instructions	
German K	6ES7 298-8FA30-8AQ0
English K	6ES7 298-8FA30-8BQ0
French K	6ES7 298-8FA30-8CQ0
Spanish K	6ES7 298-8FA30-8DQ0
Italian K	6ES7 298-8FA30-8EQ0
Chinese K	6ES7 298-8FA30-8KQ0
STEP 7 Basic V11 engineering software	
Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Home Premium, Windows 7Professional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery:	
German, English, Chinese, Italian, French, Spanish	
Single license	6ES7 822-0AA01-0YA0
Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

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Analog modules

SM 1231 RTD signal module

Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing installation

	6ES7 231-5PD30-0XB0	6ES7 231-5PF30-0XB0
Product type designation	SM1231 RTD 4x16 bit	SM 1231 RTD 8x16 bit
Supply voltages		
Rated value		
24 V DC	Yes	Yes
Current consumption		
Current consumption, typ.	40 mA	
From backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses		
Power loss, typ.	1.5 W	1.5 W
Connection method		
Required front connector	Yes	Yes
Analog inputs		
Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
Permissible input frequency for current input destruction limit), max.	± 35 V	± 35 V
Fechnical unit for temperature measurement	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
adjustable	259.000 000000, 4091000 1 41110111011	239.000 00.000, 409.000 1 4110111011
nput ranges		
Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50,	Yes; Resistance-type transmitter: Pt10, Pt50,
	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu 100,	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu 100,
	LG-Ni1000	LG-Ni1000
Resistance	Yes; 150 Ω , 300 Ω , 600 Ω	Yes; 150 Ω , 300 Ω , 600 Ω
nput ranges (rated values), resistance		
hermometers		
• Cu 10	Yes	Yes
Input resistance (Cu 10)	10 Ω	10 Ω
Ni 100 Input resistance (Ni 100)	Yes 100 Ω	Yes 100 Ω
Ni 1000	Yes	Yes
Input resistance (Ni 1000)	1 000 Ω	1 000 Ω
LG-Ni 1000	Yes	Yes
Input resistance (LG-Ni 1000)	1 000 Ω	1 000 Ω
Ni 120	Yes	Yes
Input resistance (Ni 120)	120 Ω	120 Ω
Ni 200	Yes	Yes
Input resistance (Ni 200) Ni 500	200 Ω Yes	200 Ω Yes
Input resistance (Ni 500)	500 Ω	500 Ω
Pt 100	Yes	Yes
Input resistance (Pt 100)	100 Ω	100 Ω
Pt 1000	Yes	Yes
Input resistance (Pt 1000)	1 000 Ω	1 000 Ω
Pt 200	Yes	Yes
Input resistance (Pt 200)	200 Ω	200 Ω
Pt 500 Input resistance (Pt 500)	Yes 500Ω	Yes 500Ω
nput ranges (rated values), resistors		
o to 150 Ohm	Yes	Yes
0 to 300 Ohm	Yes	Yes
• 0 to 600 Ohm	Yes	Yes
Temperature compensation		
Temperature compensation parameterizable	No	No
• •		

SM 1231 RTD signal module

Technical specifications (continued)

	6ES7 231-5PD30-0XB0	6ES7 231-5PF30-0XB0
Analog value creation		
Measurement principle	Integrating	Integrating
Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	15 bit; + sign	15 bit; + sign
 Integration time, parameterizable 	No	No
 Interference voltage suppression for inter- ference frequency f1 in Hz 	85 dB at 50/60/400 Hz	85 dB at 10 / 50 / 60 / 400 Hz
Errors/accuracies		14.5.00
Cold connection point		+/-1.5 °C
Temperature error (relative to input area)	25°C ±0.1% to 55°C ±0.2% total measurement range	25°C ±0.1% to 55°C ±0.2% total measurement range
Interference voltage suppression for		
f = n x (fl +/- 1%), fl = interference frequency • Common mode interference, min.	120 dB	120 dB
Alarms/diagnostics/status information		
Alarms	Vaa	Vaa
Alarms Diagnostic alarm	Yes Yes	Yes Yes
	165	165
Diagnostics • Diagnostic functions	Yes; can be read out	Yes; can be read out
 Monitoring the supply voltage to the electronics 	Yes	Yes
• Wire break	Yes	Yes
Diagnostic indication LED		
 for status of the inputs 	Yes	Yes
for maintenance	Yes	Yes
Climatic and mechanical conditions for storage and transport		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
Temperature Degrains in la temperature years as	40.90 to .70.90	40 °C to . 70 °C
 Permissible temperature range Air pressure acc. to IEC 60068-2-13 	-40 °C to +70 °C	-40 °C to +70 °C
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
Relative humidity	1000 to 000 till d	1990 to 999 till Q
- Permissible range (without condensation) at 25 °C	95%	95%
Mechanical and climatic conditions during		
operation		
Climatic conditions in operation		
Temperature Permissible temperature range	0° C to 55° C horizontal mounting	0° C to 55° C horizontal mounting
. Similodible temperature range	0° C to 45° C vertical mounting	0° C to 45° C vertical mounting
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
 Pollutant concentrations SO₂ at RH < 60% without condensation 	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60%	S0 ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60%
332 at 1111 C 0070 Without Goridon Sation	condensation-free	condensation-free

Analog modules

SM 1231 RTD signal module

	6ES7 231-5PD30-0XB0	6ES7 231-5PF30-0XB0
Degree of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	45 mm	
Height	100 mm	100 mm
• Depth	75 mm	75 mm
Weight		
 Weight, approx. 	220 g	220 g

Ordering data	Order No.		Order No.
SM 1231 RTD signal module	6ES7 231-5PD30-0XB0	S7-1200 automation system, Easy Book	
4 inputs for resistance temperature detectors Pt10/50/100/200/	0ES7 231-3PD30-0AB0	Brief instructions	
500/1000, Ni100/120/200/500/ 1000, Cu10/50/100, LG-Ni1000;		German K	6ES7 298-8FA30-8AQ0
resistance 150/300/600 Ohm,		English K	6ES7 298-8FA30-8BQ0
resolution 15 bit + sign		French K	6ES7 298-8FA30-8CQ0
8 inputs for resistance temper- ature detectors Pt10/50/100/200/	6ES7 231-5PF30-0XB0	Spanish K	6ES7 298-8FA30-8DQ0
500/1000, Ni100/120/200/500/ 1000, Cu10/50/100, LG-Ni1000;		Italian K	6ES7 298-8FA30-8EQ0
resistance 150/300/600 Ohm,		Chinese K	6ES7 298-8FA30-8KQ0
resolution 15 bit + sign		STEP 7 Basic V11 engineering	
Accessories		software	
Terminal block (spare part)		Target system: SIMATIC S7-1200 controllers and	
for 8/16-channel analog signal modules		the associated I/O. Requirements:	
with 7 screws, gold-plated; 4 units 1	6ES7 292-1BG30-0XA0	Windows XP Home SP3, Windows XP Professional SP3	
Front flap set (spare part)		(32 bit),	
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	Windows 7 Home Premium, Windows 7 Professional (32 bit),	
S7-1200 automation system, sstem manual		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
German K	6ES7 298-8FA30-8AH0	(32 bit)	
English K	6ES7 298-8FA30-8BH0	Type of delivery: German, English, Chinese, Italian,	
French K	6ES7 298-8FA30-8CH0	French, Spanish	
Spanish K	6ES7 298-8FA30-8DH0	Single license	6ES7 822-0AA01-0YA0
Italian K	6ES7 298-8FA30-8EH0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Chinese K	6ES7 298-8FA30-8KH0	Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
		STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
		STEP 7 Basic D Software Update Service, 1 year	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

SB 1231 RTD signal board

Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature detectors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

	6ES7 231-5PA30-0XB0
Product type designation	SB1231 AI 1xRTD
Supply voltages	
Rated value	
• 24 V DC	Yes
Current consumption	
Current consumption, typ.	5 mA
Connection method	Voo
required front connector	Yes
Analog inputs	1. Decistor of the reconstant
Number of analog inputs	1; Resistance thermometer
Permissible input frequency for current input (destruction limit), max.	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
Resistance thermometer	Yes; Platinum (Pt)
Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), voltages	
Input resistance	>=10 MOhm
(-80 mV to +80 mV)) = 10 WG11111
Input ranges (rated values),	
resistance thermometers	V
• Pt 100	Yes 100 Ω
Input resistance (Pt 100)Pt 1000	Yes
• Input resistance (Pt 1000)	1 000 Ω
• Pt 200	Yes
• Input resistance (Pt 200)	200 Ω
• Pt 500	Yes
• Input resistance (Pt 500)	500 Ω
Input ranges (rated values), resistors	
• 0 to 150 Ohm	Yes
• 0 to 300 Ohm	Yes
• 0 to 600 Ohm	Yes
Temperature compensation	
Temperature compensation	No
parameterizable	

	6ES7 231-5PA30-0XB0	
Product type designation	SB1231 AI 1xRTD	
Analog value creation		
Measurement principle	Integrating	
Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	15 bit; + sign	
 Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz 	No 85 dB at 10 / 50 / 60 / 400 Hz	
Errors/accuracies		
Temperature error (relative to input area)	25°C ±0.1% to 55°C ±0.2% total measurement range	
Interference voltage suppression for $f = n \times (fl +/- 1\%)$, $fl = interference$ frequency		
• Common mode interference, min.	120 dB	
Alarms/diagnostics/status infor-		
mation Alarms		
Alarms	Yes	
Diagnostic alarm	Yes	
Diagnostics		
Diagnostic functions	Yes; Can be read out	
Wire break	Yes	
Diagnostic indication LED		
For status of the inputs	Yes	
For maintenance	Yes	
Climatic and mechanical conditions for storage and transport		
Climatic conditions for storage and transport • Free fall		
- Drop height, max. (in packaging)	0.3 m; Five times, in dispatch package	
Temperature		
 Permissible temperature range Air pressure acc. to IEC 60068-2-13 	-40°C to +70°C	
 Permissible air pressure Relative humidity 	1080 to 660 hPa	
- Permissible range (without condensation) at 25 °C	95%	
Mechanical and climatic conditions during operation Climatic conditions in operation • Temperature		
- Permissible temperature range	0°C to 55°C horizontal mounting, 0°C to 45°C vertical mounting	
 Air pressure acc. to IEC 60068-2-13 Permissible air pressure 	1080 to 795 hPa	
Pollutant concentrations		
- SO ₂ at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	

Analog modules

• Weight, approx.

SB 1231 RTD signal board

	6ES7 231-5PA30-0XB0
Product type designation	SB1231 AI 1xRTD
Degree of protection	
IP20	Yes
Standards, approvals, certificates	3
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Mechanics/material	
Type of housing (front)	
Plastic	Yes
Dimensions and weight	
Dimensions	
Width	38 mm
 Height 	62 mm
Depth	21 mm

35 g

Ordering data		Order No.
SB 1231 RTD signal board	-1	6ES7 231-5PA30-0XB0
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bit + sign		
Accessories		
Terminal block (spare part)		
for signal board		
with 6 screws, gold-plated; 4 units	: 1	6ES7 292-1BF30-0XA0
S7-1200 automation system, system manual		
For SIMATIC S7-1200 and STEP 7 Basic		
German	Κ	6ES7 298-8FA30-8AH0
English	Κ	6ES7 298-8FA30-8BH0
French	Κ	6ES7 298-8FA30-8CH0
Spanish	Κ	6ES7 298-8FA30-8DH0
Italian	Κ	6ES7 298-8FA30-8EH0
Chinese	K	6ES7 298-8FA30-8KH0
S7-1200 automation system, Easy Book		
Brief instructions		
German	Κ	6ES7 298-8FA30-8AQ0
English	Κ	6ES7 298-8FA30-8BQ0
French	Κ	6ES7 298-8FA30-8CQ0
Spanish	Κ	6ES7 298-8FA30-8DQ0
Italian	Κ	6ES7 298-8FA30-8EQ0
Chinese	Κ	6ES7 298-8FA30-8KQ0
STEP 7 Basic V11 engineering software		
Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Home Premium, Windows 7 Forfessional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery: German, English, Chinese, Italian, French, Spanish Single license Upgrade STEP 7 Basic V10.5 to		6ES7 822-0AA01-0YA0 6ES7 822-0AA01-0YE0
STEP 7 Basic V11, single license		
Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license		6ES7 822-1AA01-0YC5
STEP 7 Basic V11, trial license		6ES7 822-0AA01-0YA7
STEP 7 Basic Software Update Service, 1 year	D	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

SIMATIC S7-1200 SIPLUS analog modules

SIPLUS SM 1231 analog input module

Overview



- With extremely short conversion times
- · For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60°C to +70°C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SM 1231	
 Analog inputs for SIPLUS S7-1200 	

SIPLUS SM 1231	
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX 1) 2)
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m)
	derating 20 K

- 1) SA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Order number	6AG1231-4HD30- 2XB0	6AG1231-4HD30- 4XB0
Order No. based on	6ES7 231-4HD30-0	XB0
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating		ed circuit boards and conents
Technical data	the electronic components The technical data of the standard product applies except for ambient conditions.	

Ordering data	Order No.
SIPLUS SM 1231 analog input signal module	
(extended temperature range and medial exposure)	
Ambient temperature range 25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%	
4 analog inputs ±10 V, ±5 V, ±2.5 V, or 0 20 mA; 12 bit + sign	6AG1 231-4HD30-2XB0
Ambient temperature range 0 +55 °C	
4 analog inputs ±10 V, ±5 V, ±2.5 V, or 0 20 mA; 12 bit + sign	6AG1 231-4HD30-4XB0
Accessories	See SIMATIC S7-1200 SM 1231 analog input, page 4/70

SIPLUS analog modules

SIPLUS SM 1232 analog output module

Overview



- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- · For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 232-4HB30- 2XB0	6AG1 232-4HB30- 4XB0
Order No. based on	6ES7 232-4HB30-0	XB00
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating		ed circuit boards and conents
Technical data	the electronic components The technical data of the standard product applies except for ambient conditions.	

SIPLUS SM 1232	
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 1232 analog output signal modules	
(extended temperature range and medial exposure)	
Ambient temperature range 25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%	
2 analog outputs, ± 10 V with 14 bit or 0 20 mA with 13 bit	6AG1 232-4HB30-2XB0
Ambient temperature range 0 +55 °C	
2 analog outputs, ± 10 V with H 14 bit or 0 20 mA with 13 bit	6AG1 232-4HB30-4XB0
Accessories	See SIMATIC S7-1200 SM 1232 analog output, page 4/75

SIMATIC S7-1200 SIPLUS analog modules

SIPLUS SB 1232 analog output module

Overview



- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 232-4HA30- 4XB0	6AG1 232-4HA30- 5XB0
Order No. based on	6ES7 232-4HA30-0XB0	
Ambient temperature range	0 +55 °C	-25 +55 °C
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents
Technical data	The technical data of the standard product applies except for ambient conditions.	

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 4.0 ppm; $HCI < 4.0 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SB 1232 analog output signal board	
(extended temperature range and medial exposure)	
Ambient temperature range - 25 +55 °C	
1 analog output, ±10 V with 12 bit or 0 20 mA with 11 bit	6AG1 232-4HA30-5XB0
Ambient temperature range 0 +55 °C	
1 analog output, ±10 V with 12 bit or 0 20 mA with 11 bit	6AG1 232-4HA30-4XB0
Accessories	See SIMATIC S7-1200 SB 1232 analog output, page 4/77

SIPLUS analog modules

SIPLUS SM 1234 analog input/output module

Overview



- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 234-4HE30- 2XB0	6AG1 234-4HE30- 4XB0
Order No. based on	6ES7 234-4HE30-0	XB0
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of product applies exconditions.	

SIPLUS SM 1231	
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ¹) ²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; $\rm H_2S <$ 9.9 ppm; CI < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H2S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

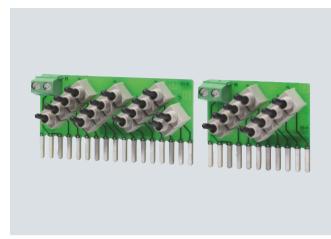
The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 1234 analog input/ output signal modules	
(extended temperature range and medial exposure)	
Ambient temperature range 25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50%	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 20 mA, 12 bit + sign; 2 analog outputs, ±10 V with 14 bit or 0 20 mA with 13 bit	6AG1 234-4HE30-2XB0
Ambient temperature range 0 +55 °C	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 20 mA, 12 bit + sign; 2 analog outputs, ±10 V with 14 bit or 0 20 mA with 13 bit	6AG1 234-4HE30-4XB0
Accessories	See SIMATIC S7-1200 SM 1234 analog input/output, page 4/80

SIMATIC S7-1200 Special modules

SIM 1274 simulator

Overview



- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

Technical specifications

	6ES7 274-1XH30- 0XA0	6ES7 274-1XF30- 0XA0
Product type designation	SIM 1274 14Ch DI simulator	SIM 1274 8Ch DI simulator
Supply voltages Rated value • 24 V DC	Yes	Yes
Degree of protection IP20	Yes	Yes

Ordering data		Order No.
Digital input simulator SIM 1274 simulator module (optional)		
with 14 input switches, for CPU 1214C	1	6ES7 274-1XH30-0XA0
with 8 input switches, for CPU 1211C, CPU 1212C	1	6ES7 274-1XF30-0XA0
Accessories		
S7-1200 automation system, system manual		
For SIMATIC S7-1200 and STEP 7 Basic		
German	K	6ES7 298-8FA30-8AH0
English	K	6ES7 298-8FA30-8BH0
French	K	6ES7 298-8FA30-8CH0
Spanish	K	6ES7 298-8FA30-8DH0
Italian	K	6ES7 298-8FA30-8EH0
Chinese	K	6ES7 298-8FA30-8KH0
S7-1200 automation system, Easy Book		
Brief instructions		
German	K	6ES7 298-8FA30-8AQ0
English	K	6ES7 298-8FA30-8BQ0
French	K	6ES7 298-8FA30-8CQ0
Spanish	K	6ES7 298-8FA30-8DQ0
Italian	K	6ES7 298-8FA30-8EQ0
Chinese	K	6ES7 298-8FA30-8KQ0
STEP 7 Basic V11 engineering software		
Target system: SIMATIC S7-1200 controllers and the associated I/O. Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit), Windows 7 Home Premium, Windows 7 Forfessional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit) Type of delivery: German, English, Chinese, Italian, French, Spanish Single license		6ES7 822-0AA01-0YA0
Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license		6ES7 822-0AA01-0YE0
Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license		6ES7 822-1AA01-0YC5
STEP 7 Basic V11, trial license		6ES7 822-0AA01-0YA7
STEP 7 Basic Software Update Service, 1 year	D	6ES7 822-0AA00-0YL0

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

Communication

CM 1241 communication module

Overview



- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

	6ES7 241-1CH30-0XB0	6ES7 241-1AH30-0XB0
Product type designation	CM 1241 RS485	CM 1241 RS232
Current consumption Current consumption, max.	220 mA; from L5+; logic	220 mA; from L5+; logic
Power losses Power loss, typ.	1.1 W	1.1 W
Interfaces Number of interfaces	1	1
Interface physics, RS 232C (V.24)		Yes
Interface physics, RS 422/RS 485 (X.27)	Yes	
Point-to-point Cable length, max.	1 000 m	10 m
Integrated protocol driver • ASCII • USS	Yes; available as library function Yes; available as library function	Yes
Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging) • Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure • Relative humidity - Permissible range (without condensation) at 25 °C	0.3 m; Five times, in dispatch package -40 °C to +70 °C 1080 to 660 hPa 95%	0.3 m; Five times, in dispatch package -40 °C to +70 °C 1080 to 660 hPa 95%
Mechanical and climatic conditions during operation Climatic conditions in operation Temperature Permissible temperature range Permissible temperature change Air pressure acc. to IEC 60068-2-13 Permissible air pressure	0°C to 55°C horizontal mounting 0°C to 45°C vertical mounting 5°C to 55°C, 3°C / minute 1080 to 795 hPa	0°C to 55°C horizontal mounting 0° C to 45° C vertical mounting 5°C to 55°C, 3°C / minute 1080 to 795 hPa

SIMATIC S7-1200 Communication

CM 1241 communication module

Technical specifications (continued)

	6ES7 241-1CH30-0XB0	6ES7 241-1AH30-0XB0
Software		
Runtime software		
Target system		
- S7-1200	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	30 mm	30 mm
Height	100 mm	100 mm
• Depth	75 mm	75 mm
Weight		
Weight, approx.	150 g	150 g

Ordering data	Order No.		Order No.
CM 1241 communication module		STEP 7 Basic V11 engineering software	
Communication module for point- to-point connection, with one RS485 interface	6ES7 241-1CH30-0XB0	Target system: SIMATIC S7-1200 controllers and the associated I/O.	
Communication module for point- to-point connection, with one RS232 interface	6ES7 241-1AH30-0XB0	Requirements: Windows XP Home SP3, Windows XP Professional SP3 (32 bit),	
Accessories		Windows 7 Home Premium, Windows 7Professional (32 bit),	
S7-1200 automation system, system manual		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
German K	6ES7 298-8FA30-8AH0	(32 bit)	
English K	6ES7 298-8FA30-8BH0	Type of delivery: German, English, Chinese, Italian,	
French K	6ES7 298-8FA30-8CH0	French, Spanish	
Spanish K	6ES7 298-8FA30-8DH0	Single license	6ES7 822-0AA01-0YA0
Italian K	6ES7 298-8FA30-8EH0	Upgrade STEP 7 Basic V10.5 to	6ES7 822-0AA01-0YE0
Chinese K	6ES7 298-8FA30-8KH0	STEP 7 Basic V11, single license	CEC7 000 1 A A 01 0 V CE
S7-1200 automation system, Easy Book		Powerpack STEP 7 Basic V11 to STEP 7 Prof. V11, floating license	6ES7 822-1AA01-0YC5
Brief instructions		STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
German K	6ES7 298-8FA30-8AQ0	STEP 7 Basic D	6ES7 822-0AA00-0YL0
English K	6ES7 298-8FA30-8BQ0	Software Update Service, 1 year	
French K	6ES7 298-8FA30-8CQ0		
Spanish K	6ES7 298-8FA30-8DQ0		
Italian K	6ES7 298-8FA30-8EQ0		
Chinese K	6ES7 298-8FA30-8KQ0		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H K: Subject to export regulations AL: N and ECCN: EAR99T

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Communication

RS485 CB 1241 communication board

Overview

- For fast, high-performance serial data exchange via point-topoint connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Product type designation	6ES7 241-1CH30-1XB0 CB 1241 RS485
Current consumption	
from backplane bus 5 V DC, typ.	50 mA
Power losses	
Power loss, typ.	1.5 W
Alarms/diagnostics/status information	
Diagnostics	
Diagnostic functions	Yes
Diagnostic indication LED	
For status of the outputs	Yes
Climatic and mechanical conditions for storage and transport Climatic conditions for storage and transport Free fall Drop height, max. (in packaging) Temperature	0.3 m; Five times, in dispatch package
 Permissible temperature range Air pressure acc. to IEC 60068-2-13 	-40°C to +70°C
Permissible air pressureRelative humidity	1080 to 660 hPa
- Permissible range (without condensation) at 25 °C	95%

	6ES7 241-1CH30-1XB0
Product type designation	CB 1241 RS485
Mechanical and climatic conditions during operation	
Climatic conditions in operation	
Temperature	
- Permissible temperature range	0°C to 55°C horizontal mounting 0° C to 45° C vertical mounting
- Permissible temperature change	5°C to 55°C, 3°C / minute
• Air pressure acc. to IEC 60068-2-13	
 Permissible air pressure Pollutant concentrations 	1080 to 795 hPa
- SO ₂ at RH < 60% without	S0 ₂ : < 0.5 ppm;
condensation	$H_2S: < 0.3 \text{ ppm};$
	RH < 60% condensation-free
Degree of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Mechanics/material	
Type of housing (front)	
Plastic	Yes
Dimensions and weight	
Dimensions	
Width	38 mm
Height	62 mm
• Depth	21 mm
Weight	
 Weight, approx. 	40 g

SIMATIC S7-1200 Communication

RS485 CB 1241 communication board

Ordering data	Order No.		Order No.
RS485 CB 1241 communication board	6ES7 241-1CH30-1XB0	STEP 7 Basic V11 engineering software	
for point-to-point connection, with 1 RS485 interface		Target system: SIMATIC S7-1200 controllers and	
Accessories		the associated I/O. Requirements:	
Terminal block (spare part)		Windows XP Home SP3, Windows XP Professional SP3	
for signal board		(32 bit),	
with 6 screws, gold-plated; 4 units I	6ES7 292-1BF30-0XA0	Windows 7 Home Premium, Windows 7Professional (32 bit),	
S7-1200 automation system, system manual		Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit),	
For SIMATIC S7-1200 and STEP 7 Basic		Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2	
German K	6ES7 298-8FA30-8AH0	(32 bit)	
English K	6ES7 298-8FA30-8BH0	Type of delivery: German, English, Chinese, Italian,	
French K	6ES7 298-8FA30-8CH0	French, Spanish	
Spanish K	6ES7 298-8FA30-8DH0	Single license	6ES7 822-0AA01-0YA0
Italian K	6ES7 298-8FA30-8EH0	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
Chinese K	6ES7 298-8FA30-8KH0	Powerpack STEP 7 Basic V11 to	6ES7 822-1AA01-0YC5
S7-1200 automation system, Easy Book		STEP 7 Prof. V11, floating license	0E37 022-1AA01-01C3
Brief instructions		STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
German K	6ES7 298-8FA30-8AQ0	STEP 7 Basic D	6ES7 822-0AA00-0YL0
English K	6ES7 298-8FA30-8BQ0	Software Update Service, 1 year	
French K	6ES7 298-8FA30-8CQ0		
Spanish K	6ES7 298-8FA30-8DQ0		
Italian K	6ES7 298-8FA30-8EQ0		
Chinese K	6ES7 298-8FA30-8KQ0		

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Net weight

SIMATIC S7-1200

Communication

CM 1242-5

Overview



The CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming effort

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

Technical specifications				
Order No.	6GK7 242-5DX30-0XE0			
Product type designation				
Transmission rate				
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s			
Interfaces				
Number of electrical connections • at interface 1 in accordance with PROFIBUS	1			
 for power supply 	0			
Design of electrical connection • at interface 1 in accordance with PROFIBUS • for power supply	9-pin D-sub socket (RS485)			
Supply voltage, current				
consumption, power loss				
Type of power supply	DC			
Supply voltage • 1 from backplane bus • External	5 V			
Relative positive tolerance at 24 V DC	-			
Relative negative tolerance at 24 V DC	-			
Current consumed from backplane bus at 5 V DC, typical	0.15 A			
 from external power supply at 24 V DC Typical 				
- Naximum	-			
Effective power loss	0.75 W			
Permitted ambient conditions				
Ambient temperature During operation Minimum Maximum During storage During transport Note	- -40 +70 °C -40 +70 °C			
Relative humidity at 25 °C without condensation during operation, maximum	95%			
IP degree of protection	IP 20			
Design, dimensions and weights				
Module format	S7-1200 compact module, single width			
Width Height Depth	30 mm 100 mm 75 mm			

0.12 kg

SIMATIC S7-1200 Communication

CM 1242-5

Technical specifications (continued)				
Order No.	6GK7 242-5DX30-0XE0			
Product properties, functions, components in general				
Maximum number of modules per CPU	3			
Number of modules - Note	-			
Performance data				
Performance data open communication				
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	-			
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	-			
Performance data PROFIBUS DP				
Service as DP master DPV0	-			
Number of DP slaves that can be operated on DP master	-			
Data volume				
 of address area of the inputs as DP master, total 	-			
of address area of the outputs as	-			
DP master, total • of address area of the inputs per DP slave	-			
• of address area of the outputs per DP slave	-			
 of address area of the diagnostic data per DP slave 	-			
Service as DP slave				
• DPV0 • DPV1	- Yes			
Data volume	100			
of address area of the inputs as DP slave, total	240 byte			
of address area of the outputs as DP slave, total	240 byte			
Performance data S7 communi- cation				
Number of possible connections for S7 communication				
MaximumFor PG connections, maximum	-			
Maximum with PG/OP connections	-			
• Note	-			
Performance data multiprotocol operation				
Number of active connections in multiprotocol mode				
Maximum without DPMaximum with DP	-			
Product functionsManagement, configuration, programming				

STEP 7 Basic V11.0 or higher

Configuration software required

Ordering data	Order No.
CM 1242-5 communication module	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	6GK7 242-5DX30-0XE0
Accessories	
RS485 PROFIBUS FastConnect connector	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
Without PG interfaceWith PG interface	6ES7 972-0BA52-0XA0 6ES7 972-0BB52-0XA0
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	6XV1 830-0EH10
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	6GK1 905-6AA00
12M PROFIBUS bus terminal	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	6GK1 500-0AA10

Communication

CM 1243-5

Overview



The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to the S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

Technical specifications

Order No.	6GK7 243-5DX30-0XE0	
Product type designation		
Transmission rate		
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s	
Interfaces		
Number of electrical connections • at interface 1 in accordance with PROFIBUS	1	
• for power supply	1	
Design of electrical connection • at interface 1 in accordance with PROFIBUS	9-pin D-sub socket (RS485)	
for power supply	3-pin terminal strip	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Supply voltage • 1 from backplane bus • External	- 24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	20%	
Current consumed • from backplane bus at 5 V DC, typical	0 A	
• from external power supply at 24 V DC		
- Typical - Maximum	0.1 A -	
Effective power loss	2.4 W	
Permitted ambient conditions		
Ambient temperature • for vertical installation - during operating phase • for horizontal installation - during operating phase • during storaget • during transport	0 45°C 0 55°C -40 +70 °C -40 +70 °C	
Relative humidity at 25 °C without condensation during operation, maximum	95 %	
IP degree of protection	IP 20	
Design, dimensions and weights		
Module format	S7-1200 compact module, single width	
Width Height Depth	30 mm 100 mm 75 mm	
Net weight	0.14 kg	

SIMATIC S7-1200 Communication

CM 1243-5

Technical specifications (continued)				
Order No.	6GK7 243-5DX30-0XE0			
Product properties, functions, components in general				
Number of modules	4			
Per CPU, maximumNote	1			
Performance data				
Performance data open communication				
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	-			
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	-			
Performance data PROFIBUS DP				
Service as DP master DPV0	-			
Number of DP slaves that can be operated on DP master	16			
Data volume • of address area of the inputs as	512 byte			
DP master, total • of address area of the outputs as DP master, total	512 byte			
of address area of the inputs per DP slave	244 byte			
 of address area of the outputs per DP slave 	244 byte			
 of address area of the diagnostic data per DP slave 	240 byte			
Service as DP slave • DPV0				
• DPV1	-			
Data volume				
 of address area of the inputs as DP slave, total 	-			
of address area of the outputs as DP slave, total	-			
Performance data S7 communication				
Number of possible connections for S7 communication • Maximum	8			
• For PG connections, maximum	1			
For PG/OP connections, maximumNote	max. 4 connections to other S7 stations			
Performance data multiprotocol operation				
Number of active connections in				
multiprotocol mode • Maximum without DP • Maximum with DP	8			
Product functions Management, configuration, programming				
0 " " "	OTED 7 D : 1/11 0 1:1			

STEP 7 Basic V11.0 or higher

Configuration software required

6GK7 243-5DX30-0XE0
6ES7 972-0BA52-0XA0 6ES7 972-0BB52-0XA0
6XV1 830-0EH10
6GK1 905-6AA00
6GK1 500-0AA10

Communication

CSM 1277 unmanaged

Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 mounting rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Technical st	pecifications
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Order number	6GK7 277-1AA00-0AA0
Product type designation	CSM 1277
Data transmission rate	
Transmission rate 1 Transmission rate 2	10 Mbit/s 100 Mbit/s
Interfaces	
Maximum number of electrical/ optical connections for network components or terminal equipment	4
Number of electrical connections • For network components or terminal equipment	4
For signal contactFor power supply	- 1
Design of electrical connection • For network components or terminal equipment • For signal contact	RJ45 port
For power supply	3-pin terminal block
Supply voltage, current consumption, power loss	
Type of power supply	DC
Supply voltage, external • Minimum	24 V 19.2 V
Maximum	28.8 V
Current consumption, maximum	0.07 A
Product component: fusing of power supply input	Yes
Type of fusing of power supply input	0.5 A / 60 V
Effective power loss at 24 V with DC	1.6 W
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP20
Design, dimensions and weights	
Type of construction	SIMATIC S7-1200 device design
Width Height Depth	45 mm 100 mm 75 mm
Net weight	0.15 kg
Type of mounting • 35 mm DIN rail mounting • Wall mounting • S7-300 rail mounting	Yes Yes No

SIMATIC S7-1200 Communication

CSM 1277 unmanaged

Technical specifications (cont	inued)	Ordering data	Order No.
Order number	6GK7 277-1AA00-0AA0	CSM 1277 compact switch	
Product properties, functions, components in general		module Unmanaged switch for	6GK7 277-1AA10-0AA0
Cascading with star topology	-	connecting a SIMATIC S7-1200 and up to three further nodes to	
Product function: switch-managed	No	Industrial Ethernet with	
Standards, specifications, approvals		 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on 	
Standard		LEDs, S7-1200 module including electronic manual on CD-ROM	
For EMC from FM	FM3611: Class 1, Division 2, Group A, B, C, D / T, CL.1,	Accessories	
	Zone 2, GP. IIC, T Ta	IE TP Cord RJ45/RJ45	
For Ex zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X	TP cable 4 x 2 with 2 RJ45 connectors • 0.5 m	6XV1 870-3QE50
For CSA and UL safety	UL 508, CSA C22.2 No. 142	• 1 m	6XV1 870-3QH10
 For Ex zone of CSA and UL 	+	• 2 m	6XV1 870-3QH20
 For emitted interference 	EN 61000-6-4 (Class A)	• 6 m	6XV1 870-3QH60
For noise immunity	EN 61000-6-2	• 10 m	6XV1 870-3QN10
Certificate of suitability	EN 61000-6-2, EN 61000-6-4	IE FC Outlet RJ45	6GK1 901-1FC00 0AA0
CE markC-Tick	Yes Yes	For connecting Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more	

Communication

SIPLUS NET CSM 1277

Overview



- Unmanaged switch for connection of SIPLUS S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 standard connectors
- · Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS NET CSM 1277			
Order number	6AG1 277-1AA00-4AA0		
Order number based on	6GK7 277-1AA00-0AA0		
Ambient temperature range	0 +55 °C		
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).		
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range		
	795 658 hPa (+2000 +3500 m) derating 10 K		
	658 540 hPa (+3500 +5000 m) derating 20 K		

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 14.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS NET CSM 1277 compact switch module		Accessories	See CSM 1277 unmanaged,
(extended temperature range and medial exposure)			page 4/105
Unmanaged switch for connection of SIPLUS S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic Manual on CD-ROM	6AG1 277-1AA00-4AA0		

SIMATIC S7-1200 Communication

CP 1242-7

Overview



The CP 1242-7 communication processor is used to connect a SIMATIC S7-1200 to the globally widespread GSM/GPRS mobile radio network and has the following characteristics:

- Worldwide wireless exchange of data between S7-1200 controllers and/or between S7-1200 controllers and control centers with an Internet connection
- Communication based on the GPRS (General Packet Radio Service) mobile wireless service with data transmission speeds of up to 86 Kbit/s in the downlink and 43 Kbit/s in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization on the basis of NTP (Network Time Protocol)
- On-demand connection buildup via voice call or text message
- Sending and receiving of text messages
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

In conjunction with the "Telecontrol Server Basic" software, the CP 1242-7 forms a telecontrol system with further properties:

- Connection of up to 5000 telecontrol stations to the control center via an OPC interface
- Data buffering in the substations in the event of connection failures
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access with STEP 7 to the substations via Internet

Technical specifications

Order No.	6GK7 242-7KX30-0XE0
Product type designation	
Transmission rate	
Transmission rate for GPRS transmission on uplink • Minimum	
Maximum	43 Kbit/s
Transmission rate for GPRS transmission on downlink • Minimum	-
Maximum	86 Kbit/s
Wireless technology	
Type of mobile wireless service supported • SMS • GPRS	Yes Yes
Type of mobile wireless network supported • GSM • UMTS	Yes -
Type of mobile wireless service - note	GPRS (Multislot Class 10)
Operating frequency	
• 850 MHz • 900 MHz	Yes Yes
• 1800 MHz	Yes
• 1900 MHz	Yes
Transmit power • At operating frequency 850 MHz • At operating frequency 900 MHz • At operating frequency 1800 MHz • At operating frequency 1900 MHz	2 W 2 W 1 W 1 W
Interfaces	
Number of electrical connections • for external antenna(s) • for power supply	1 1
Number of slots for SIM cards	1
Design of electrical connection • for external antenna(s) • for power supply	SMA socket (50 Ohm) 3-pin terminal strip
Design of SIM card slot	Slot under front flap
Supply voltage, current consumption, power loss	
Type of power supply External power supply Relative positive tolerance at 24 V DC	DC 24 V 20%
Relative negative tolerance at 24 V DC	20 %
Current input from external power supply at 24 V DC • Typical • Maximum Effective power loss	0.1 A 0.22 A 2.5 W

SIMATIC S7-1200 Communication

CP 1242-7

Technical specifications (continued)

Technical specifications (continued)		
Order No.	6GK7 242-7KX30-0XE0	
Permitted ambient conditions		
Ambient temperature • For vertical installation - During operation	0 45 °C	
 For horizontal installation During operation During storage During transport 	0 55 °C -40 +70 °C -40 +70 °C	
Note Relative humidity at 25 °C without condensation during operating phase, maximum	95 %	
IP degree of protection	IP 20	
Design, dimensions and weights		
Module format	S7-1200 compact module, single width	
Width	30 mm	
Height	100 mm	
Depth Not weight	75 mm	
Net weight	0.14 kg	
Product properties, functions, components in general		
Maximum number of modules per CPU	3	
Number of modules - Note	-	
Performance data		
Performance data open communication		
Number of possible connections for open communication by means of TC blocks, maximum	4	
Data volume as user data per send call, maximum	2 048 byte	
Performance data S7 communication		
Number of possible connections for S7 communication		
Maximum	-	
For PG connections, maximum For PG/OR connections, maximum	-	
For PG/OP connections, maximumNote		
- I NOTO		

Order No.	6GK7 242-7KX30-0XE0
Performance data Telecontrol	
Connection to the control center • Note	Telecontrol Server Basic Connection to Scada system by means of OPC interface
 with automatic connection buildup with connection buildup as required 	is supported is supported
Protocol is supported DNP3 IEC 60870-5	No No
Product function: data buffering if connection is aborted Note	Yes up to 1000 message frames
Data volume as user data per station in telecontrol mode, maximum	1 024 byte
Performance data Teleservice	
Diagnostics function: online diagnostics with SIMATIC STEP 7	Yes
Product function: program download with SIMATIC STEP 7 Product function: remote firmware update	Yes No
Product functions Management, configuration, programming	
Configuration software required	STEP 7 Basic V11.0 or higher
Product functions Security	
Product function: password protection for teleservice access	Yes
Product function: encrypted data transmission	Yes

Ordering data		Order No.
CP 1242-7 communication processor		
Communication processor for connecting SIMATIC S7-1200 to GSM/GPRS mobile wireless network		6GK7 242-7KX30-0XE0
Accessories		
Telecontrol Server Basic		
Software for		
• License for up to 8 stations	J	6NH9 910-0AA20-0AA0
 License for up to 64 stations 	J	6NH9 910-0AA20-0AB0
 License for up to 256 stations 	J	6NH9 910-0AA20-0AC0
• License for up to 1000 stations	J	6NH9 910-0AA20-0AD0
• License for up to 5000 stations	J	6NH9 910-0AA20-0AE0

	Order No.
ANT794-4MR antenna	
GSM quad band antenna	6NH9 860-1AA00
ANT794-3M antenna	
GSM quad band antenna	6NH9 870-1AA00

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-1200 SIPLUS communication

SIPLUS CM 1241 communication module

Overview



- For fast, high-performance serial data exchange via point-topoint coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus
- · Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Am	bient	con	ditio	ons

Relative humidity ... 100 % Condensation permissible

Conformity with EN 60721-3-3, Biologically active substances Class 3B2 mold and fungal spores (except fauna)

Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)} Chemically active substances

Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾ Mechanically active substances

Air pressure (depending on the

1080 ... 795 hPa (-1000 ... +2000 m) highest positive temperature range specified) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K

658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

- $\begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ O_3 < 1.0 \text{ ppm; } \text{NOX} < 10.4 \text{ ppm} \\ \end{array}$
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

SIPLUS CM 1241		
Order number	6AG1 241-1AH30- 2XB0	6AG1 241-1AH30- 4XB0
Order No. based on	6ES7 241-1AH30-0	XB0
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents
Technical data	The technical data product applies exconditions.	of the standard cept for the ambient

SIPLUS CM 1241		
Order number	6AG1 241-1CH30- 2XB0	6AG1 241-1CH30- 4XB0
Order No. based on	6ES7 241-1CH30-0	XB0
Ambient temperature range	-25 +70 °C	0 +55 °C
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and bonents
Technical data	The technical data product applies exconditions.	of the standard cept for the ambient

Ordering data	Order No.
SIPLUS CM 1241 communication module	
(extended temperature range and medial exposure)	
Ambient temperature 25 +70° C	
Communication module for point- to-point connection, with one RS485 interface	6AG1 241-1CH30-2XB0
Communication module for point- to-point connection, with one RS232 interface	6AG1 241-1AH30-2XB0
Suitable for areas with extra- ordinary medial exposure (conformal coating)	
Communication module for point- H to-point connection, with one RS485 interface	6AG1 241-1CH30-4XB0
Communication module for point- H to-point connection, with one RS232 interface	6AG1 241-1AH30-4XB0
Accessories	See SIMATIC S7-1200 CM 1241 communication module, page 4/97

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

Power supplies

SIMATIC S7-1200 PM 1207

Overview



The power supply PM1207 (Power Module) is optimized for the new SIMATIC S7-1200 controllers in terms of design and functionality and serves as an external supply for the inputs and outputs which, to prevent an imbalance, must not be drawn from the CPU encoder supply.

Technical specifications

Order number 6EP1 332-1SH71¹) Input 120/230 V AC Automatic range switchover Voltage range 85 132 V/176 264 V Overvoltage strength 2.3 x U _{in rated} , 1.3 ms Mains buffering at I _{out rated} > 20 ms at U _{in} = 93/187 V Rated line frequency, rated line-frequency range 50/60 Hz; 47 63 Hz Rated current I _{in rated} 1.2/0.67 A Switch-on current limitation (+25 °C) < 13 A, < 3 ms (U _{in} = 230 V) Pt < 0.5 A²s Built-in incoming fuse T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker (IEC 898) in the mains power input 16 A, characteristic B; 10 A, characteristic C Output Controlled, isolated DC voltage Rated voltage U _{out rated} 24 V DC Total tolerance ±3 % Approx. ±0.1 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} Static load smoothing Approx. ±0.2 % Residual ripple < 150 mV _{pp} Spikes (bandwidth: 20 MHz) < 240 mV _{pp} Adjustment range < 14 V OK = green LED Status indicator No overshoot of U _{out} (soft start) On/O	Power supply, type	2.5 A
Rated voltage value $U_{\text{in rated}}$ Voltage range 85 132 V/176 264 V 2.3 x $U_{\text{in rated}}$, 1.3 ms Mains buffering at $I_{\text{out rated}}$ Rated line frequency, rated line-frequency range Rated current $I_{\text{in rated}}$ Switch-on current limitation (+25 °C) Recommended miniature circuit breaker (IEC 898) in the mains power input Output Controlled, isolated DC voltage Patitic load smoothing Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Startup delay/voltage rise 120/230 V AC Automatic range switchover 85 132 V/176 264 V 2.3 x $U_{\text{in rated}}$ 1.3 ms > 20 ms at $U_{\text{in}} = 93/187$ V 50/60 Hz; 47 63 Hz 1.2/0.67 A Switch-on current limitation (+25 °C) < 13 A, < 3 ms ($U_{\text{in}} = 230 \text{ V}$) $< 0.5 \text{ A}^2\text{s}$ T 3.15 A/250 V (not accessible) 16 A, characteristic B; 10 A, characteristic C Controlled, isolated DC voltage 24 V DC 153 % Approx. ±0.1 % Approx. ±0.1 % Approx. ±0.2 % < 240 mV _{pp} Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior No overshoot of U_{out} (soft start) Startup delay/voltage rise 120/230 V AC Automatic range switchover 2.3 x $U_{\text{in rated}}$, 1.3 ms > 20 ms at $U_{\text{in}} = 93/187$ V 50/60 Hz; 47 63 Hz 50/60 Hz; 47 63	Order number	6EP1 332-1SH71 ¹⁾
Voltage range Voltage range Overvoltage strength Mains buffering at $I_{\text{out rated}}$ Rated line frequency, rated line-frequency range Rated current $I_{\text{in rated}}$ Switch-on current limitation (+25 °C) Pt Built-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Cutput Coutput Coutput Controlled, isolated DC voltage Static line smoothing Static load smoothing Paid voltage $U_{\text{out rated}}$ Static load smoothing Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior Voltage range 85 132 V/176 264 V 2.3 x $U_{\text{in rated}}$, 1.3 ms > 20 ms at $U_{\text{in}} = 93/187$ V 50/60 Hz; 47 63 Hz 1.2/0.67 A Switch-on current limitation (+25 °C) $< 13 \text{ A}, < 3 \text{ ms} (U_{\text{in}} = 230 \text{ V})$ $< 0.5 \text{ A}^2\text{s}$ To 3.15 A/250 V (not accessible) 16 A, characteristic B; 10 A, characteristic C Controlled, isolated DC voltage 24 V DC 24 V DC 150 mV Approx. ±0.1 % Approx. ±0.1 % Approx. ±0.2 % Cappend LED No overshoot of U_{out} (soft start) Startup delay/voltage rise $< 2 \text{ (6) s at 230 (120) V/typ.}$ 10 ms	Input	
Overvoltage strength Mains buffering at $I_{\rm out\ rated}$ Rated line frequency, rated line-frequency range Rated current $I_{\rm in\ rated}$ Switch-on current limitation (+25 °C) Pt Built-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Output Coutput Coutput Controlled, isolated DC voltage Static line smoothing Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior Soloma at $U_{\rm in} = 93/187 \text{V}$ 50/60 Hz; 47 63 Hz 1.2/0.67 A Switch-on current limitation (+25 °C) $< 13 \text{A}, < 3 \text{ms} (U_{\rm in} = 230 \text{V})$ $< 0.5 \text{A}^2 \text{s}$ To 3.15 A/250 V (not accessible) 16 A, characteristic B; 10 A, characteristic C Controlled, isolated DC voltage 24 V DC 24 V DC 150 mV Approx. ±0.1 % Approx. ±0.2 % $< 150 \text{mV}_{\rm pp}$ $< 240 \text{mV}_{\rm pp}$ No overshoot of $U_{\rm out}$ (soft start) Startup delay/voltage rise Startup delay/voltage rise $< 2 (6) \text{s} \text{at } 230 (120) \text{V/typ}$.	Rated voltage value $U_{\text{in rated}}$	
Mains buffering at $I_{\rm out\ rated}$ > 20 ms at $U_{\rm in}$ = 93/187 V 50/60 Hz; 47 63 Hz frequency range Rated current $I_{\rm in\ rated}$ 1.2/0.67 A Switch-on current limitation (+25 °C) < 13 A, < 3 ms ($U_{\rm in}$ = 230 V) f t < 0.5 f s Built-in incoming fuse T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker (IEC 898) in the mains power input Cottput	Voltage range	85 132 V/176 264 V
Rated line frequency, rated line-frequency range Rated current $l_{\rm in \ rated}$ Switch-on current limitation (+25 °C) < 13 A, < 3 ms ($U_{\rm in}$ = 230 V) ${\cal F}t$ Suilt-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Cottput Cottput Controlled, isolated DC voltage Rated voltage $U_{\rm out \ rated}$ Total tolerance • Static line smoothing • Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator Con/Off behavior Startup delay/voltage rise 50/60 Hz; 47 63 Hz 63 Hz 64 N 63 Hz 65	Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
frequency range Rated current $l_{\rm in\ rated}$ Switch-on current limitation (+25 °C) < 13 A, < 3 ms ($U_{\rm in}$ = 230 V) $\rlap/{e}t$ $l_{\rm in\ rated}$ Switch-on current limitation (+25 °C) < 13 A, < 3 ms ($U_{\rm in}$ = 230 V) $\rlap/{e}t$ $l_{\rm in\ rated}$ Suilt-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Total toler (IEC 898) in the mains power input Controlled, isolated DC voltage 24 V DC Total tolerance $l_{\rm in\ rated}$ Static line smoothing Static load smoothing Approx. $l_{\rm in\ rated}$ Approx. $l_{\rm in\ rated}$ Approx. $l_{\rm in\ rated}$ Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior No overshoot of $l_{\rm out\ (soft\ start)}$ Startup delay/voltage rise 1.2/0.67 A 1.2/0.67	Mains buffering at I _{out rated}	$>$ 20 ms at $U_{\rm in}$ = 93/187 V
Switch-on current limitation (+25 °C) $< 13 \text{ A}, < 3 \text{ ms} (U_{\text{in}} = 230 \text{ V})$ $\[Pet] \]$ Built-in incoming fuse $\]$ Recommended miniature circuit breaker (IEC 898) in the mains power input $\]$ Controlled, isolated DC voltage $\]$ Rated voltage $\[U_{\text{out rated}}\]$ Total tolerance $\[U_{\text{out rated}}\]$ • Static line smoothing $\[U_{\text{out rated}}\]$ • Static load smoothing $\[U_{\text{out rated}}\]$ Residual ripple $\[U_{\text{out mated}}\]$ Spikes (bandwidth: 20 MHz) $\[U_{\text{out mated}}\]$ Adjustment range $\[U_{\text{out mated}}\]$ Total tolerance $\[U_{\text{out mated}}\]$ Status indicator $\[U_{\text{out mated}}\]$ Total tolerance $\[U_{\text{out mated}}\]$ Approx. $\[U_{\text{out mated}}\]$ $\[U_{\text{out mated}}\]$ Approx. $\[U_{\text{out mated}}\]$ Total tolerance $\[U_{\text{out mated}}\]$ Status indicator $\[U_{\text{out mated}}\]$ No overshoot of $\[U_{\text{out mated}}\]$ No overshoot of $\[U_{\text{out mated}}\]$ Startup delay/voltage rise $\[U_{\text{out mated}}\]$ $\[U_{\text{out mated}}\]$ Startup delay/voltage rise $\[U_{\text{out mated}}\]$		50/60 Hz; 47 63 Hz
Pt Built-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Cutput Controlled, isolated DC voltage Pated voltage Uout rated Total tolerance Static line smoothing Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator Controlled, isolated DC voltage 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % 150 mV _{pp} 240 mV _{pp} 240 mV _{pp} No overshoot of Uout (soft start) Startup delay/voltage rise Controlled, isolated DC voltage 24 V DC 24 V DC 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 16 A, characteristic C	Rated current Iin rated	1.2/0.67 A
Built-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input Output Controlled, isolated DC voltage 24 V DC Total tolerance • Static line smoothing • Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior Startup delay/voltage rise T 3.15 A/250 V (not accessible) 16 A, characteristic B; 10 A, characteristic C Controlled, isolated DC voltage 24 V DC ±3 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} < 240 mV _{pp} Volume green LED No overshoot of U _{out} (soft start) Startup delay/voltage rise Startup delay/voltage rise	Switch-on current limitation (+25 °C)	$< 13 \text{ A}, < 3 \text{ ms} (U_{in} = 230 \text{ V})$
Recommended miniature circuit breaker (IEC 898) in the mains power input Cutput Coutput Controlled, isolated DC voltage 24 V DC Total tolerance • Static line smoothing • Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator Controlled, isolated DC voltage 24 V DC 24 V DC 43 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} < 240 mV _{pp} - 240 mV _{pp} No overshoot of Uout (soft start) Startup delay/voltage rise Controlled, isolated DC voltage 24 V DC 24 V DC 53 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 53 % Approx. ±0.1 % Approx. ±0.2 % Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 24 V DC 150 mV _{pp} Controlled, isolated DC voltage 16 A, characteristic B; 10 A, characteristic C	l^2t	$< 0.5 A^2 s$
breaker (IEC 898) in the mains power input Cutput Controlled, isolated DC voltage 24 V DC Total tolerance • Static line smoothing • Static load smoothing Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator Con/Off behavior Controlled, isolated DC voltage 24 V DC ±3 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} < 240 mV _{pp} No overshoot of Uout (soft start) Startup delay/voltage rise Controlled, isolated DC voltage 24 V DC ±3 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} < 240 mV _{pp} - Status indicator Con/Off behavior Vout (soft start) Startup delay/voltage rise	Built-in incoming fuse	T 3.15 A/250 V (not accessible)
Rated voltage $U_{out \ rated}$ Total tolerance Static line smoothing Static load smoothing Approx. ±0.1 % Approx. ±0.2 % Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior Startup delay/voltage rise 24 V DC ±3 % Approx. ±0.1 % Approx. ±0.2 % < 150 mV _{pp} < 240 mV _{pp} - Status indicator Dn/Off behavior Vout (soft start) Startup delay/voltage rise 24 V DC 40.1 % Approx. ±0.1 % Approx. ±0.2 %	breaker (IEC 898) in the mains	
Total tolerance ±3 % • Static line smoothing Approx. ±0.1 % • Static load smoothing Approx. ±0.2 % Residual ripple < 150 mV _{pp} Spikes (bandwidth: 20 MHz) < 240 mV _{pp} Adjustment range - Status indicator 24 V OK = green LED On/Off behavior No overshoot of U _{out} (soft start) Startup delay/voltage rise < 2 (6) s at 230 (120) V/typ. 10 ms	Output	Controlled, isolated DC voltage
Static line smoothing Static load smoothing Approx. ±0.1 % Approx. ±0.2 % Residual ripple Spikes (bandwidth: 20 MHz) Adjustment range Status indicator On/Off behavior Startup delay/voltage rise Approx. ±0.1 % Approx. ±0.2 % I so with the state of the st	Rated voltage Uout rated	24 V DC
$ \begin{array}{lll} \bullet & \text{Static load smoothing} & \text{Approx.} \pm 0.2 \ \% \\ \text{Residual ripple} & < 150 \ \text{mV}_{pp} \\ \text{Spikes (bandwidth: 20 MHz)} & < 240 \ \text{mV}_{pp} \\ \text{Adjustment range} & - \\ \text{Status indicator} & 24 \ \text{V OK} = \text{green LED} \\ \text{On/Off behavior} & \text{No overshoot of U_{out}} \\ \text{Startup delay/voltage rise} & < 2 \ (6) \ \text{s at 230 (120) V/typ.} \\ 10 \ \text{ms} \\ \end{array} $		== /:
Spikes (bandwidth: 20 MHz) < 240 mV _{pp} Adjustment range - Status indicator 24 V OK = green LED On/Off behavior No overshoot of U _{out} (soft start) Startup delay/voltage rise < 2 (6) s at 230 (120) V/typ. 10 ms	9	1.1
Adjustment range Status indicator On/Off behavior On/Off behavior Startup delay/voltage rise Adjustment range - 24 V OK = green LED No overshoot of Uout (soft start) Startup delay/voltage rise - 24 V OK = green LED No overshoot of Uout (soft start)	Residual ripple	< 150 mV _{pp}
Status indicator $24 \text{ V OK} = \text{green LED}$ On/Off behavior No overshoot of U_{out} (soft start) Startup delay/voltage rise $< 2 \text{ (6) s at } 230 \text{ (120) V/typ.}$ 10 ms	Spikes (bandwidth: 20 MHz)	< 240 mV _{pp}
On/Off behavior No overshoot of U_{out} (soft start) Startup delay/voltage rise $< 2 \text{ (6) s at 230 (120) V/typ.}$ 10 ms	Adjustment range	-
(soft start) Startup delay/voltage rise < 2 (6) s at 230 (120) V/typ. 10 ms	Status indicator	24 V OK = green LED
10 ms	On/Off behavior	
Rated current I _{out rated} 2.5 A	Startup delay/voltage rise	
	Rated current I _{out rated}	2.5 A

Power supply, type	2.5 A
Order number	6EP1 332-1SH71 ¹⁾
Current range • Up to +60 °C • Derating	0 2.5 A
Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation	Typ. 6 A for 100 ms Typ. 6 A for 100 ms
Parallel switching for enhanced performance	Yes, two units
Efficiency	
Efficiency at Uout rated, Iout rated	Approx. 83%
Power loss at Uout rated, Iout rated	Approx. 12 W
Closed-loop control	
Dyn. mains compensation $(U_{\text{in rated}} \pm 15\%)$	Typ. ±0.3 % <i>U</i> _{out}
Dynamic load smoothing (I _{out} : 50/100/50 %)	Typ. ±3% U _{out}
Load step settling time • 50 to 100 % • 100 to 50%	< 5 ms < 5 ms
Protection and monitoring	
Output overvoltage protection	< 33 V
Current limitation	2.65 A
Short-circuit protection	Constant current characteristic
Sustained short-circuit current rms value	-
Overload/short-circuit indicator	-

SIMATIC S7-1200 Power supplies

SIMATIC S7-1200 PM 1207

Power supply, type 2.5 A		
Order number	6EP1 332-1SH71 ¹⁾	
Safety		
Primary/secondary isolation	Yes, safety extra low output voltage according to EN 60950-1 and EN 50178	
Protection class	Class I	
Leakage current	< 3.5 mA	
Safety test	Yes	
CE marking	Yes	
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259; cULus-recognized (UL 60950-1, CSA C22.2 No. 60950-1), File E151273	
Protection against explosion	ATEX (available soon)	
FM approval	-	
Marine approval	GL, ABS, DNV, NK	
Degree of protection (EN 60529)	IP20	
EMC		
Emitted interference	EN 55022 Class B	
Supply harmonics limitation	Not applicable	
Noise immunity	EN 61000-6-2	
Operating data		
Ambient temperature range	0 +60 °C with natural convection	
Transport and storage temperature range	-40 +85°C	
Humidity class	Climate class 3K3 according to EN 60721, no condensation	
Mechanics		
Connections		
Supply input L, N, PE	One screw-type terminal each for 0.5 2.5 mm ²	
• Output +	2 screw-type terminals each for 0.5 2.5 mm ²	
• Output -	2 screw-type terminals each for 0.5 2.5 mm ²	
Dimensions (W x H x D) in mm	70 x 100 x 75	
Weight, approx.	0.3 kg	
Mounting	Can be snapped onto standard mounting rail EN 60715 DC 35x7.5/15, wall mounting	

SIPLUS module 6AG1 332-1SH71-7AA0 for extended temperature range -25 °C to +70 °C, derating from +55 °C to +70 °C to 1.5 A output current. Suitable for use under medial load (e.g. sulfur chloride atmosphere).

Ordering data	Order No.	
SIMATIC S7-1200 PM 1207	6EP1 332-1SH71	
Input 120/230 V AC, output 24 V DC/2.5 A		
SIMATIC S7-1200 PM 1207	6AG1 332-1SH71-7AA0	
(Extended temperature range and medial exposure, -25 +70°C)		
L: Subject to export regulations AL: 91999 and ECCN: N		

Further information

The perfectly matched, complete SITOP range includes different switch mode power supply series in addition to a unique range of add-on modules, which can be used to additionally protect the 24 V power supply against faults on the primary and secondary side - all the way to complete protection:

- Redundancy module for setting up a redundant power supply
- Uninterruptible 24 V power supplies with batteries or maintenance-free capacitors for continued operation in the event of a power failure
- Selectivity modules for the electronic protection of 24 V feeders against overload and short circuits

More information can be found in the KT 10.1 Catalog and in the Internet at $\,$

www.siemens.com/sitop

SIPLUS power supplies

SIPLUS PM 1207 power supplies

Overview



- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A from 60 °C)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 332-1SH71- 4AA0	6AG1 332-1SH71- 7AA0	
Order No. based on	6EP1 332-1SH71		
Ambient temperature range	0 +60° C	-25 +70° C	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data product applies exconditions.	of the standard cept for the ambient	

PM 1207	
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX 1) 2)
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS PM 1207 power supply	
(extended temperature range and medial exposure)	
Input 120/230 V AC, output 24 V DC, 2.5 A; derating from + 55 °C to + 70 °C to 1.2 A output current	
Ambient temperature L -25 +70 °C	6AG1 332-1SH71- 7AA0
Ambient temperature 0 +60 °C	6AG1 332-1SH71- 4AA0

L: Subject to export regulations AL: 91999 and ECCN: N

Operator control and monitoring

Basic panels - Standard

Overview



- The ideal entry level series of 3.8" to 15" for operating and monitoring compact machines and plants
- Clear process representation thanks to use of pixel-graphics displays
- Intuitive operation using Touch and tactile function keys
- Equipped with all the necessary basic functions such as alarm logging, recipe management, plots, vector graphics, and language switching
- Simple connection to the controller via integral Ethernet interface or separate version with RS485/422

Technical specifications

	6AV6 647-0AA11-3AX0	6AV6 647-0AB11-3AX0	6AV6 647-0AC11-3AX0	6AV6 647-0AD11-3AX0
Product type designation	SIMATIC HMI KTP400 Basic mono PN	SIMATIC HMI KTP600 Basic mono PN	SIMATIC HMI KTP600 Basic color DP	SIMATIC HMI KTP600 Basic color PN
Supply voltage				
Supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Permissible range	+19.2 V to +28.8 V DC			
Rated current	0.07 A	0.24 A	0.35 A	0.35 A
Memory				
Туре	Flash / RAM	Flash / RAM	Flash / RAM	Flash / RAM
Usable memory for user data	512 kbyte usable memory for user data	512 kbyte usable memory for user data	512 kbyte usable memory for user data	512 kbyte usable memory for user data
Protocols				
Protocols (terminal link)				
• Sm@rtAccess	No	No	No	No
Configuration Configuration tool	WinCC flexible Compact Version 2008 SP1 or higher (to be ordered separately)	WinCC flexible Compact Version 2008 SP1 or higher (to be ordered separately)	WinCC flexible Compact Version 2008 SP1 or higher (to be ordered separately)	WinCC flexible Compact Version 2008 SP1 or higher (to be ordered separately)
Display				
Display type	STN, gray scales	STN, gray scales	TFT, 256 Farben	TFT, 256 Farben
Size	3.8" (76.8 mm x 57.6 mm)	5.7" (115.2 mm x 86.4 mm)	5.7" (115.2 mm x 86.4 mm)	5.7" (115.2 mm x 86.4 mm)
Resolution (WxH in pixel)	320 x 240	320 x 240	320 x 240	320 x 240
Backlighting MTBF backlighting (at 25 °C)	Approx. 30000 hours	about 50,000 hours	about 50,000 hours	about 50,000 hours
Operating mode				
Control elements	Membrane keyboard	Membrane keyboard	Membrane keyboard	Membrane keyboard
Function keys, program- mable	4 function keys	6 function keys	6 function keys	6 function keys
Connection for mouse/ keyboard/barcode reader	-/-/-	- / - / -	-/-/-	-/-/-

Basic panels - Standard

	6AV6 647-0AA11-3AX0	6AV6 647-0AB11-3AX0	6AV6 647-0AC11-3AX0	6AV6 647-0AD11-3AX0
Touch operation				
Touch screenNumeric/alphabetical input	analog, resistive Yes (on-screen keyboard) / Yes (on-screen keyboard)			
Ambient conditions Mounting position	vertical	vertical	vertical	vertical
Maximum permissible angle of inclination without external ventilation	+/- 35 °	+/- 35 °	+/- 35 °	+/- 35 °
Max. relative humidity	90 %	90 %	90 %	90 %
Temperature • Operation (vertical installation)	0 °C to +50 °C			
Operation (max. tilt angle)Transport, storage	0 °C to +40 °C -20 °C to +60 °C	0 °C to +40 °C -20 °C to +60 °C	0 °C to +40 °C -20 °C to +60 °C	0 °C to +40 °C -20 °C to +60 °C
Degree of protection				
Front	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)
Rear	IP20	IP20	IP20	IP20
Certifications & standards Certifications	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12
I/O I/O devices	None	None	None	None
Type of output LED colors	None	None	None	None
Acoustics	Sound signal	Sound signal	Sound signal	Sound signal
Interfaces Interfaces	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x RS422,1 x RS485 (max. 12 Mbit/s)	1 x Ethernet (RJ45)
PC card slot	No	No	No	No
CF card slot	No	No	No	No
Multi Media Card slot	No	No	No	No
USB port	No	No	No	No
Industrial Ethernet interface	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	No	1 x Ethernet (RJ45)
Processor				
Processor	RISC 32 bit, 75 MHz			
Functionality under WinCC flexible/ WinCC Basic				
Applications/options	None	None	None	None
Number of Visual Basic Scripts	Not possible	Not possible	Not possible	Not possible
Task planner	Yes	Yes	Yes	Yes
Help system	Yes	Yes	Yes	Yes
Status/control	Not possible	Not possible	Not possible	Not possible
With alarm logging system (incl. buffer and acknowledgment) Number of messages Bit messages	200 Yes	200 Yes	200 Yes	200 Yes
Analog messages Message buffer	Yes Ring buffer (n x 256 entries), retentive, maintenance-free			

Basic panels - Standard

	6AV6 647-0AA11-3AX0	6AV6 647-0AB11-3AX0	6AV6 647-0AC11-3AX0	6AV6 647-0AD11-3AX0
Recipes				
• Recipes	5	5	5	5
Data records per recipe	20	20	20	20
Entries per data record	20	20	20	20
• Recipe memory	40 kbyte integrated Flash			
Number of process images	50	Γ0	Γ0	Γ0
Process imagesVariables	50 250	50 500	50 500	50 500
Limit values	Yes	Yes	Yes	Yes
Multiplexing	Yes	Yes	Yes	Yes
Image elements	.00	100	100	
Text objects	500 text elements	500 text elements	500 text elements	500 text elements
Graphics object	Bit maps, icons, icon (full-			
arapines esjeet	screen), vector graphics	screen), vector graphics	screen), vector graphics	screen), vector graphics
 dynamic objects 	Diagrams, bar graphs	Diagrams, bar graphs	Diagrams, bar graphs	Diagrams, bar graphs
Lists				
Text lists	150	150	150	150
 Graphics list 	100	100	100	100
 Libraries 	Yes	Yes	Yes	Yes
Security				
Number of user groups	50	50	50	50
 Passwords exportable 	No	No	No	No
 Number of user rights 	32	32	32	32
Data carrier support				
PC card	No	No	No	No
CF card	No	No	No	No
 Multi Media Card 	No	No	No	No
Recording • Recording/Printing	-	-	-	-
Fonts				
 Keyboard fonts 	US American (English)	US American (English)	US American (English)	US American (English)
Languages				
 Online languages 	5	5	5	5
 Configuration languages 	D, GB, F, I, E, CHN "tradi-			
	tional", CHN "simplified",	tional", CHN "simplified",	tional", CHN "simplified",	tional", CHN "simplified", DK, FIN, GR, J, KP / ROK,
	DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ /	DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ /	DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ /	NL, N, PL, P, RUS, S, CZ /
	SK, TR, H	SK, TR, H	SK, TR, H	SK, TR, H
Character sets	Tahoma, WinCC flexible	Tahoma, WinCC flexible	Tahoma, WinCC flexible	Tahoma, WinCC flexible
	Standard, symbol	Standard, symbol	Standard, symbol	Standard, symbol
	languages	languages	languages	languages
Transfer (upload/download)				
 Transfer of configuration 		Ethernet, automatic transfer		Ethernet, automatic transfer
	recognition	recognition	automatic transfer recog- nition	recognition
Process coupling				
Connection to controller	S7-200, S7-300/400,	S7-200, S7-300/400,	S7-200, S7- 300/400, Allen	S7-200, S7-300/400,
	Modicon (Modbus) see	Modicon (Modbus) see	Bradley (DF1), Mitsubishi	Modicon (Modbus) see
	chapter "System interfaces"	chapter "System interfaces"	(FX), OMRON (LINK/	chapter "System interfaces"
			Multilink), Modicon (Modbus) see section on	
			"System interfaces"	
Expandability/openness				
Open Platform Program	No	No	No	No
Dimensions				
Front of enclosure (W x H)	140 mm x 116 mm	214 mm x 158 mm	214 mm x 158 mm	214 mm x 158 mm
Mounting cutout/device	123 mm x 99 mm/40 mm	197 mm x 141 mm/44 mm	197 mm x 141 mm/44 mm	197 mm x 141 mm/44 mm
depth (W x H)	device depth	device depth	device depth	device depth
Dimensions and weight				
Weight • Weight	0.32 kg	1.07 kg	1.07 kg	1.07 kg
. voigin	J.UL NY	1.07 Ng	1.07 Ng	1.07 Ng

Basic panels - Standard

	6AV6 647-0AE11-3AX0	6AV6 647-0AF11-3AX0	6AV6 647-0AG11-3AX0
Product type designation	SIMATIC HMI KTP1000 Basic color DP	SIMATIC HMI KTP1000 Basic color PN	SIMATIC HMI TP1500 Basic color PN
Supply voltage Supply voltage	24 V DC	24 V DC	24 V DC
Permissible range	+19.2 V to +28.8 V DC	+19.2 V to +28.8 V DC	+19.2 V to +28.8 V DC
Rated current	0.6 A	0.6 A	0.8 A
Memory Type	Flash / RAM	Flash / RAM	Flash / RAM
Usable memory for user data	1024 kbyte usable memory for user data	1024 kbyte usable memory for user data	1024 kbyte usable memory for user data
Protocols Protocols (terminal link) • Sm@rtAccess	No	No	No
Configuration Configuration tool	WinCC flexible Compact Version 2008 or higher (to be ordered separately)	WinCC flexible Compact Version 2008 or higher (to be ordered separately)	WinCC flexible Compact Version 2008 or higher (to be ordered separately)
Display Display type	TFT, 256 colors	TFT, 256 colors	TFT, 256 colors
Size	10.4" (211.2 mm x 158.4 mm)	10.4" (211.2 mm x 158.4 mm)	15" (304.1 mm x 228.1 mm)
Resolution (WxH in pixel)	640 x 480	640 x 480	1024 x 768
Backlighting • MTBF backlighting (at 25 °C)	about 50,000 hours	about 50,000 hours	about 50,000 hours
Operating mode Control elements	Membrane keyboard	Membrane keyboard	Touch screen
Function keys, programmable	8 function keys	8 function keys	None
Connection for mouse/keyboard/barcode reader	- / - / -	- / - / -	- / - / -
Touch operation Touch screen Numeric/alphabetical input	analog, resistive Yes (on-screen keyboard) / Yes (on-screen keyboard)	analog, resistive Yes (on-screen keyboard) / Yes (on-screen keyboard)	analog, resistive Yes (on-screen keyboard) / Yes (on-screen keyboard)
Ambient conditions Mounting position	vertical	vertical	vertical
Maximum permissible angle of inclination without external ventilation	+/- 35 °	+/- 35 °	+/- 35 °
Max. relative humidity	90 %	90 %	90 %
Temperature Operation (vertical installation) Operation (max. tilt angle) Transport, storage	0 °C to +50 °C 0 °C to +40 °C -20 °C to +60 °C	0 °C to +50 °C 0 °C to +40 °C -20 °C to +60 °C	0 °C to +50 °C 0 °C to +40 °C -20 °C to +60 °C
Degree of protection			
Front	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)
Rear	IP20	IP20	IP20

Basic panels - Standard

	6AV6 647-0AE11-3AX0	6AV6 647-0AF11-3AX0	6AV6 647-0AG11-3AX0
Certifications & standards Certifications	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12	CE, UL, cULus, NEMA 4, NEMA 4x, NEMA 12
I/O devices	None	None	None
Type of output LED colors	None	None	None
Acoustics	Sound signal	Sound signal	Sound signal
Interfaces Interfaces	1 x RS422,1 x RS485 (max. 12 Mbit/s)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
PC card slot	No	No	No
CF card slot	No	No	No
Multi Media Card slot	No	No	No
USB port	No	No	No
Industrial Ethernet interface	No	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
Processor		` ,	, ,
Processor	RISC 32 bit, 200 MHz	RISC 32 bit, 200 MHz	RISC 32 bit, 200 MHz
Functionality under WinCC flexible/WinCC Basic			
Applications/options	None	None	None
Number of Visual Basic Scripts	Not possible	Not possible	Not possible
Task planner	Yes	Yes	Yes
Help system	Yes	Yes	Yes
Status/control	Not possible	Not possible	Not possible
With alarm logging system (incl. buffer and acknowledgment) Number of messages Bit messages Analog messages Message buffer	200 Yes Yes Ring buffer (n x 256 entries), retentive, maintenance-free	200 Yes Yes Ring buffer (n x 256 entries), retentive, maintenance-free	200 Yes Yes Ring buffer (n x 256 entries), retentive, maintenance-free
Recipes			
RecipesData records per recipeEntries per data record	5 20 20 40 kbyte integrated Flesh	5 20 20 40 kbyte integrated Fleeh	5 20 20
Recipe memory Number of process images	40 kbyte integrated Flash	40 kbyte integrated Flash	40 kbyte integrated Flash
Number of process images • Process images • Variables • Limit values • Multiplexing	50 500 Yes Yes	50 500 Yes Yes	50 500 Yes Yes
Image elements			
Text objectsGraphics object	500 text elements Bit maps, icons, icon (full-screen), vector graphics	500 text elements Bit maps, icons, icon (full-screen), vector graphics	500 text elements Bit maps, icons, icon (full-screen), vector graphics
Dynamic objects	Diagrams, bar graphs	Diagrams, bar graphs	Diagrams, bar graphs
Lists Text lists Graphics list Libraries	150 100 Yes	150 100 Yes	150 100 Yes
Security Number of user groups Passwords exportable Number of user rights	50 No 32	50 No 32	50 No 32

Basic panels - Standard

	6AV6 647-0AE11-3AX0	6AV6 647-0AF11-3AX0	6AV6 647-0AG11-3AX0
Data carrier support			
• PC card	No	No	No
• CF card	No	No	No
Multi Media Card	No	No	No
Recording			
Recording/Printing	-	-	-
Fonts • Keyboard fonts	US American (English)	LIC American (English)	US American (English)
	US American (English)	US American (English)	US American (English)
Languages	F	F	_
Online languagesConfiguration languages	5 D, GB, F, I, E, CHN	5 D, GB, F, I, E, CHN	5 D, GB, F, I, E, CHN
• Configuration languages	"traditional", CHN "simplified",	"traditional", CHN "simplified",	"traditional", CHN "simplified",
	DK, FIN, GR, J, KP / ROK, NL,	DK, FIN, GR, J, KP / ROK, NL,	DK, FIN, GR, J, KP / ROK, NL,
	N, PL, P, RUS, S, CZ / SK, TR,	N, PL, P, RUS, S, CZ / SK, TR,	N, PL, P, RUS, S, CZ / SK, TR,
Character sets	Tahoma. WinCC flexible	Tahoma, WinCC flexible	Tahoma. WinCC flexible
- Griaracter sets	Standard, symbol languages	Standard, symbol languages	Standard, symbol languages
Transfer (upload/download)			
 Transfer of configuration 	MPI/PROFIBUS DP, serial,	Ethernet, automatic transfer	Ethernet, automatic transfer
	automatic transfer recognition	recognition	recognition
Process coupling			
 Connection to controller 	S7-200, S7- 300/400, Allen	S7-200, S7-300/400, Modicon	\$7-200, \$7-300/400, Modicon
	Bradley (DF1), Mitsubishi (FX), OMRON (LINK/Multilink),	(Modbus) see chapter "System interfaces"	(Modbus) see chapter "System interfaces"
	Modicon (Modbus) see section	Interraces	Interraces
	on "System interfaces"		
Expandability/openness			
Open Platform Program	No	No	No
Dimensions			
Front of enclosure (W x H)	335 mm x 275 mm	335 mm x 275 mm	400 mm x 310 mm
Mounting cutout/device depth	310 mm x 248 mm / 60 mm	310 mm x 248 mm / 60 mm	367 mm x 289 mm / 60 mm
(W x H	device depth	device depth	device depth
Dimensions and weight			
Weight			
Weight	2.65 kg	2.65 kg	4.2 kg

Operator control and monitoring

Basic panels - Standard

Ordering data	Order No.		Order No.
SIMATIC HMI KP300 Basic mono PN	6AV6 647-0AH11-3AX0	Starter kit SIMATIC S7-1200 + CKTP600 Basic	6AV6 651-7DA01-3AA0
SIMATIC HMI KTP400 Basic mono PN	6AV6 647-0AA11-3AX0	consisting of: • SIMATIC HMI KTP600 Basic	
Starter kit for SIMATIC HMI KTP400 Basic mono PN	6AV6 652-7AA01-3AA0	color PN • SIMATIC S7-1200 CPU 1212C	
SIMATIC HMI KTP600 Basic mono PN	6AV6 647-0AB11-3AX0	AC/DC/Rly • SIMATIC S7-1200 SIM 1274 simulator module	
Starter kit for SIMATIC HMI KTP600 Basic mono PN	6AV6 652-7BA01-3AA0	SIMATIC STEP 7 BASIC CD SIMATIC S7-1200 HMI Manual	
SIMATIC HMI KTP600 Basic color DP	6AV6 647-0AC11-3AX0	Collection CD • Ethernet CAT5 cable, 2 m	
Starter kit for SIMATIC HMI KTP600 Basic color DP	6AV6 652-7CA01-3AA0	Configuration • All device versions: with	
SIMATIC HMI KTP600 Basic color PN	6AV6 647-0AD11-3AX0	SIMATIC WinCC V11, configurable	see catalog ST 80/ST PC
Starter kit for SIMATIC HMI CHAPPE START S	6AV6 652-7DA01-3AA0	Documentation (to be ordered separately)	
SIMATIC HMI KTP1000 Basic color DP	6AV6 647-0AE11-3AX0	You can find the manual for the Basic Panels on the Internet at	
Starter kit for SIMATIC HMI KTP1000 Basic color DP		http://support.automation. siemens.com	
SIMATIC HMI KTP1000 Basic color PN	6AV6 647-0AF11-3AX0	WinCC flexible Compact/ Standard/Advanced user manual	
Starter kit for SIMATIC HMI KTP1000 Basic color PN	6AV6 652-7FA01-3AA0	German English	6AV6 691-1AB01-3AA0 6AV6 691-1AB01-3AB0
SIMATIC HMI TP1500 Basic color PN	6AV6 647-0AG11-3AX0	FrenchItalian	6AV6 691-1AB01-3AC0 6AV6 691-1AB01-3AD0
Starter kits consist of: • the relevant SIMATIC KTP Basic		Spanish WinCC flexible Communication	6AV6 691-1AB01-3AE0
Panel SIMATIC WinCC flexible		user manual	0.000.001.101.01.01
Compact engineering software		GermanEnglish	6AV6 691-1CA01-3AA0 6AV6 691-1CA01-3AB0
 SIMATIC HMI Manual Collection (DVD), 		• French	6AV6 691-1CA01-3AC0
5 languages (English, French, German, Italian, Spanish),		ItalianSpanish	6AV6 691-1CA01-3AD0 6AV6 691-1CA01-3AE0
comprising: all currently available user manuals, manuals		SIMATIC HMI manual collection J	
and communication manuals for SIMATIC HMI		Electronic documentation, on DVD	
Ethernet cable on PN devicesMPI cable on DP devices		5 languages (English, French, German, Italian and Spanish);	
(for download and test purposes only)		contains: all currently available user manuals, manuals and	
Starter kit SIMATIC S7-1200 + DKTP400 Basic	6AV6 651-7AA01-3AA0	communication manuals for SIMATIC HMI	
consisting of: • SIMATIC HMI KTP400 Basic mono PN			
SIMATIC S7-1200 CPU 1212C AC/DC/Rly			
SIMATIC S7-1200 Simulator Module SIM 1274			
SIMATIC STEP 7 BASIC CD			
SIMATIC S7-1200 HMI Manual Collection CD Ethernet CAT5 cable, 2 m			
			N and ECCNI, ED000

D: Subject to export regulations AL: N and ECCN: 5D992

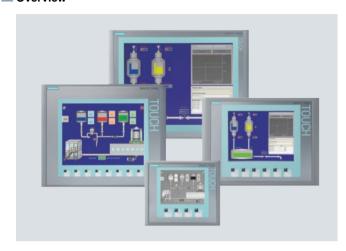
I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS operator control and monitoring

SIPLUS basic panels

Overview



- Ideal entry-level series of 3.8 inches to 15 inches for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS485/422

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS HMI KTP 400 BASIC MONO PN	SIPLUS HMI KTP 600 BASIC COLOR PN	SIPLUS HMI KTP 1000 BASIC COLOR DP	SIPLUS HMI KTP 1000 BASIC COLOR PN	SIPLUS HMI TP 1500 BASIC COLOR PN
Order No.	6AG1647-0AA11- 2AX0	6AG1647-0AD11- 2AX0	6AG1647-0AE11- 4AX0	6AG1647-0AF11- 4AX0	6AG1647-0AG11- 4AX0
Order No. based on	6AV6647-0AA11- 3AX0	6AV6647-0AD11- 3AX0	6AV6647-0AE11- 3AX0	6AV6647-0AF11- 3AX0	6AV6647-0AG11- 3AX0
Ambient temperature range	-10 +60 °C	-25 +60 °C	0 +50 °C	0 +50 °C	0 +50 °C
Conformal coating	Coating of the printed of	circuit boards and the ele	ectronic components		
Technical data	The technical data of th	ne standard product appl	ies except for ambient c	onditions.	
Ambient conditions					
Relative humidity	5 100 % Condensation permissible				
Biologically active substances	Conformity with EN 607	21-3-3, Class 3B2 mold	and fungal spores (exce	pt fauna)	
Chemically active substances	Conformity with EN 607	21-3-3, Class 3C4 incl. s	alt mist and ISA-S71.04	severity level G1; G2; G3	3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾				
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 see ambient temperatu 795 658 hPa (+2000 derating 10 K 658 540 hPa (+3500 derating 20 K	re range +3500 m)			

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOX} < 10.4 \text{ ppm} \\ \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS basic panels

Ordering data	Order No.		Order No.
SIPLUS HMI KTP400 Basic mono PN	6AG1 647-0AA11-2AX0	SIPLUS HMI KTP 1000 Basic Color PN	6AG1 647-0AF11-4AX0
Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature -10 +60 °C		Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature 0 +50 °C	
SIPLUS HMI KTP 600 Basic color PN	H 6AG1 647-0AD11-2AX0	SIPLUS HMI TP 1500 Basic Color PN	6AG1 647-0AG11-4AX0
Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature -25 +60 °C		Suitable for areas with extra- ordinary medial exposure (conformal coating); ambient temperature 0 +50 °C	
SIPLUS HMI KTP 1000 Basic Color DP	6AG1 647-0AE11-4AX0	Accessories	See SIMATIC basic panels, page 4/119
Suitable for areas with extraordinary medial exposure (conformal coating); ambient temperature 0 +50 °C			

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

Software

Software

Overview

- Software for the SIMATIC S7-1200
- Functions for all phases of the automation project:

 - configuring and parameterizing the hardware
 specifying the communication
 programming in LAD (Ladder Diagram) and FBD (Function Block Diagram)

 - configuration of the visualization test, commissioning, and service

The following is available:

• STEP 7 Professional/Basic V11

For further information see chapter 11.

5

SIMATIC S7-300

SIFLOW FC070



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5/32	SIPLUS Standard CPUs	5/225	DM 370 placeholder module
5/36	Compact CPUs	-/	2
5/68	SIPLUS compact CPUs	5/226	Communication
5/73	Fail-safe CPUs	5/226	
5/94	SIPLUS fail-safe CPUs	5/228	
5/98	Technology CPUs	5/230	Loadable drivers for CP 441-2 and CP 341
E/4.00	Blattel and I ha	5/232	
5/109	Digital modules	5/234	· ·
5/109	SM 321 digital input module	5/234	
5/115	SM 322 digital output module		
5/123	SM 323/SM 327 digital input/output	5/238 5/240	
	module	-/	G. G.G. (200.)
5/127	SIPLUS digital modules	5/243	
		5/247	
5/132	Analog modules	5/252	-: -: -: -: -: -: -: -: -: -: -: -: -: -
5/132	SM 331 analog input module	5/255	
5/141	SM 332 analog output module	5/257	
5/144	SM 334 analog input/output module	5/260	
5/147	SIPLUS analog modules	5/263	
5/14/	SIFLOS analog modules	5/266	
5/152	F digital / analog modules	5/269	
5/152	SM 326 F digital input module -	5/272	ASM 475
5/155	Safety Integrated SM 326 F digital output module -	5/274	SIPLUS communication
	Safety Integrated	5/284	Connection methods
5/158	SM 336 F analog input module -	5/284	Front connectors
	Safety Integrated	5/285	SIMATIC TOP connect for SIMATIC S7
5/160	Isolation module	5/286	SIMATIC TOP connect for SIMATIC S7
5/161	SIPLUS F digital/analog modules	5/293	Fully modular connection SIMATIC TOP connect for SIMATIC S7
5/165	Ex digital modules	5/293	Flexible connection
5/169	Ex analog modules	5/295	Interface modules
5/174	Function modules	5/296	SIPLUS interface modules
5/174 5/176	FM 350-1 counter module FM 350-2 counter module	5/297	Power supplies
5/178	FM 351 positioning module	5/303	SIPLUS power supplies
5/181	FM 352 cam controller	E/0.07	A
5/183	FM 352-5 high-speed Boolean processor	5/307	Accessories
5/188	FM 353 positioning module		
5/190	FM 354 positioning module		
5/190	FM 357-2 positioning module		
5/195	FM 355 controller module		
5/200	FM 355-2 temperature controller module		
5/204	SM 338 POS input module		
5/204	IM 174 PROFIBUS module		
5/208	SIWAREX U		Brochures
5/206	SIWAREX FTA		For brochures serving as selection
5/214	SIWAREX FTC		guides for SIMATIC products refer to:
J/2 14	JIWANLA I IU		and the second s

http://www.siemens.com/simatic/

printmaterial

Siemens ST 70 · 2011

Introduction

S7-300/S7-300F

Overview



S7-300

- The modular mini PLC system for the low and mid-performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase
- Powerful thanks to a range of integrated functions

S7-300F

- Failsafe automation system for plants with increased safety requirements for production technology
- Based on S7-300
- Additional ET 200S and ET 200M distributed I/O stations complete with safety-related modules can be connected
- Safety-related communication via PROFIBUS DP with PROFIsafe profile
- Standard modules can be used in addition for non-safetyrelevant applications

SIPLUS S7-300

- The controller for use in the toughest ambient conditions
- Features an extended temperature range of -40/-25 °C to +60/70 °C
- Suitable for medial exposure (harmful gas atmosphere)
- Condensation and increased mechanical stress is permissible
- Features the proven PLC technology of the S7-300
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, material handling, food industry, etc.
- The replacement for expensive custom solutions

For further information, please go to:

www.siemens.com/siplus-extreme

For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

Technical specifications

Technical specifications				
General technical data SIMATI	,			
Degree of protection	IP20 according to IEC 60 529			
Ambient temperature • For horizontal installation • For vertical installation	0 to 60 °C 0 to 40 °C			
Relative humidity	10 to 95%, without condensation, corresponds to relative humidity (RH), stress level 2 acc. to IEC 61131, Part 2)			
Air pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)			
Insulation				
• < 50 V	500 V DC test voltage			
• < 150 V • < 250 V	2500 V DC test voltage			
	4000 V DC test voltage			
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2			
Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,			
Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6			
 Emission of radio interference 	Interference emission according to EN 50081-2			
	Test according to: Emitted interference of electromag- netic fields according to EN 55016: Limit value class A, (measured at a distance of 10 m)			
	Interference emission via AC mains according to EN 55011: Limit value class A, Group 1			
Mechanical strength				
Vibrations	Frequency range 10 Hz ≤ f ≤ 58 Hz • Continuous: 0.0375 mm amplitude • Occasionally 0.75 mm amplitude			
	Frequency range 58 Hz ≤ f ≤ 150 Hz • Continuous: 0.5 g constant acceleration			
	 Occasionally 1 g constant acceleration 			
	Testing according to IEC 60068-2-6 Tested with:			
	5 Hz \leq f \leq 9 Hz, constant amplitude 3.5 mm; 9 Hz \leq f \leq 150 Hz, constant acceleration 1 g;			
• Shock	Duration of oscillation: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes Testing according to IEC 60068-2-27 Tested with:			
	Half-sine wave: strength of shock 15 g peak value, 11 ms duration;			
	Shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes			

SIMATIC S7-300 Introduction

S7-300/S7-300F

General technical data SIPLUS	\$7-300
Ambient temperature range	-40/-25 +60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100%, condensation allowed
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature	1080 795 hPa (-1000 +2000 m) see ambient temperature range
range specified)	795 658 hPa (+2000 3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K
Compliant with the standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1)	Yes

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ < 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3$ < 0.1 ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2$ < 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3$ < 1.0 ppm; NOx < 10.4 ppm $^{2)}$ The supplied plug covers must remain in place over the unused interface when apparently in atmospheres containing correction and

interface when operated in atmospheres containing corrosive gases!

Central processing units

Standard CPUs

Overview CPU 312



- The entry level CPU in Totally Integrated Automation (TIA)
- For smaller applications with moderate processing performance requirements

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314



- For plants with medium requirements for program size
- High processing power in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

Central processing units

Standard CPUs

Overview CPU 315-2 PN/DP



- The CPU with mid-range program memory and quantity structure
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O Controller
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 317-2 DP



- The CPU with a large program memory and quantity structure for demanding applications
- For cross-sector automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP

SIMATIC Micro Memory Card required for operation of CPU.

Central processing units

Standard CPUs

Overview CPU 317-2 PN/DP



- The CPU with a large program memory and quantity structure for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- PROFINET interface with 2-port switch
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O Controller
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 319-3 PN/DP



- The CPU with high command processing performance, large program memory and quantity structure for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O on PROFIBUS and PROFINET
- PROFINET I/O controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET interface with 2-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integral Web server with the option of creating user-defined Web sites
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of the CPU.

Standard CPUs

Technical specifications

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Product version				
associated programming package	STEP 7 > V 5.4 + SP5 or STEP 7 as of V5.2 + SP1 with HSP 176	STEP 7 > V 5.4 + SP5 or STEP 7 as of V5.2 + SP1 with HSP 175	STEP 7 > V 5.4 + SP5 or STEP 7 as of V5.2 + SP1 with HSP 177	STEP7 V 5.5 or higher
Supply voltages				
Rated value • permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
external protection for supply cables (recommendation)	Min. 2 A	Min. 2 A	Min. 2 A	Min. 2 A
Current consumption				
Current consumption (rated value)	650 mA	650 mA	850 mA	750 mA
Current consumption (in no-load operation), typ.	140 mA	140 mA	150 mA	150 mA
Inrush current, typ.	3.5 A	3.5 A	3.5 A	4 A
l ² t	1 A ² ·s	1 A ^{2.} s	1 A ² ·s	1 A ² ·s
from supply voltage L+, max.	650 mA	650 mA	900 mA	
Power losses				
Power loss, typ.	4 W	4 W	4.5 W	
Memory				
Work memory	001/11	1001(1)	0501/11	0041/11
integrated	32 Kibyte; For program and data	128 Kibyte; For program and data	256 Kibyte	384 Kibyte
• expandable	No	No	No	No
Size of retentive memory for retentive data blocks	32 Kibyte	64 Kibyte	128 Kibyte	128 Kibyte
Load memory				
pluggable (MMC)pluggable (MMC), max.	Yes 8 Mbyte	Yes 8 Mbyte	Yes 8 Mbyte	Yes 8 Mbyte
Backup				
• present	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data	Yes; Program and data	Yes; Program and data	Yes; Program and data
CPU-blocks	, <u> </u>		, <u> </u>	, <u>J</u>
DB				
Number, max.	1 024; Number range:	1 024; Number range: 1 to 16000	1 024; Number range:	1 024; Number range:
• Size, max.	1 to 16000 32 Kibyte	64 Kibyte	1 to 16000 64 Kibyte	1 to 16000 64 Kibyte
FB	,	<u> </u>	,	, , , , , , , , , , , , , , , , , , ,
Number, max.	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999
• Size, max.	32 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
FC				
Number, max.	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999	1 024; Number range: 0 to 7999
• Size, max.	32 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
OB				
 Size, max. 	32 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth per priority class	16	16	16	16

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
CPU processing times				
for bit operations, min.	0.1 μs	0.06 µs	0.05 µs	0.05 µs
for word operations, min.	0.24 µs	0.12 μs	0.09 μs	0.09 µs
for fixed point arithmetic, min.	0.32 μs	0.16 µs	0.12 µs	0.12 µs
for floating point arithmetic, min.	1.1 µs	0.59 μs	0.45 µs	0.45 μs
Counters, timers and their retentivity				
S7 counter				
Number	256	256	256	256
Retentivity				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	255	255	255	255
Counting range				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	999	999	999	999
IEC counter				
• present	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB
	31 D	51.5	31 15	01 15
S7 times	050	050	050	050
• Number	256	256	256	256
Retentivity				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	255	255	255	255
- preset	no retentivity	no retentivity	no retentivity	no retentivity
Time range				
- lower limit	10 ms	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s	9 990 s
IEC timer				
• present	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB
Data areas and their				
retentivity				
Flag				
 Number, max. 	256 byte	256 byte	2 048 byte	2 048 byte
 Retentivity available 	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 2047
 Number of clock memories 	8; 1 memory byte			
Data blocks				
Number, max.	1 024; Number range:			
,	1 to 16000	1 to 16000	1 to 16000	1 to 16000
• Size, max.	32 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
 Retentivity adjustable 	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain
	property on DB	property on DB	property on DB	property on DB
Retentivity preset	yes	yes	yes	yes
Local data	00 1/31	00 1/11-1-14	00 1/31-1-14	00.700
 per priority class, max. 	32 Kibyte; Max. 2 KB per block	32 Kibyte; Max. 2 KB per block	32 Kibyte; Max. 2 KB per block	32 768 byte; 2048 byte max. per block
Address area		, ,		p -::
I/O address area				
	1.024 byto	1.004 byto	2.049 byto	2.049 byto
• overall	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Outputs of which distributed	1 024 byte	1 024 byte	2 048 byte	2 048 byte
of which, distributed			2.049 byta	2.049 byto
InputsOutputs			2 048 byte	2 048 byte
- OHIDHS			2 048 byte	2 048 byte

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Process image				
• Inputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Outputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Inputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Outputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Inputs, preset	128 byte	128 byte	128 byte	128 byte
Outputs, preset	128 byte	128 byte	128 byte	128 byte
Subprocess images	,	,	,	<u> </u>
 Number of subprocess images, 			1	1; With PROFINET IO,
max.			·	the length of the user data
				is limited to 1600 bytes
Digital channels				
• Inputs	256	1 024	16 384	16 384
Outputs	256	1 024	16 384	16 384
 Inputs, of which central 	256	1 024	1 024	1 024
Outputs, of which central	256	1 024	1 024	1 024
Analog channels				
• Inputs	64	256	1 024	1 024
• Outputs	64	256	1 024	1 024
 Inputs, of which central 	64	256	256	256
Outputs, of which central	64	256	256	256
Hardware configuration				
Central devices, max.	1	1	1	1
Expansion devices, max.	0	3	3	3
Racks, max.	1	4	4	4
Modules per rack, max.	8	8	8	8
Number of DP masters				
• integrated	0	0	1	1
• via CP	4	4	4	4
Number of operable FMs and				
CPs (recommended)				
• FM	8	8	8	8
 CP, point-to-point 	8	8	8	8
• CP, LAN	4	10	10	10
Time				
Clock				
Hardware clock (22 al. 1882 al. 2882)		Yes	Yes	Yes
(real-time clock)	V			
Software clock better backed and	Yes Buffered No Can be	Vaa	Vaa	Vaa
 battery-backed and synchronizable 	synchronized Yes	Yes	Yes	Yes
Behavior of the clock following	The clock continues at the			Clock continues running
POWER-ON	time of day it had when power was switched off			after POWER OFF
Behavior of the clock following	,	The clock continues at the	The clock continues at the	The clock continues at the
expiry of backup period		time of day it had when	time of day it had when	time of day it had when
Deviation per day, max.	10 o: Tvp : 2 o	power was switched off	power was switched off	power was switched off
	10 s; Typ.: 2 s	10 s; Typ.: 2 s	10 s; Typ.: 2 s	10 s; Typ.: 2 s
Runtime meter • Number	1	1	1	1
- INGILIDEI	0	0	0	0
Number/Number range	C/	U		
Number/Number range Range of values		0 to 2031 hours	0 to 2021 hours	
Number/Number rangeRange of values	0 to 2^31 hours	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)
Range of values		0 to 2^31 hours (when using SFC 101) 1 hour	0 to 2^31 hours (when using SFC 101) 1 hour	(when using SFC 101) 1 hour
g .	0 to 2^31 hours (when using SFC 101)	(when using SFC 101)	(when using SFC 101)	(when using SFC 101)

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Clock synchronization • supported • to MPI, master	Yes Yes	Yes Yes	Yes Yes	Yes Yes
to MPI, slaveto DP, masterto DP, slave	Yes	Yes	Yes Yes; on DP slave only time-of-day slave Yes	Yes Yes; on DP slave only time-of-day slave Yes
in AS, master in AS, slave on Ethernet via NTP	Yes	Yes	Yes	Yes Yes Yes; as client
S7 message functions Number of login stations for message functions, max.	6; Depending on the connections configured for PG/OP and S7 basic communication	12; Depending on the connections configured for PG/OP and S7 basic communication	16; Depending on the connections configured for PG/OP and S7 basic communication	16; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes	Yes
simultaneously active Alarm-S blocks, max.	300	300	300	300
Test commissioning functions Status/control • Status/control variable • Variables	Yes Inputs, outputs, memory bits, DB, times, counters	Yes Inputs, outputs, memory bits, DB, times, counters	Yes Inputs, outputs, memory bits, DB, times, counters	Yes Inputs, outputs, memory bits, DB, times, counters
 Number of variables, max. of which status variables, max. of which control variables, max. 	30 30 14	30 30 14	30 30 14	30 30 14
Forcing • Forcing	Yes	Yes	Yes	Yes
Status block	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously
Single step	Yes	Yes	Yes	Yes
Number of breakpoints	4	4	4	4
Diagnostic buffer • present • Number of entries, max. - adjustable - Of which powerfail-proof	Yes 500 No 100; Only the last 100 entries are retained	Yes 500 No 100; Only the last 100 entries are retained	Yes 500 No 100; Only the last 100 entries are retained	Yes 500 No 100; Only the last 100 entries are retained
 Number of entries readable in RUN, max. adjustable preset 	Yes; From 10 to 499	Yes; From 10 to 499	Yes; From 10 to 499	499 Yes; From 10 to 499 10
Service data • can be read out				Yes
Monitoring functions Status LEDs	Yes	Yes	Yes	Yes
Communication functions PG/OP communication	Yes	Yes	Yes	Yes
Data record routing			Yes	Yes
Routing	No	No	Yes; Max. 4	Yes
Global data communication • supported • Size of GD packets, max.	Yes 22 byte	Yes 22 byte	Yes 22 byte	Yes 22 byte
S7 basic communication • supported	Yes	Yes	Yes	Yes

Standard CPUs

6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Yes	Yes	Yes	Yes
Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
			Yes 5
			Yes
			Yes; via integrated PROFINET interface and loadable FBs
			8
			Yes Yes; via integrated
			PROFINET interface and loadable FBs
			32 768 byte Yes; via integrated
			PROFINET interface and loadable FBs
			1 472 byte
			16
			15 15
2	8	12	14
			14
			0
			0
			14
			32 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24
			AL GOTTION INCL. MAX. ET
			50 %
			32
			30
	Yes; via CP and loadable FC 6 5 5	Yes; via CP and loadable FC Yes; via CP and loadable FC Yes; via CP and loadable FC 12 5 11 5 11	Yes; via CP and loadable FC 12 16 5 11 15 5 11 15

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
PROFINET CBA (at set setpoint communication load)				
Total of all Master/Slave				1 000
connections				4 000 by to
 Data length of all incoming connections master/slave, max. 				4 000 byte
 Data length of all outgoing connections master/slave, max. 				4 000 byte
 Number of device-internal and PROFIBUS interconnections 				500
 Data length of device-internal und PROFIBUS interconnec- 				4 000 byte
tions, max.Data length per connection, max.				1 400 byte
Remote interconnections with acyclic transmission				
 Sampling frequency: Sampling time, min. 				500 ms
- Number of incoming interconnections				100
- Number of outgoing				100
interconnections - Data length of all incoming interconnections,				2 000 byte
max. - Data length of all outgoing interconnections,				2 000 byte
max.Data length per connection, max.				1 400 byte
Remote interconnections with cyclic transmission				
 Transmission frequency: Transmission interval, min. 				10 ms
 Number of incoming interconnections 				200
 Number of outgoing interconnections 				200
 Data length of all incoming interconnections, max. 				2 000 byte
- Data length of all outgoing interconnections, max.				2 000 byte
 Data length per connection, max. 				450 byte
 HMI variables via PROFINET (acyclic) 				
Number of stations that can log on for HMI variables (PN OPC/iMap)				3; 2x PN OPC/1x iMap
- HMI variable updating				500 ms
 Number of HMI variables Data length of all HMI variables, max. 				200 2 000 byte
 PROFIBUS proxy functionality 				V
SupportedNumber of linked PROFIBUS devices				Yes 16
 Data length per connection, max. 				240 byte; Slave-dependent

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
1st interface				
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
solated	No	No	No	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA
Functionality				
• MPI	Yes	Yes	Yes	Yes
DP master	No	No	No	Yes
DP slave	No	No	No	Yes
Point-to-point connection	No	No	No	No
MPI				
Number of connections	6	12	16	
• Services	9			
- PG/OP communication	Yes	Yes	Yes	Yes
- Routing	No	No	Yes	Yes
S	Yes			
- Global data communication		Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes	Yes
- S7 communication, as client	No	No	No	No; but via CP and
				loadable FB
- S7 communication, as server	Yes	Yes	Yes	Yes
 Transmission rate, max. 	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	12 Mbit/s
				Yes Yes No Yes; I blocks only Yes No Yes Yes Yes Yes Yes; OB61; isochronous mode can only be used alternatively on PROFIBU DP or PROFINET IO Yes Yes 8 Yes; As subscriber Yes 12 Mbit/s 124 2 Kibyte 2 Kibyte
User data per DP slave Inputs, max. Outputs, max.				244 byte 244 byte

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
DP slave				
• Services				
- PG/OP communication				Yes
- Routing				Yes; Only with active interface
- Global data communication				No
- S7 basic communication				No
- S7 communication				Yes
- S7 communication, as client				No
- S7 communication, as server				Yes; Connection
				configured on one side
D:				only
 Direct data exchange (slave-to-slave communi- 				Yes
cation)				
- DPV1				No
Transmission rate, max.				12 Mbit/s
Transfer memory				
- Inputs				244 byte
- Outputs				244 byte
 Address area, max. 				32
User data per address area,				32 byte
max.				
2nd interface Type of interface			integrated RS 485	PROFINET
Type of interface			interface	PROFINEI
Physics			RS 485	Ethernet RJ45
Isolated			Yes	Yes
Integrated switch			100	Yes
Number of ports				2
Power supply to interface			200 mA	_
(15 to 30 V DC), max.			200 1111 (
Automatic detection of				Yes; 10/100 Mbit/s
transmission speed				Vee
Autonegotiation				Yes
Autocrossing				Yes
Media redundancy				V
SupportedSwitchover time on line break,				Yes
typically				200 ms; PROFINET MRP
 Number of stations in the ring, 				50
max.				
Change of IP address at runtime, supported				Yes
Functionality				
• MPI			No	No
• DP master			Yes	No
DP slave			Yes	No
PROFINET IO controller				Yes; Also simultaneously with IO device functionality
PROFINET IO device				Yes; Also simultaneously
				with IO controller function-
				ality
PROFINET CBA				Yes
• Web server				Yes
- Number of HTTP clients			N	5
 Local Operating Network 			No	

Standard CPUs

P master Number of connections, max. Services PRO(PP communication Routing Globel data communication No ST communication, a client ST communication, as server Res ST communication and server Res ST communication of DP server Res STNC/FREEZE A clientation/deactivation of DP server Res STRAING S		6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Number of connections, max. Sarvices - PG/OP communication - Routing - Global data communication - Sr basic communication - Sr communication - Sr communication, as client - Sr communication, as scient - Sr communication as provided of the science of	DP master				
• Services				16	
- Routing - Global data communication - S7 basic communication - S7 basic communication - S7 communication, as client - S7 communication, as server - S7 communication of S7 communication - S7 communication of S7 communication - S7 communica	· · · · · · · · · · · · · · · · · · ·				
Global data communication S7 basic communication S7 communication S7 communication S7 communication S7 communication, as elient S7 communication, as elient S7 communication, as elient S7 communication, as elient S7 communication, as server Equidistance mode support Eschronous mode SYNC/FREZE SYGS Activation/daactivation of DP slaves Number of DP slaves that can be simultaneously activated/ deactivated, max. DPV1 S1 can server S1 can server S1 can server S1 can server S2 can server S4 can server S5 can server S5 can server S5 can server S6 can server S7 can server S8 can	- PG/OP communication			Yes	
Global data communication S7 basic communication S7 communication S7 communication S7 communication S7 communication, as elient S7 communication, as elient S7 communication, as elient S7 communication, as elient S7 communication, as server Equidistance mode support Eschronous mode SYNC/FREZE SYGS Activation/daactivation of DP slaves Number of DP slaves that can be simultaneously activated/ deactivated, max. DPV1 S1 can server S1 can server S1 can server S1 can server S2 can server S4 can server S5 can server S5 can server S5 can server S6 can server S7 can server S8 can	•				
- S7 basic communication - S7 communication - S7 communication, as client - S7 communication, as server - S7 communication, as server - Yes - S7 communication, as server - Yes - S7 communication, as server - Yes - S9 communication of DP - S9 communication of DP - S9 communication - S9	-				
- 97 communication Yes No No S7 communication, as client No Yes S7 communication, as server Yes Equidistance mode support Yes Ye					
- S7 communication, as client - S7 communication, as server - Equidistance mode support - Isochronous mode - SYNC/FREZE - Activation/deactivation of DP - Slaves - Number of DP slaves that can be simultaneously activated/ deactivated, max DPV1 - Transmission rate, max Address area - Inputs, max Outputs, max.				-	
- 97 communication, as server					
- Isochronous mode - SYNC/FREZE - Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/ deactivated, max DPV1 - Yes - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max PG/OP communication - Routing - Routing - Global data communication - Routing - Global data communication - S7 basic communication - S7 communication, as client - No - S7 communication, as client - No - S7 communication, as server - Direct data exchange - Clave-to-slave communication - S7 Communication, as client - Transfer deace - Transfer memory - Inputs - Outputs - S4 byte - Outputs - S6 byte - S8 byte - Outputs - S8 byte - Outputs - S8 byte - Outputs - Outputs - S8 byte - Outputs - Outputs - S8 byte - Outputs - Outputs - Outputs - S8 byte - Outputs - Outputs - Outputs - S8 byte - S8 byte - S9 byte - S8 byte - S8 byte - S9 byte - S9 byte - S8 byte - S9 byte -				Yes	
- Isochronous mode - SYNC/FREZE - Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/ deactivated, max DPV1 - Yes - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max PG/OP communication - Routing - Routing - Global data communication - Routing - Global data communication - S7 basic communication - S7 communication, as client - No - S7 communication, as client - No - S7 communication, as server - Direct data exchange - Clave-to-slave communication - S7 Communication, as client - Transfer deace - Transfer memory - Inputs - Outputs - S4 byte - Outputs - S6 byte - S8 byte - Outputs - S8 byte - Outputs - S8 byte - Outputs - Outputs - S8 byte - Outputs - Outputs - S8 byte - Outputs - Outputs - Outputs - S8 byte - Outputs - Outputs - Outputs - S8 byte - S8 byte - S9 byte - S8 byte - S8 byte - S9 byte - S9 byte - S8 byte - S9 byte -	- Equidistance mode support			Yes	
- SYNO/FREZE - Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/ deactivated, max DPV1 - Transmission rate, max Address area - Inputs, max Outputs, max Outputs - Outputs - Outputs - Transfer memory - Inputs - Outputs - Outputs - Ves - Outputs - Ves - Ves - Outputs - Ves - Outputs - Ves - Outputs - Ves - Outputs - Outputs - Ves - Ves - Outputs - Ves - Ves - Outputs - Ves - Outputs - Ves - Outputs - Outputs - Outputs - Ves - Outputs - Outputs - Ves - Outputs - Outputs - Ves - Outputs - Outputs - Outputs - Ves - Outputs - Outputs - Ves - Outputs - Outputs - Outputs - Ves - Outputs	· · · · · · · · · · · · · · · · · · ·			Yes; OB 61	
- Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/ deactivated, max DPV1 - Yes - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max Outputs, max Utputs, max PG/OP communication - Routing - Global data communication - Routing - Global data communication - S7 communication, as client - S8 client - S9 client - The current GSD file can be obtained from: - Wes - Utputs - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Utputs	- SYNC/FREEZE				
be simultaneously activated/ deactivated, max. - DPV1 • Transmission rate, max. • Address area • Inputs, max. • Outputs, max. • Outputs • Yes • Outputs • Outputs • Ou				Yes	
- DPV1 • Transmission rate, max. • Number of DP slaves, max. • Address area • Inputs, max. • Outputs, max. • Outputs	be simultaneously activated/			8	
• Transmission rate, max. • Number of DP slaves, max. • Number of DP slaves, max. • Address area - Inputs, max. • Outputs, max. • Output				Yes	
 Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. Outputs, max. Outputs <l< td=""><td></td><td></td><td></td><td></td><td></td></l<>					
 Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. Outputs, max. Outputs, max. Outputs, max. Outputs, max. DP slave Number of connections Services PG/OP communication Routing Fosionly with active interface Global data communication S7 basic communication, as client S7 communication, as server Pses (slave-to-slave communication), as server Picet data exchange (slave-to-slave communication) OPV1 GSD file Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs Outputs 244 byte Outputs Outputs 	,				
- Inputs, max Outputs, max Outputs, max User data per DP slave - Inputs, max Outputs, max Outputs, max Outputs, max. - Outputs, max. 244 byte 244 byte 244 byte 244 byte 244 byte 244 byte 245 byte 246 byte 247 byte 248 byte 248 byte 248 byte 249 byte 248 byte 249 byte 249 byte 249 byte 249 byte 249 byte 249 byte 244 byte				,	
- Outputs, max. • User data per DP slave - Inputs, max Outputs, max Outputs, max Outputs, max. • Number of connections • Services • PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication, as client - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 • GSD file • Transmission rate, max. • Automatic baud rate search • Transfer memory - Inputs - Outputs • User data per DP slave - 244 byte - 244 byte - 244 byte - 244 byte - Outputs				2 048 byte	
User data per DP slave Inputs, max. Outputs, max. 244 byte 244 byte 244 byte P slave Number of connections Services PG/OP communication Routing Ro	•			2 048 byte	
- Inputs, max Outputs, max. 244 byte DP slave Number of connections Services - PG/OP communication - Routing - Routing - Global data communication - S7 basic communication - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - GSD file - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Outputs - Step (244 byte) - Outputs - 16 - (244 byte) - 16 - (244 byte) - 16 - (244 byte) - (244	·			,	
DP slave Number of connections Services PG/OP communication Routing Yes; Only with active interface Global data communication S7 basic communication S7 communication, as client S7 communication, as client S7 communication, as server Direct data exchange (slave-to-slave communication) DPV1 No GSD file The current GSD file can be obtained from: www.siemens.com/profibus-gsd Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs 244 byte Outputs				244 byte	
 Number of connections Services PG/OP communication Routing Global data communication S7 basic communication S7 communication, as client S7 communication, as client S7 communication, as server Direct data exchange (slave-to-slave communication) DPV1 GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs 244 byte Outputs 	- Outputs, max.			244 byte	
 Number of connections Services PG/OP communication Routing Global data communication S7 basic communication S7 communication, as client S7 communication, as client S7 communication, as server Direct data exchange (slave-to-slave communication) DPV1 GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs 244 byte Outputs 	DP slave				
 Services - PG/OP communication - Routing - Routing - Global data communication - S7 basic communication - S7 basic communication - S7 communication, as client - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - GSD file - The current GSD file can be obtained from:				16	
- PG/OP communication - Routing - Global data communication - S7 basic communication - S7 basic communication - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Global data communication - No - No - No - No - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Outputs - No - No - Yes - No - Yes - Only with active interface - No - Yes - Only with active interface - Yes - Yes - Yes - Yes - Yes - Yes - Only with active interface - Yes - Yes - Yes - Yes - Yes - Only with active - No - Yes - Only with active - Yes - Only with					
interface Global data communication S7 basic communication S7 communication, as client S7 communication, as server Yes Direct data exchange (slave-to-slave communication) DPV1 GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs interface No No Yes Yes Yes Yes Yes Yes Yes Yes Y	- PG/OP communication			Yes	
- Global data communication - S7 basic communication - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - The current GSD file can be obtained from: www.siemens.com/profibus-gsd - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Outputs - No - No - No - No - Yes - Y	- Routing			Yes; Only with active	
- S7 basic communication - S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - GSD file - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - S7 communication, as client - No - Yes	<u> </u>			interface	
- S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - GSD file - GSD file - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Outputs - DPV1 - No	- Global data communication			No	
- S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 • GSD file • The current GSD file can be obtained from: www.siemens.com/ profibus-gsd • Transmission rate, max. • Automatic baud rate search • Transfer memory - Inputs - Outputs • Outputs	 S7 basic communication 			No	
- Direct data exchange (slave-to-slave communication) - DPV1 • GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd • Transmission rate, max. • Automatic baud rate search • Transfer memory - Inputs - Outputs Yes No 12 Mbit/s Yes - 244 byte - 244 byte	- S7 communication, as client			No	
(slave-to-slave communication) - DPV1 • GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd • Transmission rate, max. • Automatic baud rate search • Transfer memory - Inputs - Outputs • Outputs				Yes	
 GSD file The current GSD file can be obtained from: www.siemens.com/ profibus-gsd Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs The current GSD file can be obtained from: www.siemens.com/ profibus-gsd Yes; only with passive interface Transfer memory Inputs Outputs 244 byte Outputs 244 byte	(slave-to-slave communi- cation)			Yes	
be obtained from: www.siemens.com/ profibus-gsd • Transmission rate, max. • Automatic baud rate search • Transfer memory - Inputs - Outputs be obtained from: www.siemens.com/ profibus-gsd 12 Mbit/s Yes; only with passive interface 244 byte 244 byte	- DPV1			No	
 Transmission rate, max. Automatic baud rate search Transfer memory Inputs Outputs 12 Mbit/s Yes; only with passive interface Transfer memory 244 byte 244 byte 244 byte 	• GSD file			be obtained from: www.siemens.com/	
 Transfer memory Inputs Outputs 244 byte 244 byte 				12 Mbit/s Yes; only with passive	
- Outputs 244 byte					
				,	
	•				
• User data per address area, 32 byte					
max.				,	

Standard CPUs

Technical specifications (co	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
DDOENIET IS	0E3/ 312-1AE14-UABU	0E3/ 314-1AG14-UABU	0E3/ 313-ZAT14-UABU	0E3/ 313-ZEM14-UABU
PROFINET IO controller				
• Services				V
- PG/OP communication				Yes
- Routing				Yes
- S7 communication				Yes; with loadable FBs, max. configurable
				connections: 14, max.
				number of instances: 32
- Isochronous mode				Yes; OB61; isochronous
				mode can only be used
				alternatively on PROFIBUS DP or
				PROFINET IO
- Open IE communication				Yes; via TCP/IP, ISO on
•				TCP and UDP
 Transmission rate, max. 				100 Mbit/s
Number of connectable IO				128
devices, max.				100
 Max. number of connectable IO devices for RT 				128
- of which in line, max.				128
Number of IO devices with IRT				128
and the option "high flexibility"				.20
- of which in line, max.				61
• Number of IO devices with IRT				64
and the option "high perfor-				
mance", max.				0.4
- of which in line, max.				64
IRT, supported Shared devices supported				Yes
Shared device, supportedPrioritized startup supported				Yes Yes
- Number of IO devices, max.				32
Activation/deactivation of				Yes
IO devices				100
- Number of IO devices that				8
can be simultaneously				
activated/deactivated, max.				V
 IO devices changing during operation (partner ports), 				Yes
supported				
- Max. number of IO devices				8
per tool				
Device replacement without				Yes
swap medium				050 1 510
 Updating time 				250 µs to 512 ms (depending on the
				operating mode, see
				Manual "S7-300
				CPU 31xC and CPU 31x, Technical Data" for more
				details)
Address area				
- Inputs, max.				2 Kibyte
- Outputs, max.				2 Kibyte
• User data per address area,				
max.				
- User data consistency, max.				1 024 byte
PROFINET IO device				
• Services				
- PG/OP communication				Yes
- Routing				Yes
- S7 communication				Yes; With loadable FBs,
				max. configurable connections: 14, max.
				number of instances: 32

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
PROFINET IO device				
- Isochronous mode - Open IE communication				No Yes; Via TCP/IP, ISO on TCP, UDP
- IRT, supported - PROFlenergy, supported				Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
- Shared device, supported - Number of IO controllers with shared device, max.				Yes 2
Transfer memory Inputs, max.				1 440 byte; Per IO controller with shared device
- Outputs, max.				1 440 byte; Per IO controller with shared device
SubmodulesNumber, max.User data per submodule,				64 1 024 byte
max.				1 024 byte
PROFINET CBA				Voc
acyclic transmissioncyclic transmission				Yes Yes
Open IE communication Open IE communication, supported				Yes
 Number of connections, max. Local port numbers used at the system end 				8 0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
• Keep-alive function, supported				Yes
Isochronous mode				
Isochronous mode			Yes	Yes; Via PROFIBUS DP or PROFINET interface
Programming				
Programming language • STEP 7	Yes; V5.2 SP1 or higher	Yes; V5.2 SP1 or higher	Yes; V5.2 SP1 or higher	Yes; V5.5 or higher
• LAD	with HW update Yes	with HW update Yes	with HW update Yes	Yes
• FBD	Yes	Yes	Yes	Yes
• STL	Yes	Yes	Yes	Yes
• SCL	Yes	Yes	Yes	Yes
• CFC		Yes	Yes	Yes
• GRAPH	Yes	Yes	Yes	Yes
• HiGraph [®]	Yes	Yes	Yes	Yes
Command set	See instruction list	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8	8
Know-how protection • User program protection/ password protection	Yes	Yes	Yes	Yes
Block encryption				Yes; with S7 block privacy
System functions (SFC)	see instruction list	see instruction list	see instruction list	see instruction list
System function blocks (SFB)	see instruction list	see instruction list	see instruction list	see instruction list

Standard CPUs

	6ES7 312-1AE14-0AB0	6ES7 314-1AG14-0AB0	6ES7 315-2AH14-0AB0	6ES7 315-2EH14-0AB0
Environmental requirements				
Operating temperature • Min.				0 °C
Dimensions and weight				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
• Depth	130 mm	130 mm	130 mm	130 mm
Weight				
 Weight, approx. 	270 g	280 g	290 g	340 g

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
Product version			
associated programming package	STEP 7 V 5.2 or higher + SP 1 with HW update	STEP7 V 5.5 or higher	STEP7 V 5.5 or higher
Supply voltages			
Rated value			
• permissible range, lower limit (DC)	20.4 V	20.4 V	19.2 V
external protection for supply cables (recommendation)	Min. 2 A	Min. 2 A	Min. 2 A
Current consumption Current consumption (rated value)	850 mA	750 mA	1 250 mA
Current consumption (in no-load operation), typ.	100 mA	150 mA	500 mA
Inrush current, typ.	2.5 A	4 A	4 A
l²t	1 A ² ·s	1 A ² ·s	1.2 A ² ·s
Power losses			
Power loss, typ.	4 W		14 W
 Memory Work memory integrated expandable Size of retentive memory for retentive data blocks 	512 Kibyte; For program and data No 256 Kibyte	1 024 Kibyte No 256 Kibyte	2 048 Kibyte No 700 Kibyte
Load memory • pluggable (MMC) • pluggable (MMC), max.	Yes 8 Mbyte	Yes 8 Mbyte	Yes 8 Mbyte
Backup			
• present	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes
without battery	Yes; Program and data	Yes; Program and data	Yes
CPU-blocks DB			
• Number, max.	2 047; Number band: 1 to 2047	2 048; Number range: 1 to 16000	4 096; Number range: 1 to 16000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
Number, max.	2 048; Sequence of numbers: 0 to 2047	2 048; Number range: 0 to 7999	4 096; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
Number, max.	2 048; Sequence of numbers: 0 to 2047	2 048; Number range: 0 to 7999	4 096; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
ОВ			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte

Standard CPUs

Nesting depth • per priority class • additional within an error OB CPU processing times for bit operations, min. for word operations, min. for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter • Number • Retentivity - adjustable - lower limit - upper limit • Counting range	16 4 0.05 μs 0.2 μs 0.2 μs 1 μs 512 Yes 0	16 4 0.025 μs 0.03 μs 0.04 μs 0.16 μs	16 4 0.004 μs 0.01 μs 0.01 μs 0.04 μs
 additional within an error OB CPU processing times for bit operations, min. for word operations, min. for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity adjustable lower limit upper limit 	4 0.05 μs 0.2 μs 0.2 μs 1 μs 512 Yes	0.025 μs 0.03 μs 0.04 μs 0.16 μs	0.004 μs 0.01 μs 0.01 μs 0.04 μs
CPU processing times for bit operations, min. for word operations, min. for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity - adjustable - lower limit - upper limit	0.05 μs 0.2 μs 0.2 μs 1 μs 512 Yes	0.025 μs 0.03 μs 0.04 μs 0.16 μs	0.004 μs 0.01 μs 0.01 μs 0.04 μs
for bit operations, min. for word operations, min. for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity adjustable lower limit upper limit	0.2 μs 0.2 μs 1 μs 512 Yes	0.03 μs 0.04 μs 0.16 μs	0.01 μs 0.01 μs 0.04 μs
for word operations, min. for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity adjustable lower limit upper limit	0.2 μs 0.2 μs 1 μs 512 Yes	0.03 μs 0.04 μs 0.16 μs	0.01 μs 0.01 μs 0.04 μs
for fixed point arithmetic, min. for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity - adjustable - lower limit - upper limit	0.2 μs 1 μs 512 Yes	0.04 μs 0.16 μs	0.01 μs 0.04 μs
for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity adjustable lower limit upper limit	0.2 μs 1 μs 512 Yes	0.16 μs	0.04 μs
for floating point arithmetic, min. Counters, timers and their retentivity S7 counter Number Retentivity adjustable lower limit upper limit	1 μs 512 Yes	0.16 μs	0.04 μs
Counters, timers and their retentivity S7 counter • Number • Retentivity - adjustable - lower limit - upper limit	512 Yes		·
retentivity S7 counter • Number • Retentivity - adjustable - lower limit - upper limit	Yes	512	2 048
NumberRetentivityadjustablelower limitupper limit	Yes	512	2 048
Retentivityadjustablelower limitupper limit	Yes	512	2 048
adjustablelower limitupper limit			
- lower limit - upper limit			
- lower limit - upper limit		Yes	Yes
- upper limit		0	0
	511	511	2 047
- Counting range	· · ·		20
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
	999	999	999
- upper limit	999	999	999
IEC counter			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
S7 times			
Number	512	512	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
	511	511	2 047
- upper limit			
- preset	no retentivity	no retentivity	no retentivity
• Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Data areas and their retentivity			
Flag			
Number, max.	4 096 byte	4 096 byte	8 192 byte
Retentivity available	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 8191
*	*		
Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks			
Number, max.	2 047; Number range: 1 to 2047	2 048; Number range: 1 to 16000	4 096; Number range: 1 to 16000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Retentivity adjustable	Yes; via non-retain property on DB	Yes; via non-retain property on DB	Yes; via non-retain property on DE
Retentivity preset	Yes	Yes	Yes
Local data			
• per priority class, max.	1 024 byte	32 768 byte; 2048 bytes max. per	32 768 byte; 2048 bytes max. per
por priority olass, max.	1 SET DYTO	block	block
Address area			
Address area			
I/O address area	0.4001	0.4001	0.4001
• overall	8 192 byte	8 192 byte	8 192 byte
Outputs	8 192 byte	8 192 byte	8 192 byte
of which, distributed			
- Inputs	8 192 byte	8 192 byte	8 192 byte
- Outputs	8 192 byte	8 192 byte	8 192 byte

Standard CPUs

Technical specifications (contin	<u> </u>	000000000000000000000000000000000000000	0505040.05104.045
	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
Process image			
• Inputs	2 048 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte	8 192 byte
• Inputs, adjustable	2 048 byte	8 192 byte	8 192 byte
Outputs, adjustable	2 048 byte	8 192 byte	8 192 byte
• Inputs, preset	256 byte	256 byte	256 byte
Outputs, preset	256 byte	256 byte	256 byte
Subprocess images			
Number of subprocess images, max.	1	1; With PROFINET IO, the length of the user data is limited to 1600 bytes	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels			
• Inputs	65 536	65 536	65 536
Outputs	65 536	65 536	65 536
 Inputs, of which central 	1 024	1 024	1 024
 Outputs, of which central 	1 024	1 024	1 024
Analog channels			
• Inputs	4 096	4 096	4 096
Outputs	4 096	4 096	4 096
 Inputs, of which central 	256	256	256
Outputs, of which central	256	256	256
Hardware configuration			
Central devices, max.	1	1	
Expansion devices, max.	3	3	
Racks, max.	4	4	4
Modules per rack, max.	8	8	8
Number of DP masters			
 integrated 	2	1	2
• via CP	4	4	4
Number of operable FMs and CPs			
(recommended)			
• FM	8	8	8
CP, point-to-point	8	8	8
• CP, LAN	10	10	10
Time			
Clock			
 Hardware clock (real-time clock) 	Yes	Yes	Yes
 battery-backed and synchronizable 	Yes	Yes	Yes
 Behavior of the clock following 	Clock continues running after	Clock continues running after	Clock continues running after
POWER-ON	POWER OFF	POWER OFF	POWER OFF
Behavior of the clock following	The clock continues at the time of	The clock continues at the time of	The clock continues at the time of
expiry of backup period	day it had when power was switched off	day it had when power was switched off	day it had when power was switched off
Deviation per day, max.	10 s	10 s; Typ.: 2 s	10 s; Typ.: 2 s
Runtime meter		7 71	, 51
Number	4	4	4
Number/Number range	0 to 3	0 to 3	0 to 3
Range of values	0 to 2^31 hours (when using	0 to 2^31 hours (when using	0 to 2^31 hours (when using
	SFC 101)	SFC 101)	SFC 101)
Granularity	1 hour	1 hour	1 hour
Retentive	Yes; Must be restarted at each	Yes; Must be restarted at each	Yes; Must be restarted at each
	restart	restart	restart
Clock synchronization			
supported	Yes	Yes	Yes
 to MPI, master 	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
• to DP, master	Yes; on DP slave only time-of-day	Yes; on DP slave only time-of-day	Yes; on DP slave only time-of-day
. 55	slave	slave	slave
• to DP, slave	Yes	Yes	Yes
• in AS, master	Yes	Yes	Yes
• in AS, slave	Yes	Yes	Yes
on Ethernet via NTP	No	Yes; as client	Yes; as client

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
S7 message functions			
Number of login stations for message functions, max.	32; Depending on the connections configured for PG/OP and S7 basic communication	32; Depending on the connections configured for PG/OP and S7 basic communication	32; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes
simultaneously active Alarm-S blocks, max.	60	300	300
Test commissioning functions Status/control • Status/control variable • Variables • Number of variables, max. • of which status variables, max. • of which control variables, max.	Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14	Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14	Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14
Forcing • Forcing	Yes	Yes	Yes
Status block	Yes	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously
Single step	Yes	Yes	Yes
Number of breakpoints	2	4	4
Diagnostic buffer Present Number of entries, max. adjustable Of which powerfail-proof Number of entries readable in RUN, max.	Yes 100 No 100	Yes 500 No 100; Only the last 100 entries are retained 499	Yes 500 No 100 499
- adjustable - preset		Yes; From 10 to 499 10	Yes; From 10 to 499 10
Service data • can be read out		Yes	Yes
Monitoring functions Status LEDs		Yes	Yes
Communication functions PG/OP communication	Yes	Yes	Yes
Data record routing	No	Yes	Yes
Routing	Yes	Yes	Yes
Global data communication • supported • Size of GD packets, max.	Yes 22 byte	Yes 22 byte	Yes 22 byte
S7 basic communication • supported	Yes	Yes	Yes
S7 communication • supported	Yes	Yes	Yes
S5-compatible communication • supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Web server • supported • Number of HTTP clients • User-defined websites		Yes 5 Yes	Yes 5 Yes

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
Open IE communication • TCP/IP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max Several passive connections per		16 Yes	32 Yes
port, supported ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.Data length, max.UDP		16 32 768 byte Yes; via integrated PROFINET interface and loadable FBs	32 32 768 byte Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.Data length, max.		16 1 472 byte	32 1 472 byte
Number of connections			
 overall usable for PG communication 	32 31	32 31	32 31
usable for OP communication	31	31	31
 usable for S7 basic communication 	30	30	30
• usable for S7 communication		16	16
reserved for S7 communicationAdjustable for S7 communication, min.		0	0
- Adjustable for S7 communication, max.		16	16
 Max. total number of instances usable for routing 	8	32 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24	32 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as DP maste max. 24; X2 as DP slave (active): max. 14; X3 as PROFINET: 48 max
PROFINET CBA (at set setpoint			max. 14, 70 do l'Hol ineli. 40 max
communication load) • Setpoint for the CPU communi-		50 %	20 %
cation loadNumber of remote interconnection partners		32	32
Number of functions, master/slave Total of all Master/Slave connections		30 1 000	50 3 000
Data length of all incoming connections master/slave, max.		4 000 byte	24 000 byte
 Data length of all outgoing connections master/slave, max. 		4 000 byte	24 000 byte
Number of device-internal and PROFIBUS interconnections		500	1 000
Data length of device-internal und PROFIBUS interconnections, max. Data langth paragraphism max.		4 000 byte	8 000 byte
 Data length per connection, max. Remote interconnections with acyclic transmission 		1 400 byte	1 400 byte
- Sampling frequency: Sampling time, min.		500 ms	200 ms
 Number of incoming interconnections 		100	100
- Number of outgoing interconnections		100	100
- Data length of all incoming inter- connections, max.		2 000 byte	3 200 byte
- Data length of all outgoing inter- connections, max.		2 000 byte	3 200 byte
- Data length per connection, max.		1 400 byte	1 400 byte

Standard CPUs

lecnnical specifications (contin	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
PROFINET CBA (at set setpoint	TEST OF ENGINEERS	CLOT OTT ELECT UNDO	CLOT VIO CERT I VADO
communication load)			
 Remote interconnections with cyclic transmission 			
- Transmission frequency: Trans-		10 ms	1 ms
mission interval, min.		000	200
 Number of incoming intercon- nections 		200	300
- Number of outgoing intercon-		200	300
nections - Data length of all incoming inter-		2 000 byte	4 800 byte
connections, max.		•	·
 Data length of all outgoing inter- connections, max. 		2 000 byte	4 800 byte
- Data length per connection, max.		450 byte	450 byte
 HMI variables via PROFINET (acyclic) 			
- Number of stations that can log on		3; 2x PN OPC/1x iMap	3; 2x PN OPC/1x iMap
for HMI variables (PN OPC/iMap) - HMI variable updating		500 ms	500 ms
- Number of HMI variables		200	600
- Data length of all HMI variables,		2 000 byte	9 600 byte
max.			
 PROFIBUS proxy functionality supported 		Yes	Yes
- Number of linked PROFIBUS		16	32
devices		040 lasta Olassa dasa andara	0.40 h. ta Olava dava andavat
- Data length per connection, max.		240 byte; Slave-dependent	240 byte; Slave-dependent
1st interface Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Isolated	Yes	Yes	Yes
Power supply to interface	200 mA	200 mA	150 mA
(15 to 30 V DC), max.			
Functionality	V	V	V
MPIDP master	Yes Yes	Yes Yes	Yes Yes
DP master DP slave	Yes	Yes	Yes
Point-to-point connection	No	No	No
MPI			
Number of connections	32		
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
 Global data communication 	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No	No; but via CP and loadable FB	No; but via CP and loadable FB
 S7 communication, as server 	Yes	Yes	Yes
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
DP master			
• Services	V	V.	.,
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	No	No Year I blooks only	No Vasa I blaska arku
- S7 basic communication	Yes; I blocks only	Yes; I blocks only	Yes; I blocks only
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No	No	No

Standard CPUs

Technical specifications (contin	nued)		
	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
DP master			
• Services			
- S7 communication, as server	Yes	Yes	Yes
- Equidistance mode support	Yes	Yes	Yes
- Isochronous mode	No	Yes; OB61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO	No
- SYNC/FREEZE	Yes	Yes	Yes
 Activation/deactivation of DP slaves 	Yes	Yes	Yes
 Number of DP slaves that can be simultaneously activated/ deactivated, max. 	4	8	8
- Direct data exchange (slave-to-slave communication)		Yes; As subscriber	Yes; As subscriber
- DPV1	Yes	Yes	Yes
Transmission rate, max. Neuroland FDR alarman max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.Address area	124	124	124
- Inputs, max.	8 096 byte	8 Kibyte	8 Kibyte
Outputs, max.User data per DP slave	8 096 byte	8 Kibyte	8 Kibyte
- Inputs, max.	244 byte	244 byte	244 byte
- Outputs, max.	244 byte	244 byte	244 byte
DP slave			
 Services 			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes; Only with active interface	Yes; Only with active interface	Yes; with interface active
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes
S7 communication, as clientS7 communication, as server	No Yes	No Yes; Connection configured on one	No Yes; Connection configured on one
- Direct data exchange (slave-to-slave communication)	Yes	side only Yes	side only Yes
- DPV1	No	No	No
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Transfer memory			
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
 Address area, max. 	32	32	32
User data per address area, max.	32 byte	32 byte	32 byte
2nd interface Type of interface	integrated RS 485 interface	PROFINET	integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485
Isolated	Yes	Yes	Yes
Integrated switch		Yes	
Number of ports		2	
Power supply to interface (15 to 30 V DC), max.	200 mA		200 mA
Automatic detection of transmission speed		Yes; 10/100 Mbit/s	
Autonegotiation		Yes	
Autocrossing		Yes	
Media redundancy			
• supported		Yes	
 Switchover time on line break, typically 		200 ms; PROFINET MRP	
Number of stations in the ring, max.		50	

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
Change of IP address at runtime, supported		Yes	
Functionality MPI DP master DP slave PROFINET IO controller PROFINET CBA Web server Number of HTTP clients	No Yes Yes	No No No Yes; Also simultaneously with IO device functionality Yes; Also simultaneously with IO controller functionality Yes Yes 5	No Yes Yes No No No
Local Operating Network	No		
DP master Number of connections, max. Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - Isochronous mode	Yes Yes No Yes; I blocks only Yes No Yes Yes Yes Yes; OB 61		Yes Yes No Yes; I blocks only Yes No Yes; Connection configured on one side only Yes Yes; OB 61 - isochronous mode is
 SYNC/FREEZE Activation/deactivation of DP slaves Number of DP slaves that can be simultaneously activated/deactivated, max. Direct data exchange (slave-to-slave communication) DPV1 Transmission rate, max. Number of DP slaves, max. Address area Inputs, max. 	Yes Yes 12 Mbit/s 124 8 096 byte		possible either on DP or PROFINET IO (not simultaneously) Yes Yes 8 Yes; As subscriber Yes 12 Mbit/s 124 8 Kibyte
 Outputs, max. User data per DP slave Inputs, max. Outputs, max. 	8 096 byte 244 byte 244 byte		8 Kibyte 244 byte 244 byte
- Outputs, max. DP slave Number of connections Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication, as client - S7 communication, as server	32 Yes Yes; with interface active No No No No Yes		Yes Yes; with interface active No No No No Yes; Connection configured on one
 Direct data exchange (slave-to-slave communication) DPV1 GSD file 	Yes No The current GSD file can be obtained from: www.siemens.com/profibus-gsd		No The current GSD file can be obtained from: www.siemens.com/profibus-gsd

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
DP slave			
 Transmission rate, max. 	12 Mbit/s		12 Mbit/s
 Automatic baud rate search 	Yes; only with passive interface		Yes; only with passive interface
 Transfer memory 			
- Inputs	244 byte		244 byte
- Outputs	244 byte		244 byte
Address area, max.	32		32
User data per address area, max.	32 byte		32 byte
PROFINET IO controller			
• Services			
- PG/OP communication		Yes	
- Routing		Yes	
- S7 communication		Yes; with loadable FBs, max. configurable connections: 16,	
		max. number of instances: 32	
- Isochronous mode		Yes; OB61; isochronous mode can	
		only be used alternatively on	
On an IF a service attent		PROFIBUS DP or PROFINET IO	
- Open IE communication		Yes; via TCP/IP, ISO on TCP and UDP	
a Transmission water re-			
Transmission rate, max. Number of connectable IO devices.		100 Mbit/s	
 Number of connectable IO devices, max. 		128	
Max. number of connectable IO		128	
devices for RT		123	
- of which in line, max.		128	
 Number of IO devices with IRT 		128	
and the option "high flexibility"			
- of which in line, max.		61	
Number of IO devices with IRT and the entire "bigh performance"		64	
and the option "high performance", max.			
- of which in line, max.		64	
• IRT, supported		Yes	
Shared device, supported		Yes	
 Prioritized startup supported 		Yes	
- Number of IO devices, max.		32	
 Activation/deactivation of 		Yes	
IO devices		0	
 Number of IO devices that can be simultaneously activated/ 		8	
deactivated, max.			
IO devices changing during		Yes	
operation (partner ports),			
supported			
 Max. number of IO devices per tool 		8	
Device replacement without swap		Yes	
medium		100	
Updating time		250 µs to 512 ms (depending on	
		the operating mode, see Manual	
		"S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)	
Address area		recrimical Data for more details)	
- Inputs, max.		8 Kibyte	
- Outputs, max.		8 Kibyte	
User data per address area, max.		,,,,	
- User data consistency, max.		1 024 byte	
PROFINET IO device			
Services			
- PG/OP communication		Yes	
- Routing		Yes	
- S7 communication		Yes; With loadable FBs, max.	
		configurable connections: 16,	
In a character on the		max. number of instances: 32	
- Isochronous mode		No	

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
PROFINET IO device			
• Services		V V TOD#D 100 TOD 1100	
- Open IE communication		Yes; Via TCP/IP, ISO on TCP, UDP	
IRT, supportedPROFlenergy, supported		Yes; With SFB 73 / 74 prepared for	
- Phorietietgy, supported		loadable PROFlenergy standard	
		FB for I-Device	
- Shared device, supported		Yes	
 Number of IO controllers with shared device, max. 		2	
Transfer memory			
- Inputs, max.		1 440 byte; Per IO controller with	
		shared device	
- Outputs, max.		1 440 byte; Per IO controller with shared device	
Submodules		Shared device	
- Number, max.		64	
- User data per submodule, max.		1 024 byte	
PROFINET CBA			
acyclic transmission		Yes	
 cyclic transmission 		Yes	
Open IE communication			
• Open IE communication, supported		Yes	
 Number of connections, max. 		16	
 Local port numbers used at the system end 		0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964,	
system end		65532, 65533, 65534, 65535	
 Keep-alive function, supported 		Yes	
3rd interface			
Type of interface			PROFINET
Physics			Ethernet RJ45
Isolated			Yes
Integrated switch			Yes
Number of ports			2
Automatic detection of transmission speed			Yes; 10/100 Mbit/s
Autonegotiation			Yes
Autocrossing			Yes
Media redundancy			
• supported			Yes
 Switchover time on line break, 			200 ms; PROFINET MRP
typically Number of stations in the ring, may			50
Number of stations in the ring, max. Change of IR address at runtime.			Yes
Change of IP address at runtime, supported			res
Functionality			
• MPI			No
DP master			No
DP slave PROFINET IO controller			No Yes; also simultaneously with
- I NOI INET TO CONTIONED			I-Device functionality
PROFINET IO device			Yes; also simultaneously with
PROFINET CBA			IO controller functionality
PROFINET CBA Open IE communication			Yes Yes; via TCP/IP, ISO on TCP and
- Open in communication			UDP
Web server			Yes
 Number of HTTP clients 			5

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
PROFINET IO controller			
• Services			
- Isochronous mode			Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously
Max. number of connectable IO devices for RT			256
 of which in line, max. Number of IO devices with IRT and the option "high flexibility" 			256 256
- of which in line, max.			61
 Number of IO devices with IRT and the option "high performance", max. 			64
- of which in line, max.			64
IRT, supported			Yes
 Shared device, supported 			Yes
 Prioritized startup supported 			Yes
Number of IO devices, max.Activation/deactivation of			32 Yes
IO devicesNumber of IO devices that can be simultaneously activated/deacti-			8
vated, max. • IO devices changing during			Yes
operation (partner ports), supported			8
Max. number of IO devices per tool			
 Device replacement without swap medium Send clock times 			Yes 250 μs, 500 μs,1 ms; 2 ms, 4 ms
Updating time			(not in the case of IRT with "high flexibility" option) 250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)
PROFINET IO device			<u> </u>
• Services			
- PG/OP communication			Yes
- Routing - S7 communication			Yes Yes; With loadable FBs, max. configurable connections: 16, max. number of instances: 32
- Isochronous mode - Open IE communication			No Yes; Via TCP/IP, ISO on TCP, UDP
- IRT, supported			Yes
- PROFlenergy, supported			Yes; With SFB 73 / 74 prepared fo loadable PROFlenergy standard FB for I-Device
- Shared device, supported			Yes
Number of IO controllers with shared device, max.			2
Transfer memory			
- Inputs, max.			1 440 byte; Per IO controller with shared device
- Outputs, max.			1 440 byte; Per IO controller with shared device
 Submodules 			
- Number, max.			64
- User data per submodule, max.			1 024 byte
PROFINET CBA			
acyclic transmission			Yes
• cyclic transmission			Yes

Standard CPUs

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK14-0AB0	6ES7 318-3EL01-0AB0
Open IE communication Open IE communication, supported Number of connections, max. Local port numbers used at the system end Keep-alive function, supported			Yes 32 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535 Yes
Isochronous mode			- 11
Isochronous mode		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
Programming			
Programming language • STEP 7	Yes; V5.2 SP1 or higher with HW update	Yes; V5.5 or higher	Yes; V5.5 or higher
• LAD • FBD • STL	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
• SCL	Yes	Yes	Yes
• CFC	Yes	Yes	Yes
 GRAPH HiGraph[®] 	Yes Yes	Yes Yes	Yes Yes
Command set	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8
Know-how protection • User program protection/password protection • Block encryption	Yes	Yes Yes; with S7 block privacy	Yes Yes; with S7 block privacy
System functions (SFC)	see instruction list	see instruction list	see instruction list
System function blocks (SFB)	see instruction list	see instruction list	see instruction list
Environmental requirements Operating temperature • Min.		0 ℃	0 ℃
Dimensions and weight Dimensions • Width • Height • Depth Weight	80 mm 125 mm 130 mm	40 mm 125 mm 130 mm	120 mm 125 mm 130 mm
Weight, approx.	460 g	340 g	1 250 g

Standard CPUs

Ordering data	Order No.		Order No.
CPU 312	6ES7 312-1AE14-0AB0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
32 KB work memory, 24 V DC power supply, MPI; MMC required		Electronic manuals on DVD, multi- lingual: LOGO!, SIMADYN, SIMATIC bus components,	
CPU 314	6ES7 314-1AG14-0AB0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
128 KB work memory, 24 V DC power supply, MPI; MMC required		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC	
CPU 315-2 DP	6ES7 315-2AH14-0AB0	- S7, SIMATIC Software, SIMATIC TDC	
256 KB work memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, MMC required		SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD	6ES7 998-8XC01-8YE2
CPU 315-2 PN/DP	6ES7 315-2EH14-0AB0	 and the three subsequent updates 	
384 KB work memory, 24 V DC		Power supply connector	6ES7 391-1AA00-0AA0
power supply, combined MPI/ PROFIBUS DP master/slave		10 units, spare part	
interface, Ethernet/PROFINET interface with 2-port switch; MMC required		Manual "Communication for SIMATIC S7-300/-400"	
CPU 317-2 DP	6ES7 317-2AJ10-0AB0	German	6ES7 398-8EA00-8AA0
512 KB work memory, 24 V DC		English	6ES7 398-8EA00-8BA0
power supply, MPI, PROFIBUS DP master/slave interface, MMC		French	6ES7 398-8EA00-8CA0
required		Spanish	6ES7 398-8EA00-8DA0
CPU 317-2 PN/DP	6ES7 317-2EK14-0AB0	Italian	6ES7 398-8EA00-8EA0
1 MB work memory, 24 V DC		SIMATIC S7 training case	6ES7 910-3AA00-0XA0
power supply, combined MPI/ PROFIBUS DP master/slave interface, Ethernet/PROFINET		With mounting components for mounting S7-200 and S7-300	
interface with 2-port switch; MMC required		PC adapter USB	6ES7 972-0CB20-0XA0
CPU 319-3 PN/DP	6ES7 318-3EL01-0AB0	For connecting a PC to SIMATIC S7-200/300/400 via USB; with USB cable (5 m)	
1.4 MB work memory, 24 V DC power supply, combined MPI/		PROFIBUS bus components	
PROFIBUS DP master/slave interface, PROFIBUS DP master/ slave interface, Ethernet/ PROFINET interface with 2-port switch; MMC required		RS 485 PROFIBUS DP bus connector • With 90° cable outlet, max. transmission rate 12 Mbit/s - Without PG interface	6ES7 972-0BA12-0XA0
SIMATIC Micro Memory Card		- With PG interface	6ES7 972-0BB12-0XA0
64 KB	6ES7 953-8LF20-0AA0	 With 90° cable outlet for FastConnect connection 	
128 KB	6ES7 953-8LG20-0AA0	system, max. transmission rate	
512 KB	6ES7 953-8LJ20-0AA0	12 Mbit/s - Without PG interface, 1 unit	6ES7 972-0BA52-0XA0
2 MB	6ES7 953-8LL20-0AA0	- Without PG interface, 100 units	6ES7 972-0BA52-0XB0
4 MB	6ES7 953-8LM20-0AA0	- With PG interface, 1 unit	6ES7 972-0BB52-0XA0
8 MB	6ES7 953-8LP20-0AA0	- With PG interface, 100 units	6ES7 972-0BB52-0XB0
MPI cable	6ES7 901-0BF00-0AA0	With axial cable outlet for	6GK1 500-0EA02
For connecting SIMATIC S7 and the PG through MPI; 5 m in length		SIMATIC OP, for connecting to PPI, MPI, PROFIBUS PROFIBUS Fast Connect bus	6XV1 830-0EH10
Slot number plates	6ES7 912-0AA00-0AA0	cable	OATT GOO GETTIO
S7-300 manual		Standard type with special design	
Design, CPU data, module data, instruction list		for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum	
German	6ES7 398-8FA10-8AA0	ordering quantity 20 m	0007 070 04 400 01/10
English	6ES7 398-8FA10-8BA0	RS 485 repeater for PROFIBUS Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure	6ES7 972-0AA02-0XA0
		D: Subject to export regulations AL:	N and ECCN- 5D002
		D. Subject to export regulations AL.	IN AND LOCK, JUSSE

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Standard CPUs

Ordering data	Order No.		Order No.
PROFINET bus components		IE FC RJ45 Plugs	
IE FC TP standard cable GP 2x2	6XV1 840-2AH10	RJ45 plug connector for Industrial Ethernet with a rugged metal	
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval;		enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
sold by the meter		IE FC RJ45 Plug 145	
FO standard cable GP (50/125)	6XV1 873-2A	145° cable outlet	
Standard cable, splittable, UL		1 unit	6GK1 901-1BB30-0AA0
approval, sold by the meter		10 units	6GK1 901-1BB30-0AB0
SCALANCE X204-2 Industrial Ethernet Switch	6GK5 204-2BB10-2AA3	50 units	6GK1 901-1BB30-0AE0
Industrial Ethernet Switches with		IE FC RJ45 Plug 180	
integral SNMP access, Web		180° cable outlet	
diagnostics, copper cable diagnostics and PROFINET		1 unit	6GK1 901-1BB10-2AA0
diagnostics for configuring line,		10 units	6GK1 901-1BB10-2AB0
star and ring topologies; four 10/100 Mbit/s RJ45 ports and two		50 units	6GK1 901-1BB10-2AE0
FO ports	6GK7 377-1AA00-0AA0	PROFIBUS/PROFINET bus components	see Catalogs IK PI, CA 01
CSM 377 compact wwitch module	6GR7 377-1AAUU-UAAU	For establishing MPI/PROFIBUS/ PROFINET communication	
Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three other participants to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM		THO INCLUDING THE INCLUDING	

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-300

Central processing units

SIPLUS Standard CPUs

Overview SIPLUS CPU 314



- For plants with medium program scope requirements
- High processing performance in binary and floating-point

SIMATIC Micro Memory Card required for operation of the CPU.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 314		
Order number	6AG1 314-1AG14-2AY0	6AG1 314-1AG14-7AB0
Order No. based on	6ES7 314-1AG14-0AB0	6ES7 314-1AG14-0AB0
Ambient temperature range	-25 +60 °C	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions	
Compliant with the standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes No	
Ambient conditions		

Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1$ ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOx < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS CPU 314	
(extended temperature range and medial exposure)	
Work memory 128 KB, power H supply 24 V DC, MPI; MMC required	6AG1 314-1AG14-7AB0
Additional conformance with H EN 50155	6AG1 314-1AG14-2AY0
Accessories	See SIMATIC CPU 314, page 5/30

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS Standard CPUs

Overview SIPLUS CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O configuration
- For setting up distributed I/O structures

SIMATIC Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 315-2AH14-2AY0	6AG1 315-2AH14-7AB0
Order No. based on	6ES7 315-2AH14-0AB0	6ES7 315-2AH14-0AB0
Ambient temperature range	-25 +60 °C	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the e	lectronic components
Technical data	The technical data of the standard product app	olies except for the ambient conditions
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	No
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold	d and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) (2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 inclu	ding conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 315-2 DP		Accessories	See SIMATIC CPU 315-2 DP,
(extended temperature range and medial exposure)			page 5/30
Work memory 256 KB, power H supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	6AG1 315-2AH14-7AB0		
Additional conformance with H EN 50155	6AG1 315-2AH14-2AY0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-300

Central processing units

SIPLUS Standard CPUs

Overview SIPLUS CPU 315-2 PN/DP



- The CPU with medium-sized program memory and quantity structure
- High processing performance in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- · Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 315-2EH14-2AY0	6AG1 315-2EH14-7AB0	
Order No. based on	6ES7 315-2EH14-0AB0	6ES7 315-2EH14-0AB0	
Ambient temperature range	-25 +60 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards an	d the electronic components	
Technical data	The technical data of the standard prod	duct applies except for the ambient conditions	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	No	
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3E	32 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 35	64 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) sec 795 658 hPa (+2000 +3500 m) der 658 540 hPa (+3500 +5000 m) der	rating 10 K	

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 315-2 PN/DP		Accessories	See SIMATIC CPU 315-2 PN/DP,
(extended temperature range and medial exposure)			page 5/30
Work memory 384 KB, power supply 24 V DC, combined MPI/ PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6AG1 315-2EH14-7AB0		
Additional conformance with EN 50155	6AG1 315-2EH14-2AY0		

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS Standard CPUs

Overview SIPLUS CPU 317-2 PN/DP



- The CPU with a large program memory and quantity structure for demanding applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET

- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO controller for operating distributed I/Os on PROFINET
- For cross-sector automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- For comprehensive I/O configuration
- For setting up distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP master/slave interface
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 317-2EK13-2AB0	6AG1 317-2EK13-2AY0		
Order No. based on	6ES7 317-2EK13-0AB0	6ES7 317-2EK13-0AB0		
Ambient temperature range	-25 +70 °C			
Conforms with standard for electronic equipment used on rolling stock (EN 50155)	No	Yes		
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical specifications	The technical data of the standard product applies except for the ambient conditions.			
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	e 1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K			

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

Technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 317-2 PN/DP		Accessories	See SIMATIC CPU 317-2 PN/DP,
(extended temperature range and medial exposure)			page 5/30
Work memory 512 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	6AG1 317-2EK13-2AB0		
Additional conformance with H EN 50155	6AG1 317-2EK13-2AY0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-300

Central processing units

Compact CPUs

Overview CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with demanding requirements for processing performance
- · With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 313C-2 PtP



- The compact CPU with integrated digital inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 313C



- The compact CPU with integral digital and analog inputs/ outputs
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

SIMATIC S7-300

Central processing units

Compact CPUs

Overview CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/ outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- · With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/ outputs and PROFIBUS DP master/slave interface
- · With technological functions
- For tasks with special functions
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/ outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O controller
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)
- Integrated Web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

Compact CPUs

Technical specifications				
	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Product version associated programming package	STEP 7 V5.3 SP2 or higher with HW update	STEP 7 V5.3 SP2 or higher with HW update	STEP 7 V5.3 SP2 or higher with HW update	STEP 7 V5.3 SP2 or higher with HW update
Supply voltages	·		·	<u> </u>
Rated value • permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
external protection for supply cables (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Current consumption Current consumption (rated value)	500 mA	700 mA	700 mA	900 mA
Current consumption (in noload operation), typ.	60 mA	150 mA	100 mA	100 mA
Inrush current, typ.	11 A	11 A	11 A	11 A
l²t	0.7 A ² ·s			
from supply voltage L+, max.	500 mA	700 mA	700 mA	900 mA
Power losses	6 W	14 W	10 W	10 W
Power loss, typ. Memory	O VV	14 VV	TO VV	TO VV
Work memory				
• integrated	32 Kibyte; For program and data	64 Kibyte; For program and data	64 Kibyte; For program and data No	64 Kibyte; For program and data No
expandable Load memory	No	No	INO	INO
• pluggable (MMC)	Yes	Yes	Yes	Yes
• pluggable (MMC), max.	4 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
Backup present	Yes; guaranteed by MMC (maintenance-free)			
• without battery	Yes; Program and data			
CPU-blocks DB • Number, max. • Size, max.	511; Number range: 1 to 511 16 Kibyte			
FB	,	,	,	,
Number, max. Size, max.	1 024; Sequence of numbers: 0 to 2047 16 Kibyte	1 024; Sequence of numbers: 0 to 2047 16 Kibyte	1 024; Sequence of numbers: 0 to 2047 16 Kibyte	1 024; Sequence of numbers: 0 to 2047 16 Kibyte
FC • Number, max.	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047
• Size, max.	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
OB • Size, max.	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
Nesting depth • per priority class • additional within an error OB	8 4	8 4	8 4	8 4
CPU processing times for bit operations, min.	0.2 μs	0.1 μs	0.1 μs	0.1 μs
for word operations, min.	0.4 μs	0.2 μs	0.2 μs	0.2 μs
for fixed point arithmetic, min.	5 µs	2 µs	2 µs	2 μs
for floating point arithmetic, min.	6 µs	3 µs	3 µs	3 µs

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Counters, timers and their				
retentivity				
S7 counter	400	0.50	050	050
Number	128	256	256	256
 of which retentive without battery 				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	127	255	255	255
Retentivity				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	127	255	255	255
Counting range				
- lower limit	0	0	0	0
- upper limit	999	999	999	999
EC counter				
• present	Yes	Yes	Yes	Yes
Type	SFB	SFB	SFB	SFB
S7 times				
 Number 	128	256	256	256
 Retentivity 				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	127	255	255	255
- preset	no retentivity	no retentivity	no retentivity	no retentivity
Time range				
- lower limit	10 ms	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s	9 990 s
IEC timer				
present	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB
Data areas and their				
retentivity				
Flag				
 Number, max. 	128 byte	256 byte	256 byte	256 byte
Retentivity available	Yes; MB 0 to MB 127	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255
 Number of clock memories 	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks				
Number, max.	511; from DB1 to DB511	511; from DB1 to DB511	511; Number range:	511; Number range:
			1 to 511	1 to 511
• Size, max.	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
 Retentivity adjustable 	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain
Retentivity preset	property on DB	property on DB	property on DB	property on DB
	yes	yes	yes	yes
Local data	0501	5.01	5.01	5404
per priority class, max.	256 byte	510 byte	510 byte	510 byte
Address area				
/O address area				
overall	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte
Outputs	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte
of which, distributed				
- Inputs			none	1 006 byte; max.
- Outputs			none	1 006 byte; max.
Process image				
Inputs	128 byte	128 byte	128 byte	128 byte
Outputs	128 byte	128 byte	128 byte	128 byte

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Digital channels				
Inputs	266	1 016	1 008	8 064
Outputs	262	1 008	1 008	8 064
Inputs, of which central	266	1 016	1 008	1 008
Outputs, of which central	262	1 008	1 008	1 008
<u> </u>	202	1 000	1 000	1 000
nalog channels				
Inputs	64	253	248	503
Outputs	64	250	248	503
Inputs, of which central	64	253	248	248
Outputs, of which central	64	250	248	248
ardware configuration				
entral devices, max.	1	1	1	1
xpansion devices, max.	0	3	3	3
acks, max.	1	4	4	4
lodules per rack, max.	8	8; in rack 3 max. 7	8; in rack 3 max. 7	8; in rack 3 max. 7
	0	o, iii iack 3 iiiax. I	o, iii iack 3 iiiax. 7	o, iii rack o max. <i>i</i>
umber of DP masters				
integrated	none	none	No	1
via CP	4	4	4	4
umber of operable FMs				
nd CPs (recommended)				
FM	8	8	8	8
CP, point-to-point	8	8	8	8
CP, LAN	4	6	6	6
ime				
lock				
Hardware clock		Yes	Yes	Yes
(real-time clock)		163	163	163
Software clock	Yes			
battery-backed and	No	Yes	Yes	Yes
synchronizable	110	163	103	163
Deviation per day, max.	15 s	10 s	10 s	10 s
	10 0	10.0	10 0	100
untime meter		_		
Number	1	1	1	1
Number/Number range	0	0	0	0
Range of values	0 to 2^31 hours	0 to 2^31 hours	0 to 2^31 hours	0 to 2^31 hours
0 1 1	(when using SFC 101)	(when using SFC 101)	(when using SFC 101)	(when using SFC 101)
Granularity	1 hour	1 hour	1 hour	1 hour
Retentive	Yes; Must be restarted at each restart	Yes; Must be restarted at each restart	Yes; Must be restarted at each restart	Yes
	eachresian	eachrestart	eachrestart	
lock synchronization				
supported	Yes	Yes	Yes	Yes
to MPI, master	Yes	Yes	Yes	Yes
to MPI, slave	Yes	Yes	Yes	Yes
to DP, master				Yes; on DP slave only
				time-of-day slave
to DP, slave				Yes
in AS, master	Yes	Yes	Yes	Yes
7 message functions				
lumber of login stations for	6; Depending on the	8; Depending on the	8; Depending on the	8
nessage functions, max.	connections configured for	connections configured for	connections configured for	
-	PG/OP and S7 basic	PG/OP and S7 basic	PG/OP and S7 basic	
	communication	communication	communication	
rocess diagnostic	Yes	Yes	Yes	Yes
nessages				
imultaneously active Alarm-	20	20	20	20
blocks, max.				

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Test commissioning				
unctions				
Status/control	Voc	Vaa	Vaa	Voo
Status/control variable	Yes	Yes	Yes	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters			
Number of variables, may		30		30
Number of variables, max.	30 30	30	30	
of which status variables, max.	30	30	30	30
of which control variables,	14	14	14	14
max.	14	14	14	14
Forcing	V	V	V	V
Forcing	Yes	Yes	Yes	Yes
Status block	Yes	Yes	Yes	Yes
Single step	Yes	Yes	Yes	Yes
Number of breakpoints	2	2	2	2
•	2	2	2	2
Diagnostic buffer	-			.,
Present	Yes	Yes	Yes	Yes
Number of entries, max.	100	100	100	100
- adjustable				No
Communication functions				
PG/OP communication	Yes	Yes	Yes	Yes
·				1.1
Routing	No	No	No	Yes
Blobal data communication				
supported	Yes	Yes	Yes	Yes
Size of GD packets, max.	22 byte	22 byte	22 byte	22 byte
87 basic communication				
supported	Yes	Yes	Yes; Server	Yes
	103	100	100, 001 101	100
67 communication				
supported	Yes	Yes	Yes	Yes
S5-compatible communi-				
cation				
supported	Yes; via CP and loadable			
	FC	FC	FC	FC
Number of connections				
overall	6	8	8	8
usable for PG communi-	5	7	7	7
cation				
usable for OP communi-	5	7	7	7
cation				
usable for S7 basic	2	4	4	4
communication				
usable for routing	No	No	No	4; max.
Connection method				
equired front connector	1x 40-pin	2x 40-pin	1x 40-pin	1x 40-pin
MPI				
Cable length, max.	50 m; without repeater			
	oo iii, wiliiodi lopcalci	55 m, without repeater	55 m, without repeater	55 m, without repeater
Point-to-point			1 000	
Point-to-point			1 200 m	
Point-to-point Cable length, max.			1 200 m	
Point-to-point Cable length, max. ntegrated protocol driver			1 200 m	
Point-to-point Cable length, max. ntegrated protocol driver 9 3964 (R)		_	Yes	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII			Yes Yes	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII RK512			Yes	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII RK512 Fransmission speed,			Yes Yes	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII RK512 Transmission speed, RS 422/485			Yes Yes No	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII RK512 Transmission speed, RS 422/485 With 3964 (R) protocol,			Yes Yes No 38.4 Kbit/s half duplex;	
Point-to-point Cable length, max. Integrated protocol driver 3964 (R) ASCII RK512 Transmission speed, RS 422/485			Yes Yes No	

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
1st interface				
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
Isolated	No	No	No	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA
Functionality • MPI • DP master	Yes No No	Yes No No	Yes No	Yes No No
DP slavePoint-to-point connection	No No	No	No No	No
MPI	110	140	110	110
Number of connectionsServices	6	8	8	8
PG/OP communicationRoutingGlobal data communication	Yes No Yes	Yes No Yes	Yes No Yes	Yes Yes Yes
- S7 basic communication - S7 communication - S7 communication, as client	Yes Yes No	Yes Yes No	Yes Yes No	Yes Yes No
 S7 communication, as server 	Yes	Yes	Yes	Yes
Transmission rate, max.	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s
2nd interface Type of interface			integrated RS 422/ 485 interface	integrated RS 485 interface
Physics			RS 422/RS 485 (X.27)	RS 485
Isolated			Yes	Yes
Power supply to interface (15 to 30 V DC), max.			No	200 mA
Number of connection resources			none	8
Functionality MPI DP master DP slave PROFINET IO controller PROFINET CBA Local Operating Network			No No No No No Yes	No Yes Yes No No

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
OP master				
 Number of connections, 				8; for PG / OP communi-
max.				cation
Number of connections				1 for PG, 1 for OP
(of which reserved), max.				
Services				V
- PG/OP communication				Yes
- Routing				Yes
 Global data communi- cation 				No
- S7 basic communication				Yes; I blocks only
- S7 communication				Yes
- S7 communication, as				No
client				110
- S7 communication, as				Yes
server				
- Equidistance mode				Yes
support				
- Isochronous mode				No
- SYNC/FREEZE				Yes
 Activation/deactivation of DP slaves 				Yes
- Direct data exchange				Yes
(slave-to-slave communi-				ies
cation)				
- DPV1				Yes
Transmission rate, max.				12 Mbit/s
Number of DP slaves, max.				32
Address area				
- Inputs, max.				1 Kibyte
- Outputs, max.				1 Kibyte
User data per DP slave				
- Inputs, max.				244 byte
- Outputs, max.				244 byte
OP slave				
Number of connections				8
Services				
- PG/OP communication				Yes
- Routing				Yes; Only with active
				interface
 Global data communi- cation 				No
- S7 basic communication				No
- S7 communication, as				No
client				1 40
- S7 communication, as				Yes
server				
- Direct data exchange				Yes
(slave-to-slave communi-				
cation) - DPV1				No
GSD file				No The current GSD file can
GSD lile				be obtained from:
				www.siemens.com/
				profibus-gsd
Transmission rate, max.				12 Mbit/s
Automatic baud rate				Yes; only with passive
search				interface
Transfer memory				
- Inputs				244 byte
- Outputs				244 byte
Address area, max.				32
 User data per address area, max. 				32 byte
arca, IIIax.				

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Programming				
Programming language				
STEP 7	Yes; V5.3 SP2 with HW update	Yes; V5.3 SP2 with HW update	Yes; V5.2 SP1 with HW update	Yes; V5.3 SP2 with HW update
LAD	Yes	Yes	Yes	Yes
FBD	Yes	Yes	Yes	Yes
STL	Yes	Yes	Yes	Yes
SCL	Yes	Yes	Yes	Yes
GRAPH	Yes	Yes	Yes	Yes
HiGraph [®]	Yes	Yes	Yes	Yes
ommand set	see instruction list	see instruction list	see instruction list	see instruction list
esting levels	8	8	8	8
now-how protection				
User program protection/ password protection	Yes	Yes	Yes	Yes
ystem functions (SFC)	see instruction list	see instruction list	see instruction list	see instruction list
ystem function blocks (SFB)	see instruction list	see instruction list	see instruction list	see instruction list
igital inputs				
lumber of digital inputs	10	24	16	16
of which, inputs usable for	8	12	12	12
technological functions				
lumber of simultaneously				
ontrollable inputs				
horizontal installation				
- up to 40 °C, max.	10	24	16	16
- up to 60 °C, max.	5	12	8	8
vertical installation				
- up to 40 °C, max.	5	12	8	8
Technological functions				
- shielded, max.	100 m	100 m	100 m	100 m
- unshielded, max.	not allowed	not allowed	not allowed	not allowed
Standard DI				
- shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
- unshielded, max.	600 m	600 m	600 m	600 m
nput characteristic curve cc. to IEC 1131, Type 1	Yes	Yes	Yes	Yes
nput voltage				
Rated value, DC	24 V	24 V	24 V	24 V
for signal "0"	-3 to +5 V			
for signal "1"	15 to 30 V			
put current				
for signal "1", typ.	9 mA	9 mA	9 mA	9 mA
put delay (for rated value				
input voltage)				
for standard inputs				
- parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms
- Rated value	3 ms	3 ms	3 ms	3 ms
for counter/technological				
functions	49 110	16.00	16.00	16.00
- at "0" to "1", max.	48 μs	16 μs	16 μs	16 µs
able length	1 000 m; 100 m for	1 000 m: 100 m for	1 000 m; 100 m for	1 000 m: 100 m for
Cable length, shielded, max.	technological functions	technological functions	technological functions	technological functions
Cable length unshielded,	600 m; For technological	600 m; For technological	600 m; For technological	600 m; For technologica
ouble length dilbilielded,	ood iii, i oi iddiiiddylddi	550 m, r or technological	550 m, i oi lecimological	550 m, r or technologica

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Digital outputs Number of digital outputs of which high-speed outputs	6 2	16 4	16 4	16 4
Short-circuit protection • Response threshold, typ.	Yes; electronically switched 1 A			
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)
Lamp load, max.	5 W	5 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes	Yes
Output voltage • for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current • for signal "1" rated value • for signal "1" permissible range, min.	500 mA 5 mA	500 mA 5 mA	500 mA 5 mA	500 mA 5 mA
 for signal "1" permissible range, max. for signal "1" minimum load 	0.6 A 5 mA	0.6 A 5 mA	0.6 A 5 mA	0.6 A 5 mA
currentfor signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No Yes	No Yes	No Yes	No Yes
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • of the pulse outputs, with resistive load, max.	100 Hz 0.5 Hz 100 Hz 2.5 kHz			
Aggregate current of outputs (per group) • horizontal installation - up to 40 °C, max. - up to 60 °C, max. • vertical installation - up to 40 °C, max.	2 A 1.5 A 1.5 A	3 A 2 A 2 A	3 A 2 A 2 A	3 A 2 A 2 A
Load resistance range • lower limit • upper limit	48 Ω 4 kΩ	48 Ω 4 kΩ	48 Ω 4 kΩ	48 Ω 4 kΩ
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m			

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Analog inputs Number of analog inputs for voltage/current measurement		4		
Number of analog inputs for resistance/temperature measurement		1		
Cable length, shielded, max.		100 m		
permissible input frequency for current input (destruction limit), max.		5 V; permanent		
permissible input current for voltage input (destruction limit), max.		0.5 mA; permanent		
Technical unit for temperature measurement adjustable		Yes; Degrees Celsius / degrees Fahrenheit / Kelvin		
Input ranges (rated values), voltages • 0 to +10 V • -10 V to +10 V		Yes Yes		
Input ranges (rated values), currents • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA		Yes Yes Yes		
Input ranges (rated values), resistance thermometers • Pt 100		Yes		
Input ranges (rated values), resistors No-Load voltage, typ. Measured current, typ. 0 to 600 Ohm		2.5 V 1.8 to 3.3 mA Yes		
Voltage input • permissible input voltage for voltage input (destruction limit), max.		30 V; permanent		
Current input • permissible input current for current input (destruction limit), max.		50 mA; permanent		
Characteristic linearization • parameterizable • for resistance thermometer		Yes; by software Pt 100		
Temperature compensation • Temperature compensation parameterizable		No		

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Analog outputs Number of analog outputs		2		
Cable length, shielded, max.		200 m		
Voltage output, short-circuit protection		Yes		
Voltage output, short-circuit current, max.		55 mA		
Current output, no-load voltage, max.		17 V		
Output ranges, voltage • 0 to 10 V • -10 to +10 V		Yes Yes		
Output ranges, current • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA		Yes Yes Yes		
Connection of actuators • for voltage output 2-conductor connection • for voltage output 4-conductor connection		Yes; Without compensation of the line resistances No		
for current output 2-conductor connection		Yes		
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max.		1 kΩ 0.1 μF 300 Ω 0.1 mH		
Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA • Current, max.		16 V; permanent 50 mA; permanent		
Analog value creation Measurement principle		Actual value encryption (successive approximation)		
Integrations and conversion time/ resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Permissible input frequency, max. Interference voltage suppression for interference frequency f1 in Hz Conversion time (per channel) Time constant of the input filter Basic execution time of the module (all channels released)		12 bit Yes; 2.5 / 16.6 / 20 ms 400 Hz 400 / 60 / 50 Hz 1 ms 0.38 ms 1 ms		
Settling time • for resistive load • for capacitive load		0.6 ms 1 ms		

Compact CPUs

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Encoder				
Connection of signal encoders • for voltage measurement		Yes		
• for current measurement as 2-wire transducer		Yes; with external supply		
• for current measurement as 4-wire transducer		Yes		
 for resistance measurement with 2-conductor connection 		Yes; without compensation of the line resistances		
 for resistance measurement with 3-conductor connection 		No		
• for resistance measurement with 4-conductor connection		No		
Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA
Errors/accuracies Temperature error (relative to input area)		+/- 0.006 %/K		
Crosstalk between the inputs, min.		60 dB		
Repeat accuracy in settled status at 25 °C (relative to input area)		+/- 0.06 %		
Output ripple (based on output area, bandwidth 0 to 50 kHz)		+/- 0.1 %		
Linearity error (relative to output area)		+/- 0.15 %		
Temperature error (relative to output area)		+/- 0.01 %/K		
Crosstalk between the outputs, min.		60 dB		
Repeat accuracy in settled status at 25 °C (relative to output area)		+/- 0.06 %		
Operational limit in overall temperature range • Voltage, relative to input area		+/- 1 %		
 Current, relative to input area 		+/- 1 %		
Impedance, relative to input area A Voltage, relative to a sutput		+/- 5 %		
Voltage, relative to output areaCurrent, relative to output		+/- 1 %		
area Basic error limit (operational		., , , ,		
limit at 25 °C) • Voltage, relative to input		+/- 0.7 %; Linearity error		
area • Current, relative to input area		+/- 0.06% +/- 0.06%		
 Impedance, relative to input area Resistance-type 		+/- 3 %; Linearity error +/- 0.2% +/- 3 %		
thermometer, relative to input area • Voltage, relative to output		+/- 0.7 %		
areaCurrent, relative to output area		+/- 0.7 %		

Compact CPUs

lechnical specifications	,			
	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency		00 dB		
 Series mode interference (peak value of interference < rated value of input range), min. 		30 dB		
Common mode inter- ference, min.		40 dB		
Integrated Functions Number of counters	2; 2 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)
Counter frequency (counter) max.	10 kHz	30 kHz	30 kHz	30 kHz
Frequency measurement	Yes	Yes	Yes	Yes
controlled positioning	No	No	No	No
PID controller	No	Yes	Yes	Yes
Number of pulse outputs	2; 2 channels pulse width modulation up to 2.5 kHz (see Manual "Techno- logical Functions")	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Techno- logical Functions" manual)	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Techno- logical Functions" manual)	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technolo- gical Functions" manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz
Galvanic isolation Galvanic isolation digital inputs				
 Galvanic isolation digital inputs 	Yes	Yes	Yes	Yes
 between the channels between the channels and the backplane bus 	No Yes	No Yes	No Yes	No Yes
Galvanic isolation digital outputs	V	v	V	V
 Galvanic isolation digital outputs between the channels 	Yes	Yes	Yes Yes	Yes
 between the channels, in groups of 	INO	8	8 8	8
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes
Galvanic isolation analog inputs				
Galvanic isolation analog inputs		Yes; common for analog I/O		
between the channelsbetween the channels and the backplane bus		No Yes		
Galvanic isolation analog outputs Galvanic isolation analog		Yes; common for analog		
outputs		1/0		
 between the channels between the channels and the backplane bus 		No Yes		
Dimensions and weight				
Dimensions				
• Width	80 mm	120 mm	120 mm	120 mm
HeightDepth	125 mm 130 mm	125 mm 130 mm	125 mm 130 mm	125 mm 130 mm
Weight				

Compact CPUs

2 7 V5.3 SP2 or higher with update	STEP 7 V5.3 SP2 or higher with HW update	STEP7 V5.5 or higher with HSP191
\ /	00.4.1/	10.0.1/
V	20.4 V	19.2 V
ature circuit breaker, type C; 2 A; miniature circuit breaker B, min. 4 A	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A	Miniature circuit breaker, type C; min. 2 A; miniature circuit breake type B, min. 4 A
mA	1 000 mA	850 mA
mA	150 mA	190 mA
	11 A	5 A
² ·S	0.7 A ² ·s	0.7 A ² ·s
mA	1 000 mA	850 mA
1	14 W	14 W
byte; For program and data	96 Kibyte; For program and data No	192 Kibyte No 64 Kibyte
yte	Yes 8 Mbyte	Yes 8 Mbyte
ntenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free) Yes; Program and data
i Togram and data	res, i rogram and data	res, i rogram and data
· ·	511; Number range: 1 to 511 16 Kibyte	1 024; Number range: 1 to 16000 64 Kibyte
	1 024; Sequence of numbers:	1 024; Number range: 0 to 7999
	16 Kibyte	64 Kibyte
	1 024; Sequence of numbers: 0 to 2047	1 024; Number range: 0 to 7999
	16 Kibyte	64 Kibyte
byte; see instruction list	16 Kibyte	64 Kibyte
• ,	•	,
	8 4	16 4
S	0.1 µs	0.06 µs
	0.1 μs 0.2 us	<u> </u>
S S	0.2 μs	0.12 µs
		<u> </u>
	guaranteed by MMC ntenance-free) Program and data Number range: 1 to 511 ibyte 4; Sequence of numbers: 2047 ibyte 4; Sequence of numbers: 2047 ibyte ibyte ibyte; see instruction list	Number range: 1 to 511 ibyte 4; Sequence of numbers: 2047 ibyte 4; Sequence of numbers: 1 to 2047 ibyte 1 024; Sequence of numbers: 2047 ibyte 1 04; Sequence of numbers: 2047 ibyte 1 054; Sequence of numbers: 2047 ibyte 1 054; Sequence of numbers: 2047 ibyte 1 054; Sequence of numbers: 2047 ibyte

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Counters, timers and their			
retentivity			
S7 counter			
 Number 	256	256	256
 of which retentive without battery 			
- adjustable	Yes	Yes	
- lower limit	0	0	
- upper limit	255	255	
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	255	255	255
Counting range			
- adjustable			Yes
- lower limit	0	0	0
- upper limit	999	999	999
IEC counter			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
	0.5	Ol B	01 B
S7 times	050	050	050
• Number	256	256	256
Retentivity	N.	V.	· ·
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	255	255	255
- preset	no retentivity	no retentivity	no retentivity
Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Data areas and their retentivity			
Flag			
Number, max.	256 byte	256 byte	256 byte
Retentivity available	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255
Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks			
Number, max.	511; Number range: 1 to 511	511; Number range: 1 to 511	1 024; Number range: 1 to 16000
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte
Retentivity adjustable	Yes; via non-retain property	Yes; via non-retain property	Yes; via non-retain property
Hotoritivity adjustable	on DB	on DB	on DB
Retentivity preset	Yes	Yes	Yes
Local data			
per priority class, max.	510 byte	510 byte	32 Kibyte; 2048 bytes max. per
po. p. only oldoo, max.	5.5 Sylo	5.5 Sylv	block

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Address area			
I/O address area			
• overall	1 Kibyte	1 Kibyte	2 048 byte
Outputs	1 Kibyte	1 Kibyte	2 048 byte
 of which, distributed 			
- Inputs	none	979 byte	2 003 byte
- Outputs	none	986 byte	2 010 byte
Process image			
• Inputs	128 byte	128 byte	2 048 byte
Outputs	128 byte	128 byte	2 048 byte
 Inputs, adjustable 			2 048 byte
 Outputs, adjustable 			2 048 byte
• Inputs, preset			256 byte
Outputs, preset			256 byte
Subprocess images			
• Number of subprocess images, max.			1; With PROFINET IO, the length
			of the user data is limited to 1600 bytes
Distribution of			1000 bytes
Digital channels • Inputs	1 016	7 856	16 048
Outputs	1 008	7 904	16 096
Inputs, of which central	1 016	1 016	1 016
Outputs, of which central	1 008	1 008	1 008
Analog channels	1 000	1 000	1 000
• Inputs	253	494	1 006
• Outputs	250	495	1 007
Inputs, of which central	253	253	253
Outputs, of which central	250	250	250
Hardware configuration			
Central devices, max.	1	1	1
Expansion devices, max.	3	3	3
Racks, max.	4	4	4
Modules per rack, max.	8; in rack 3 max. 7	8; in rack 3 max. 7	8; in rack 3 max. 7
	o, iii rack o max. r	o, iii rack o max. r	o, in rack o max. r
Number of DP masters • integrated	none	1	1
• via CP	4	4	4
	7	4	4
Number of operable FMs and CPs (recommended)			
• FM	8	8	8
• CP, point-to-point	8	8	8
• CP, LAN	10	10	10

Compact CPUs

lechnical specifications (continu	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Time	0E37 314-0BG03-0AB0	0E37 314-0CG03-0AB0	0E37 314-0E1104-0AB0
Clock			
Hardware clock (real-time clock)	Yes	Yes	Yes
Battery-backed and	Yes	Yes	Yes
synchronizable			
Behavior of the clock following			Clock continues running after
POWER-ON • Behavior of the clock following			POWER OFF The clock continues at the time
expiry of backup period			of day it had when power was switched off
Deviation per day, max.	10 s	10 s	10 s; Typ.: 2 s
Runtime meter	4	4	4
Number Number/Number range	1	1 0	1
Number/Number rangeRange of values	0 to 2^31 hours	0 to 2^31 hours	0 to 2^31 hours
- Hange of values	(when using SFC 101)	(when using SFC 101)	(when using SFC 101)
Granularity	1 hour	1 hour	1 hour
Retentive	Yes; Must be restarted at each	Yes; Must be restarted at each	Yes; Must be restarted at each
	restart	restart	restart
Clock synchronization			-
• supported	Yes	Yes	Yes
• to MPI, master	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
• to DP, master		Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave
• to DP, slave		Yes	Yes
• in AS, master	Yes	Yes	Yes
• in AS, slave			Yes
• on Ethernet via NTP			Yes; as client
S7 message functions			
Number of login stations for message functions, max.	12; Depending on the connections configured for PG/OP and S7 basic communication	12; Depending on the connections configured for PG/OP and S7 basic communication	12; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes
Simultaneously active Alarm-S blocks, max.	40	40	300
Test commissioning functions			
Status/control			
 Status/control variable 	Yes	Yes	Yes
 Variables 	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters
 Number of variables, max. 	30	30	30
• of which status variables, max.	30	30	30
• of which control variables, max.	14	14	14
Forcing • Forcing	Yes	Yes	Yes
Status block	Yes	Yes	Yes; Up to 2 simultaneously
Single step	Yes	Yes	Yes
Number of breakpoints	2	2	4
Diagnostic buffer			
• present	Yes	Yes	Yes
Number of entries, max.	100	100	500
- adjustable			No
- Of which powerfail-proof			100; Only the last 100 entries are
Number of entries readable in RUN,			retentive 499
max.			100
- adjustable			Yes; From 10 to 499
- preset			10
Service data			
can be read out			Yes

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Monitoring functions Status LEDs			Yes
Communication functions PG/OP communication	Yes	Yes	Yes
Data record routing			Yes
Routing	No	Yes	Yes
Global data communication • supported • Size of GD packets, max.	Yes 22 byte	Yes 22 byte	Yes 22 byte
S7 basic communication • supported	Yes	Yes	Yes
S7 communication • supported	Yes	Yes	Yes
S5-compatible communication • supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Web server • supported • Number of HTTP clients • User-defined websites			Yes 5 Yes
Open IE communication • TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. Several passive connections per port, supported ISO-on-TCP (RFC1006) 			8 Yes Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. Data length, max. UDP Number of connections, max. 			8 32 768 byte Yes; via integrated PROFINET interface and loadable FBs 8
- Data length, max.			1 472 byte
Number of connections • overall • usable for PG communication • usable for OP communication • usable for S7 basic communication	12 11 11 8	12 11 11 8	12 11 11 8
usable for S7 communication reserved for S7 communication Adjustable for S7 communication, min.			10 0 0
 Adjustable for S7 communication, max. 			10
Max. total number of instancesusable for routing	No	4; max.	32 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24

Compact CPUs

l lecnnical specifications (continu	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
DDOCINET ODA (at a at a atra sint	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
PROFINET CBA (at set setpoint communication load)			50.07
Setpoint for the CPU communication load			50 %
 Number of remote interconnection partners 			32
 Number of functions, master/slave 			30
Total of all Master/Slave connections			1 000
Data length of all incoming connections master/slave, max.			4 000 byte
 Data length of all outgoing connections master/slave, max. 			4 000 byte
 Number of device-internal and PROFIBUS interconnections 			500
 Data length of device-internal und PROFIBUS interconnections, max. 			4 000 byte
 Data length per connection, max. 			1 400 byte
 Remote interconnections with acyclic transmission 			
 Sampling frequency: Sampling time, min. 			500 ms
 Number of incoming inter- connections 			100
 Number of outgoing inter- connections 			100
 Data length of all incoming inter- connections, max. 			2 000 byte
 Data length of all outgoing inter- connections, max. 			2 000 byte
- Data length per connection, max.			1 400 byte
 Remote interconnections with cyclic transmission 			
 Transmission frequency: Transmission interval, min. 			10 ms
 Number of incoming inter- connections 			200
 Number of outgoing inter- connections 			200
 Data length of all incoming inter- connections, max. 			2 000 byte
 Data length of all outgoing inter- connections, max. 			2 000 byte
Data length per connection, max.HMI variables via PROFINET			450 byte
(acyclic) - Number of stations that can log on			3; 2x PN OPC/1x iMap
for HMI variables (PN OPC/iMap)			•
- HMI variable updating			500 ms
- Number of HMI variables			200
 Data length of all HMI variables, max. 			2 000 byte
PROFIBUS proxy functionality			Voc
- supported - Number of linked PROFIBUS			Yes 16
devices - Data length per connection, max.			240 byte; Slave-dependent
Connection method			2.5 Syto, clave depondent
required front connector	2x 40-pin	2x 40-pin	2x 40-pin
MPI			
Cable length, max.	50 m; without repeater	50 m; without repeater	

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	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Point-to-point			
Cable length, max.	1 200 m		
Integrated protocol driver			
• 3964 (R)	Yes		
• ASCII	Yes		
• RK512	Yes		
Transmission speed, RS 422/485			
 with 3964 (R) protocol, max. 	19.2 kbit/s; 38.4 Kbit/s half		
::I AOOII	duplex; 19.2 Kbit/s full duplex		
 with ASCII protocol, max. 	19.2 kbit/s; 38.4 kbit/s half duplex; 19.2 kbit/s full duplex		
• with RK 512 protocol, max.	19.2 kbit/s; 38.4 Kbit/s half		
with the one protocol, max.	duplex; 19.2 Kbit/s full duplex		
1st interface			
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
	·		-
Physics	RS 485	RS 485	RS 485
Isolated	No	No	Yes
Power supply to interface	200 mA	200 mA	200 mA
(15 to 30 V DC), max.			
Functionality			
• MPI	Yes	Yes	Yes
DP master	No	No	Yes
• DP slave	No	No	Yes
Point-to-point connection	No	No	No
MPI			
 Number of connections 	12	12	
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	No	Yes	Yes
- Global data communication	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
S7 communicationS7 communication, as client	Yes No	Yes No	Yes No
- S7 communication, as server	Yes	Yes	Yes
• Transmission rate, max.	187.5 kbit/s	187.5 kbit/s	12 Mbit/s
DP master	107.0 Nongo	107.0 10140	12 Moly C
• Services			
- PG/OP communication			Yes
- Routing			Yes
- Global data communication			No
- S7 basic communication			Yes
- S7 communication			Yes
- S7 communication, as client			No
- S7 communication, as server			Yes
- Equidistance mode support			Yes
- Isochronous mode			No
- SYNC/FREEZE			Yes
- Activation/deactivation of DP			Yes
slaves			
 Number of DP slaves that can be simultaneously activated/ 			8
deactivated, max.			
- Direct data exchange			Yes; As subscriber
(slave-to-slave communication)			
- DPV1			Yes
• Transmission rate, max.			12 Mbit/s
Number of DP slaves, max.			124
Address area			O Kilou to
- Inputs, max.			2 Kibyte
- Outputs, max.			2 Kibyte
User data per DP slave Inputs, max			244 byto
Inputs, max.Outputs, max.			244 byte 244 byte
- Outputs, max.			244 Dyle

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
DP slave			
Services			
- PG/OP communication			Yes
- Routing			Yes; Only with active interface
- Global data communication			No
- S7 basic communication			No
- S7 communication			Yes
- S7 communication, as client			No
- S7 communication, as server			Yes; Connection configured on one side only
Direct data exchange (slave-to-slave communication) DPV1			Yes No
Transmission rate, max.			12 Mbit/s
Transfer memory			
- Inputs			244 byte
- Outputs			244 byte
 Address area, max. 			32
 User data per address area, max. 			32 byte
2nd interface			
Type of interface	integrated RS 422/ 485 interface	integrated RS 485 interface	PROFINET
Physics	RS 422/RS 485 (X.27)	RS 485	Ethernet RJ45
Isolated	Yes	Yes	Yes
Integrated switch			Yes
Number of ports			2
Power supply to interface (15 to 30 V DC), max.	No	200 mA	
Automatic detection of transmission speed			Yes; 10/100 Mbit/s
Autonegotiation			Yes
Autocrossing			Yes
Media redundancy			
supported			Yes
Switchover time on line break,			200 ms; PROFINET MRP
typically Number of stations in the ring, max.			50
Change of IP address at runtime,			Yes
supported			
Number of connection resources	none	12	
Functionality			
• MPI	No	No	No
DP master	No	Yes	No
DP slave	No	Yes	No
PROFINET IO controller	No	No	Yes; Also simultaneously with IO device functionality
PROFINET IO device			Yes; Also simultaneously with IO controller functionality
PROFINET CBA	No	No	Yes
• Web server			Yes
- Number of HTTP clients			5
Local Operating Network	Yes	No	
200ai Oporating Notwork	100	110	

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	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
DP master			
 Number of connections, max. 		12; for PG / OP communication	
 Number of connections 		1 for PG, 1 for OP	
(of which reserved), max.			
• Services			
- PG/OP communication		Yes	
- Routing		Yes	
- Global data communication		No	
- S7 basic communication		Yes; I blocks only	
- S7 communication		Yes	
- S7 communication, as client		No	
- S7 communication, as server		Yes	
- Equidistance mode support		Yes	
- Isochronous mode		No	
- SYNC/FREEZE		Yes	
- Activation/deactivation of DP		Yes	
slaves		100	
- Direct data exchange		Yes	
(slave-to-slave communication)			
- DPV1		Yes	
 Transmission rate, max. 		12 Mbit/s	
 Number of DP slaves, max. 		32	
Address area			
- Inputs, max.		1 Kibyte	
- Outputs, max.		1 Kibyte	
User data per DP slave		.,	
- Inputs, max.		244 byte	
- Outputs, max.		244 byte	
DP slave		•	
Number of connections		12	
• Services		12	
- PG/OP communication		Yes	
- Routing		Yes; Only with active interface	
- Global data communication		No	
- S7 basic communication		No	
- S7 communication, as client		No	
- S7 communication, as server		Yes	
 Direct data exchange (slave-to-slave communication) 		Yes	
- DPV1		No	
• GSD file		The current GSD file can be	
• GSD file		obtained from:	
		www.siemens.com/profibus-gsd	
Transmission rate, max.		12 Mbit/s	
Automatic baud rate search		Yes; only with passive interface	
Transfer memory		, , , , , , , , , , , , , , , , , , ,	
- Inputs		244 byte	
- Outputs		244 byte	
Address area, max.		32	
User data per address area, max.		32 byte	
oosi data poi addicoo area, max.		02 5,10	

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
PROFINET IO controller			
• Services			V
- PG/OP communication			Yes
RoutingS7 communication			Yes; With loadable FBs, max.
- Isochronous mode			configurable connections: 10, max. number of instances: 32 Yes; OB 61
- Open IE communication			Yes; via TCP/IP, ISO on TCP and UDP
 Transmission rate, max. Number of connectable IO devices, max. 			100 Mbit/s 128
Max. number of connectable IO devices for RT			128
 of which in line, max. Number of IO devices with IRT and the option "high flexibility" 			128 128
 of which in line, max. Number of IO devices with IRT and the option "high performance", max. 			61 64
- of which in line, max.			64
• IRT, supported			Yes
Shared device, supported			Yes
 Prioritized startup supported Number of IO devices, max. 			Yes 32
 Activation/deactivation of IO devices 			Yes
 Number of IO devices that can be simultaneously activated/ deactivated, max. 			8
IO devices changing during operation (partner ports), supported			Yes
 Max. number of IO devices per tool Device replacement without swap 			8 Yes
medium			
Updating time Address area			250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)
- Inputs, max.			2 Kibyte
- Outputs, max.			2 Kibyte
User data per address area, max.			2
- User data consistency, max.			1 024 byte
PROFINET IO device			
• Services			
- PG/OP communication			Yes
- Routing - S7 communication			Yes Yes; With loadable FBs, max. configurable connections: 10,
- Isochronous mode			max. number of instances: 32 No
- Open IE communication			Yes; Via TCP/IP, ISO on TCP, UDP
- IRT, supported			Yes
- PROFlenergy, supported			Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
 Shared device, supported Number of IO controllers with shared device, max. 			Yes 2
Transfer memoryInputs, max.			1 440 byte; Per IO controller with shared device
- Outputs, max.			1 440 byte; Per IO controller with shared device
SubmodulesNumber, max.			64
 User data per submodule, max. 			1 024 byte

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
PROFINET CBA			
acyclic transmission			Yes
cyclic transmission			Yes
Open IE communication			
Open IE communication, supported			Yes
Number of connections, max.			8
Local port numbers used at the			0, 20, 21, 25, 80, 102, 135, 161
system end			8080, 34962, 34963, 34964,
			65532, 65533, 65534, 65535
Keep-alive function, supported			Yes
sochronous mode			
sochronous mode			Yes; For PROFINET only
Programming			
Programming language			
STEP 7	Yes; V5.3 SP2 with HW update	Yes; V5.3 SP2 with HW update	Yes; V5.5 or higher
LAD	Yes	Yes	Yes
FBD	Yes	Yes	Yes
STL	Yes	Yes	Yes
SCL	Yes	Yes	Yes
CFC	Yes	Yes	Yes
GRAPH	Yes	Yes	Yes
HiGraph [®]	Yes	Yes	Yes
Command set	see instruction list	see instruction list	see instruction list
Nesting levels	8	8	8
Know-how protection			
User program protection/password	Yes	Yes	Yes
protection			
Block encryption			Yes; with S7 block privacy
System functions (SFC)	see instruction list	see instruction list	see instruction list
System function blocks (SFB)	see instruction list	see instruction list	see instruction list
Digital inputs			
Number of digital inputs	24	24	24
of which inputs usable for	16	16	16
technological functions			
Number of simultaneously			
controllable inputs			
horizontal installation			
- up to 40 °C, max.	24	24	24
- up to 60 °C, max.	12	12	12
vertical installation			
- up to 40 °C, max.	12	12	12
Technological functions			
- shielded, max.	50 m	50 m	50 m; At maximum count
			frequency
- unshielded, max.	not allowed	not allowed	not allowed
Standard DI			
- shielded, max.	1 000 m	1 000 m	1 000 m
- unshielded, max.	600 m	600 m	600 m
nput characteristic curve acc. to EC 1131, Type 1	Yes	Yes	Yes

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Input voltage			
 Rated value, DC 	24 V	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V	-3 to +5 V
• for signal "1"	15 to 30 V	15 to 30 V	15 to 30 V
Input current • for signal "1", typ.	9 mA	9 mA	8 mA
Input delay (for rated value of input voltage)			
for standard inputsparameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms (You can reconfigure the input delay of the standard inputs during program runtime. Please note that under certain circumstances your newly set filter time may not be effective until the next filter cycle.)
- Rated value	3 ms	3 ms	3 ms
• for counter/technological functions	56	00	00
- at "0" to "1", max.	8 µs	8 µs	8 µs; Minimum pulse width/ minimum pause between pulses at maximum counting frequency
Cable length			
Cable length, shielded, max.	1 000 m; 50 m for technological functions	1 000 m; 50 m for technological functions	1 000 m; 50 m for technological functions
Cable length unshielded, max.	600 m; For technological functions: No	600 m; For technological functions: No	600 m; For technological functions: No
Digital outputs			
Number of digital outputs • of which high-speed outputs	16 4	16 4	16 4; Notice: You cannot connect the fast outputs of your CPU in parallel
Short-circuit protection • Response threshold, typ.	Yes; Clocked electronically 1 A	Yes; Clocked electronically 1 A	Yes; Clocked electronically 1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)
Lamp load, max.	5 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes
Output voltage • for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current	L+ (-0.0 V)	L+ (-0.0 V)	L+ (-0.0 V)
• for signal "1" rated value	500 mA	500 mA	500 mA
• for signal "1" permissible range, min.	5 mA	5 mA	5 mA
\bullet for signal "1" permissible range, max.		0.6 A	0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Parallel switching of 2 outputs			
for increased power	No V-	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency • with resistive load, max.	100 Hz	100 Hz	100 Hz
with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	100 Hz	100 Hz	100 Hz
of the pulse outputs, with resistive load, max.	2.5 kHz	2.5 kHz	2.5 kHz

Compact CPUs

A A A B Ω kΩ 000 m 00 m V; permanent 5 mA; permanent	3 A 2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m 4 1	3 A 2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m
A A A B Ω kΩ 000 m 000 m V; permanent	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m 4 1	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m
A A A B Ω kΩ 000 m 000 m V; permanent	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m 4 1	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m
A A A B Ω kΩ 000 m 000 m V; permanent	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m 4 1	2 A 2 A 48 Ω 4 kΩ 1 000 m 600 m
A B Ω kΩ 000 m 00 m V; permanent	2 A 48 Ω 4 kΩ 1 000 m 600 m 4 1	2 A 48 Ω 4 kΩ 1 000 m 600 m
8 Ω kΩ 000 m 00 m V; permanent	48 Ω 4 kΩ 1 000 m 600 m 4 1	48 Ω 4 kΩ 1 000 m 600 m
8 Ω kΩ 000 m 00 m V; permanent	48 Ω 4 kΩ 1 000 m 600 m 4 1	48 Ω 4 kΩ 1 000 m 600 m
kΩ 000 m 00 m 00 m V; permanent	4 kΩ 1 000 m 600 m 4 1 100 m	4 kΩ 1 000 m 600 m 4
kΩ 000 m 00 m 00 m V; permanent	4 kΩ 1 000 m 600 m 4 1 100 m	4 kΩ 1 000 m 600 m 4
000 m 00 m 00 m V; permanent	1 000 m 600 m 4 1	1 000 m 600 m 4
00 m 00 m V; permanent	600 m 4 1 100 m	600 m 4
00 m 00 m V; permanent	600 m 4 1 100 m	600 m 4
00 m V; permanent	4 1 100 m	1
00 m V; permanent	1 100 m	1
00 m V; permanent	1 100 m	1
V; permanent	100 m	
V; permanent	100 m	
V; permanent		100 m
V; permanent		100 m
	5 V: permanent	
5 m∆: nermanent	. ,	5 V; permanent
5 m∆· nermanent		
o m, , pormanont	0.5 mA; permanent	0.5 mA; permanent
es; Degrees Celsius / degrees	Yes; Degrees Celsius / degrees	Yes; Degrees Celsius / degrees
ahrenheit / Kelvin	Fahrenheit / Kelvin	Fahrenheit / Kelvin
es	Yes	Yes
es	Yes	Yes
es	Yes	Yes
es	Yes	Yes
es	Yes	Yes
es	Yes	Yes
.5 V	2.5 V	3.3 V
		1.25 mA
es	Yes	Yes
1 V: nermanent	30 V: permanent	30 V; permanent
v, permanent	oo v, permanent	oo v, permanent
0 mA; permanent	50 mA: permanent	50 mA; permanent
, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,
es: by software	Yes: by software	Yes; by software
t 100		Pt 100
	No	No
O	INO	No
a	hrenheit / Kelvin s s s s s s s V; permanent mA; permanent s; by software 100	hrenheit / Kelvin Sayes Yes Yes Yes Yes Yes Yes Yes

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Analog outputs Number of analog outputs	2	2	2
Cable length, shielded, max.	200 m	200 m	200 m
Voltage output, short-circuit protection	Yes	Yes	Yes
Voltage output, short-circuit current, max.	55 mA	55 mA	55 mA
Current output, no-load voltage, max.	17 V	17 V	14 V
Output ranges, voltage • 0 to 10 V • -10 to +10 V	Yes Yes	Yes Yes	Yes Yes
Output ranges, current • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Connection of actuators • for voltage output 2-conductor connection • for voltage output 4-conductor connection • for current output 2-conductor connection	Yes; Without compensation of the line resistances No	Yes; Without compensation of the line resistances No	Yes; Without compensation of the line resistances No
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max.	1 kΩ 0.1 μF 300 Ω 0.1 mH	1 kΩ 0.1 μF 300 Ω 0.1 mH	1 kΩ 0.1 μF 300 Ω 0.1 mH
Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA	16 V; permanent	16 V; permanent	16 V; permanent
Current, max.	50 mA; permanent	50 mA; permanent	50 mA; permanent
Analog value creation Measurement principle	Actual value encryption (successive approximation)	Actual value encryption (successive approximation)	Actual value encryption (successive approximation)
Integrations and conversion time/ resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable permissible input frequency, max. Interference voltage suppression for interference frequency f1 in Hz Conversion time (per channel) Time constant of the input filter Basic execution time of the module (all channels released)	12 bit Yes; 2.5 / 16.6 / 20 ms 400 Hz 400 / 60 / 50 Hz 1 ms 0.38 ms 1 ms	12 bit Yes; 2.5 / 16.6 / 20 ms 400 Hz 400 / 60 / 50 Hz 1 ms 0.38 ms 1 ms	12 bit Yes; 16.6 / 20 ms 400 Hz 60 / 50 Hz 1 ms 0.38 ms 1 ms
Settling time • for resistive load • for capacitive load	0.6 ms 1 ms	0.6 ms 1 ms	0.6 ms 1 ms
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire	Yes Yes; with external supply Yes	Yes Yes; with external supply Yes	Yes Yes; with external supply Yes
• for resistance measurement with 2-conductor connection	Yes; without compensation of the line resistances	Yes; without compensation of the line resistances	Yes; without compensation of the line resistances

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
for resistance measurement with 3-conductor connection	No	No	No
• for resistance measurement with 4-conductor connection	No	No	No
Connectable encoders			
2-wire BEROS	Yes	Yes	Yes
 permissible quiescent current (2-wire BEROS), max. 	1.5 mA	1.5 mA	1.5 mA
Errors/accuracies			
Temperature error (relative to input area)	+/- 0,006 %/K	+/- 0,006 %/K	+/- 0,006 %/K
Crosstalk between the inputs, min.	60 dB	60 dB	60 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0,06 %	+/- 0,06 %	+/- 0,06 %
Output ripple (based on output area, pandwidth 0 to 50 kHz)	+/- 0,1 %	+/- 0,1 %	+/- 0,1 %
inearity error (relative to output area)	+/- 0,15 %	+/- 0,15 %	+/- 0,15 %
Temperature error (relative to output area)	+/- 0,01 %/K	+/- 0,01 %/K	+/- 0,01 %/K
Crosstalk between the outputs, min.	60 dB	60 dB	60 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0,06 %	+/- 0,06 %	+/- 0,06 %
Operational limit in overall temperature range			
Voltage, relative to input area	+/- 1 %	+/- 1 %	+/- 1 %
Current, relative to input area	+/- 1 %	+/- 1 %	+/- 1 %
Impedance, relative to input area	+/- 5 %	+/- 5 %	+/- 1 %
Voltage, relative to output area	+/- 1 %	+/- 1 %	+/- 1 %
Current, relative to output area	+/- 1 %	+/- 1 %	+/- 1 %
Basic error limit (operational limit at 25 °C)			
Voltage, relative to input area	+/- 0,7 %; Linearity error +/- 0.06%	+/- 0,7 %; Linearity error +/- 0.06%	+/- 0,8 %; Linearity error +/- 0.06%
Current, relative to input area	+/- 0,7 %; Linearity error +/- 0.06%	+/- 0,7 %; Linearity error +/- 0.06%	+/- 0,8 %; Linearity error +/- 0.06%
• Impedance, relative to input area	+/- 3 %; Linearity error +/- 0.2%	+/- 3 %; Linearity error +/- 0.2%	+/- 0,8 %; Linearity error +/- 0.2%
Resistance-type thermometer, relative to input area	+/- 3 %	+/- 3 %	+/- 0,8 %
Voltage, relative to output area	+/- 0,7 %	+/- 0,7 %	+/- 0,8 %
Current, relative to output area	+/- 0,7 %	+/- 0,7 %	+/- 0,8 %
nterference voltage suppression or f = n x (fl +/- 1%), fl = interference requency			
Series mode interference (peak value of interference < rated value of input range), min.	30 dB	30 dB	30 dB
Common mode interference, min.	40 dB	40 dB	40 dB
Common mode interference, min.	40 GD	70 UD	70 UD

Compact CPUs

	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0	6ES7 314-6EH04-0AB0
Integrated Functions			
Number of counters	4; see "Technological Functions" manual	4; see "Technological Functions" manual	4; see "Technological Functions" manual
Counter frequency (counter) max.	60 kHz	60 kHz	60 kHz
Frequency measurement	Yes	Yes	Yes
Controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of pulse outputs	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz
Galvanic isolation Galvanic isolation digital inputs Galvanic isolation digital inputs between the channels between the channels and the backplane bus	Yes No Yes	Yes No Yes	Yes No Yes
Galvanic isolation digital outputs Galvanic isolation digital outputs between the channels between the channels, in groups of between the channels and the backplane bus	Yes Yes 8 Yes	Yes Yes 8 Yes	Yes Yes 8 Yes
Galvanic isolation analog inputs Galvanic isolation analog inputs between the channels between the channels and the backplane bus	Yes; common for analog I/O No Yes	Yes; common for analog I/O No Yes	Yes; common for analog I/O No Yes
Galvanic isolation analog outputs Galvanic isolation analog outputs between the channels between the channels and the backplane bus	Yes; common for analog I/O No Yes	Yes; common for analog I/O No Yes	Yes; common for analog I/O No Yes
Environmental requirements Operating temperature • Min.			0 °C
Dimensions and weight Dimensions • Width • Height • Depth	120 mm 125 mm 130 mm	120 mm 125 mm 130 mm	120 mm 125 mm 130 mm
Weight • Weight, approx.	676 g	676 g	730 g

Compact CPUs

Ordering data	Order No.		Order No.
CPU 312C	6ES7 312-5BE03-0AB0	MPI cable	6ES7 901-0BF00-0AA0
Compact CPU, 32 KB work memory, 24 V DC power supply, 10 DI/6 DO integrated, integrated functions, MPI; including slot	0E37 312-0BE00-0AB0	For connecting SIMATIC S7 and the PG through MPI; 5 m in length Point-to-point link cable	0E37 301-0E1 00-0AA0
number labels; MMC is required		for connection to CPU 31xC-2 PtP	
CPU 313C	6ES7 313-5BF03-0AB0	5 m	6ES7 902-3AB00-0AA0
Compact CPU, 64 KB work memory, 24 V DC power supply,		10 m	6ES7 902-3AC00-0AA0
24 DI/16 DO, 4 AI/2 AO integrated, integrated functions,		50 m Front connector (1 unit)	6ES7 902-3AG00-0AA0
MPI; MMC is required	6507.040.6D500.0AD0	For compact CPUs	
CPU 313C-2 PtP Compact CPU, 64 KB, 24 V DC power supply, 16 DI/16 DO integrated, integrated functions, MPI; RS 422/485 interface; MMC is required	6ES7 313-6BF03-0AB0	40-pin, with screw contacts1 unit100 units40-pin, with spring-loaded	6ES7 392-1AM00-0AA0 6ES7 392-1AM00-1AB0
CPU 313C-2 DP	6ES7 313-6CF03-0AB0	contacts • 1 unit	6ES7 392-1BM01-0AA0
Compact CPU, 64 KB work memory, 24 V DC power supply, 16 DI/16 DO integrated, integrated functions, MPI		100 units 40-pin, with FastConnect	6ES7 392-1BM01-1AB0
PROFIBUS DP master/slave interface; MMC is required		• 1 unit	6ES7 392-1CM00-0AA0
CPU 314C-2 PtP	6ES7 314-6BG03-0AB0	SIMATIC TOP connect	See page 5/290; for information about
Compact CPU, 96 KB work memory, 24 V DC power supply, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI, RS 422/485 interface; MMC is required			which components can be used for the respective module, see Industry Mall or Catalog KT 10.2
CPU 314C-2 DP	6ES7 314-6CG03-0AB0	Slot number plates	6ES7 912-0AA00-0AA0
Compact CPU, 96 KB work memory, 24 V DC power supply, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface: MMC is required	0E37 314-0C003-0AB0	S7-300 manual Design, CPU data, module data, instruction list German English	6ES7 398-8FA10-8AA0 6ES7 398-8FA10-8BA0
CPU 314C-2 PN/DP	6ES7 314-6EH04-0AB0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
Compact CPU, 192 KB work memory, 24 V DC power supply, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; PROFINET IO controller/I-Device interface, MMC is required	6507 212 EDE02 AVD0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC CT, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC ST, SIMATIC Software, SIMATIC TDC	
Starter kit 2009	6ES7 313-5BF03-4YB0	SIMATIC manual collection D	6ES7 998-8XC01-8YE2
Comprising a CPU 313C, STEP 7 V5.4 (Floating License), PC adapter incl. cable, Micro Memory Card 64 MB, 160 mm mounting rail, front connector		update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	220, 330 3,001-01-2
SIMATIC Micro Memory Card		Power supply connector	6ES7 391-1AA00-0AA0
64 KB	6ES7 953-8LF20-0AA0	10 units, spare part	
128 KB	6ES7 953-8LG20-0AA0	Labeling strips	6ES7 392-2XX00-0AA0
512 KB	6ES7 953-8LJ20-0AA0	10 units, spare part	
2 MB	6ES7 953-8LL20-0AA0	Label cover	6ES7 392-2XY00-0AA0
4 MB	6ES7 953-8LM20-0AA0	10 units, spare part	
8 MB	6ES7 953-8LP20-0AA0	D: Subject to export regulations AL:	N and ECCN, ED002

- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Compact CPUs

Ordering data	Order No.		Order No.
S7 SmartLabel V3.0		RS 485 PROFIBUS DP bus	
Software for automatic labeling of modules direct from the STEP 7 project		With 90° cable outlet, max. transmission rate 12 Mbit/s Without BC interface.	6ES7 972-0BA12-0XA0
Single license	2XV9 450-1SL03-0YX0	 Without PG interface With PG interface 	6ES7 972-0BA12-0XA0
Jpgrade single license	J 2XV9 450-1SL03-0YX4	 With 90° cable outlet for 	
Labeling sheets for machine inscription		FastConnect connection system, max. transmission rate 12 Mbit/s	
For 16-channel signal modules, DIN A4, for printing with laser printer;		 Without PG interface, 1 unit Without PG interface, 100 units With PG interface, 1 unit 	6ES7 972-0BA52-0XA0 6ES7 972-0BA52-0XB0 6ES7 972-0BB52-0XA0
10 units		- With PG interface, 100 units	6ES7 972-0BB52-0XB0
petrol	6ES7 392-2AX00-0AA0	With axial cable outlet for	6GK1 500-0EA02
light-beige	6ES7 392-2BX00-0AA0	SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	
yellow	6ES7 392-2CX00-0AA0	PROFIBUS Fast Connect bus	6XV1 830-0EH10
red	6ES7 392-2DX00-0AA0	cable	
For 32-channel signal modules, DIN A4, for printing with laser printer;		Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum	
10 units		ordering quantity 20 m	
petrol	6ES7 392-2AX10-0AA0	RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0
light-beige	6ES7 392-2BX10-0AA0	Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure	
yellow	6ES7 392-2CX10-0AA0		and actaloga IV DL CA 01
red	6ES7 392-2DX10-0AA0	PROFIBUS bus components	see catalogs IK PI, CA 01
PC adapter USB	6ES7 972-0CB20-0XA0	For establishing MPI/PROFIBUS communication	
For connecting a PC to SIMATIC S7-200/300/400 via USB; with USB cable (5 m)			

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-300

Central processing units

SIPLUS compact CPUs

Overview SIPLUS CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 312C	
Order No.	6AG1 312-5BE03-2AB0	6AG1 312-5BE03-2AY0
Order No. based on	6ES7 312-5BE03-0AB0	6ES7 312-5BE03-0AB0
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit board	s and the electronic components
Technical specifications	The technical data of the standard	product applies except for the ambient conditions
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class	ss 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m see ambient temperature range	
	795 658 hPa (+2000 +3500 m derating 10 K)
	658 540 hPa (+3500 +5000 m derating 20 K)

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; CI < 0.12 ppm;

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 312C		Accessories	See SIMATIC CPU 312C,
(extended temperature range and medial exposure)			page 5/66
Compact CPU, work memory H 32 KB, power supply 24 V DC, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC is required	6AG1 312-5BE03-2AB0		
Additional conformance with H EN 50155	6AG1 312-5BE03-2AY0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS compact CPUs

Overview SIPLUS CPU 313C



- The compact CPU with integral digital and analog inputs/ outputs
- For plants with high processing performance and response time requirements
- With technological functions

Micro Memory Card required to operate the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 313C	
Order No.	6AG1 313-5BF03-2AB0 6AG1 313-5BF03-2AY0	
Order No. based on	6ES7 313-5BF03-0AB0 6ES7 313-5BF03-0AB0	
Ambient temperature range	-25 +70 °C; condensation permitted	
Conformal coating	Coating of the PCB and the electronic components according	rding to EN 60721
Technical specifications	The technical specifications of the standard product app	ly except for the ambient conditions.
Compliant with the standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Ambient conditions		
Relative humidity	5 100 %, condensation permitted	
Biologically active substances	Conformity with EN 60721-3-3, class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) See ambient temperature range 795658 hPa (+2000 + 3500 m) Derating 10K 658 540 hPa (+3500 +5000 m) Derating 20 K	

 $[\]begin{array}{l} \text{1SA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 313C		Accessories	See SIMATIC CPU 313C,
(extended temperature range and medial exposure)			page 5/66
Compact CPU, work memory 64 KB, power supply 24 V DC, 24 DI/16 DO, 4 AI/2 AO integrated, integrated functions, MPI; MMC is required	H 6AG1 313-5BF03-2AB0		
Additional conformance with EN 50155	6AG1 313-5BF03-2AY0	H: Subject to export regulati	ions AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS compact CPUs

Overview SIPLUS CPU 313C-2DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 313C-2 DP	
Order number	6AG1 313-6CF03-2AB0	6AG1 313-6CF03-2AY0
Order number based on	6ES7 313-6CF03-0AB0	6ES7 313-6CF03-0AB0
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the ele	ectronic components
Technical data	The technical data of the standard product app	lies except for the ambient conditions
Compliant with the standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 include	ding conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	
4)		

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

Technical documentation on SIPLUS is available under: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 313C-2 DP		Accessories	See SIMATIC CPU 313C-2 DP,
(extended temperature range and medial exposure)			page 5/66
Compact CPU, 64 KB work H memory, power supply 24 V DC, 16 DI/16 DO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	6AG1 313-6CF03-2AB0		
Additional conformance with L EN 50155	6AG1 313-6CF03-2AY0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-300

Central processing units

SIPLUS compact CPUs

Overview SIPLUS CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/ outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 315-2 PN/DP					
Order number	6AG1 314-6BG03-7AB0				
Order No. based on	6ES7 314-6BG03-0AB0				
Ambient temperature range	-25 +70 °C				
Conformal coating	Coating of the printed circuit boards and the electronic components				
Technical data	The technical data of the standard product applies except for the ambient conditions				
Ambient conditions					
Relative humidity	5 100 % Condensation permissible				
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)				
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}				
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾				
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K				

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS CPU 314C-2 PtP	
(extended temperature range and medial exposure)	
Compact CPU, work memory 96 KB, power supply 24 V DC, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI; RS 422/485 interface; MMC is required	6AG1 314-6BG03-7AB0
Accessories	See SIMATIC CPU 314C-2 PtP, page 5/66

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS compact CPUs

Overview SIPLUS CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/ outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 314C-2 DP	
Order number	6AG1 314-6CG03-2AB0	6AG1 314-6CG03-2AY0
Order No. based on	6ES7 314-6CG03-0AB0	6ES7 314-6CG03-0AB0
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic c	omponents
Technical data	The technical data of the standard product applies except	ot for the ambient conditions
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	No	Yes
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fung.	al spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist a	and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including cond	uctive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOx} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOx} < 10.4 \text{ ppm} \\ \text{NOx} < 10.4 \text{ ppm} \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 314C-2 DP		Accessories	See SIMATIC CPU 314C-2 DP,
(extended temperature range and medial exposure)			page 5/66
Compact CPU, 96 KB work H memory, power supply 24 V DC, 24 DI / 16 DO / 4 AI / 2 AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; MMC required	6AG1 314-6CG03-2AB0		
Additional conformance with H EN 50155	6AG1 314-6CG03-2AY0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-300

Central processing units

Fail-safe CPUs

Overview 315F-2 DP



- Based on the SIMATIC CPU 315-2 DP
- For setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 315F-2 PN/DP



- Based on CPU 315-2 PN/DP
- The CPU with medium-sized program memory and quantity structures for setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e according to ISO 13849, and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/ or through the integrated PROFIBUS DP interface (PROFIsafe):
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component Based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

SIMATIC S7-300

Central processing units

Fail-safe CPUs

Overview 317F-2 PN/DP



- Based on CPU 317-2 PN/DP
- The fail-safe CPU with a large program memory and quantity structure for demanding applications; for setting up a fail-safe automation system in plants with increased safety requirements.
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e according to ISO 13849-1, and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/ or through the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component Based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 319F-3 PN/DP



- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e according to 13849-1, and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected decentralized over the integrated PROFINET interface (PROFIsafe) and/or over the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe I/O modules of ET200M can also be connected centrally
- Central and distributed use of standard modules for non safety-relevant applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Fail-safe CPUs

Technical specifications

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
Product version					
Hardware product version	01	01	01	01	01
Firmware version	V3.0	V3.1	V2.6	V3.1	V3.2
Associated programming package	STEP 7 > V 5.4 + SP5 or STEP 7 as of V5.2 + SP1 with HSP 177, S7 Distributed Safety as of V5.4		STEP 7 V5.2 SP1 with hardware update or higher; S7 Distributed Safety 5.2 SP1 or higher	STEP 7 > V 5.4 + SP5 or STEP 7 V5.4 + SP4 or higher with HSP 189, S7 Distributed Safety V5.4 or higher	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4
Input voltage • 24 V DC	Yes	Yes	Yes	Yes	Yes
Input current					
Current consumption (rated value)	850 mA	750 mA		750 mA	1 250 mA
Current consumption (in no-load operation), typ.	150 mA	150 mA	100 mA	150 mA	500 mA
Inrush current, typ.	3.5 A	4 A	2.5 A	4 A	4 A
l²t	1 A ² ·s	1.2 A ^{2.} s			
from supply voltage L+, max.	900 mA				
Power losses					
Power loss, typ.	4.5 W		4 W		14 W
Memory					
Work memory					
 integrated 	384 Kibyte	512 Kibyte	1 024 Kibyte	1.5 Mbyte	2 560 Kibyte
 expandable 	No	No	No	No	No
 Size of retentive memory for retentive data blocks 	128 Kibyte	128 Kibyte		256 Kibyte	700 Kibyte
Load memory					
 pluggable (MMC) 	Yes	Yes	Yes	Yes	Yes
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
 Data management on MMC (after last programming), min. 	10 a	10 a	10 a	10 a	10 a
Backup					
• present	Yes; guaranteed by MMC (maintenance-free)	Yes			
• without battery	Yes; Program and data	Yes			
CPU-blocks					
Number of blocks (total)	1 024; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.	1 024; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.	2 048; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.	2 048; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.	4 096; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.
DB					
Number, max.	1 024	1 024; Number range: 1 to 16000	2 047; Number band: 1 to 2047	2 048	4 096
 Size, max. 	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
FB					
Number, max.	1 024	1 024; Number range: 0 to 7999	2 048; Sequence of numbers: 0 to 2047	2 048	4 096
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
FC • Number, max.	1 024	1 024; Number range: 0 to 7999	2 048; Sequence of numbers: 0 to 2047	2 048	4 096
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
OB					
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth					
per priority classadditional within an error OB	16 4	16 4	16 4	16 4	16 4
CPU processing times					
for bit operations, min.	0.05 μs	0.05 μs	0.05 μs	0.025 µs	0.004 µs
for word operations, min.	0.09 μs	0.09 μs	0.2 μs	0.03 μs	0.01 µs
for fixed point arithmetic, min.	0.12 μs	0.12 μs	0.2 μs	0.04 μs	0.01 µs
for floating point arithmetic, min.	0.45 μs	0.45 µs	1 µs	0.16 μs	0.04 µs
Counters, timers and their retentivity					
S7 counter					
• Number	256	256	512	512	2 048
Retentivity	\/	\/	V	V	V
- adjustable	Yes 0	Yes	Yes 0	Yes 0	Yes 0
- lower limit	255	0	511	511	2 047
upper limitpreset	Z 0 to Z 7	255 Z 0 to Z 7	8	Z 0 to Z 7	Z 0 to Z 7
Counting range	201027	201027	O	201027	201027
- adjustable	Yes	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0
- upper limit	999	999	999	999	999
IEC counter					
• present	Yes	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB	SFB
Number	Unlimited (limited only by RAM capacity)	Unlimited (limited onl by RAM capacity)			
S7 times					
• Number	256	256	512	512	2 048
Retentivity					
- adjustable	Yes	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0
- upper limit	255	255	511	511	2 047
- preset	no retentivity	no retentivity	no retentivity	no retentivity	no retentivity
Time range lower limit	10 ma	10 ma	10 mg	10 ma	10 mg
- lower limit - upper limit	10 ms 9 990 s	10 ms 9 990 s			
- upper millit	9 990 S	3 330 8	5 550 S	3 330 8	5 550 S

Fail-safe CPUs

	6ES7 315-6FF04-	6ES7 315-2FJ14-	6ES7 317-6FF03-	6ES7 317-2FK14-	6ES7 318-3FL01-
	0AB0	0AB0	0AB0	0AB0	0AB0
IEC timer • present • Type • Number	Yes	Yes	Yes	Yes	Yes
	SFB	SFB	SFB	SFB	SFB
	unlimited (limited only	unlimited (limited only	unlimited (limited only	unlimited (limited only	unlimited (limited only
	by RAM capacity)	by RAM capacity)	by RAM capacity)	by RAM capacity)	by RAM capacity)
Data areas and their retentivity	by the an eapacity)	by it will expusitly	by it will expanding	Sy i i iii eapaoity)	Sy it an expansity
retentive data area, total	All, 128 KB max.	All, 128 KB max.	All, max. 256 KB	All, max. 256 KB	All, max. 700 KB
Flag Number, max. Retentivity available Retentivity preset Number of clock memories	2 048 byte	2 048 byte	4 096 byte	4 096 byte	8 192 byte
	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 8191
	MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15
	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks • Retentivity adjustable • Retentivity preset	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain	Yes; via non-retain
	property on DB	property on DB	property on DB	property on DB	property on DB
	yes	yes	yes	yes	yes
Local data • per priority class, max.	32 Kibyte; Max. 2 KB per block	32 Kibyte; Max. 2 KB per block	1 024 byte	32 Kibyte; Max. 2 KB per block	32 768 byte; 2048 bytes max. per block
Address area I/O address area overall Outputs of which, distributed Inputs Outputs	2 048 byte	2 048 byte	8 Kibyte	8 192 byte	8 192 byte
	2 048 byte	2 048 byte	8 Kibyte	8 192 byte	8 192 byte
	2 048 byte	2 048 byte	8 Kibyte	8 192 byte	8 192 byte
	2 048 byte	2 048 byte	8 Kibyte	8 192 byte	8 192 byte
Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default	2 048 byte 2 048 byte 384 byte 384 byte	2 048 byte 2 048 byte 384 byte 384 byte		8 192 byte 8 192 byte 1 024 byte 1 024 byte	8 192 byte 8 192 byte 1 024 byte 1 024 byte
Subprocess imagesNumber of subprocess images, max.	1	1		1	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels • integrated channels (DI) • integrated channels (DO)	0		0		
Inputs Outputs Inputs, of which central Outputs, of which central	16 384	16 384	65 536	65 536	65 536
	16 384	16 384	65 536	65 536	65 536
	1 024	1 024	1 024	1 024	1 024
	1 024	1 024	1 024	1 024	1 024

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
Analog channels					
 Integrated channels (AI) 	0		0		
 Integrated channels (AO) 	0		0		
 Inputs 	1 024	1 024	4 096	4 096	4 096
 Outputs 	1 024	1 024	4 096	4 096	4 096
 Inputs, of which central 	256	256	256	256	256
 Outputs, of which central 	256	256	256	256	256
Hardware configuration					
Racks, max.	4	4	4	4	4
Modules per rack, max.	8	8	8	8	8
Expansion devices, max.	3	3	3	3	
Number of DP masters					
 integrated 	1	1	2	1	2
• via CP	4	4	4	4	4
Number of operable FMs and CPs (recommended)					
• FM	8	8	8	8	8
 CP, point-to-point 	8	8	8	8	8
• CP, LAN	10	10	10	10	10
Time					
Clock					
 Hardware clock (real-time clock) 	Yes	Yes	Yes	Yes	Yes
 battery-backed and synchronizable 	Yes	Yes	Yes	Yes	Yes
 Deviation per day, max. 	10 s; Typ.: 2 s	10 s; Typ.: 2 s	10 s	10 s; Typ.: 2 s	10 s; Typ.: 2 s
Backup time	6 wk	6 wk; at 40°C ambient temperature	6 wk	6 wk	6 wk
 Behavior of the clock following POWER-ON 		·			Clock continues running after POWER OFF
Behavior of the clock following expiry of backup period	The clock continues at the time of day it had when power was switched off	The clock continues at the time of day it had when power was switched off		The clock continues at the time of day it had when power was switched off	The clock continues a the time of day it had when power was switched off
Runtime meter					
 Number 	1	1	4	4	4
 Number/Number range 	0	0	0 to 3	0 to 3	0 to 3
Range of values	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101
 Granularity 	1 hour	1 hour	1 hour	1 hour	1 hour
Retentive	Yes; must be restarted at each restart	Yes; must be restarted at each restart	Yes; must be restarted at each restart	Yes; must be restarted at each restart	Yes; must be restarted at each restart

Fail-safe CPUs

Technical specificati		CEC7 045 05 14 4	CEC7 017 CEE00	CEC7 017 0EV14	CEC7 010 0EL 01
	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
Clock synchronization					
 supported 	Yes	Yes	Yes	Yes	Yes
 to MPI, master 	Yes	Yes	Yes	Yes	Yes
 to MPI, slave 	Yes	Yes	Yes	Yes	Yes
• to DP, master	Yes; on DP slave only time-of-day slave				
 to DP, slave 	Yes	Yes	Yes	Yes	Yes
• in AS, master	Yes	Yes	Yes	Yes	Yes
• in AS, slave		Yes	Yes	Yes	Yes
• on Ethernet via NTP		Yes; as client		Yes; as client	Yes; as client
1st interface					
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485				
Isolated	No	Yes	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA	150 mA
Functionality					
• MPI	Yes	Yes	Yes	Yes	Yes
 DP master 	No	Yes	Yes	Yes	Yes
 DP slave 	No	Yes	Yes	Yes	Yes
 Point-to-point connection 	No	No	No	No	No
MPI					
Number of connections	16	16	32	32	
ServicesPG/OP communication	Yes	Yes	Yes	Yes	Yes
- Routing	Yes	Yes	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes	Yes	Yes
 S7 basic communication 	Yes	Yes	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes	Yes	Yes
 S7 communication, as client 	No	No; but via CP and loadable FB	No	No; but via CP and loadable FB	No; but via CP and loadable FB
 S7 communication, as server 	Yes	Yes	Yes	Yes	Yes
 Transmission rate, max. 	187.5 kbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s
DP master					
ServicesPG/OP communi-		Yes	Yes	Yes	Yes
cation - Global data		No	No	No	No
communication - S7 basic		Yes; I blocks only	Yes	Yes; I blocks only	Yes; I blocks only
communication - S7 communication		Yes	Yes	Yes	Yes
- S7 communication, as client		No	No	No	No

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
DP master					
 Services 					
 S7 communication, as server 		Yes	Yes	Yes	Yes
 Equidistance mode support 		Yes	Yes	Yes	Yes
- Isochronous mode		Yes; OB 61	No	Yes; OB 61	No
- SYNC/FREEZE		Yes	Yes	Yes	Yes
 Activation/deacti- vation of DP slaves 		Yes	Yes	Yes	Yes
- Number of DP slaves that can be simultaneously activated/deacti- vated, max.		8		8	8
 Direct data exchange (slave-to-slave communication) 					Yes; As subscriber
DPV1Transmission rate,		Yes 12 Mbit/s	Yes 12 Mbit/s	Yes 12 Mbit/s	Yes 12 Mbit/s
max. • Number of DP slaves, max.		124	124	124	124
Address area					
- Inputs, max.		2 Kibyte	244 byte	8 Kibyte	8 Kibyte
- Outputs, max.		2 Kibyte	244 byte	8 Kibyte	8 Kibyte
User data per DP slave					
Inputs, max.Outputs, max.		244 byte 244 byte		244 byte 244 byte	244 byte 244 byte
DP slave					
 Services 					
- PG/OP communi-		Yes		Yes	Yes
cation - Global data commu-		No	No	No	No
nication - S7 basic communi- cation		No	Yes	No	No
- S7 communication		Yes	Yes	Yes	Yes
- S7 communication, as client		No	No	No	No
- S7 communication, as server		Yes; Connection configured on one side only	Yes	Yes; Connection configured on one side only	Yes; Connection configured on one side only
- Direct data exchange (slave-to-slave communication)		Yes	Yes	Yes	Yes
- DPV1		No	No	No	No
 Transmission rate, max. 		12 Mbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s
Automatic baud rate search		Yes; only with passive interface	Yes; only with passive interface	Yes; only with passive interface	Yes; only with passive interface
Transfer memory		244 byto	244 byto	244 byta	244 byta
- Inputs		244 byte	244 byte	244 byte	244 byte
 Outputs Address area, max. 		244 byte 32	244 byte 32	244 byte 32	244 byte 32
 Address area, max. User data per address area, max. 		32 byte	32 byte	32 byte	32 byte

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
2nd interface					
Type of interface	integrated RS 485 interface	PROFINET	integrated RS 485 interface	PROFINET	integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485	Ethernet RJ45	RS 485
Isolated	Yes	Yes	Yes	Yes	Yes
Integrated switch		Yes		Yes	
Number of ports		2		2	
Power supply to interface (15 to 30 V DC), max.	200 mA		200 mA		200 mA
Automatic detection of transmission speed		Yes; 10/100 Mbit/s		Yes; 10/100 Mbit/s	
Autonegotiation		Yes		Yes	
Autocrossing		Yes		Yes	
Functionality MPI DP master DP slave PROFINET IO controller PROFINET IO device PROFINET CBA	No Yes Yes	No No No Yes No Yes	No Yes Yes	No No No Yes No Yes	No Yes Yes No No
 Local Operating Network 	No	No	No	No	
DP master • Number of connections, max. • Services	16		32		
- PG/OP communi- cation	Yes		Yes		Yes
- Global data commu- nication	No		No		No
- S7 basic communi- cation	Yes; I blocks only		Yes		Yes; I blocks only
S7 communicationS7 communication, as client	Yes No		Yes No		Yes No
- S7 communication, as server	Yes		Yes		Yes
- Equidistance mode support	Yes		Yes		Yes
- Isochronous mode	Yes; OB 61		Yes; OB 61		Yes; OB 61 - isochronous mode i possible either on E or PROFINET IO (not simultaneously)
SYNC/FREEZEActivation/deactivation of DP slaves	Yes Yes		Yes Yes		Yes Yes

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
DP master					
 Services 					
 Number of DP slaves that can be simultaneously activated/deacti- vated, max. 	8				8
- Direct data exchange (slave-to-slave communication)					Yes; As subscriber
- DPV1	Yes		Yes		Yes
 Transmission rate, max. 	12 Mbit/s		12 Mbit/s		12 Mbit/s
 Number of DP slaves, max. 	124; Per station		124		124
 Address area 					
- Inputs, max.	2 048 byte		244 byte		8 Kibyte
- Outputs, max.	2 048 byte		244 byte		8 Kibyte
 User data per DP slave 					
Inputs, max.Outputs, max.	244 byte 244 byte				244 byte 244 byte
DP slave					
 Number of connections 	16		32		
Services					
- PG/OP communi- cation	Yes		Yes		Yes
 Global data commu- nication 	No		No		No
 S7 basic communi- cation 	No		Yes		No
- S7 communication	Yes		Yes		Yes
 S7 communication, as client 	No		No		No
 S7 communication, as server 	Yes		Yes		Yes
 Direct data exchange (slave-to-slave 	Yes		Yes		Yes
communication)					
- DPV1	No		No		No
• GSD file	The current GSD file can be obtained from: www.siemens.com/profibus-gsd		The current GSD file can be obtained from: www.siemens.com/profibus-gsd		The current GSD file can be obtained from: www.siemens.com/profibus-gsd
 Transmission rate, max. 	12 Mbit/s		12 Mbit/s		12 Mbit/s
Automatic baud rate searchTransfer memory	Yes; only with passive interface		Yes; only with passive interface		Yes; only with passive interface
- Inputs	244 byte		244 byte		244 byte
- Outputs	244 byte		244 byte		244 byte
 Address area, max. 	32		32		32
 User data per address area, max. 	32 byte		32 byte		32 byte

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET IO controller					
 Services 					
 PG/OP communi- cation 		Yes		Yes	
- S7 communication		Yes; with loadable FBs, max. configu- rable connections: 14, max. number of instances: 32		Yes; with loadable FBs, max. configu- rable connections: 16, max. number of instances: 32	
- Isochronous mode		No		No	
 Open IE communi- cation 		Yes; via TCP/IP, ISO on TCP and UDP		Yes; via TCP/IP, ISO on TCP and UDP	
 Transmission rate, max. 		100 Mbit/s		100 Mbit/s	
 Number of connectable IO devices, max. 		128		128	
 Max. number of connectable IO devices for RT 		128		128	
- of which in line, max.		128		128	
 Number of IO devices with IRT and the option "high flexibility" 		128		128	
- of which in line, max.		61		61	
 IRT, supported 		Yes		Yes	
 Prioritized startup supported 		Yes		Yes	
 Number of IO devices, max. 		32		32	
 Activation/deacti- vation of IO devices 		Yes		Yes	
 Number of IO devices that can be simultaneously activated/deacti- vated, max. 		8		8	
 IO devices changing during operation (partner ports), supported 		Yes		Yes	
 Max. number of IO devices per tool 		8		8	
Device replacement without swap medium		Yes		Yes	
• Send clock times		250 μs, 500 μs, 1 ms		250 μs, 500 μs, 1 ms	

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET IO controller Updating time		250 μs - 128 ms (with send cycle of 250 μs); 500 μs - 256 ms (with send cycle of 500 μs); 1 ms - 512 ms (with send cycle 1 ms); minimum value of the send cycle is also dependent on the set communication share for PROFINET IO, on the number of		250 μs - 128 ms (with send cycle of 250 μs); 500 μs - 256 ms (with send cycle of 500 μs); 1 ms - 512 ms (with send cycle 1 ms); minimum value of the send cycle is also dependent on the set communication share for PROFINET IO, on the number of	
Address area		IO devices		IO devices	
Inputs, max.Outputs, max.User data per address area, max.		2 Kibyte 2 Kibyte		8 Kibyte 8 Kibyte	
- User data consistency, max.		254 byte		254 byte	
Open IE communication Open IE communication, supported Number of connections, max.		Yes 8		Yes 8	
Local port numbers used at the system end		0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535		0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	
ard interface Type of interface					PROFINET
Physics					Ethernet RJ45
solated					Yes
ntegrated switch					Yes
lumber of ports					2
Automatic detection of ransmission speed					Yes; 10/100 Mbit/s
Autonegotiation					Yes
Autocrossing					Yes
Media redundancy supported Switchover time on line break, typically Number of stations in the ring, max.					Yes 200 ms; PROFINET MRP 50
Change of IP address at runtime, supported					Yes

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
Functionality MPI DP master DP slave PROFINET IO device					No No No Yes; also simultaneously with I device functionality No; also simultaneously with IO controller functionality Yes
PROFINET IO controller					
Services PG/OP communication S7 communication					Yes; With loadable FBs, max. configu- rable connections: 16, max. number of
- Isochronous mode					instances: 32 Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
Open IE communicationTransmission rate,					Yes; via TCP/IP, ISO on TCP, UDP 100 Mbit/s
max.					
 Number of connectable IO devices, max. 					256
 Max. number of connectable IO devices for RT 					256
- of which in line, max.					256
 Number of IO devices with IRT and the option "high flexibility" 					256
 of which in line, max. Number of IO devices with IRT and the option "high performance", max. 					61 64
of which in line, max.IRT, supported					64 Yes
Shared device, supportedPrioritized startup					Yes
supported - Number of					32
IO devices, max.					

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET IO controller • Activation/deacti-					Yes
vation of IO devices - Number of IO devices that can be simultaneously activated/deacti- vated, max.					8
 IO devices changing during operation (partner ports), supported Max. number of IO 					Yes 8
devices per tool • Device replacement					Yes
without swap medium • Send clock times					250 μs, 500 μs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)
Updating timeAddress area					250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details)
Inputs, max.Outputs, max.User data per address area, max.					8 Kibyte 8 Kibyte
- User data consis- tency, max.					1 024 byte
PROFINET IO device • Services					
PG/OP communicationRoutingS7 communication					Yes Yes; With loadable FBs, max. configu- rable connections: 16, max. number of instances: 32
 Isochronous mode Open IE communication IRT, supported PROFlenergy, supported 					No Yes; Via TCP/IP, ISO on TCP, UDP Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
 Shared device, supported Number of IO controllers with shared device, max. 					Yes 2

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET IO controller					
 Transfer memory 					
- Inputs, max.					1 440 byte; Per IO controller with shared device
- Outputs, max.					1 440 byte; Per IO controller with shared device
Submodules					0.4
- Number, max.					64
 User data per submodule, max. 					1 024 byte
Open IE communication					
Open IE communi- option, supported					Yes
 ation, supported Number of connections, max. 					32
Local port numbers used at the system end					0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534,
Keep-alive function, supported					65535 Yes
Communication					
functions PG/OP communication	Yes	Yes	Yes	Yes	Yes
Data record routing	Yes	Yes	100	Yes	Yes
Global data communi-	103	103		103	103
cation					
 supported 	Yes	Yes	Yes	Yes	Yes
 Number of GD loops, max. 	8	8	8	8	8
 Number of GD packets, max. 	8	8	8	8	8
 Number of GD packets, transmitter, max. 	8	8	8	8	8
 Number of GD packets, receiver, max. 	8	8	8	8	8
 Size of GD packets, max. 	22 byte				
 Size of GD packet (of which consistent), max. 	22 byte				
S7 basic communication					
• supported	Yes	Yes	Yes	Yes	Yes
• User data per job, max.	,	76 byte	76 byte	76 byte	76 byte
 User data per job (of which consistent), max. 	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
S7 communication					
• supported	Yes	Yes	Yes	Yes	Yes
• as server	Yes	Yes	Yes	Yes	Yes
• as client	Yes; via CP and loadable FB	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB	Yes; via CP and loadable FB	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB
User data per job, max.	180 byte; With PUT/ GET	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)	180 byte; With PUT/ GET	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
 User data per job (of which consistent), max. 	240 byte; as server		160 byte; as server		
S5-compatible communication					
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Open IE communication					
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 		8		16	32
 Data length for connection type 01H, max. 		1 460 byte		1 460 byte	1 460 byte
- Data length for connection type 11H, max.		32 768 byte		32 768 byte	32 768 byte
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 		8		16	32
- Data length, max. • UDP		32 768 byte Yes; via integrated PROFINET interface and loadable FBs		32 768 byte Yes; via integrated PROFINET interface and loadable FBs	32 768 byte Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
- Data length, max.		1 472 byte		1 472 byte	1 472 byte
Web server • supported		Yes; Read-only		Yes; Read-only	Yes
Number of HTTP clients		function		function 5	5
User-defined websites					Yes

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET CBA					
(at set setpoint commu- nication load)					
 Setpoint for the CPU communication load 		50 %		50 %	20 %
 Number of remote interconnection partners 		32		32	32
 Number of functions, master/slave 		30		30	50
 Total of all Master/ Slave connections 		1 000		1 000	3 000
 Data length of all incoming connections master/slave, max. 		4 000 byte		4 000 byte	24 000 byte
 Data length of all outgoing connections master/slave, max. 		4 000 byte		4 000 byte	24 000 byte
 Number of device- internal and PROFIBUS intercon- nections 		500		500	1 000
 Data length of device- internal und PROFIBUS intercon- nections, max. 		4 000 byte		4 000 byte	8 000 byte
 Data length per connection, max. 		1 400 byte		1 400 byte	1 400 byte
 Remote interconnections with acyclic transmission 					
- Sampling frequency: Sampling time, min.		500 ms		500 ms	200 ms
- Number of incoming interconnections		100		100	100
 Number of outgoing interconnections 		100		100	100
 Data length of all incoming intercon- nections, max. 		2 000 byte		2 000 byte	3 200 byte
 Data length of all outgoing intercon- nections, max. 		2 000 byte		2 000 byte	3 200 byte
 Data length per connection, max. Remote interconnec- 		1 400 byte		1 400 byte	1 400 byte
tions with cyclic trans- mission					
 Transmission frequency: Trans- mission interval, min. 		10 ms		10 ms	1 ms
- Number of incoming interconnections		200		200	300

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
PROFINET CBA (at set setpoint commu- nication load)					
Remote interconnections with cyclic transmission					
- Number of outgoing interconnections		200		200	300
 Data length of all incoming intercon- nections, max. 		2 000 byte		2 000 byte	4 800 byte
 Data length of all outgoing intercon- nections, max. 		2 000 byte		2 000 byte	4 800 byte
 Data length per connection, max. 		450 byte		450 byte	450 byte
HMI variables via PROFINET (acyclic)					
Number of stations that can log on for HMI variables (PN OPC/iMap)		3; 2x PN OPC/ 1x iMap		3; 2x PN OPC/ 1x iMap	3; 2x PN OPC/ 1x iMap
- HMI variable updating		500 ms		500 ms	500 ms
Number of HMI variables		200		200	600
- Data length of all HMI variables, max.		2 000 byte		2 000 byte	9 600 byte
PROFIBUS proxy functionality					
- supported		Yes		Yes	Yes
 Number of linked PROFIBUS devices 		16		16	32
 Data length per connection, max. 		240 byte; Slave- dependent		240 byte; Slave- dependent	240 byte; Slave- dependent
Number of connections					
overall usable for PG commu-	16 15	16 15	32 31	32 31	32 31
nication					
usable for OP commu- nication	15	15	31	31	31
usable for S7 basic communication	12	14	30	30	30
usable for S7 communication		14		16	16
Max. total number of instances		32		32	32
usable for routing		X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24	8	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24	X1 as MPI: max. 10; X1 as DP master: ma 24; X1 as DP slave (active): max. 14; X2 as DP master: max. 24; X2 as DP slave (active): max. 14; X3 as PROFINET: 48 m

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
S7 message functions					
Number of login stations for message functions, max.	16; Depending on the connections configured for PG/OP and S7 basic communication	16; Depending on the connections configured for PG/OP and S7 basic communication	32; Depending on the connections configured for PG/OP and S7 basic communication	32; Depending on the connections configured for PG/OP and S7 basic communication	32; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes	Yes	Yes
Simultaneously active Alarm-S blocks, max.	300	300	60	300	300
Test commissioning					
functions Status/control					
Status/control variable	Yes	Yes	Yes	Yes	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters				
Number of variables, max.	30	30	30	30	30
 of which status variables, max. 	30	30	30	30	30
 of which control variables, max. 	14	14	14	14	14
Forcing					
Forcing	Yes	Yes	Yes	Yes	Yes
Forcing, variablesNumber of variables, max.	Inputs, outputs 10				
Status block	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously	Yes	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously
Single step	Yes	Yes	Yes	Yes	Yes
Number of breakpoints	4	4	2	4	4
Diagnostic buffer					
Present	Yes	Yes	Yes	Yes	Yes
 Number of entries, max. 	500	500	100	500	500
- adjustable	No	No	No	No	No
- Of which powerfail-	100; Only the last 100	100; Only the last 100		100; Only the last 100	100
proofNumber of entries readable in RUN, max.	entries are retained	entries are retained		entries are retained 499	499
- adjustable	Yes; From 10 to 499			Yes; From 10 to 499	Yes: From 10 to 499
- preset	10			10	10
Isochronous mode					
Isochronous mode	Yes				Yes; Via 2nd PROFIBUS DP or PROFINET interface
Permissible potential difference					
Operating temperature					
• Min.		0 °C		0 °C	0 °C
• max.		60 °C		60 °C	60 °C

Fail-safe CPUs

	6ES7 315-6FF04- 0AB0	6ES7 315-2FJ14- 0AB0	6ES7 317-6FF03- 0AB0	6ES7 317-2FK14- 0AB0	6ES7 318-3FL01- 0AB0
Configuration					
programming					
 Programming 					
language					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
- HiGraph [®]	Yes	Yes	Yes	Yes	Yes
 Command set 	See instruction list				
 Nesting levels 	8	8	8	8	8
Know-how protection					
 User program 	Yes	Yes	Yes	Yes	Yes
protection/password					
protection					
Block encryption					Yes; with S7 block privacy
Dimensions and weight					
Dimensions					
• Width	40 mm	40 mm	80 mm	40 mm	120 mm
Height	125 mm				
• Depth	130 mm				
Weight					
 Weight, approx. 	290 g		460 g	340 g	1 250 g
	200 9		.55 9	5 .5 g	. 200 9

Ordering data	Order No.		Order No.
CPU 315F-2 DP	6ES7 315-6FF04-0AB0	CPU 319F-3 PN/DP	6ES7 318-3FL01-0AB0
CPU for SIMATIC S7-300F; 384 KB RAM, power supply 24 V DC, MPI, PROFIBUS DP master/ slave interface, incl. slot number labels; MMC required		Work memory 2.5 MB, 24 V DC power supply, combined MPI/ PROFIBUS DP master/slave interface, PROFIBUS DP master/ slave interface, Ethernet/	
CPU 315F-2 PN/DP	6ES7 315-2FJ14-0AB0	PROFINET interface; MMC required	
CPU for SIMATIC S7-300F; 512 KB work memory, 24 V DC power supply, MPI/PROFIBUS DP		Distributed Safety V5.4 programming tool	
master/slave interface, Industrial Ethernet/PROFINET interface; incl. slot number labels		Task: Software for configuring fail- safe user programs for SIMATIC S7-300F, S7-400F, ET 200S	
CPU 317F-2 DP	6ES7 317-6FF03-0AB0	Requirements: STEP 7 V5.3 SP3 and higher	
1024 KB work memory, 24 V DC power supply, MPI, PROFIBUS		Floating license	6ES7 833-1FC02-0YA5
DP master/slave interface, MMC		Software Update Service	6ES7 833-1FC00-0YX2
required		Distributed Safety Upgrade	
CPU 317F-2 PN/DP Work memory 1.5 MB, 24 V DC power supply, MPI/PROFIBUS DP	6ES7 317-2FK14-0AB0	From V5.x to V5.4; Floating license for 1 user	6ES7 833-1FC02-0YE5
master/slave interface, Industrial		SIMATIC Micro Memory Card	
Ethernet/PROFINET interface; MMC required		64 KB	6ES7 953-8LF20-0AA0
		128 KB	6ES7 953-8LG20-0AA0
		512 KB	6ES7 953-8LJ20-0AA0
		2 MB	6ES7 953-8LL20-0AA0
		4 MB	6ES7 953-8LM20-0AA0
		8 MB	6ES7 953-8LP20-0AA0

Fail-safe CPUs

Ordering data	Order No.		Order No.
MPI cable	6ES7 901-0BF00-0AA0	PROFIBUS Fast Connect bus cable	6XV1 830-0EH10
For connecting SIMATIC S7 and he PG through MPI; 5 m in length		Standard type with special design	
Slot number plates	6ES7 912-0AA00-0AA0	for quick mounting, 2-core, shielded, sold by the meter, max.	
67-300 manual		delivery unit 1000 m, minimum ordering quantity 20 m	
Design, CPU data, module data, nstruction list		PROFINET bus components	
German	6ES7 398-8FA10-8AA0	IE FC TP standard cable GP 2x2	6XV1 840-2AH10
English	6ES7 398-8FA10-8BA0	4-core, shielded TP installation	
SIMATIC manual collection J Electronic manuals on DVD,	6ES7 998-8XC01-8YE0	 cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter 	
multilingual: LOGO!, SIMADYN, SIMATIC bus components,		FO standard cable GP (50/125)	6XV1 873-2A
SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC		Standard cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	0AV1 073-ZA
Selisors, Simaric NET, Simaric PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC		SCALANCE X204-2 Industrial Ethernet Switch	6GK5 204-2BB10-2AA3
TDC		Industrial Ethernet Switches with	
SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2	integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET	
Current "Manual Collection" DVD and the three subsequent updates		diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and	
Power supply connector	6ES7 391-1AA00-0AA0	two FO ports	00/7.077.444.00.0440
10 units, spare part		CSM 377 compact switch module	6GK7 377-1AA00-0AA0
Manual "Communication for SIMATIC S7-300/-400" German English French Spanish	6ES7 398-8EA00-8AA0 6ES7 398-8EA00-8BA0 6ES7 398-8EA00-8CA0 6ES7 398-8EA00-8DA0	Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three other participants to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	
Italian	6ES7 398-8EA00-8EA0	IE FC RJ45 Plugs	
PC adapter USB For connecting a PC to SIMATIC S7-200/300/400 via USB; with USB cable (5 m) PROFIBUS bus components	6ES7 972-0CB20-0XA0	RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
RS 485 PROFIBUS DP bus connector		IE FC RJ45 Plug 145	
 With 90° cable outlet, max. 		145° cable outlet	
transmission rate 12 Mbit/s - Without PG interface	6ES7 972-0BA12-0XA0	1 unit	6GK1 901-1BB30-0AA0
- With PG interface	6ES7 972-0BB12-0XA0	10 units	6GK1 901-1BB30-0AB0
 With 90° cable outlet for FastConnect connection 		50 units	6GK1 901-1BB30-0AE0
system, max. transmission rate		IE FC RJ45 Plug 180	
12 Mbit/s - Without PG interface, 1 unit	6ES7 972-0BA52-0XA0	180° cable outlet	
- Without PG interface, 100 units	6ES7 972-0BA52-0XB0	1 unit	6GK1 901-1BB10-2AA0
- With PG interface, 1 unit	6ES7 972-0BB52-0XA0	10 units	6GK1 901-1BB10-2AB0
- With PG interface, 100 units	6ES7 972-0BB52-0XB0	50 units	6GK1 901-1BB10-2AE0
 With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS 	6GK1 500-0EA02	PROFIBUS/PROFINET bus components	see catalogs IK PI, CA 01
•		For establishing MPI/PROFIBUS/ PROFINET communication	
		D: Subject to export regulations AL: I: Subject to export regulations AL: I	

J: Subject to export regulations AL: N and ECCN: EAR99S

Central processing units

SIPLUS fail-safe CPUs

Overview SIPLUS CPU 315F-2DP



- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 315F-2 DP
Order number	6AG1 315-6FF04-2AB0
Order number based on	6ES7 315-6FF04-0AB0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No
Ambient conditions	
Relative humidity	5 100 % Condensation permissible

For further technical documentation on SIPLUS, see: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS CPU 315F-2 DP	6AG1 315-6FF04-2AB0
(extended temperature range and medial exposure)	
CPU for SIPLUS S7-300F; 384 KB work memory, 24 V DC supply voltage, MPI, PROFIBUS DP master/slave interface, incl. slot number labels; MMC required	
Accessories	See SIMATIC CPU 315F-2 DP, page 5/92

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Central processing units

SIPLUS fail-safe CPUs

Overview SIPLUS CPU 315F-2 PN/DP



- The CPU with a medium sized program memory and quantity structures to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849 and up to category 4 of EN 954-1

- The fail-safe I/O modules can be locally connected to the integrated PROFINET interface (PROFIsafe) and/or to the integrated PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally
- Component based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 315F-2 PN/DP		
Order No.	6AG1 315-2FJ14-2AB0	6AG1 315-2FJ14-2AY0	
Order No. based on	6ES7 315-2FJ14-0AB0 6ES7 315-2FJ14-0AB0		
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	
Ambient conditions:			
Relative humidity	5 100%, condensation allowed		

Technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
CPU 315F-2 PN/DP		Accessories	See SIMATIC CPU 315F-2 PN/DP
CPU for SIPLUS S7-300F; work memory 512 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; incl. slot number labels	6AG1 315-2FJ14-2AB0		page 5/92
Additional conformance with EN 50155	6AG1 315-2FJ14-2AY0		

SIPLUS fail-safe CPUs

Overview SIPLUS CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity structure for demanding applications
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 317F-2 DP		
Order number	6AG1 317-6FF03-2AB0 6AG1 317-6FF03-2AY0		
Order No. based on	6ES7 317-6FF03-0AB0 6ES7 317-6FF03-0AB0		
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components.		
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No Yes		
Technical data	The technical data is identical to that of the based on modules.		
Ambient conditions			
Relative humidity	5 100%, condensation allowed		

Technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 317F-2 DP		Accessories	See SIMATIC CPU 317F-2 DP,
(extended temperature range and medial exposure)			page 5/92
Work memory 1024 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, MMC required	6ES7 317-6FF03-2AB0		
Additional conformance with L EN 50155	6AG1 317-6FF03-2AY0		

L: Subject to export regulations AL: 91999 and ECCN: N

Central processing units

SIPLUS fail-safe CPUs

Overview SIPLUS CPU 317F-2 PN/DP



- The failsafe CPU with a large program memory and quantity structures for demanding applications to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849-1 and up to category 4 of EN 954-1

- The fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 317F-2 PN/DP		
Order number	6AG1 317-2FK14-2AB0	6AG1 317-2FK14-2AY0	
Order No. based on 6ES7 317-2FK14-0AB0 6ES7 317-2FK		6ES7 317-2FK14-0AB0	
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	
Ambient conditions			
Relative humidity	5 100%, condensation allowed		

Technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 317F-2 PN/DP (extended temperature range and medial exposure)		Accessories	See SIMATIC CPU 317F-2 PN/DP page 5/92
Work memory 1.5 MB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/PROFINET interface; MMC required	6AG1 317-2FK14-2AB0		
Additional conformance with EN 50155	6AG1 317-2FK14-2AY0		

Central processing units

Technology CPUs

Overview CPU 315T-2 DP



- SIMATIC CPU with integral Technology/Motion Control functionality
- With full standard CPU 315-2 DP functionality
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/ real master, gear synchronization, cam disk or print mark compensation
- 3D path interpolation with standard kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7-Technology" option package required

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

Overview CPU 317T-2 DP



- SIMATIC CPU with integral Technology/Motion Control functionality
- With full standard CPU 317-2 DP functionality
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/ real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- · Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7-Technology" option package required

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

Central processing units

Technology CPUs

Overview CPU 317F-2 DP



- Failsafe SIMATIC CPU with integral Technology/Motion Control functionality
- With full functionality of the standard CPU 317-2 DP and CPU 317F-2 DP
- For cross-industry automation tasks in series machine, special machine and plant construction

- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Used as central controller in production lines with central and distributed I/O
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
 - "S7-Technology" option package required
- "S7 Distributed Safety" option package required

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

Technical specifications

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
Product version			
associated programming package	STEP 7 V5.4 + SP5 (and higher) and "S7-Technology" V4.2 option package	STEP 7 V5.4 + SP5 (and higher) and "S7-Technology" V4.2 option package	STEP7 V 5.4 SP5 or higher, "S7-Technology" V4.2 or higher, Distributed Safety V5.4 SP5 or higher, S7-F Configuration Pack V5.5 SP7 or higher
Supply voltages			
Rated value			
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
external protection for supply cables (recommendation)	Min. 2 A	Min. 2 A	Min. 2 A
Current consumption Current consumption (in no-load operation), typ.	200 mA	200 mA	250 mA
Inrush current, typ.	2.5 A	2.5 A	2.5 A
I ² t	1 A ² ·s	1 A ² ·s	1 A ² ·s
Power losses			
Power loss, typ.	6 W	6 W	6 W
Wemory Work memory • integrated • expandable • Size of retentive memory for retentive data blocks	256 Kibyte No	1 024 Kibyte No	1 536 Kibyte No 256 Kibyte
Load memory			
pluggable (MMC)	Yes	Yes	Yes
 pluggable (MMC), max. 	8 Mbyte	8 Mbyte	8 Mbyte
Backup			
• present	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data	Yes; Program and data	Yes; Program and data
CPU-blocks DB			
Number, max.Size, max.	1 023; Number band: 1 to 1023 64 Kibyte	2 047; Number band: 1 to 2047 64 Kibyte	2 047; Number band: 1 to 2047 64 Kibyte

Technology CPUs

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
-B			
Number, max.	1 024; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047
Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
C Number, max.	1 024; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047
Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
OB			
Size, max. Number of technology synchronous alarm OBs	64 Kibyte 1; OB 65	64 Kibyte 1; OB 65	64 Kibyte 1; OB 65
lesting depth			
per priority class additional within an error OB	8 4	16 4	16 4
CPU processing times or bit operations, min.	0.1 µs	0.05 µs	0.05 µs
or word operations, min.	0.2 μs	0.2 μs	0.2 µs
or fixed point arithmetic, min.	2 µs	0.2 µs	0.2 μs
or floating point arithmetic, min.	3 µs	1 μs	1 μs
Counters, timers and their		· · · · · · · · · · · · · · · · · · ·	<u> </u>
etentivity 67 counter • Number	256; Number range: 0255	512; Number range: 0511	512; Number range: 0511
Retentivity - adjustable	Yes	Yes	Yes
Counting range	V		V.
adjustablelower limit	Yes 0	Yes 0	Yes 0
- upper limit	999	999	999
EC counter			
present	Yes	Yes	Yes
Туре	SFB	SFB	SFB
37 times Number	256; Number range: 0 to 255	512; Number range: 0 to 511	512; Number range: 0 to 511
Retentivity	Voc	Voc	Van
adjustablepreset	Yes no retentivity	Yes no retentivity	Yes no retentivity
Time range	,	,	,
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
EC timer present Type	Yes SFB	Yes SFB	Yes SFB
Data areas and their retentivity	GI B	Ol D	0.5
lag			
Number, max.	2 048 byte	4 096 byte	4 096 byte
Retentivity available	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 4095
Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks	1 002: From DD 1 to DD 1000	2.047: from DD 1 to DD 2047	2.047: from DB 1 to DB 2047
Number, max. Size, max.	1 023; From DB 1 to DB 1023 64 Kibyte	2 047; from DB 1 to DB 2047 64 Kibyte	2 047; from DB 1 to DB 2047 64 Kibyte
Retentivity adjustable	Yes; via non-retain property on DB	Yes; via non-retain property on DB	Yes; via non-retain property on I
Retentivity preset	Yes	Yes	Yes
ocal data			
per priority class, max.	1 024 byte	1 024 byte	1 024 byte

Technology CPUs

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
Address area			
I/O address area			
• overall	2 048 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte	8 192 byte
 of which, distributed 			
- Inputs	2 048 byte	8 192 byte	8 192 byte
- Outputs	2 048 byte	8 192 byte	8 192 byte
Process image			
 Inputs, adjustable 	2 048 byte	2 048 byte	2 048 byte
Outputs, adjustable	2 048 byte	2 048 byte	2 048 byte
• Inputs, preset	128 byte	256 byte	1 024 byte
Outputs, preset	128 byte	256 byte	1 024 byte
Subprocess images			
• Number of subprocess images,	1	1	1
max.			
Digital channels			
• Inputs	16 384	65 536	65 536
• Outputs	16 384	65 536	65 536
Inputs, of which central	512	512	512
Outputs, of which central	512	512	512
Analog channels			
• Inputs	1 024	4 096	4 096
• Outputs	1 024	4 096	4 096
• Inputs, of which central	64	64	64
Outputs, of which central	64	64	64
Hardware configuration Central devices, max.	1	1	1
Expansion devices, max.	0	0	0
Racks, max.	1	1	1
Modules per rack, max.	8	8	8
Number of DP masters			
• integrated	2; 1 DP and 1 DP (drive)	2; 1 DP and 1 DP (drive)	2; 1 DP and 1 DP (drive)
• via CP	2; for DP	2; for DP	2; for DP
Number of operable FMs and CPs	, -	, -	, .
(recommended)			
• FM	8	8	8
• CP, point-to-point	8	8	8
• CP, LAN	10	10	8
Time			
Clock	Voo	Voo	Vac
Hardware clock (real-time clock)	Yes	Yes	Yes
 battery-backed and synchronizable 	Yes	Yes	Yes
Behavior of the clock following POWER-ON			Clock continues running after POWER OFF
Behavior of the clock following			The clock continues at the time of
expiry of backup period			day it had when power was switched off
Deviation per day, max.	10 s	10 s	10 s
Runtime meter			
Number	1	4	4
 Number/Number range 	0	0 to 3	0 to 3
 Range of values 	0 to 2^31 hours	0 to 2^31 hours	0 to 2^31 hours
- Hange of Values			
Ü	(when using SFC 101)	(when using SFC 101)	(when using SFC 101)
Granularity Retentive	(when using SFC 101) 1 hour Yes; must be restarted at each	1 hour Yes; must be restarted at each	1 hour Yes; must be restarted at each

Technology CPUs

Clock synchronization • supported • to MPI, master • to MPI, slave • to DP, master • to DP, slave • to D
 supported to MPI, master to MPI, slave to DP, master to DP, master to DP, slave to SP, slav
 to MPI, master to MPI, slave to DP, master to DP, master to DP, slave to SP to DP, slave to SP to SP
• to MPI, slave • to DP, master • to DP, slave • in AS, master • in AS, slave ST message functions Number of login stations for message functions, max. 16; Depending on the connections configured for PG/OP and S7 basic communication Process diagnostic messages Yes Yes Yes Yes Yes Yes Yes
• to DP, master • to DP, slave • Yes • Yes • yes • in AS, master • in AS, slave S7 message functions Number of login stations for message functions, max. In the station of the connections configured for PG/OP and S7 basic communication Process diagnostic messages • Yes • Test commissioning functions Status/control Yes Yes Yes Yes Yes Yes Yes Ye
• to DP, slave • in AS, master • in AS, slave S7 message functions Number of login stations for message functions, max. Process diagnostic messages Yes Yes Yes Yes Yes Yes Yes
• in AS, master • in AS, slave Yes Yes Yes Yes Yes Yes Yes Yes Yes
• in AS, slave S7 message functions Number of login stations for message functions, max. 16; Depending on the connections configured for PG/OP and S7 basic communication Process diagnostic messages Yes Yes 32; Depending on the connections configured for PG/OP and S7 basic communication Yes Yes Yes Yes Yes Yes Yes Ye
Number of login stations for message functions, max. 16; Depending on the connections configured for PG/OP and S7 basic communication Process diagnostic messages Yes Yes Yes Yes Yes Test commissioning functions Status/control 16; Depending on the connections configured for PG/OP and S7 basic communication 32; Depending on the connections configured for PG/OP and S7 basic communication Yes Yes Yes 60 60
message functions, max. connections configured for PG/OP and S7 basic communication Process diagnostic messages Yes Yes Yes Yes Yes Yes Test commissioning functions Status/control
simultaneously active Alarm-S blocks, max. Test commissioning functions Status/control
Alarm-S blocks, max. Test commissioning functions Status/control
Status/control
• olanos/connorvanable Yes Yes Yes
 Variables Inputs, outputs, memory bits, DB, times, counters Inputs, outputs, memory bits, DB, times, counters Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max. 30 30 30
• of which status variables, max. 30 30 30
• of which control variables, max. 14 14 14
Forcing
• Forcing Yes Yes Yes
Status block Yes Yes Yes; up to 2 simultaneous
Single step Yes Yes Yes
Number of breakpoints 2 2 2; without continuation
Diagnostic buffer
• present Yes Yes Yes
• Number of entries, max. 100 100 100
- adjustable No No No
- of which powerfail-proof 100
Monitoring functions Status LEDs Yes
Communication functions
PG/OP communication Yes Yes Yes
Routing Yes Yes Yes
Global data communication
• supported Yes Yes Yes
• size of GD packets, max. 22 byte 22 byte 22 byte 22 byte
S7 basic communication
• supported Yes Yes Yes
S7 communication • supported Yes Yes Yes
S5-compatible communication • supported Yes; via CP and loadable FC Yes; via CP and loadable FC Yes; via CP and loadable FC Yes; via CP and loadable
Number of connections
• overall 32 32
• usable for PG communication 15 31 31
• usable for OP communication 15 31 31
• usable for S7 basic 12 30 30
communication
• usable for routing 8; additional 8; additional 8

Technology CPUs

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
1st interface			
Type of interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Isolated	Yes	Yes	Yes
Power supply to interface	200 mA	200 mA	200 mA
(15 to 30 V DC), max.	20011111	200 1111 (200
Functionality	V		
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
Point-to-point connection	No	No	No
MPI			
Number of connections	32	32	32
Services			
 PG/OP communication 	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
 Global data communication 	Yes	Yes	Yes
 S7 basic communication 	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB	No; but via CP and loadable FB
- S7 communication, as server	Yes; Connection configured on	Yes; Connection configured on	Yes
	one side only	one side only	
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
DP master			
• Services			
 PG/OP communication 	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
 Global data communication 	No	No	No
 S7 basic communication 	Yes; I blocks only	Yes; I blocks only	Yes; I blocks only
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB	No; but via CP and loadable FB
- S7 communication, as server	Yes; Connection configured on	Yes; Connection configured on	Yes
	one side only	one side only	
 Equidistance mode support 	Yes	Yes	Yes
- Isochronous mode	Yes; OB 61	Yes; OB 61	Yes; OB 61
- SYNC/FREEZE	Yes	Yes	Yes
 Activation/deactivation of DP 	Yes	Yes	Yes
slaves			
 Number of DP slaves that can be simultaneously activated/ 			4
deactivated, max.			
- DPV1	Yes	Yes	Yes
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.	124	124	124
Address area	127	124	124
- Inputs, max.	2 048 byte	8 192 byte	8 192 byte
- Outputs, max.	2 048 byte	8 192 byte	8 192 byte
 User data per DP slave 	2 048 byte	8 192 byte	o 192 Dyte
	244 byte	244 byto	244 byte
- Inputs, max.	,	244 byte	*
- Outputs, max.	244 byte	244 byte	244 byte
DP slave			
• Services	V	V	V
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes; only with active interface	Yes; only with active interface	Yes; only with active interface
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes; only server, configured on one
			side only

Technology CPUs

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
DP slave			
Services			
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB	Yes; but via CP and loadable FB
- S7 communication, as server	Yes; Connection configured on one side only	Yes; Connection configured on one side only	Yes; Connection configured on one side only
- Direct data exchange (slave-to-slave communication)	Yes	Yes	Yes
- DPV1 • GSD file	No	No	No www.siemens.com/profibus-gsd
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Transfer memory	12 MBIGS	12 Mbly3	12 IVIDIUS
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
Address area, max.	32	32	32
User data per address area, max.	32 byte	32 byte	32 byte
and interface		,	
Type of interface	integrated RS 485 interface	integrated RS 485 interface	integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
solated	Yes	Yes	Yes
Power supply to interface	200 mA	200 mA	200 mA
15 to 30 V DC), max.			
unctionality			
MPI	No	No	No
DP master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master
DP slave	No	No	No
Local Operating Network	No	No	No
OP master			
Services			
- PG/OP communication	No	No	No
- Routing	No	No	Yes
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	No	No	No
- Equidistance mode support	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- SYNC/FREEZE	No	No	No
- Activation/deactivation of DP slaves	Yes	Yes	Yes
- DPV1	No	No	No
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.	64	64	64
Address area			
- Inputs, max.	1 024 byte	1 024 byte	1 024 byte
- Outputs, max.	1 024 byte	1 024 byte	1 024 byte
User data per DP slave			
- Inputs, max.	244 byte	244 byte	244 byte
- Outputs, max.	244 byte	244 byte	244 byte
OP slave	http://gupport.gutorestics	http://gupport.gutorestics	
• GSD file	http://support.automation. siemens.com in Product Support	http://support.automation. siemens.com in Product Support	
	area	area	

Technology CPUs

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
Programming			
Programming language			
STEP 7	Yes; V5.2 SP1 or higher and S7 Technology option package	Yes	Yes
LAD	Yes	Yes	Yes
FBD	Yes	Yes	Yes
STL	Yes	Yes	Yes
SCL	Yes	Yes	Yes
CFC	Yes	Yes	Yes
GRAPH	Yes	Yes	Yes
_			
• HiGraph [®]	Yes	Yes	Yes
Command set	See instruction list 8	See instruction list 8	see instruction list
Nesting levels	8	8	8
Know-how protection	V	V	V
User program protection/ password protection	Yes	Yes	Yes
System functions (SFC)	see instruction list	see instruction list	see instruction list
System function blocks (SFB)	see instruction list	see instruction list	see instruction list
Digital inputs			
Number of digital inputs	4	4	4
of which, inputs usable for technological functions	4	4	4
Number of simultaneously control-			
able inputs			
horizontal installation			
- up to 40 °C, max.	4	4	4
- up to 60 °C, max.	4	4	4
vertical installation			
- up to 40 °C, max.	4	4	4
nput characteristic curve acc. to	Yes	Yes	Yes
EC 1131, Type 1	103	103	103
nput voltage			
Rated value, DC	24 V	24 V	24 V
for signal "0"	-3 to +5 V	-3 to +5 V	-3 to +5 V
for signal "1"	15 to 30 V	15 to 30 V	15 to 30 V
nput current			
for signal "1", typ.	7 mA	7 mA	7 mA
0 . 31	7 1100	7 170 (, ,,,,,
nput delay (for rated value of input voltage)			
for counter/technological functions			
O .	10 us typically	10 yes typically	10 year trypically:
- at "0" to "1", max.	10 µs; typically	10 μs; typically	10 µs; typically
- at "1" to "0", max.	10 μs; typically	10 μs; typically	10 μs; typically
Cable length	4.000	4.000	4.000
Cable length, shielded, max.	1 000 m	1 000 m	1 000 m
Digital outputs	0	0	0
Number of digital outputs	8	8	8
of which high-speed outputs	8	8	8
unctions	For technology functions, e.g. high-speed cam switch signals	For technology functions, e.g. high-speed cam switch signals	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes	Yes	Yes
Response threshold, typ.	1.0 A	1.0 A	1.0 A
Limitation of inductive shutdown voltage to	48 V	48 V	48 V
_amp load, max.	5 W	5 W	5 W
Controlling a digital input	No	No	No

Technology CPUs

recnnical specifications (contin	ided)		
	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0	6ES7 317-6TF14-0AB0
Output voltage			
• for signal "0" (DC), max.	3 V; (2L+)	3 V; (2L+)	3 V; 2L+
• for signal "1", min.	Rated voltage -2.5 V	Rated voltage -2.5 V	Rated voltage -2.5 V (2L+)
Output current			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
 for signal "1" permissible range for 0 to 60 °C, min. 	5 mA	5 mA	5 mA
 for signal "1" permissible range for 0 to 60 °C, max. 	0.6 A	0.6 A	0.6 A
• for signal "0" residual current, max.	0.3 mA	0.3 mA	0.3 mA
Parallel switching of 2 outputs			
 for increased power 	No	No	No
 for redundant control of a load 	No	No	No
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.2 Hz; to IEC 947-5-1, 13 DC	0.2 Hz; to IEC 947-5-1, 13 DC	0.2 Hz; to IEC 947-5-1, 13 DC
• on lamp load, max.	100 Hz	100 Hz	100 Hz
Aggregate current of outputs (per group)			
horizontal installation			
- up to 40 °C, max.	4 A	4 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A
 all other mounting positions 			
- up to 40 °C, max.	3 A	3 A	3 A
Load resistance range			
lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Cable length			
 Cable length, shielded, max. 	1 000 m	1 000 m	1 000 m
Encoder			
Connectable encoders			
• 2-wire BEROS	No	No	No
Galvanic isolation			
Galvanic isolation digital inputs			
between the channels and the	Yes	Yes	Yes
backplane bus			
Galvanic isolation digital outputs			
 between the channels and the backplane bus 	Yes	Yes	Yes
Environmental requirements			
Operating temperature			
• Min.	0 °C	0 °C	0 °C
Dimensions and weight			
Dimensions			
• Width	160 mm	160 mm	160 mm
Height	125 mm	125 mm	125 mm
• Depth	130 mm	130 mm	130 mm
Weight			
Weight, approx.	750 g	750 g	750 g
5 , 11	S	- 5	Ü

Technology CPUs

Ordering data	Order No.		Order No.
CPU 315T-2 DP	6ES7 315-6TH13-0AB0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
256 KB work memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface; with technology/motion control functions; MMC required CPU 317T-2 DP	6ES7 317-6TK13-0AB0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7. SIMATIC Software. SIMATIC	
1024 KB work memory, 24 V DC		TDC	
power supply, MPI, PŔOFIBUS DP master/slave interface, PROFIBUS DP (DRIVE) interface; with technology/motion control functions;		SIMATIC manual collection Dupdate service for 1 year Current "Manual Collection" DVD and the three subsequent	6ES7 998-8XC01-8YE2
MMC required		updates	
CPU 317TF-2 DP	6ES7 317-6TF14-0AB0	Power supply connector	6ES7 391-1AA00-0AA0
1.5 MB work memory, 24 V DC		10 units, spare part	
oower supply, MPI, PROFIBUS DP master/slave interface,		Labeling strips	6ES7 392-2XX00-0AA0
PROFIBUS DP(DRIVE) interface;		10 units, spare part	
with technology/motion control functions;		Label cover	6ES7 392-2XY00-0AA0
MMC required		10 units, spare part	
S7-Technology V4.2	6ES7 864-1CC42-0YA5	S7 SmartLabel V3.0	
Task: Option package for configuring and programming technology tasks with SIMATIC S7 CPU 3		Software for automatic labeling of modules direct from the STEP 7 project	
1xT-2 DP and the SIMATIC S7		Single license J	2XV9 450-1SL03-0YX0
CPU 317TF-2 DP Requirements:		Upgrade single license J	2XV9 450-1SL03-0YX4
STEP 7 V5.4 SP5 or higher Type of delivery:		Labeling sheets for machine inscription	
on DVD; incl. documentation for CPU 3 1xT-2 DP, CPU 317TF-2 DP (included on DVD)		For 16-channel signal modules, DIN A4, for printing with laser printer;	
SIMATIC Micro Memory Card		10 units	
4 MB	6ES7 953-8LM20-0AA0	petrol	6ES7 392-2AX00-0AA0
3 MB	6ES7 953-8LP20-0AA0	light-beige	6ES7 392-2BX00-0AA0
/IPI cable	6ES7 901-0BF00-0AA0	yellow	6ES7 392-2CX00-0AA0
For connecting SIMATIC S7 and he PG through MPI; 5 m in length		red	6ES7 392-2DX00-0AA0
Front connector (1 unit)		For 32-channel signal modules, DIN A4, for printing with laser	
40-pin, with screw contacts		printer;	
1 unit	6ES7 392-1AM00-0AA0	10 units	
100 units	6ES7 392-1AM00-1AB0	petrol	6ES7 392-2AX10-0AA0
10-pin, with spring-loaded		light-beige	6ES7 392-2BX10-0AA0
contacts 1 unit	6ES7 392-1BM01-0AA0	yellow	6ES7 392-2CX10-0AA0
100 units	6ES7 392-1BM01-1AB0	red	6ES7 392-2DX10-0AA0
40-pin, with FastConnect ● 1 unit	6ES7 392-1CM00-0AA0	Manual "Communication for SIMATIC S7-300/-400"	
Slot number plates	6ES7 912-0AA00-0AA0	German	6ES7 398-8EA00-8AA0
67-300 manual		English	6ES7 398-8EA00-8BA0
Design, CPU data, module data,		French	6ES7 398-8EA00-8CA0
nstruction list		Spanish	6ES7 398-8EA00-8DA0
German	6ES7 398-8FA10-8AA0	Italian	6ES7 398-8EA00-8EA0
English	6ES7 398-8FA10-8BA0	PC adapter USB For connecting a PC to SIMATIC S7-200/300/400 via USB; with	6ES7 972-0CB20-0XA0
		USB cable (5 m)	N and ECCN, ED000

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Technology CPUs

Ordering data	Order No.		Order No.
RS 485 PROFIBUS DP bus connector		PROFIBUS Fast Connect bus cable	6XV1 830-0EH10
With 90° cable outlet, max. transmission rate 12 Mbit/s Without PG interface With PG interface With 90° cable outlet for	6ES7 972-0BA12-0XA0 6ES7 972-0BB12-0XA0	Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
FastConnect connection system, max. transmission rate		RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0
12 Mbit/s		Transmission rate up to 12 Mbit/s;	
- Without PG interface, 1 unit	6ES7 972-0BA52-0XA0	24 V DC; IP20 enclosure	
 Without PG interface, 100 units With PG interface, 1 unit 	6ES7 972-0BA52-0XB0 6ES7 972-0BB52-0XA0	PROFIBUS bus components	see catalogs IK PI, CA 01
With PG interface, 100 units With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	6ES7 972-0BB52-0XB0 6GK1 500-0EA02	For establishing MPI/PROFIBUS communication	OAUI

SM 321 digital input module

Overview



- Digital inputs
- For connecting standard switches and two-wire proximity switches (BERO)

Technical specifications

	6ES7 321-1BH02- 0AA0	6ES7 321-1BH50- 0AA0	6ES7 321-1BL00- 0AA0	6ES7 321-1BP00- 0AA0	6ES7 321-1BH10- 0AA0
Supply voltages Load voltage L+					
 Rated value (DC) 	24 V	24 V	24 V	24 V	24 V
Current consumption from backplane bus 5 V DC, max.	10 mA	10 mA	15 mA	100 mA	110 mA
Power losses					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
Connection method required front connector	20-pin	20-pin	40-pin	Cable: 6ES7 392- 4Bxx0-0AA0 terminal blocks: 6ES7 392- 1xN00-0AA0	20-pin
Isochronous mode					
Isochronous mode	No	No	No	No	Yes
Digital inputs Number of digital inputs	16	16	32	64	16
Number of simultane- ously controllable inputs • horizontal installation - up to 40 °C, max.			32	64	
- up to 40 °C, max.	16	16	16	32	16
• vertical installation					
- up to 40 °C, max.	16	16	32	32	16
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes	Yes	Yes	Yes
Input voltage Rated value, DC for signal "0" for signal "1"	24 V -30 to +5 V 13 to 30 V	24 V -5 to +30 V -13 to -30 V	24 V -30 to +5 V 13 to 30 V	24 V -30 to +5 V 13 to 30 V	24 V -30 to +5 V 13 to 30 V
	10 t0 30 V	- 13 10 -30 V	13 10 30 V	13 10 30 V	13 10 30 V
Input current • for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA; typical	7 mA

SM 321 digital input module

	6ES7 321-1BH02- 0AA0	6ES7 321-1BH50- 0AA0	6ES7 321-1BL00- 0AA0	6ES7 321-1BP00- 0AA0	6ES7 321-1BH10- 0AA0
Input delay (for rated value of input voltage) • for standard inputs					
- parameterizable				No	
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
Cable length Cable length, shielded, max.	1 000 m				
Cable length unshielded, max.	600 m				
Encoder					
Connectable encoders					
2-wire BEROS	Yes	Yes	Yes	No	Yes
- permissible	1.5 mA	1.5 mA	1.5 mA		1.5 mA
quiescent current					
(2-wire BEROS), max.					
Alarms/diagnostics/ status information					
Alarms					
Alarms	No	No	No	No	No
Diagnostic alarm	NO	INO	INU	No	NO
J					
Process alarm				No	
Diagnostics Diagnostic functions	No	No	No	No	No
Diagnostic indication LED					
 Status indicator digital input (green) 	Yes	Yes	Yes	Yes	Yes
solation					
solation checked with	500 V DC				
Galvanic isolation Galvanic isolation digital nputs					
between the channels	No	No	No	No	No
between the channels,	16	16	16	16	16
in groups of	10	10	10	10	10
between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes	Yes; Optocoupler
Dimensions and weight					
Dimensions					
Width	40 mm				
Height	125 mm				
Depth	120 mm	120 mm	120 mm	112 mm	120 mm
Veight					
Weight, approx.	200 g	200 g	260 g	230 g; approx.	200 g

SM 321 digital input module

	6ES7 321-7BH01-0AB0	6ES7 321-1CH00-0AA0	6ES7 321-1CH20-0AA0	6ES7 321-1FH00-0AA0
Supply voltages				
Load voltage L+				
Rated value (DC)	24 V	24 V	48 V	
Load voltage L1 • Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.
Current consumption				
from load voltage L+ (without load), max.	90 mA			
from backplane bus 5 V DC, max.	130 mA	100 mA	40 mA	29 mA
Power losses				
Power loss, typ.	4 W	1.5 W; at 24 V; 2,8 W at 48 V	4.3 W	4.9 W
Connection method				
required front connector	20-pin	40-pin	20-pin	20-pin
Isochronous mode				
Isochronous mode	Yes	No	No	No
Digital inputs Number of digital inputs	16	16	16	16
Number of simultaneously control-				
lable inputs • horizontal installation				
- up to 50 °C, max.			8	
- up to 60 °C, max.	16	16	8; 6 to Ue 146 V	16
 vertical installation 				
- up to 40 °C, max.	16	16	8	16
Input characteristic curve acc. to IEC 1131, Type 1		Yes	Yes	Yes
Input characteristic curve acc. to IEC 1131, Type 2	Yes			
Input voltage • Rated value, AC • Rated value, DC • for signal "0" • for signal "1"	24 V -30 to +5 V 13 to 30 V	24 V; AC 24 or 48 V 24 V; DC 24 or 48 V -5 to +5 V AC 14 to 60 V AC	48 V; 48 to 125 V DC -146 to +15 V DC 30 to 146 V DC	230 V; 120 / 230 V AC 0 to 40 V 79 to 264 V
Frequency range		0 to 63 Hz		47 to 63 Hz
Input current • for signal "1", typ.	7 mA	2.7 mA	3.5 mA	6.5 mA; (120V, 60Hz), 16mA (230V, 50Hz)
Input delay (for rated value of input voltage) • for standard inputs - parameterizable	Yes; 0.1/0.5/3/15/20 ms	No		No
- at "0" to "1", min.	1110		0.1 ms	
- at "0" to "1", max.		16 ms	3.5 ms	25 ms
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m	1 000 m 600 m	1 000 m 600 m	1 000 m 600 m
	000 111	000 111	000 111	000 111
Encoder Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
- permissible quiescent current	2 mA	1 mA	1 mA	2 mA
(2-wire BEROS), max.				

SM 321 digital input module

	6ES7 321-7BH01-0AB0	6ES7 321-1CH00-0AA0	6ES7 321-1CH20-0AA0	6ES7 321-1FH00-0AA0
Alarms/diagnostics/status information				
Alarms				
 Alarms 	Yes	No	No	No
 Diagnostic alarm 	Yes; Parameterizable	No	No	No
 Process alarm 	Yes; Parameterizable	No	No	No
Diagnostics				
 Diagnostic functions 	Yes; Parameterizable	No	No	No
Diagnostic indication LED • Status indicator digital input (green)	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	500 V DC	1500 V AC	1500 V DC	4000 V DC
Galvanic isolation				
Galvanic isolation digital inputs				
 between the channels 	No	Yes	No	No
 between the channels, in groups of 	16	1	8	4
 between the channels and the backplane bus 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions and weight				
Dimensions				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm
Weight				
 Weight, approx. 	200 g	260 g	200 g	240 g

	6ES7 321-1EL00-0AA0	6ES7 321-1FF01-0AA0	6ES7 321-1FF10-0AA0
Supply voltages Load voltage L1 • Rated value (AC)	120 V	230 V; 120/230 V AC	230 V; 120/230 V AC; all load voltages must have the same
			phase.
Current consumption			
from backplane bus 5 V DC, max.	16 mA	29 mA	100 mA
Power losses			
Power loss, typ.	4 W	4.9 W	4.9 W
Connection method			
required front connector	40-pin	20-pin	40-pin
Isochronous mode			
Isochronous mode	No	No	No
Digital inputs			
Number of digital inputs	32	8	8
Number of simultaneously controllable inputs • horizontal installation			
- up to 40 °C, max.	32		
- up to 60 °C, max.	24	8	8
vertical installation			
- up to 40 °C, max.	32	8	8
Input characteristic curve acc. to IEC 1131, Type 1		Yes	Yes
Input characteristic curve acc. to IEC 1131, Type 2	Yes		

SM 321 digital input module

	6ES7 321-1EL00-0AA0 6ES7 321-1FF01-0AA0		6ES7 321-1FF10-0AA0	
Input voltage				
Rated value, AC	120 V	230 V; 120 / 230 V AC	120 V; 120 / 230 V AC	
• for signal "0"	0 to 20 V	0 to 40 V	0 to 40 V	
• for signal "1"	74 to 132 V	79 to 264 V	79 to 264 V	
• Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	
	17 10 00 112	17 to 00 112	17 10 00 112	
Input current	21 mA	6 E m A : (120 V) : 11 m A (220 V)	7.5 m Å · (100 \/) · 17.2 m Å (000 \/)	
• for signal "1", typ.	21 MA	6.5 mA; (120 V); 11mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)	
Input delay (for rated value of input voltage)				
 for standard inputs 				
- parameterizable	No	No	No	
- at "0" to "1", max.	15 ms	25 ms	25 ms	
Cable length				
Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	
Cable length unshielded, max.	600 m	600 m	600 m	
	555 111	500 III	333111	
Encoder Connectable and date				
Connectable encoders	V	V	\ <u>'</u>	
• 2-wire BEROS	Yes	Yes	Yes	
 permissible quiescent current (2-wire BEROS), max. 	4 mA	2 mA	2 mA	
Alarms/diagnostics/status information				
Alarms				
• Alarms	No	No	No	
Diagnostic alarm	No	No	No	
Process alarm	No	No	No	
	NO	110	110	
Diagnostics				
Diagnostic functions	No	No	No	
Diagnostic indication LED				
Status indicator digital input	Yes; per channel	Yes	Yes	
(green)				
Isolation				
Isolation checked with	2500 V DC	4000 V DC	1500 V AC	
Galvanic isolation				
Galvanic isolation digital inputs				
• between the channels	No	No	Yes	
between the channels,	8	2	1	
in groups of	0	۷	'	
between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	
Dimensions and weight				
Dimensions and weight				
	40 mm	40 mm	40 mm	
• Width	40 mm	40 mm	40 mm	
Height	125 mm	125 mm	125 mm	
• Depth	120 mm	120 mm	120 mm	
Weight				
 Weight, approx. 	300 g	240 g	240 g	

SM 321 digital input module

Ordering data	Order No.		Order No.
SM 321 digital input modules		SIMATIC TOP connect	See page 5/290
incl. labeling strips, bus connector		Bus connectors	6ES7 390-0AA00-0AA0
16 inputs, 24 V DC	6ES7 321-1BH02-0AA0	1 unit (spare part)	
16 inputs, 24 V DC, active low	6ES7 321-1BH50-0AA0	Labeling strips	
32 inputs, 24 V DC	6ES7 321-1BL00-0AA0	10 units (spare part)	
64 inputs, 24 V DC, active high/	6ES7 321-1BP00-0AA0	for modules with 20-pin front connector	6ES7 392-2XX00-0AA0
low Note:		for modules with 40-pin front connector	6ES7 392-2XX10-0AA0
6ES7392-40-0AA0 connection cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.		Label cover	
16 inputs, 24 to 48 V DC	6ES7 321-1CH00-0AA0	10 units (spare part)	
16 inputs, 48 to 125 V DC	6ES7 321-1CH20-0AA0	for modules with 20-pin front connector	6ES7 392-2XY00-0AA0
16 inputs, 24 V DC, for isochronous mode	6ES7 321-1BH10-0AA0	for modules with 40-pin front connector	6ES7 392-2XY10-0AA0
32 inputs, 120 V AC	6ES7 321-1EL00-0AA0	S7 SmartLabel V3.0	
8 inputs, 120/230 V AC	6ES7 321-1FF01-0AA0	Software for automatic labeling of	
8 inputs, 120/230 V AC, single root	6ES7 321-1FF10-0AA0	modules direct from the STEP 7 project	
16 inputs, 120/230 V AC	6ES7 321-1FH00-0AA0	Single license J	2XV9 450-1SL03-0YX0
16 inputs, 24 V DC, for	6ES7 321-7BH01-0AB0	Upgrade single license J	2XV9 450-1SL03-0YX4
isochronous mode, diagnostics-capable	0207 021 751101 0A50	Labeling sheets for machine inscription	
Front connectors		For 16-channel signal modules, DIN A4, for printing with laser	
20-pin, with screw contacts	- 	printer; 10 units	
1 unit100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	petrol	6ES7 392-2AX00-0AA0
20-pin, with spring-loaded	OLOT OSE TAGOS TABO	light-beige	6ES7 392-2BX00-0AA0
contacts		yellow	6ES7 392-2CX00-0AA0
• 1 unit • 100 units	6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0	red	6ES7 392-2DX00-0AA0
20-pin, with FastConnect	6ES7 392-1BJ00-1AB0	For 32-channel signal modules,	
• 1 unit	6ES7 392-1CJ00-0AA0	DIN A4, for printing with laser printer; 10 units	
40-pin, with screw contacts		petrol	6ES7 392-2AX10-0AA0
• 1 unit	6ES7 392-1AM00-0AA0	light-beige	6ES7 392-2BX10-0AA0
• 100 units	6ES7 392-1AM00-1AB0	yellow	6ES7 392-2CX10-0AA0
40-pin with spring-loaded contacts		red	6ES7 392-2DX10-0AA0
• 1 unit	6ES7 392-1BM01-0AA0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
• 100 units	6ES7 392-1BM01-1AB0	Electronic manuals on DVD,	
40-pin, with FastConnect 1 unit	6ES7 392-1CM00-0AA0	multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
S7-300 connecting cable	OLOT 392-1CWIUU-UAAU	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
For 64-channel modules; 2 units		Sensors, SIMATIC NET, SIMATIC	
1 m	6ES7 392-4BB00-0AA0	PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC	
2.5 m	6ES7 392-4BC50-0AA0	S7, SIMATIC Software, SIMATIC	
5 m	6ES7 392-4BF00-0AA0	CINATIO manual callection D	CEC7 000 CYCC4 0YES
Terminal block	1231 002 121 00 0AA0	SIMATIC manual collection D update service for 1 year	6ES7 998-8XC01-8YE2
For 64-channel modules; 2 units		Current "Manual Collection" DVD	
With screw contacts	6ES7 392-1AN00-0AA0	and the three subsequent updates	
With spring-loaded contacts	6ES7 392-1BN00-0AA0	S7-300 manual	
Front door, elevated design	6ES7 328-0AA00-7AA0	Design, CPU data, module data,	
e.g. for 32-channel modules: for		instruction list	
connecting 1.3 mm ² /16 AWG conductors		German	6ES7 398-8FA10-8AA0
Conductors		English	6ES7 398-8FA10-8BA0

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

SM 322 digital output module

Overview



- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

	6ES7 322-1BH01- 0AA0	6ES7 322-1BH10- 0AA0	6ES7 322-1BL00- 0AA0	6ES7 322-1BP00- 0AA0	6ES7 322-1BP50- 0AA0	6ES7 322-8BF00- 0AB0
Supply voltages Load voltage L+						
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Current consumption from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
from backplane bus 5 V DC, max.	80 mA	70 mA	110 mA	100 mA	100 mA	70 mA
Power losses Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
Connection method required front connector	20-pin	20-pin	40-pin	Cable: 6ES7 392- 4Bxx0-0AA0 terminal block: 6ES7 392-1xN00- 0AA0	Cable: 6ES7 392- 4Bxx0-0AA0 terminal block: 6ES7 392-1xN00- 0AA0	20-pin
Digital outputs Number of digital outputs	16	16	32	64	64	8
Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	M+ (45 V)	L+ (-45 V)
Lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Output voltage • for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5 V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
Output current • for signal "1" rated value • for signal "1" permissible range, min. • for signal "1"	0.5 A	0.5 A	0.5 A	0.3 A 2.4 mA 0.36 A	0.3 A 2.4 mA 0.36 A	0.5 A
permissible range, max. • for signal "1" permissible range for 0 to 40 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
 for signal "1" permissible range for 40 to 60 °C, min. 	5 mA	5 mA	5 mA			10 mA

SM 322 digital output module

recnnical specifications (continued)							
	6ES7 322-1BH01- 0AA0	6ES7 322-1BH10- 0AA0	6ES7 322-1BL00- 0AA0	6ES7 322-1BP00- 0AA0	6ES7 322-1BP50- 0AA0	6ES7 322-8BF00- 0AB0	
• for signal "1" permissible range for 40 to 60 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A	
 for signal "1" minimum load current 	5 mA	5 mA	5 mA			10 mA	
 for signal "0" residual current, max. 	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA	
Switching frequency • with resistive load,	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz	
max. • with inductive load, max.	0.5 Hz	0.5 Hz		0.5 Hz	0.5 Hz	2 Hz	
• on lamp load, max.	10 Hz						
Aggregate current of outputs (per group) • horizontal installation							
up to 40 °C, max.up to 60 °C, max.vertical installation	4 A 3 A	4 A 3 A	4 A 3 A	1.6 A 1.2 A	1.6 A 1.2 A	4 A 3 A	
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A	
Cable length Cable length, shielded, max.	1 000 m						
Cable length unshielded, max.	600 m						
Alarms/ diagnostics/status information							
Alarms • Diagnostic alarm	No	No	No	No	No	Yes; parameter- izable	
Diagnostics • Diagnostics	No	No	No	No	No	Yes	
Isolation Isolation checked with	500 V DC						
Galvanic isolation Galvanic isolation digital outputs • between the	8	8	8	16	16	8	
channels, in groups of • between the	Yes; Optocoupler						
channels and the backplane bus							
Dimensions and weight Dimensions							
Width	40 mm						
HeightDepth	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 112 mm	125 mm 112 mm	125 mm 120 mm	
Weight • Weight, approx.	190 g	200 g	260 g	230 g	230 g	210 g	

SM 322 digital output module

	6ES7 322-5GH00- 0AB0	6ES7 322-1CF00- 0AA0	6ES7 322-1BF01- 0AA0	6ES7 322-1FF01- 0AA0	6ES7 322-5FF00- 0AB0	6ES7 322-1FH00- 0AA0
Supply voltages Load voltage L+ • Rated value (DC)	24 V; 24 / 48	48 V; 48 to 125 V DC	24 V			
Load voltage L1 • Rated value (AC)				230 V; 120 / 230 V AC	230 V; 120 / 230 V AC	230 V; 120 / 230 V AC
Current consumption from load voltage L+ (without load), max.	200 mA	2 mA	60 mA			2 mA
from load voltage L1 (without load), max.				2 mA	2 mA	3 mA
rom backplane bus 5 V DC, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
Power losses Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
Connection method required front connector	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
Digital outputs Number of digital outputs	16	8	8	8	8	16
Short-circuit orotection	No; to be provided externally	Yes; Electronic	Yes; Electronic	Yes; Fuse 8 A, 250 V; per group	Yes; to be provided externally; fuse 3.15 A / 250 V, quick response	Yes; Fuse 8 A, 250 V; per group
Limitation of nductive shutdown voltage to		M (-1 V)	L+ (-48 V)		1	
Lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
Output voltage • for signal "1", min.	L+ (-0.25 V)	L+ (-1.2 V)	L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
Output current • for signal "1" rated value	0.5 A	1.5 A	2 A	2 A	2 A	1 A
for signal "1" permissible range		10 mA	5 mA	10 mA	10 mA	10 mA
for 0 to 40 °C, min. for signal "1" permissible range		1.5 A	2.4 A	2 A	2 A	1 A
for 0 to 40 °C, max. for signal "1" permissible range		10 mA	5 mA	10 mA	10 mA	10 mA
for 40 to 60 °C, min. for signal "1" permissible range for 40 to 60 °C,		1.5 A	2.4 A	1 A	1 A	0.5 A
max. • for signal "1" minimum load		10 mA	5 mA	10 mA	10 mA	10 mA
current for signal "1" permissible surge	1.5 A; for 50 ms, 1 A 2 s one-time	3 A; for 10 ms		20 A; max. 1 AC cycle	20 A; with 2 half waves	20 A; with 2 half waves
current, max. for signal "0" residual current, max.	10 μΑ	0.5 mA	0.5 mA	2 mA	2 mA	2 mA
Switching frequency with resistive load,	10 Hz	25 Hz	100 Hz	10 Hz	10 Hz	10 Hz
max. • with inductive load, max.		0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
on lamp load, max.	0.5 Hz	10 Hz	10 Hz	1 Hz	1 Hz	1 Hz

SM 322 digital output module

	6ES7 322-5GH00- 0AB0	6ES7 322-1CF00- 0AA0	6ES7 322-1BF01- 0AA0	6ES7 322-1FF01- 0AA0	6ES7 322-5FF00- 0AB0	6ES7 322-1FH00- 0AA0
Aggregate current of outputs (per group) • horizontal installation						
 up to 40 °C, max. up to 50 °C, max. 		6 A 4 A		4 A	8 A	4 A
- up to 60 °C, max.	0.5 A; (8 A per module)	3 A	4 A	2 A	4 A	2 A
 vertical installation up to 40 °C, max. 		4 A	4 A	2 A	4 A	2 A
 all other mounting positions 						
- up to 40 °C, max.	0.5 A; (8 A per module)					
Cable length Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Alarms/ diagnostics/status information						
Alarms Diagnostic alarm	Yes; parameter- izable	No	No	No	Yes; parameter- izable	No
Diagnostics • Diagnostics	Yes; parameters can be assigned	No	No	Yes	Yes	Yes
Isolation Isolation checked with	1500 V AC	1500 V AC	500 V DC	1500 V AC	1500 V AC	4000 V DC
Galvanic isolation Galvanic isolation						
digital outputs between the channels, in groups of	1	4	4	4	1	8
between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions and weight Dimensions						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
HeightDepth	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm
Weight Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g

SM 322 digital output module

	6ES7 322-1FL00- 0AA0	6ES7 322-1HF01- 0AA0	6ES7 322-1HF10- 0AA0	6ES7 322-5HF00- 0AB0	6ES7 322-1HH01- 0AA0
Supply voltages					
_oad voltage L+					
Rated value (DC)		24 V	120 V	24 V	120 V
Load voltage L1 • Rated value (AC)	120 V; 120 / 230 V AC		230 V	230 V	230 V
Current consumption	,,				
rom load voltage L+		110 mA: Current			
without load), max.		consumption of relay			
rom load voltage L1	10 mA	110 mA			
without load), max.					
rom backplane bus 5 V DC, max.	190 mA	40 mA	40 mA	100 mA	100 mA
Power losses					
Power loss, typ.	25 W	3.2 W	4.2 W	3.5 W	4.5 W
Connection method					
equired front connector	20-pin	20-pin	40-pin	40-pin	20-pin
Digital outputs					
Number of digital outputs	32	8; Relay	8; Relay	8; Relay	16; Relay
Short-circuit protection	No		No; to be provided externally	No; to be provided externally	
amp load, max.	50 W	50 W	1 500 W; 230 V AC	1 500 W; 230 V AC	50 W; 230 V AC
Output voltage			·	·	
for signal "1", min.	L1 (-0.8 V)				
Output current					
for signal "1" rated	1 A	2 A	5 A	5 A	2 A
value • for signal "1" permis-	10 mA				
sible range for 0 to 40 °C, min.	TOTILA				
for signal "1" permis-	1 A				
sible range for 0 to 40 °C, max.					
for signal "1" permis-	10 mA				
sible range for 40 to 60 °C, min.					
for signal "1" permis-	1 A				
sible range for 40 to 60 °C, max.					
for signal "1" minimum	10 mA	5 mA	5 mA	10 mA	10 mA
load current for signal "1" permis-	10 A; per group				
sible surge current,	(for 2 AC cycles)				
max.					
for signal "0" residual current, max.	2 mA				
Switching frequency					
with resistive load,	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
max.					
with inductive load,	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
max. on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of					
outputs (per group)					
horizontal installation	4.4				
- up to 40 °C, max.	4 A		5 A	5 A	ο Λ
- up to 60 °C, max.	3 A		5 A	5 A	8 A
vertical installation					

SM 322 digital output module

	6ES7 322-1FL00- 0AA0	6ES7 322-1HF01- 0AA0	6ES7 322-1HF10- 0AA0	6ES7 322-5HF00- 0AB0	6ES7 322-1HH01- 0AA0
Cable length					
Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
 Cable length unshielded, max. 	600 m	600 m	600 m	600 m	600 m
Relay outputs					
Rated input voltage of relay L+ (DC)		24 V; 110 mA	24 V		24 V
Number of operating cycles		300 000; 230 V AC: 100000; 120 V AC: 200000; 24 V DC: 300000 (at 2 A)	300 000; 300000 (24 V DC, at 2 A); 200000 (120 V AC, at 3 A); 100000 (230 V AC, at 3 A)	100 000; 100,000 (24 V DC, at 5 A), 100,000 (230 V AC, at 5 A)	100 000; 50000 (24 V DC, at 2 A); 700000 (120 V AC, at 2 A); 100000 (230 V AC, at 2 A)
Switching capacity of					
 with inductive load, max. with resistive load, max. 		2 A; 2 A (230 V AC), 2 A (24 V DC) 2 A	3 A; 3 A (230 V DC); 2 A (24 V AC) 8 A; 8 A (230 V DC); 5 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC) 5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC) 2 A; 2 A (230 V AC), 2 A (24 V DC)
Alarms/diagnostics/					
status information					
Alarms					
Diagnostic alarm	No	No	No	Yes; Parameterizable	No
Diagnostics					
 Diagnostics 	Yes	No	No	Yes	No
Isolation					
Isolation checked with	4000 V DC	1500 V AC	2000 V AC	1500 V AC	1500 V AC
Galvanic isolation					
Galvanic isolation digital outputs					
 between the channels, in groups of 	8	2	1	1	8
 between the channels and the backplane bus 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions and weight					
Dimensions					
• Width	80 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
• Depth	117 mm	120 mm	120 mm	120 mm	120 mm
Weight					
 Weight, approx. 	500 g	190 g	320 g	320 g	250 g

SM 322 digital output module

Ordering data	Order No.	Order No.	
SM 322 digital output modules		S7-300 connecting cable	
ncl. labeling strips, bus		For 64-channel modules; 2 units	
B outputs, 24 V DC, 2 A	6ES7 322-1BF01-0AA0	1 m	6ES7 392-4BB00-0AA0
16 outputs, 24 V DC, 0.5 A	6ES7 322-1BH01-0AA0	2.5 m	6ES7 392-4BC50-0AA0
16 outputs, 24 V DC, 0.5 A, high	6ES7 322-1BH10-0AA0	5 m	6ES7 392-4BF00-0AA0
speed	0L37 322-1B1110-0AA0	Terminal block	
32 outputs, 24 V DC, 0.5 A	6ES7 322-1BL00-0AA0	For 64-channel modules; 2 units	
64 outputs, 24 V DC, 0.3 A	6ES7 322-1BP00-0AA0	With screw contacts	6ES7 392-1AN00-0AA0
Note:		With spring-loaded contacts	6ES7 392-1BN00-0AA0
SES7392-40-0AA0 connection cable and 6ES7392-1.N00-0AA0		Front door, elevated design	6ES7 328-0AA00-7AA0
erminal blocks necessary.		e.g. for 32-channel modules; for	
64 outputs, 24 V DC, 0.3 A, sink output	6ES7 322-1BP50-0AA0	connecting 1.3 mm ² /16 AWG conductors	
Note:		SIMATIC TOP connect	See page 5/290
SES7392-40-0AA0 connection cable and 6ES7392-1.N00-0AA0		Bus connectors	6ES7 390-0AA00-0AA0
erminal blocks necessary.		1 unit (spare part)	
B outputs, 24 V DC, 0.5 A,	6ES7 322-8BF00-0AB0	Set of fuses for SM 322	
diagnostics-capable	0F07 000 F01102 04 P0	10 fuses 8 A quick-response, 2 fuse holders:	6ES7 973-1HD00-0AA0
16 outputs, 24/48 V DC, 0.5 A	6ES7 322-5GH00-0AB0	for 6ES7 322-1FF01-0AA0,	
8 outputs, 48 to 125 V DC, 1.5 A	6ES7 322-1CF00-0AA0	6ES7 322-1FH00-0AA0	
8 outputs, 120/230 V AC, 1 A	6ES7 322-1FF01-0AA0	10 fuses 6.3 A; for 6ES7 322-1CF00-0AA0	6ES7 973-1GC00-0AA0
B outputs, 120/230 V AC, 2 A	6ES7 322-5FF00-0AB0	Labeling strips	
16 outputs, 120/230 V AC, 1 A	6ES7 322-1FH00-0AA0	10 units (spare part)	
32 outputs, 120 V AC, 1 A	6ES7 322-1FL00-0AA0	for modules with 20-pin front	6ES7 392-2XX00-0AA0
3 outputs, relay contacts, 2 A	6ES7 322-1HF01-0AA0	connector	0E37 392-2AAUU-UAAU
3 outputs, relay contacts, 5 A	6ES7 322-1HF10-0AA0	for modules with 40-pin front	6ES7 392-2XX10-0AA0
B outputs, relay contacts, 5 A, with RC filter, overvoltage	6ES7 322-5HF00-0AB0	connector	
protection		Label cover	
16 outputs, relay contacts, 8 A	6ES7 322-1HH01-0AA0	10 units (spare part)	
Front connectors		for modules with 20-pin front connector	6ES7 392-2XY00-0AA0
20-pin, with screw contacts		for modules with 40-pin front	6ES7 392-2XY10-0AA0
1 unit	6ES7 392-1AJ00-0AA0	connector	OLOT USE-EXTITUUMAU
• 100 units	6ES7 392-1AJ00-1AB0	S7 SmartLabel V3.0	
20-pin, with spring-loaded contacts		Software for automatic labeling of	
1 unit	6ES7 392-1BJ00-0AA0	modules direct from the STEP 7 project	
• 100 units	6ES7 392-1BJ00-1AB0	Single license J	2XV9 450-1SL03-0YX0
20-pin, with FastConnect	6ES7 302-1C IOO 04 40	Upgrade single license J	2XV9 450-1SL03-0YX4
1 unit	6ES7 392-1CJ00-0AA0		
40-pin, with screw contacts 1 unit	6ES7 392-1AM00-0AA0		
● 100 units	6ES7 392-1AM00-1AB0		
40-pin with spring-loaded			
contacts	6EC7 202 1DM01 0AA0		
• 1 unit • 100 units	6ES7 392-1BM01-0AA0 6ES7 392-1BM01-1AB0		
40-pin, with FastConnect			
• 1 unit	6ES7 392-1CM00-0AA0		

J: Subject to export regulations AL: N and ECCN: EAR99S

SM 322 digital output module

Ordering data	Order No.		Order No.
Labeling sheets for machine inscription		SIMATIC manual collection Electronic manuals on DVD, multi-	6ES7 998-8XC01-8YE0
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		lingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
petrol	6ES7 392-2AX00-0AA0	I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC	
light-beige	6ES7 392-2BX00-0AA0	PC Based Automation, SIMATIC	
yellow	6ES7 392-2CX00-0AA0	PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software,	
red	6ES7 392-2DX00-0AA0	SIMATIC TDC	
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
petrol	6ES7 392-2AX10-0AA0	Current "Manual Collection" DVD and the three subsequent	
light-beige	6ES7 392-2BX10-0AA0	updates	
		S7-300 manual	
yellow red	6ES7 392-2CX10-0AA0 6ES7 392-2DX10-0AA0	Design, CPU data, module data, instruction list	
		German	6ES7 398-8FA10-8AA0
		English	6ES7 398-8FA10-8BA0

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

SM 323/SM 327 digital input/output module

Overview



- Digital inputs and outputs
- For connecting standard switches, two-wire proximity switches (BERO), solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Supply voltages			
Load voltage L+			
Rated value (DC)	24 V	24 V	24 V
Current consumption			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus 5 V DC, max.	40 mA	80 mA	60 mA
Power losses			
Power loss, typ.	3.5 W	6.5 W	3 W
Connection method			
required front connector	20-pin	40-pin	20-pin
Isochronous mode			
Isochronous mode	No	No	No
Digital inputs			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Number of simultaneously controllable inputs			
 all mounting positions 			
 Concurrently controllable inputs, up to 40 °C 	8	16	16
 Concurrently controllable inputs, up to 60 °C 	8	8	16
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes	Yes
Input voltage			
Rated value, DC	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V	15 to 30 V
Input current			
• for signal "1", typ.	7 mA	7 mA	6 mA
Input delay (for rated value of input voltage)			
 for standard inputs 			
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	1.2 ms	1.2 ms
- at "1" to "0", max.	4.8 ms	4.8 ms	4.8 ms
Cable length			
Cable length, shielded, max.	1 000 m	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m	600 m

SM 323/SM 327 digital input/output module

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Digital outputs Number of digital outputs	8	16	8; can also be parameterized individually as DI
Short-circuit protection • Response threshold, typ.	Yes; Electronic 1 A	Yes; Electronic 1 A	Yes; Electronic 1 A
imitation of inductive shutdown oltage to	L+ (-53 V)	L+ (-48 V)	L+ (-54 V)
_amp load, max.	5 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes
Output voltage • for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.5 V)
Output current • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C, min. • for signal "1" permissible range for 0 to 60 °C, max.	0.5 A	0.5 A	0.5 A 5 mA 0.6 A
• for signal "1" minimum load current • for signal "0" residual current, max.	5 mA 0.5 mA	5 mA 0.5 mA	0.5 mA
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	100 μs 500 μs	100 μs 500 μs	350 µs 500 µs
Parallel switching of 2 outputs for increased power for redundant control of a load	No Yes; outputs of the same group only	No Yes; outputs of the same group only	No Yes; outputs of the same group only
Switching frequency with resistive load, max. with inductive load, max. on lamp load, max.	100 Hz 0.5 Hz 10 Hz	100 Hz 0.5 Hz 100 Hz	100 Hz 0.5 Hz 10 Hz
Aggregate current of outputs (per group) • horizontal installation - up to 40 °C, max. - up to 60 °C, max. • vertical installation - up to 40 °C, max.	4 A 4 A	4 A 3 A 2 A	4 A 3 A 2 A
Load resistance range lower limit upper limit	48 Ω 4 kΩ	48 Ω 4 kΩ	48 Ω 4 kΩ
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m	1 000 m 600 m	1 000 m 600 m
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 2 mA	Yes 1.5 mA	Yes 1.5 mA
Alarms/diagnostics/status information Alarms			
Alarms Diagnostics	No	No	No
Diagnostic functions	No	No	No
Diagnostic indication LED Status indicator digital output (green)	Yes	Yes	Yes
Status indicator digital input (green)	Yes	Yes	Yes

SM 323/SM 327 digital input/output module

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
Galvanic isolation			
Galvanic isolation digital inputs			
 between the channels 	Yes	Yes	No
 between the channels, in groups of 	8	16	
 between the channels and the backplane bus 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Galvanic isolation digital outputs			
between the channels	Yes	Yes	No
 between the channels, in groups of 	8	8	
 between the channels and the backplane bus 	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference			
between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight			
Dimensions			
• Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weight			
 Weight, approx. 	220 g	260 g	200 g

SM 323/SM 327 digital input/output module

Ordering data	Order No.		Order No.
SM 323 digital input/output		S7 SmartLabel V3.0	
modules incl. labeling strips, bus connector		Software for automatic labeling of modules direct from the STEP 7 project	
8 inputs, 8 outputs	6ES7 323-1BH01-0AA0	Single license J	2XV9 450-1SL03-0YX0
16 inputs, 16 outputs	6ES7 323-1BL00-0AA0	Upgrade single license J	2XV9 450-1SL03-0YX4
SM 327 digital input/output modules		Labeling sheets for machine inscription	
incl. labeling strips, bus connector		For 16-channel signal modules, DIN A4, for printing with laser	
8 inputs, 8 inputs or outputs (parametrizable)	6ES7 327-1BH00-0AB0	printer; 10 units petrol	6ES7 392-2AX00-0AA0
Front connectors		light-beige	6ES7 392-2BX00-0AA0
20-pin, with screw contacts		yellow	6ES7 392-2CX00-0AA0
• 1 unit	6ES7 392-1AJ00-0AA0	red	6ES7 392-2DX00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0		0L37 332-2DX00-0AA0
20-pin, with spring-loaded contacts		For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units	
1 unit100 units	6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0	petrol	6ES7 392-2AX10-0AA0
20-pin, with FastConnect	0E37 332-1D000-1AD0	light-beige	6ES7 392-2BX10-0AA0
• 1 unit	6ES7 392-1CJ00-0AA0	yellow	6ES7 392-2CX10-0AA0
40-pin, with screw contacts		red	6ES7 392-2DX10-0AA0
• 1 unit	6ES7 392-1AM00-0AA0	SIMATIC manual collection J	6ES7 998-8XC01-8YE0
100 units40-pin with spring-loaded	6ES7 392-1AM00-1AB0	Electronic manuals on DVD, multi- lingual: LOGO!, SIMADYN,	
• 1 unit	6ES7 392-1BM01-0AA0	SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
• 100 units	6ES7 392-1BM01-0AA0	I/O, SIMATIC HMI, SIMATIC	
40-pin, with FastConnect		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC	
• 1 unit	6ES7 392-1CM00-0AA0	PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
Front door, elevated design	6ES7 328-0AA00-7AA0	TDC	
e.g. for 32 channel modules; enables connection of 1.3 mm ² /16 AWG wires		SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
SIMATIC TOP connect	see page 5/290	 Current "Manual Collection" DVD and the three subsequent 	
Bus connectors	6ES7 390-0AA00-0AA0	updates	
1 unit (spare part)		S7-300 manual	
Labeling strips		Design, CPU data, module data,	
10 units (spare part)		instruction list	CEC7 200 0EA42 2AA2
for modules with 20-pin front	6ES7 392-2XX00-0AA0	German	6ES7 398-8FA10-8AA0
connector		English	6ES7 398-8FA10-8BA0
for modules with 40-pin front connector	6ES7 392-2XX10-0AA0		
Label cover			
10 units (spare part)			
for modules with 20-pin front connector	6ES7 392-2XY00-0AA0		
for modules with 40-pin front connector	6ES7 392-2XY10-0AA0		

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS SM 321 digital input module

Overview



- Digital inputs
- For connection of switches and 2-wire proximity switches (BERO)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 321	16 DI 24 V DC 1 X 20-pin	32 DI 24 V DC 1 X 40-pin	16 DI 48-125 V DC 1 X 20-pin
Order number	6AG1 321-1BH02-2AA0	6AG1 321-1BL00-2AA0	6AG1 321-1CH20-2AA0
Order No. based on	6ES7 321-1BH02-0AA0	6ES7 321-1BL00-0AA0	6ES7 321-1CH20-0AA0
Ambient temperature range	-40 +70 °C	-40 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 321	8 DI 120/230 V AC 1 X 20-pin	8 DI 120/230 V AC 1 X 40-pin	16 DI 120/230 V AC 1 X 20-pin
Order number	6AG1 321-1FF01-2AA0	6AG1 321-1FF10-7AA0	6AG1 321-1FH00-7AA0
Order No. based on	6ES7 321-1FF01-0AA0	6ES7 321-1FF10-0AA0	6ES7 321-1FH00-0AA0
Ambient temperature range	-40 +70 °C	-25 +70 °C	-40 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	No	No
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 321	16 DI 24 V DC 1 X 20-pin	16 DI 24 V DC DIAGNOSTICS	
Order number	6AG1 321-7BH01-2AB0	6AG1 321-7TH00-4AB0	
Order No. based on	6ES7 321-7BH01-0AB0	6ES7 321-7TH00-0AB0	
Ambient temperature range	- 25 +70 °C	0 +60 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	No	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 321 digital input module

Overview (continued)			
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K		

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOx < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOx < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS SM 321 digital input module		
(extended temperature range an medial exposure)	d	
incl. labeling strips, bus connector		
16 inputs, 24 V DC	Н	6AG1 321-1BH02-2AA0
32 inputs, 24 V DC	Н	6AG1 321-1BL00-2AA0
16 inputs, 48 to 120 V DC	Н	6AG1 321-1CH20-2AA0
8 inputs, 120/230 V AC	Н	6AG1 321-1FF01-2AA0
8 inputs, 120/230 V AC, single root	L	6AG1 321-1FF10-7AA0
16 inputs, 120/230 V AC		6AG1 321-1FH00-7AA0
16 inputs, 24 V DC, diagnostics-capable	Н	6AG1 321-7BH01-2AB0
16 inputs, NAMUR, redundant design possible	I	6AG1 321-7TH00-4AB0
Accessories		See SIMATIC S7-300 digital input modules, page 5/114

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS SM 322 digital output module

Overview



- Digital outputs
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 322	8 DO 24 V DC, 2 A, 1 X 20-pin	16 DO 24 V DC, 0.5 A, 1 X 20-pin	32 DO 24 V DC, 0.5 A, 1 X 40-pin
Order number	6AG1 322-1BF01-2XB0	6AG1 322-1BH01-2AA0	6AG1 322-1BL00-2AA0
Order No. based on	6ES7 322-1BF01-0AA0	6ES7 322-1BH01-0AA0	6ES7 322-1BL00-0AA0
Ambient temperature range	-25 +70 °C	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 322	8 DO 48 - 125 V DC 1.5 A, 1 X 20 pin	8 DO 120/230 V AC 1 A, 1 X 20 pin	16 DO, 120/230 V AC 1 A, 1 X 20-pin	
Order number	6AG1 322-1CF00-7AA0	6AG1 322-1FF01-7AA0	6AG1 322-1FH00-7AA0	
Order No. based on	6ES7 322-1CF00-0AA0	6ES7 322-1FF01-0AA0	6ES7 322-1FH00-0AA0	
Ambient temperature range	-25 +70 °C	-25 +70 °C	-40 +70 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	No	No	
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions.			

SIPLUS SM 322	8 DO (relay) 24 V DC, 5 A/230 V AC 5 A, 1 X 40-pin	16 RO relay contacts, 1 X 20-pin	8 DO 120/230 V AC 2 A, 1 X 40 pin	
Order number	6AG1 322-1HF10-2AA0	6AG1 322-1HH01-2AA0	6AG1 322-5FF 00-4AB0	
Order No. based on	6ES7 322-1HF10-0AA0	6ES7 322-1HH01-0AA0	6ES7 322-5FF00-0AB0	
Ambient temperature range	-25 +60 °C	-40 +70 °C	0 +60 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	No	
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standar	d product applies except for the amb	ient conditions.	

SIPLUS SM 322 digital output module

Overview (continued)

SIPLUS SM 322	8 RO (relay), 24 V DC, 120 - 230 V AC, 5 A, 1 X 40 pin	8 DO 24 V DC, 0.5 A, short-circuit protection, diagnostics, 1 X 20-pin	16 DO 24 V DC, 0.5 A, diagnostics, wire-break detection 0/1 signal, 1 X 40-pin	
Order number	6AG1 322-5HF00-4AB0	6AG1 322-8BF00-2AB0	6AG1 322-8BH01-2AB0	
Order No. based on	6ES7 322-5HF00-0AB0	6ES7 322-8BF00-0AB0	6ES7 322-8BH01-0AB0	
Ambient temperature range	0 +60 °C	-25 +70 °C	-25 +70 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	No	
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard	The technical data of the standard product applies except for the ambient conditions.		

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

G1 322-1BF01-2XB0
G1 322-8BF00-2AB0
G1 322-1BH01-2AA0
G1 322-1BL00-2AA0
G1 322-1CF00-7AA0
G1 322-1HF10-2AA0
G1 322-5HF00-4AB0
G1 322-1FF01-2AA0
G1 322-5FF00-4AB0
G1 322-1FH00-7AA0
G1 322-1HH01-2AA0
G1 322-8BH01-2AB0
e SIMATIC S7-300 digital put modules, page 5/121

- H: Subject to export regulations AL: 91999 and ECCN: EAR99H
- I: Subject to export regulations AL: N and ECCN: EAR99H
- L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

substances

Air pressure (depending on

the highest positive temper-

ature range specified)

SIMATIC S7-300 SIPLUS digital modules

3S4 including conductive sand, dust ²⁾

1080 ... 795 hPa (-1000 ... +2000 m)

795 ... 658 hPa (+2000 ... +3500 m)

658 ... 540 hPa (+3500 ... +5000 m)

see ambient temperature range

SIPLUS SM 323 digital input/output module

Overview



- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BERO), solenoid valves, contactors, small-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 322	8 DI/8 DO 24 V DC, 0.5 A Total current 2 A, 1 X 20-pin
Order number	6AG1 323-1BH01-2AA0
Order No. based on	6ES7 323-1BH01-0AA0
Ambient temperature range	-40 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active	Conformity with EN 60721-3-3, Class

1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

derating 10 K

derating 20 K

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: $\underline{www.siemens.com/siplus-extreme}$

Ordering data	Order No.
SIPLUS SM 323 digital input/ output module	
(extended temperature range and medial exposure)	
incl. labeling strips, bus connector	
8 inputs, 8 outputs H	6AG1 323-1BH01-2AA0
Accessories	See SIMATIC S7-300 digital input/output modules, page 5/126

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Analog modules

SM 331 analog input module

Overview



- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

Technical specifications

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF02-0AB0	6ES7 331-7KB02-0AB0
Supply voltages				
Load voltage L+				
Rated value (DC)	24 V	24 V		24 V
• Reverse polarity protection	Yes	Yes		Yes
Current consumption				
from load voltage L+ (without load), max.	200 mA	50 mA		80 mA
from backplane bus 5 V DC, max.	50 mA	60 mA	90 mA	50 mA
Power losses				
Power loss, typ.	1 W	1.5 W	0.4 W	1.3 W
Connection method				
required front connector	20-pin	20-pin	40-pin	20-pin
Isochronous mode				
Isochronous mode	No	Yes	No	No
Analog inputs				
Number of analog inputs	8	8	8	2
Number of analog inputs for resistance measurement	4		8	1
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and thermocouples
Input ranges (rated values), voltages				
• 0 to +10 V	No	No	Yes	No
• 1 to 5 V	Yes	Yes	Yes	Yes
• 1 to 10 V	No	Yes	No	No
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	No	No	Yes
• -250 mV to +250 mV	Yes	No	No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	No	No	Yes	No
• -500 mV to +500 mV	Yes	Yes	Yes	Yes
• -80 mV to +80 mV	Yes	Yes	No	Yes
Input ranges (rated values), currents				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 to +10 mA	Yes		No	Yes
• -20 to +20 mA	Yes	Yes	Yes	Yes
• -3.2 to +3.2 mA	Yes	No	No	Yes
• 4 to 20 mA	Yes	Yes	Yes	Yes

SM 331 analog input module

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF02-0AB0	6ES7 331-7KB02-0AB0
Input ranges (rated values),				
thermoelements				
• Type B	No	No	No	
• Type E	Yes	No	No	Yes
• Type J	Yes	No	No	Yes
• Type K	Yes	No	No	Yes
• Type L	No	No	No	No
• Type N	Yes	No	No	Yes
• Type R	No	No	No	No
• Type S	No	No	No	No
• Type T	No	No	No	No
	No	No		No
• Type U			No	
Type TXK/TXK(L) to GOST	No	No	No	No
Input ranges (rated values), resistance thermometers				
• Cu 10	No	No	No	No
• Ni 100	Yes; Standard	No	Yes; Standard/climate	Yes
• Ni 1000	No	No	Yes	
• LG-Ni 1000	No		Yes; Standard / climate	
• Ni 120	No		No	
• Ni 200	No		No	
• Ni 500	No		No	
• Pt 100	Yes; Standard		Yes; Standard / climate	Yes
	,			ies
• Pt 1000	No		No	
• Pt 200	No		No	
• Pt 500	No		No	
Input ranges (rated values), resistors				
• 0 to 150 Ohm	Yes	No	No	Yes
• 0 to 300 Ohm	Yes	No	No	Yes
• 0 to 600 Ohm	Yes	No	Yes	Yes
• 0 to 6000 Ohm	No	No	Yes	No
Voltage input				
permissible input voltage	20 V; permanent; 75 V for	20 V; 20 V DC permanent,	30 V; 12 V permanent, 30 V	20 V; permanent; 75 V for
for voltage input	max. 1 s (mark to space	75 V DC for max. 1 s (duty	for max. 1 s	max. 1 s (mark to space
(destruction limit), max.	ratio 1:20)	factor 1:20)	IOI IIIax. 1 S	ratio 1:20)
Current input	,	,		
permissible input current	40 mA	40 mA	40 mA	40 mA
for current input	40 MA	40 MA	40 MA	40 mA
(destruction limit), max.				
Characteristic linearization				
	Voc		Voc	Voo
parameterizable for thermosouples	Yes		Yes	Yes
• for thermocouples	Type E, J, K, L, N		DH100 -+ 1 1/ 1	Type E, J, K, L, N
• for resistance thermometer	Pt100 (standard, climatic		yes; Pt100 standard/air	Pt100 (standard, climatic
	range), Ni100 (standard, climatic range)		con.; Ni100 standard/air con.; Ni1000 standard/air	range), Ni100 (standard, climatic range)
	ciirialic range)		con.: LG-Ni1000 standard/	Cilifiatic range)
			air con.	
Temperature compensation				
Temperature compensation parameterizable	Yes			Yes
•				Yes
Internal temperature compensation	Yes			100
compensation				
	Yes			Yes

Analog modules

SM 331 analog input module

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF02-0AB0	6ES7 331-7KB02-0AB0
Analog value creation Measurement principle	integrating	Actual value encryption	integrating	integrating
ntegrations and conversion				
ime/ resolution per channel Resolution with overrange (bit including sign), max.	15 bit; Unipolar: 9/12/12/ 14 bits; bipolar: 9 bits + sign/12 bits + sign/12 bits + sign/14 bits + sign	14 bit; Unipolar: 14 bits; bipolar: 13 bits + sign	13 bit	15 bit; Unipolar: 9/12/12/ 14 bits; bipolar: 9 bits + sign/12 bits + sign/12 bits + sign/14 bits + sign
Integration time, parameterizable	Yes; 2.5/ 16.67/ 20/ 100 ms	Yes	Yes; 60 / 50 ms	Yes; 2.5/ 16.67/ 20/ 100 ms
 Basic conversion time, ms Basic conversion time, including integration time, 	3/ 17/ 22/ 102 ms	52 µs per channel	66 / 55 ms 66 / 55 ms	6/ 34/ 44/ 204 ms
ms • Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	50 / 60 Hz	400 / 60 / 50 / 10 Hz
Encoder Connection of signal				
encoders • for current measurement as 2-wire transducer	Yes	Yes	Yes; with external supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with 2-conductor connection	Yes		Yes	Yes
• for resistance measurement with 3-conductor connection	Yes		Yes	Yes
• for resistance measurement with 4-conductor connection	Yes		Yes	Yes
Errors/accuracies				
Operational limit in overall emperature range				
Voltage, relative to input area	+/- 1 %; +/-1% (80 mV); +/-0.6% (250 to 1000 mV); +/-0.8% (2.5 to 10 V)	+/- 0,4 %	+/- 0,6 %; +/-0.6% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); +/-0.5% (+/-50 mV, 500 mV, 1 V)	+/- 1 %; +/-1% (80 mV); +/-0.6% (250 to 1000 mV +/-0.8% (2.5 to 10 V)
Current, relative to input area	+/- 0,7 %; from 3.2 to 20 mA	+/- 0,3 %	+/- 0,5 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA	+/- 0,7 %; from 3.2 to 20 mA
Impedance, relative to input area	+/- 0,7 %; 150, 300, 600 Ohm		+/- 0,5 %; 0 to 6 kOhm, 0 to 600 kOhm	+/- 0,7 %; 150, 300, 600 Ohm
Resistance-type thermometer, relative to input area	+/- 0,7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)		1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)	+/- 0,7 %; +/-0.7% (Pt100 Ni100); +/-0.8% (Pt100 climate)
Basic error limit (operational limit at 25 °C)				
Voltage, relative to input area	+/- 0,6 %; +/-0.4% (250 to 1000 mV); +/-0.6% (2.5 to 10 mV); +/-0.7% (80 mV)	+/- 0,25 %	+/- 0,4 %; 0.4% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (+/-50 mV, 500 mV, 1 V)	+/- 0,6 %; +/-0.6% (80 m\ 2.5 to 10 V); +/-0.4% (250 to 1000 mV)
 Current, relative to input area 	+/- 0,5 %; 3.2 to 20 mA	+/- 0,2 %	+/- 0,3 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA	+/- 0,5 %; 3.2 to 20 mA
 Impedance, relative to input area Resistance-type thermometer, relative to input area 	+/- 0,5 %; 150, 300, 600 Ohm +/- 0,6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climate)		+/- 0,3 %; 0 to 6 kOhm, 0 to 600 kOhm 1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000,	+/- 0,5 %; 150, 300, 600 Ohm +/- 0,6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climate)

SM 331 analog input module

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF02-0AB0	6ES7 331-7KB02-0AB0
Alarms/diagnostics/status information				
Alarms				
Diagnostic alarm	Yes; parameterizable, channels 0 and 2	Yes; parameterizable	No	Yes
Limit value alarm	Yes; parameterizable	Yes; parameterizable, channels 0 and 2	No	Yes; parameterizable, channel 0
Diagnostics				
 Diagnostic information readable 	Yes	Yes	No	Yes
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
Galvanic isolation				
Galvanic isolation analog inputs				
 between the channels 	No	No	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes
Dimensions and weight				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	117 mm	120 mm
Weight				
Weight, approx.	250 g	200 g	250 g	250 g

Analog modules

SM 331 analog input module

	6ES7 331-7PF01- 0AB0	6ES7 331-7PF11- 0AB0	6ES7 331-7PE10- 0AB0	6ES7 331-7NF00- 0AB0	6ES7 331-7NF10- 0AB0
Supply voltages					
Load voltage L+					
Rated value (DC)	24 V	24 V			24 V
 Reverse polarity protection 	Yes	Yes			Yes
Current consumption					
from load voltage L+ (without load), max.	240 mA	200 mA			200 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	100 mA	130 mA	100 mA
Power losses					
Power loss, typ.	4.6 W	3 W	2.2 W	0.6 W	3 W
Connection method					
required front connector	40-pin	40-pin	1x 40-pin	40-pin	40-pin
Isochronous mode					
Isochronous mode	No	No	No	No	No
Analog inputs					
Number of analog inputs	8	8	6	8	8
Number of analog	8				
inputs for resistance					
measurement					
Cable length, shielded, max.	200 m	100 m	200 m	200 m	200 m
Input ranges (rated					
values), voltages	NI-	NI -		NI-	NI-
• 0 to +10 V	No	No		No	No
• 1 to 5 V	No	No		Yes	Yes
• 1 to 10 V	No	No	V	No	No
• -1 V to +1 V	No	No	Yes	No	No
• -10 V to +10 V	No	No		Yes	Yes
• -2.5 V to +2.5 V	No	No	V	No	No
• -250 mV to +250 mV	No	No	Yes	No	No
• -5 V to +5 V	No	No		Yes	Yes
-50 mV to +50 mV	No	No	Yes	No	No
• -500 mV to +500 mV	No	No	Yes	No	No
• -80 mV to +80 mV	No	No	Yes	No	No
nput ranges (rated values), currents					
• 0 to 20 mA	No	No		Yes	Yes
-10 to +10 mA	No	No			
-20 to +20 mA	No	No		Yes	Yes
• -3.2 to +3.2 mA	No	No		No	No
• 4 to 20 mA	No	No		Yes	Yes

SM 331 analog input module

	6ES7 331-7PF01- 0AB0	6ES7 331-7PF11- 0AB0	6ES7 331-7PE10- 0AB0	6ES7 331-7NF00- 0AB0	6ES7 331-7NF10- 0AB0
Input ranges (rated values), thermoelements					
• Type B	No	Yes	Yes	No	No
• Type E	No	Yes	Yes	No	No
• Type J	No	Yes	Yes	No	No
• Type K	No	Yes	Yes	No	No
• Type L	No	Yes	Yes	No	No
• Type N	No	Yes	Yes	No	No
• Type R	No	Yes	Yes	No	No
• Type S	No	Yes	Yes	No	No
• Type T	No	Yes	Yes	No	No
• Type U	No	Yes	Yes	No	No
Type TXK/TXK(L) to GOST	No	Yes	Yes	No	No
• Input resistance (Type TXK/TXK(L) to GOST)			10 ΜΩ		
Input ranges (rated values), resistance thermometers					
• Cu 10	Yes	No		No	No
• Ni 100	Yes	No		No	No
• Ni 1000	Yes	No		No	No
• LG-Ni 1000	Yes	No		No	No
• Ni 120	Yes	No		No	No
• Ni 200	Yes	No		No	No
• Ni 500	Yes	No		No	No
• Pt 100	Yes	No		No	No
• Pt 1000	Yes	No		No	No
• Pt 200	Yes	No		No	No
• Pt 500	Yes	No		No	No
Input ranges (rated values), resistors	103	140		110	140
• 0 to 150 Ohm	Yes	No		No	No
• 0 to 300 Ohm	Yes	No		No	No
• 0 to 600 Ohm	Yes	No		No	No
• 0 to 6000 Ohm		No		No	No
Voltage input • permissible input voltage for voltage input (destruction limit), max.	75 V; 35 V permanent, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	35 V; 35 V permanent, 75 V for max. 1 s (mark to space ratio 1:20)	50 V; permanent	75 V; 35 V permanent, 75 V for max. 1 s (mark to space ratio 1:20)
Current input	,	*	,		•
 permissible input current for current input (destruction limit), max. 				32 mA	40 mA
Characteristic linear- ization					
parameterizablefor thermocouples	Yes	Yes Type B, E, J, K, L, N, R, S. T, U, C	Yes Type B, E, J, K, L, N, R, S. T, U, C, TXK, XK(L)		
for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/ climate)				

Analog modules

SM 331 analog input module

	6ES7 331-7PF01-	6ES7 331-7PF11-	6ES7 331-7PE10-	6ES7 331-7NF00-	6ES7 331-7NF10-
	0AB0	0AB0	0AB0	0AB0	0AB0
Temperature compensation					
Temperature compensation param-		Yes	Yes		
eterizableinternal temperature compensation		Yes	Yes		
external temperature compensation with		Yes	Yes		
 compensations socket external temperature compensation with Pt100 		Yes	Yes		
Analog value creation Measurement principle	integrating	integrating	integrating	integrating	integrating
Integrations and conversion time/		3 44 3			
resolution per channel • Resolution with overrange (bit including sign), max.	16 bit; Two's complement	16 bit; Two's complement	16 bit; Two's complement	16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/15 bits + sign/15 bits +	16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/15 bits + sign/15 bits +
• Integration time,	Yes	Yes	Yes	sign/15 bits + sign Yes; 10/ 16.67/ 20/ 100	sign/15 bits + sign Yes; 23/ 72/ 83/ 95 ms
parameterizable Basic conversion time, ms	up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms	up to 4 channels: 10 ms per module, as of 5 channels: 190 ms per module	30 / 50 / 60 / 300	ms	10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)
Integration time, ms Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz	400 / 60 / 50 Hz	10 / 16,67 / 20 / 100	400 / 60 / 50 / 10 Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz
Encoder Connection of signal encoders • for current measurement as 2-wire transducer				Yes; with external transmitter; possible with separate supply for transmitter	Yes; with external transmitter, current supply; possible with separate supply for transmitter.
• for current measurement as 4-wire transducer				Yes	transmitter Yes
• for resistance measurement with 2- conductor connection	Yes; without resistance correction				
 for resistance measurement with 3- conductor connection 	Yes				
 for resistance measurement with 4- conductor connection 	Yes				
Errors/accuracies Operational limit in overall temperature range					
 Voltage, relative to input area Current, relative to 		+/- 1 K	+/- 1 %/K	+/- 0,1 %; +/-0.7% +/- 0,3 %; +/-0.9%	+/- 0,1 % +/- 0,1 %
input area • Impedance, relative to input area	+/- 0,1 %			, 1,2 11, 1, 0.076	,
Resistance-type thermometer, relative to input area	+/- 1 K				

SM 331 analog input module

	6ES7 331-7PF01- 0AB0	6ES7 331-7PF11- 0AB0	6ES7 331-7PE10- 0AB0	6ES7 331-7NF00- 0AB0	6ES7 331-7NF10- 0AB0
Basic error limit (operational limit at 25 °C)					
 Voltage, relative to input area 				+/- 0,05 %	+/- 0,05 %
 Current, relative to input area 				+/- 0,05 %	+/- 0,05 %
 Impedance, relative to input area 	+/- 0,05 %				
 Resistance-type thermometer, relative to input area 	+/- 0.5 K				
Alarms/diagnostics/ status information					
Diagnostic alarm	Yes; parameterizable per group	Yes; parameterizable per group	Yes; channel by channel	Yes; parameterizable	Yes; parameterizable
Limit value alarm	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable, channels 0 and 2	Yes; parameterizable all channels (end of cycle interrupt is also supported across modules)
Diagnostics • Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
Isolation Isolation checked with	500 V DC	500 V DC		500 V DC	500 V AC
Galvanic isolation Galvanic isolation analog inputs					
between the channelsbetween the channels, in groups of	No 2	No 2	Yes 1	No 2	No 2
between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
Dimensions and weight					
Dimensions	40	40	40	40	40
• Width	40 mm	40 mm	40 mm	40 mm	40 mm
HeightDepth	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm	125 mm 120 mm
Weight					
 Weight, approx. 	272 g	272 g	272 g	272 g	272 g

SM 331 analog input module

Ordering Data	Order No.		Order No.
SM 331 analog input modules		Label cover	6ES7 392-2XY00-0AA0
Including labeling strips, bus connector, measuring range		10 units (spare part), for modules with 20-pin front connector	
modules		Labeling strips	6ES7 392-2XX00-0AA0
8 inputs, 13-bit resolution	6ES7 331-1KF02-0AB0	10 units (spare part), for modules	
8 inputs, resolution 9/12/14 bit	6ES7 331-7KF02-0AB0	with 20-pin front connector	
2 inputs, resolution 9/12/14 bit	6ES7 331-7KB02-0AB0	S7 SmartLabel V3.0	
8 inputs, enhanced resolution 16 bits	6ES7 331-7NF00-0AB0	Software for automatic labeling of modules direct from the STEP 7 project	
8 inputs, enhanced resolution 16 bits. 4-channel mode	6ES7 331-7NF10-0AB0	Single license J	2XV9 450-1SL03-0YX0
8 inputs, resolution 14 bit, for isochronous mode	6ES7 331-7HF01-0AB0	Upgrade single license J	
6 inputs, for thermal resistors, resolution 16 bits	6ES7 331-7PE10-0AB0	Labeling sheets for machine labeling	
8 inputs, for thermal resistors	6ES7 331-7PF01-0AB0	For 16-channel signal modules, DIN A4, for printing with laser	
1 ,		printer; 10 units	
8 inputs, for thermoelements	6ES7 331-7PF11-0AB0	— petrol	6ES7 392-2AX00-0AA0
Measuring range module for analog inputs	6ES7 974-0AA00-0AA0	light-beige	6ES7 392-2BX00-0AA0
1 module for 2 analog inputs;		yellow	6ES7 392-2CX00-0AA0
2 units (spare part)		red	6ES7 392-2DX00-0AA0
Front connectors		For 32-channel signal modules,	
20-pin, with screw contacts		DIN A4, for printing with laser	
• 1 unit • 100 units	6ES7 392-1AJ00-0AA0	printer; 10 units	0F07 000 04V40 04 15
	6ES7 392-1AJ00-1AB0	petrol	6ES7 392-2AX10-0AA0
20-pin, with spring-loaded contacts		light-beige	6ES7 392-2BX10-0AA0
• 1 unit	6ES7 392-1BJ00-0AA0	yellow	6ES7 392-2CX10-0AA0
• 100 units	6ES7 392-1BJ00-1AB0	red	6ES7 392-2DX10-0AA0
20-pin, with FastConnect	CEC7 200 40 100 04 40	SIMATIC manual collection	6ES7 998-8XC01-8YE0
• 1 unit	6ES7 392-1CJ00-0AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN,	
40-pin, with screw contacts 1 unit	6ES7 392-1AM00-0AA0	SIMATIČ bus components,	
• 100 units	6ES7 392-1AM00-1AB0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
40-pin with spring-loaded		Sensors, SIMATIC NET, SIMATIC	
contacts ● 1 unit	6ES7 392-1BM01-0AA0	PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC	
• 1 unit • 100 units	6ES7 392-1BM01-0AA0 6ES7 392-1BM01-1AB0	S7, SIMATIC Software, SIMATIC TDC	
40-pin, with FastConnect			6ES7 998-8XC01-8YE2
• 1 unit	6ES7 392-1CM00-0AA0	SIMATIC manual collection Dupdate service for 1 year	023/ 990-0XC01-01E2
Front door, elevated design	6ES7 328-0AA00-7AA0	Current "Manual Collection" DVD	
e.g. for 32-channel modules; for		and the three subsequent updates	
connecting 1.3 mm ² /16 AWG wires		S7-300 manual	
SIMATIC TOP connect	see page 5/290	Design, CPU data, module data,	
Bus connectors	6ES7 390-0AA00-0AA0	instruction list	
1 unit (spare part)	OLOT USU-UNAUU-UAAU	German	6ES7 398-8FA10-8AA0
Shield connecting element	6ES7 390-5AA00-0AA0	English	6ES7 398-8FA10-8BA0
	OLOT 330-3AAUU-UAAU	_	
80 mm wide, with 2 rows for 4 terminal elements each			
Terminal elements			
2 units			
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0		
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0		
For 1 cable with 4 mm to 13 mm	6ES7 390-5CA00-0AA0		

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

SM 332 analog output module

Overview



- Analog outputs
- For the connection of analog actuators

Technical specifications

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Supply voltages Load voltage L+				
Rated value (DC)	24 V	24 V	24 V	24 V
Current consumption from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus 5 V DC, max.	60 mA	60 mA	100 mA	120 mA
Power losses				
Power loss, typ.	3 W	3 W	6 W	3 W
Connection method required front connector	20-pin	20-pin	40-pin	20-pin
Analog outputs Number of analog outputs	2	4	8	4; Isochronous mode
Cable length, shielded, max.	200 m	200 m	200 m	200 m
Voltage output, short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
Output ranges, voltage • 0 to 10 V • 1 to 5 V • -10 to +10 V	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Output ranges, current • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max.	1 kΩ 1 μF 500 Ω 10 mH	1 kΩ 1 μF 500 Ω 10 mH	1 kΩ 1 μF 500 Ω 10 mH	1 kΩ 1 μF 500 Ω 1 mH

Analog modules

SM 332 analog output module

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Analog value creation				
Integration and conversion				
time/ resolution per channel				
 Resolution with overrange 	12 bit; +/-10 V, +/-20 mA,	12 bit; +/-10 V, +/-20 mA,	12 bit; +/-10 V, +/-20 mA,	16 bit
(bit including sign), max.	4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V,	4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V,	4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V,	
	0 to 20 mA: 12 bits	0 to 20 mA: 12 bits	0 to 20 mA: 12 bits	
Conversion time (per	0.8 ms	0.8 ms	0.8 ms	200 μs; in isochronous
channel)				mode 640 µs
Settling time				
for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
for inductive load	0.5 ms; 0.5 ms (1 mH);	0.5 ms; 0.5 ms (1 mH);	0.5 ms; 0.5 ms (1 mH);	0.5 ms
	3.3 ms (10 mH)	3.3 ms (10 mH)	3.3 ms (10 mH)	
Errors/accuracies				
Operational limit in overall				
temperature range				
 Voltage, relative to output area 	+/- 0,5 %	+/- 0,5 %	+/- 0,5 %	+/- 0,12 %
Current, relative to output	+/- 0,6 %	+/- 0.6 %	+/- 0,6 %	+/- 0,18 %
area	17 0,0 70	17 0,0 70	17 0,0 70	17 0,10 70
Basic error limit (operational				
limit at 25 °C)				
Voltage, relative to output	+/- 0,4 %	+/- 0,4 %	+/- 0,4 %	+/- 0,02 %
area	+/- 0,5 %	./ 0.5.9/	+/- 0,5 %	+/- 0,02 %
 Current, relative to output area 	+/- 0,5 %	+/- 0,5 %	+/- 0,5 %	+/- 0,02 %
Alarms/diagnostics/status				
information				
Substitute values	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable	Yes; Pparameterizable
connectable				
Alarms				
Diagnostic alarm	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable	Yes
Diagnostics				
 Diagnostic information readable 	Yes	Yes	Yes	
Isolation Isolation checked with	500 V DC	500 V DC	500 V DC	1500 V DO
	300 V DC	300 V DC	500 V DC	1500 V DC
Galvanic isolation				
Galvanic isolation analog outputs				
between the channels and	Yes	Yes	Yes	Yes
the backplane bus	100	100	100	100
Dimensions and weight				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
 Height 	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm
Weight				
 Weight, approx. 	220 g	220 g	272 g	220 g

SM 332 analog output module

Ordering data	Order No.	_	Order No.
SM 332 analog output modules		Label cover	6ES7 392-2XY00-0AA0
incl. labeling strips, bus connector		10 units (spare part), for modules with 20-pin front connector	
4 outputs, 11/12 bit	6ES7 332-5HD01-0AB0	Labeling strips	6ES7 392-2XX00-0AA0
4 outputs, 16 bit	6ES7 332-7ND02-0AB0	10 units (spare part), for modules	
2 outputs, 11/12 bit	6ES7 332-5HB01-0AB0	with 20-pin front connector	
8 outputs, 11/12 bit	6ES7 332-5HF00-0AB0	S7 SmartLabel V3.0	
Front connectors		Software for automatic labeling of modules direct from the STEP 7	
20-pin, with screw contacts		project	
• 1 unit	6ES7 392-1AJ00-0AA0	Single license J	2XV9 450-1SL03-0YX0
• 100 units	6ES7 392-1AJ00-1AB0	Upgrade single license J	2XV9 450-1SL03-0YX4
20-pin, with spring-loaded contacts • 1 unit	6ES7 392-1BJ00-0AA0	Labeling sheets for machine labeling	
• 100 units	6ES7 392-1BJ00-1AB0	For 16-channel signal modules, DIN A4, for printing with laser	
20-pin, with FastConnect 1 unit	6ES7 392-1CJ00-0AA0	printer; 10 units	000000000000000000000000000000000000000
40-pin, with screw contacts		petrol	6ES7 392-2AX00-0AA0
• 1 unit	6ES7 392-1AM00-0AA0	light-beige 	6ES7 392-2BX00-0AA0
• 100 units	6ES7 392-1AM00-1AB0	yellow	6ES7 392-2CX00-0AA0
40-pin with spring-loaded		red	6ES7 392-2DX00-0AA0
contacts ■ 1 unit	6ES7 392-1BM01-0AA0	For 32-channel signal modules, DIN A4, for printing with laser	
• 100 units	6ES7 392-1BM01-1AB0	printer; 10 units	
40-pin, with FastConnect		petrol	6ES7 392-2AX10-0AA0
• 1 unit	6ES7 392-1CM00-0AA0	light-beige	6ES7 392-2BX10-0AA0
Front door, elevated design	6ES7 328-0AA00-7AA0	yellow	6ES7 392-2CX10-0AA0
e.g. for 32-channel modules; for connecting 1.3 mm ² /16 AWG		red	6ES7 392-2DX10-0AA0
wires		SIMATIC manual collection J	6ES7 998-8XC01-8YE0
SIMATIC TOP connect	see page 5/290	Electronic manuals on DVD,	
Bus connectors		 multilingual: LOGO!, SIMADYN, SIMATIC bus components, 	
1 unit (spare part)	6ES7 390-0AA00-0AA0	SIMATIC C7, SIMATIC distributed	
Shield connecting element	6ES7 390-5AA00-0AA0	 I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC 	
80 mm wide, with 2 rows for 4 terminal elements each		PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
Terminal elements		TDC	
2 units		SIMATIC manual collection D	6ES7 998-8XC01-8YE2
For 2 cables with 2 mm to 6 mm	6ES7 390-5AB00-0AA0	update service for 1 year	
diameter		Current "Manual Collection" DVD and the three subsequent	
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0	updates	
For 1 cable with 4 mm to 13 mm	6ES7 390-5CA00-0AA0	S7-300 manual	
diameter		Design, CPU data, module data, instruction list	
		German	6ES7 398-8FA10-8AA0
		English	6ES7 398-8FA10-8BA0

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Analog modules

SM 334 analog input/output module

Overview



- Analog inputs and outputs
- For the connection of analog sensors and actuators

Technical specifications

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
Current consumption	440 4	00 4
from load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus 5 V DC, max.	55 mA	60 mA
Power losses		
Power loss, typ.	3 W	2 W
Connection method		
required front connector	20-pin	20-pin
Analog inputs		
Number of analog inputs	4	4
Number of analog inputs for voltage measurement	4	2
Number of analog inputs for resistance measurement		4
Cycle time (all channels) max.	5 ms	85 ms
Input ranges (rated values), voltages • 0 to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
Input ranges (rated values), resistance thermom-		
eters		
• Pt 100		Yes; only climatic range
Input ranges (rated values), resistors • 0 to 10000 Ohm		Yes
Voltage input		
 permissible input voltage for voltage input (destruction limit), max. 	20 V	20 V; permanent; 75 V for max. 1 s (mark to space ratio 1:20)
Current input		
 permissible input current for current input (destruction limit), max. 	40 mA	
Analog outputs		
Number of analog outputs	2	2
Cable length, shielded, max.	200 m	100 m
Voltage output, short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max.	11 mA	10 mA
Current output, no-load voltage, max.	15 V	

SM 334 analog input/output module

Technical specifications (continued)		
	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Output ranges, voltage • 0 to 10 V	Yes	Yes
	103	100
Output ranges, current • 0 to 20 mA	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	5 kΩ	$2.5~\mathrm{k}\Omega$
 with voltage outputs, capacitive load, max. 	1 μF	1 μF
 with current outputs, max. 	300 Ω	
 with current outputs, inductive load, max. 	1 mH	
Analog value creation		
Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	8 bit	12 bit
• Integration time, ms		16.67/20 ms
Settling time		
 for resistive load 	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	
Encoder		
Connection of signal encoders		
• for current measurement as 4-wire transducer	Yes	
 for resistance measurement with 2-conductor connection 		Yes
• for resistance measurement with 3-conductor		Yes
connection		
for resistance measurement with 4-conductor connection		Yes
Errors/accuracies		
Operational limit in overall temperature range		
 Voltage, relative to input area 	+/- 0,9 %	+/- 0,7 %; 0 to 10 V
 Current, relative to input area 	+/- 0,8 %	
Impedance, relative to input area		+/- 3,5 %; 10 kOhm
Resisttype thermometer, relative to input area	1.000	+/- 1 %
Voltage, relative to output areaCurrent, relative to output area	+/- 0,6 % +/- 1 %	+/- 1 %
Basic error limit (operational limit at 25 °C)		
Voltage, relative to input area	+/- 0,7 %	+/- 0,5 %; 0 to 10 V
Current, relative to input area	+/- 0,6 %	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
• Impedance, relative to input area		+/- 2,8 %; 10 kOhm
• Resisttype thermometer, relative to input area		+/- 0,8 %
 Voltage, relative to output area 	+/- 0,5 %	+/- 0,85 %
 Current, relative to output area 	+/- 0,5 %	
Alarms/diagnostics/status information		
Alarms • Alarms	No	No
	INO	INO
Diagnostics • Diagnostic functions	No	No
Isolation Isolation checked with	500 V DC	500 V DC
	000 V DO	000 V DO
Galvanic isolation		
Galvanic isolation analog inputs	No	Voo
• between the channels and the backplane bus	No	Yes
Galvanic isolation analog outputs • between the channels and the backplane bus	No	Yes
Dimensions and weight		
Dimensions		
• Width	40 mm	40 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weight		
Weight, approx.	285 g	200 g

SM 334 analog input/output module

Ordering data	Order No.		Order No.
SM 334 analog input/output		Labeling strips	6ES7 392-2XX00-0AA0
modules incl. labeling strips, bus		10 units (spare part), for modules with 20-pin front connector	
connector		S7 SmartLabel V3.0	
4 inputs, 2 outputs	6ES7 334-0CE01-0AA0	Software for automatic labeling of	
4 inputs, 2 outputs, resistance measurement, Pt 100	6ES7 334-0KE00-0AB0	modules direct from the STEP 7 project	
Front connectors		Single license J	2XV9 450-1SL03-0YX0
20-pin, with screw contacts		Upgrade single license J	2XV9 450-1SL03-0YX4
• 1 unit • 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	Labeling sheets for machine labeling	
20-pin, with spring-loaded terminals • 1 unit	6ES7 392-1BJ00-0AA0	For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
• 100 units	6ES7 392-1BJ00-1AB0	petrol	6ES7 392-2AX00-0AA0
20-pin, with FastConnect		light-beige	6ES7 392-2BX00-0AA0
• 1 unit	6ES7 392-1CJ00-0AA0	yellow	6ES7 392-2CX00-0AA0
Front door, elevated design	6ES7 328-0AA00-7AA0	red	6ES7 392-2DX00-0AA0
e.g. for 32-channel modules; for connecting 1.3 mm ² /16 AWG wires		SIMATIC manual collection J	6ES7 998-8XC01-8YE0
SIMATIC TOP connect	see page 5/290	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN,	
Bus connectors	6ES7 390-0AA00-0AA0	SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
1 unit (spare part)		I/O, SIMATIĆ HMI, SIMATIC	
Shield connecting element	6ES7 390-5AA00-0AA0	Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC	
80 mm wide, with 2 rows for 4 terminal elements each		PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
Terminal elements		SIMATIC manual collection D	6ES7 998-8XC01-8YE2
2 units		update service for 1 year	0207 330-02001-0122
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0	Current "Manual Collection" DVD and the three subsequent	
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0	updates S7-300 manual	
For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0	Design, CPU data, module data, instruction list	
Label cover	6ES7 392-2XY00-0AA0	German	6ES7 398-8FA10-8AA0
10 units (spare part), for modules with 20-pin front connector		English	6ES7 398-8FA10-8BA0

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS SM 331 analog input module

Overview



- Analog inputs
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 331	8 AI, 1 X 40-pin	8 AI, 1 X 40-pin	2 AI, 1 X 20-pin	
Order number	6AG1 331-1KF02-4AB0	6AG1 331-1KF02-7AB0	6AG1 331-7KB02-2AB0	
Order No. based on	6ES7 331-1KF02-0AB0	6ES7 331-1KF02-0AB0	6ES7 331-7KB02-0AB0	
Ambient temperature range	0 +60 °C	-25 +70 °C	-25 +70 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	No	No	
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standa	ard product applies except for the	ambient conditions.	

SIPLUS SM 331	8 AI, 1 X 20-pin	8 AI, 1 X 40-pin	8 AI, 1 X 40-pin	
Order number	6AG1 331-7KF02-2AB0	6AG1 331-7NF00-2AB0	6AG1 331-7NF10-2AB0	
Order No. based on	6ES7 331-7KF02-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0	
Ambient temperature range	-25 +70 °C	-25 +70 °C	-25 +60 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	No	
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standa	ard product applies except for the	ambient conditions.	

SIPLUS SM 331	8 AI, 1 X 40-pin	8 AI, 1 X 40-pin	
Order number	6AG1 331-7PF01-4AB0	6AG1 331-7PF11-4AB0	
Order No. based on	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	
Ambient temperature range	0 +60 °C	0 +60 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	No	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 331 analog input module

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOx < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOx < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS SM 331 analog input modules		
(extended temperature range and medial exposure)		
Including labeling strips, bus connector, measuring range modules		
8 inputs, resolution 13 bit; only medial exposure	1	6AG1 331-1KF02-4AB0
8 inputs, resolution 13 bit	1	6AG1 331-1KF02-7AB0
2 inputs, resolution 9/12/14 bit	Н	6AG1 331-7KB02-2AB0
8 inputs, resolution 9/12/14 bit	L	6AG1 331-7KF02-2AB0
8 inputs, enhanced resolution 16 bit	Н	6AG1 331-7NF00-2AB0
8 inputs, enhanced resolution 16 bit, 4-channel mode	Н	6AG1 331-7NF10-2AB0
8 inputs, for thermal resistors	L	6AG1 331-7PF01-4AB0
8 inputs, for thermocouples	L	6AG1 331-7PF11-4AB0
Accessories		See SIMATIC S7-300 analog input modules, page 5/140

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS SM 332 analog output module

Overview



- Analog outputs
- For connection of analog actuators

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 332	2 AO 1 X 20-pin	4 AO 1 X 20-pin	8 AO 1 X 40-pin
Order number	6AG1 332-5HB01-2AB0	6AG1 332-5HD01-7AB0	6AG1 332-5HF00-2AB0
Order No. based on	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0
Ambient temperature range	-25 +70 °C	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	No	No
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 332	8 AO 1 X 40-pin	4 AO 1 X 20-pin	
Order number	6AG1 332-5HF00-4AB0	6AG1332-7ND02-4AB0	
Order No. based on	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0	
Ambient temperature range	0 +60 °C	0 +60 °C	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	No	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS SM 332 analog output module

Overview (continued)		
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOx < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOx < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

	Order No.
L	6AG1 332-5HD01-7AB0
I	6AG1 332-7ND02-4AB0
Н	6AG1 332-5HB01-2AB0
L	6AG1 332-5HF00-2AB0
L	6AG1 332-5HF00-4AB0
	See SIMATIC S7-300 analog output modules, page 5/143
	I H L

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS SM 334 analog input/output module

Overview



- Analog inputs and outputs
- · For connection of analog sensors and actuators

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 334	2 AO
Order number	6AG1 334-0KE00-7AB0
Order No. based on	6ES7 334-0KE00-0AB0
Ambient temperature range	-25 + 70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 334 analog input/ output modules	
(extended temperature range and medial exposure)	
incl. labeling strips, bus connector	
4 inputs, 2 outputs, resistance measurement, Pt 100	6AG1 334-0KE00-7AB0
Accessories	See SIMATIC S7-300 analog input/output modules, page 5/146

F digital / analog modules

SM 326 F digital input module - Safety Integrated

Overview



- Digital inputs for the fail-safe SIMATIC S7 systems
- For connecting:
 Switches and 2-wire proximity switches
 Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation

 - Centrally: with S7-31xF-2 DP
 Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

Technical specifications

	6ES7 326-1RF00-0AB0	6ES7 326-1BK02-0AB0
Supply voltages Supply voltage of electronics and encoders 1L+/2L+		
• Rated value (DC)	24 V	24 V
Current consumption from load voltage L+ (without load), max.	160 mA	450 mA
from backplane bus 5 V DC, max.	90 mA	100 mA
Power losses Power loss, typ.	4.5 W	10 W
Connection method required front connector	40-pin	40-pin
Digital inputs Number of digital inputs	8; 8 (one-channel); 4 (two-channel)	24
Number of simultaneously controllable inputs • all mounting positions - Concurrently controllable inputs, up to 40 °C - Concurrently controllable inputs, up to 60 °C	8; vertical setup 8; horizontal set up	24 24; (at 24 V) or 18 (at 28.8 V)
Input voltage Rated value, DC for signal "0" for signal "1"	in accordance with DIN 19234 or NAMUR	24 V -30 to +5 V 11 to 30 V
Input current • for signal "0", max. (permissible quiescent current)	0.35 to 1.2 mA	2 mA
• for signal "1", typ.	2.1 to 7 mA	10 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", max. - at "1" to "0", max. • for NAMUR inputs - at "0" to "1", max. - at "1" to "0", max.	1.2 to 3 ms 1.2 to 3 ms	3.4 ms 3.4 ms
Cable length Cable length, shielded, max. Cable length unshielded, max.	200 m 100 m	200 m 100 m

SIMATIC S7-300 F digital / analog modules

SM 326 F digital input module - Safety Integrated

	6ES7 326-1RF00-0AB0	6ES7 326-1BK02-0AB0
Encoder supply		
Number of outputs	8	4; Isolated
Output voltage	8.2 V DC	
Output current, rated value		400 mA
Encoder		
Connectable encoders		
• 2-wire BEROS		Yes; if short-circuit test is deactivated
 permissible quiescent current (2-wire BEROS), max. 		2 mA
Ex(i) characteristics		
Module for Ex(i) protection	Yes	
Max. values of input circuits (per channel)		
 Co (permissible external capacity), max. 	3 μF	
 Io (short-circuit current), max. 	13.9 mA	
 Lo (permissible external inductivity), max. 	80 mH	
 Po (power of load), max. 	33.1 mW	
Uo (output no-load voltage), max.	10 V	
• Um (fault voltage), max.	60 V DC/ 30 V AC	00.00
Ta (permissible ambient temperature), max.	60 °C	60 °C
Alarms/diagnostics/status information		
Alarms	Yes	Voc
Diagnostic alarm	res	Yes
Diagnostics • Diagnostic information readable	Yes	Yes
	ies	res
Isolation Isolation checked with	500 V DC	500 V DC / 350 V AC
	300 V DC	300 V DC / 330 V AC
Galvanic isolation		
Galvanic isolation digital inputs • between the channels	Yes	Yes
between the channels, in groups of	165	12
between the channels and the backplane bus	Yes	Yes
Standards, approvals, certificates		
Test number KEMA	99 ATEX 2671 X	
Highest safety class achievable in safety mode		
• to DIN VDE 0801	AK 4 (one channel), AK 5 und 6 (two channel)	AK 6
• acc. to EN 954	Cat. 3 (single-channel), Cat. 4 (two-channel)	Cat. 4
• acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)	SIL 3
Dimensions and weight		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weight		
 Weight, approx. 	482 g	442 g

SIMATIC S7-300 F digital / analog modules

SM 326 F digital input module - Safety Integrated

Ordering Data	Order No.		Order No.
F digital input module SM 326		Active bus module	6ES7 195-7HC00-0XA0
24 inputs, 24 V DC	6ES7 326-1BK02-0AB0	BM 1 x 80 for 1 module with	0201 100 111000 07010
8 inputs, 24 V DC, NAMUR	6ES7 326-1RF00-0AB0	80 mm width	
Distributed Safety V5.4		SITOP power supply module	6ES7 307-1EA01-0AA0
programming tool		for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	
Task: Software for configuring fail- safe user programs for SIMATIC		Front connectors	
S7-300F, S7-400F, ET 200S		40-pin, with screw contacts	
Requirements: STEP 7 V5.3 SP3 and higher		• 1 unit	6ES7 392-1AM00-0AA0
Floating License	6ES7 833-1FC02-0YA5	• 100 units	6ES7 392-1AM00-1AB0
Software Update Service	6ES7 833-1FC00-0YX2	40-pin with spring-loaded	
Distributed Safety Upgrade		contacts • 1 unit	6ES7 392-1BM01-0AA0
From V5.x to V5.4; Floating	6ES7 833-1FC02-0YE5	• 100 units	6ES7 392-1BM01-1AB0
license for 1 user	0207 000 11 002 0120	40-pin, with FastConnect	
Labeling sheet with strips for		• 1 unit	6ES7 392-1CM00-0AA0
10 electronic blocks For 16-channel electronic	6ES7 193-1BH00-0XA0	Labeling strips	6ES7 392-2XX20-0AA0
blocks incl. add-on terminals		For fail-safe modules (spare part);	
 For 32-channel electronic blocks incl. add-on terminals 	6ES7 193-1BL00-0XA0	10 units	CEC7 200 0VV00 04 40
Connecting cable for	6ES7 901-4BD00-0XA0	Label cover	6ES7 392-2XY20-0AA0
PROFIBUS	0E37 901-4BD00-0XA0	For fail-safe modules (spare part); 10 units	
12 Mbit/s, for connecting PG to		LK 393 cable guide	6ES7 393-4AA10-0AA0
PROFIBUS DP, pre-assembled with 2 x 9-pin Sub-D connector, 3 m		For F modules; L+ and M connections; 5 units	
PROFIBUS bus connector		S7-300 manual	
• 90° cable outlet, terminating resistor with isolating function,	6ES7 972-0BA12-0XA0	Design, CPU data, module data, instruction list	
without PG socket, up to 12 Mbit/s		German	6ES7 398-8FA10-8AA0
• 90° cable outlet, terminating	6ES7 972-0BB12-0XA0	English	6ES7 398-8FA10-8BA0
resistor with isolating function, without PG socket, up to		SIMATIC manual collection	6ES7 998-8XC01-8YE0
12 Mbit/s		Electronic manuals on DVD,	
 90° cable outlet, FastConnect terminating resistor with 		multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
isolating function, without PG		SIMATIC C7, SIMATIC distributed	
socket, up to 12 Mbit/s; 1 unit		I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC	
- 1 unit	6ES7 972-0BA52-0XA0	PC Based Automation, SIMATIC	
- 100 units	6ES7 972-0BA52-0XB0	PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
90° cable outlet, FastConnect		TDC	
terminating resistor with isolating function, with PG		SIMATIC manual collection	6ES7 998-8XC01-8YE2
socket, up to 12 Mbit/s;		update service for 1 year	
1 unit - 1 unit	6ES7 972-0BB52-0XA0	Current "Manual Collection" DVD	
- 100 units	6ES7 972-0BB52-0XB0	and the three subsequent updates	
DIN rail for active bus modules		- F	
for max. 5 active bus modules for			
hot swapping function	000000000000000000000000000000000000000		
• 483 mm (19") long	6ES7 195-1GA00-0XA0		
530 mm long620 mm long	6ES7 195-1GF30-0XA0 6ES7 195-1GG30-0XA0		
• 2000 mm long	6ES7 195-1GC00-0XA0		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

F digital / analog modules

SM 326 F digital output module - Safety Integrated

Overview



- Digital outputs for the fail-safe SIMATIC S7 systems
- Two versions (1 x current sourcing, 1 x current sinking)
- For connecting solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
- Centrally: with S7-31xF DP, S7-31xF PN/DP Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-41xF-2 and S7-400F/FH

Technical specifications

	6ES7 326-2BF10-0AB0	6ES7 326-2BF41-0AB0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V; 1L+, 2L+, 3L+	24 V; 1L+, 2L+, 3L+
Current consumption		
from load voltage1L+, max.	100 mA; from supply voltage	75 mA; from supply voltage
from load voltage 2L+ (without load), max.	100 mA	100 mA
from load voltage 3L+ (without load), max.	100 mA	100 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
Power losses		
Power loss, typ.	6 W	12 W
Connection method		
required front connector	40-pin	40-pin
Digital outputs		
Number of digital outputs	10	8
Short-circuit protection	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-33 V)
Lamp load, max.	5 W	5 W
Output voltage		
• for signal "1" without series diode, min.		L+ (-1.0 V)
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 0 to 40 °C, max.		2 A; 2 A for horizontal installation, 1 A for
• for signal "1" permissible range for 40 to 60 °C, min.	7 mΛ	vertical installation 7 mA
• for signal "1" permissible range for 40 to 60 °C, max.		1 A; for horizontal installation
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency	0.0	0.0
with resistive load, max.	25 Hz	30 Hz
with inductive load, max.	25 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Aggregate current of outputs (per group)		
horizontal installation		
- up to 40 °C, max.	10 A	7.5 A
- up to 60 °C, max.	6 A	5 A
vertical installation		
- up to 40 °C, max.	5 A	5 A
Cable length		
Cable length, shielded, max.	1 000 m	200 m; 200 m for SIL3, AK 6, Cat 4
Cable length unshielded, max.	600 m	

SIMATIC S7-300 F digital / analog modules

SM 326 F digital output module - Safety Integrated

	6ES7 326-2BF10-0AB0	6ES7 326-2BF41-0AB0
Alarms/diagnostics/status information		
Alarms		
Diagnostic alarm	Yes	Yes; Parameterizable
Diagnostics		
Diagnostic information readable	Yes	Yes
Isolation		
Isolation checked with	370 V for 1 min	500 V DC / 350 V AC
Galvanic isolation		
Galvanic isolation digital outputs		
 between the channels 	Yes	Yes
 between the channels, in groups of 	5	4
 between the channels and the backplane bus 	Yes	Yes
 between the channels and the power supply of the electronics 	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• to DIN VDE 0801	AK 5 and 6	
• acc. to EN 954	Cat. 4	Cat. 4
• acc. to IEC 61508	SIL 3	SIL 3
Dimensions and weight		
Dimensions		
• Width	40 mm	80 mm
Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weight		
• Weight, approx.	330 g	465 g

SIMATIC S7-300 F digital / analog modules

SM 326 F digital output module - Safety Integrated

Ordering data	Order No.		Order No.
F digital output module SM 326		Active bus modules	
10 outputs, 24 V DC, 2 A PP; width 40 mm	6ES7 326-2BF10-0AB0	BM 2 x 40 for accepting 2 IO modules each 40 mm wide	6ES7 195-7HB00-0XA0
8 outputs, 24 V DC, 2 A PM; width 80 mm	6ES7 326-2BF41-0AB0	BM 1 x 80 for accepting 1 IO module 80 mm wide	6ES7 195-7HC00-0XA0
Distributed Safety V5.4		SITOP power supply module	6ES7 307-1EA01-0AA0
programming tool Task: Software for configuring fail-		for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	
safe user programs for SIMATIC S7-300F. S7-400F. ET 200S		Front connectors	
Requirements: STEP 7 V5.3 SP3		40-pin, with screw contacts	
and higher		• 1 unit	6ES7 392-1AM00-0AA0
Floating License	6ES7 833-1FC02-0YA5	• 100 units	6ES7 392-1AM00-1AB0
Software Update Service	6ES7 833-1FC00-0YX2	40-pin with spring-loaded	
Distributed Safety Upgrade		contacts • 1 unit	6ES7 392-1BM01-0AA0
From V5.x to V5.4; Floating	6ES7 833-1FC02-0YE5	• 100 units	6ES7 392-1BM01-1AB0
license for 1 user		40-pin, with FastConnect	
Labeling sheet with strips for 10 electronic blocks		• 1 unit	6ES7 392-1CM00-0AA0
• For 16-channel electronic	6ES7 193-1BH00-0XA0	Labeling strips	6ES7 392-2XX20-0AA0
 blocks incl. add-on terminals For 32-channel electronic 	6ES7 193-1BL00-0XA0	For fail-safe modules (spare part), 10 units	
blocks incl. add-on terminals	CEST 130 TEESO GAAG		CEC7 200 0VV00 04 40
Connecting cable for	6ES7 901-4BD00-0XA0	Label cover	6ES7 392-2XY20-0AA0
PROFIBUS		For fail-safe modules (spare part), 10 units	
12 Mbit/s, for connecting PG to PROFIBUS DP, pre-assembled		LK 393 cable guide	6ES7 393-4AA10-0AA0
with 2 x 9-pin Sub-D connector,		For F modules; L+ and	
3 m		M connections, 5 units	
PROFIBUS bus connector	6ES7 972-0BA12-0XA0	S7-300 manual	
 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 	0E37 972-UBA12-UXAU	Design, CPU data, module data, instruction list	
12 Mbit/s		German	6ES7 398-8FA10-8AA0
90° cable outlet, terminating register with inelating function	6ES7 972-0BB12-0XA0	English	6ES7 398-8FA10-8BA0
resistor with isolating function, without PG socket, up to		SIMATIC manual collection J	
12 Mbit/s		Electronic manuals on DVD,	0201 000-0X001-01E0
 90° cable outlet, FastConnect terminating resistor with 		multilingual: LOGO!, SIMADYN,	
isolating function, without PG		SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
socket, up to 12 Mbit/s; 1 unit		I/O, SIMATIC HMI, SIMATIC	
- 1 unit	6ES7 972-0BA52-0XA0	Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC	
- 100 units	6ES7 972-0BA52-0XB0	PCS 7, SIMATIC PG/PC, SIMATIC	
 90° cable outlet, FastConnect terminating resistor with 		S7, SIMATIC Software, SIMATIC TDC	
isolating function, with PG		SIMATIC manual collection D	6ES7 998-8XC01-8YE2
socket, up to 12 Mbit/s; 1 unit		update service for 1 year	0L3/ 990-0ACUI-01E2
- 1 unit	6ES7 972-0BB52-0XA0	Current "Manual Collection" DVD	
- 100 units	6ES7 972-0BB52-0XB0	and the three subsequent	
DIN rail for active bus modules		updates	
for max. 5 active bus modules, for			
function "Insertion and removal"	CEC7 105 10 10 10 0V 10		
483 mm (19") long530 mm long	6ES7 195-1GA00-0XA0 6ES7 195-1GF30-0XA0		
• 620 mm long	6ES7 195-1GF30-0XA0		

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

F digital / analog modules

SM 336 F analog input module - Safety Integrated

Overview



- Analog inputs for the fail-safe SIMATIC S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIMATIC S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 20 mA HART:
 - 6 analog inputs with galvanic isolation between channels and backplane bus
 - Input ranges: 0 to 20 mA, 4 to 20 mA
 - Short-circuit proof power supply from 2 or 4-wire transducer via the module
 - External encoder supply possible
 Applicable in safety mode
 HART communication

 - Firmware update using HW Config
- Identification data

	6ES7 336-4GE00-0AB0
Product type designation	SM 336 F-AI 6x0/4 to 20 mA HART
Supply voltages Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Current consumption	
from backplane bus 5 V DC, max.	90 mA
from supply voltage L+, max.	150 mA; Typical
Power losses	
Power loss, typ.	4.5 W
Connection method required front connector	20-pin
Analog inputs Number of analog inputs	6
Cable length, shielded, max.	1 000 m
Input ranges (rated values), currents • 0 to 20 mA	Yes
• 4 to 20 mA	Yes
Current input • permissible input current for current input (destruction limit), max.	40 mA
Analog value creation Integrations and conversion time/ resolution per channel	
 Resolution with overrange (bit including sign), max. 	16 bit; 15 bits + sign
Integration time, ms	20 at 50 Hz 16.7 at 60 Hz
 Interference voltage suppression for interference frequency f1 in Hz 	f=n x (f1+-0.5%)
Encoder	
Connection of signal encoders • for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

	6ES7 336-4GE00-0AB0
Errors/accuracies Operational limit in overall temperature range	
Current, relative to input area	+/- 0,2 %; 40µA
Basic error limit (operational limit at 25 °C)	
Current, relative to input area	+/- 0,1 %
Alarms/diagnostics/status information Alarms	
Diagnostic alarm	Yes
Diagnostics Diagnostic information readable	Yes
Isolation Isolation checked with	370 V for 1 min
Galvanic isolation Galvanic isolation analog inputs • between the channels • between the channels and the backplane bus • between the channels and the power supply of the electronics	Yes Yes Yes
Standards, approvals, certificates Highest safety class achievable in safety mode • acc. to DIN V 19250 • acc. to EN 954 • acc. to IEC 61508	old Cat. 4 SIL 3
Dimensions and weight Dimensions • Width • Height • Depth	40 mm 125 mm 120 mm
Weight ◆ Weight, approx.	350 g

SIMATIC S7-300 F digital / analog modules

SM 336 F analog input module - Safety Integrated

simplify in the module SM 336 mputs, 15 bit, (04 - 20 mA HAPT for Space 1 stributed Safety VS-1 organisming tool sets Software for configuring faller user programs for SIMATIC 7-200F, 37-00F, ET 2005, ET 2005 CET 2005 adurements. STEP 7 VS-3 SP3 digital for specific programs for SIMATIC 7-200F, 37-00F, ET 2005 Cell programs for SIMATIC 7-200F, 37-00F, ET 2005 Cell programs for SIMATIC 7-200F, 37-00F, ET 2005 Cell programs for SIMATIC 7-200F, 37-00F, 200F, 20	<u> </u>			<u></u>
Imputs	Ordering Data	Order No.		Order No.
particulared Sarlety VS.4 organisming tool on the Software for configuring fall-file user programme for SMMATIC P.300F S7-400F, ET 2005 southerness ETP 7 VS.3 SP3 d higher for configuring fall-file user programme for SMMATIC P.300F S7-400F, ET 2005 southerness ETP 7 VS.3 SP3 d higher for configuring fall-file user programme for SMMATIC C.300F S7-400F, ET 2005 southerness ETP 7 VS.3 SP3 d higher for strike and budate Service filters and budate Service filters and budate Service for SS-3-1FC02-0VX2 for section budate Service for SS-3-1FC02-0VX2 for section budate Service for SS-3-1FC02-0VX5 for SS-3-1	• .		,	6ES7 307-1EA01-0AA0
Serioutic safety Vs.4 gyramming tool SMANTC subserprogram to SMANTC stributed Safety Upgrade om Vs. xo Vs.4, Floating of ESS 739.1BH00-0XA0 of ESS 739.1		6ES7 336-4GE00-0AB0		
sex Software for configuring falls for superprograms for SIMATIC 7-300F S7-400F, ET 2005 outperments (SIMATIC 7-300F S7-400F, ET 2005 outperments) (SIMATIC 7-300F S7-300F, SIMATIC 7-300F, SIMATIC 3-300F, SIMATIC 3-				
if user programs for SIMATIC 2-your SY-200F, ET 200S for T200S for			20-pin, with screw contacts	
squirements: STEP 7 V5.3 SP3 did higher of higher or orinacis o	safe user programs for SIMATIC		• •	6ES7 392-1AJ00-0AA0
anting Liconse of Se57 833-1FC02-0YA5 of Marker Update Service of Se57 833-1FC02-0YA5 of Marker Update Service of Se57 833-1FC00-0YX2 stributed Safety Upgrade onn Vx. xt 0 Vx. 4; Floating ense for 1 user of User o			• 100 units	6ES7 392-1AJ00-1AB0
pating Licerise	and higher			
stributed Safety Upgrade om V5x 1o V5 4; Floating onse for 1 user babeling sheet with strips for letectronic blocks for 10-channel electronic blocks for 10-channel electronic blocks for 32-channel e	Floating License	6ES7 833-1FC02-0YA5		6EC7 202 1D 100 0AA0
setributed Safety Upgrade om VS x to VS 4; Floating cannel for 1 user anse for 1 user placetions blooks for 16-channel electronic blocks incl. add-on terminals for 32-channel electronic blocks for 32-channel step for for fall-safe modules (spare part), 10 units 57 SmartLabel V3.0 Software for automatic labeling of modules direct from the STEP 7 project incl. add for for the STEP 7 project for modules (spare part), 10 units 57 SmartLabel V3.0 Software for automatic labeling of modules direct from the STEP 7 project labeling sheets for machine sester with isolating function, without PG socket, up to 10 mins for 23-channel signal modules, petrol for 32-channel signal modules, for 332-22X10-0AA0 feES7 332-20X10-0AA0 feES7 333-4AA10-0AA0 feES7 333-4AA10-0AA0 feES7 333-4AA10-0AA0 feES7 333-4AA10-0A	Software Update Service	6ES7 833-1FC00-0YX2		
com VS x to VS 4; Floating enes for 1 user sense for 1 us	Distributed Safety Upgrade		20-pin_with FastConnect	
babeling shet with strips for electronic blocks for 13e-1se babeling shet with strips for electronic blocks for 13e-channel electronic blocks for 13e-channel electronic blocks for 13e-channel electronic blocks for 13e-share lectronic blocks for 13e-share modules (spare part), 10 units 6ES7 93-22XY20-0AA0 For fall-safe modules (spare part), 10 units 77 SmartLabel V3.0 Software for automatic labeling of modules (direct from the STEP 7 project Single license J 2XV9 450-15L03-0YX0 2XV9 450-15L03-0YX0 Upgrade single license J 2XV9 450-15L03-0YX4 Labeling shets for machine inscription For 32-channel signal modules, DIN A4, for printing with laser printier, 10 units perfor 6ES7 972-0BB12-0XA0 6ES7 972-0BB12-0XA0 6ES7 972-0BA52-0XA0 6ES7 972-0BA52-0XB0 6ES7 972-0BA52-0XB0 6ES7 972-0BB52-0XB0	From V5.x to V5.4; Floating	6ES7 833-1FC02-0YE5	• •	6ES7 392-1CJ00-0AA0
ple electronic blocks for 16-channel electronic blocks incl. add-on terminals for 32-channel signal add-on terminals for 32-channel signal electron the STEP 7 project Single license J 2XV9 450-15L03-0YX0 Software for automatic labeling of modules direct from the STEP 7 project Single license J 2XV9 450-15L03-0YX0 Upgrade single license Upgrade sing	license for 1 user		Labeling strips	6ES7 392-2XX20-0AA0
Gest	Labeling sheet with strips for		For fail-safe modules (spare part),	
Label cover For 32-channel electronic blocks incl. add-on terminals for 32-channel electronic blocks incl. add-on terminals on 200 For fail-safe modules (spare part), 10 units For Sarchandel sheling of modules direct from the STEP 7 project Single license J 2XV9 450-1SL03-0YX0 Upgrade single license J 2XV9 450-1SL03-0YX0 Easting inclients Labeling sheets for machine increption inclients Easting inclients Easting inclients J 2XV9 450-1SL03-0YX0 Upgrade single license J 2XV9 450-1SL03-0YX0 Easting inclients Labeling sheets for machine increption increption increption increption increp		6FS7 193-1RH00-0XA0		
Dicoks incl. add-on terminals on connecting cable for ROFIBUS Molity's, for connecting PG to accepting 2 Molity's project Molity Substance of the STEP 7 project Single license J 2 XV9 450-1SL03-0YX0 Single license J 2 XV9 450-1SL03-0YX0 Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single license J 2 XV9 450-1SL03-0YX0 Wighter Project Including 4 Molity Single Project	blocks incl. add-on terminals	0E37 193-1B1100-0XA0	Label cover	6ES7 392-2XY20-0AA0
Software for automatic labeling of modules for ROFIBUS Whility. For connecting PG to ACPIBUS DP, pre-assembled the 2 x 9-pin Sub-D connector, m BOFIBUS DP, pre-assembled the 2 x 9-pin Sub-D connector, m BOFIBUS bus	• For 32-channel electronic	6ES7 193-1BL00-0XA0		
Software for automatic labeling of modules direct from the STEP 7 project Single license J 2XV9 450-1SL03-0YX0 Single license J 2XV9 450-1SL03-0YX0 Upgrade single license J 2XV9 450-1SL03-0YX4 Labeling sheets for machine inscription For 32-channel signal modules, Din Ad, for printing with laser printer; 10 units petrol ESS 7 972-0BB12-0XA0 ESS 7 972-0BB12				
Software for automatic labeling of modules direct from the STEP 7 project Software for automatic labeling of modules direct from the STEP 7 project Single license J 2XV9 450-1SL03-0YX0 Upgrade single license Upgrade	Connecting cable for PROFIBUS	6ES/ 901-4BD00-0XA0		
ROFIBUS DP, pre-assembled the 2 x 9-pin Sub-D connector, m ROFIBUS bus connector m ROFIBUS bus connector m ROFIBUS bus connector move cable outlet, terminating resistor with isolating function without PG socket, up to 12 Mbit/s; 1 unit				
MOFIBUS bus connector 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit 1 conditions of 1 unit 1 conditions without PG socket, up to 12 Mbit/s; 1 unit 1 conditions without PG socket, up to 12 Mbit/s; 1 unit 1 conditions with pG socket, up to 12 Mbit/s; 1 unit 1 conditions with PG socket, up to 12 Mbit/s; 1 unit 1 conditions with PG socket, up to 12 Mbit/s; 1 unit 2 conditions, but possible to the provided pro	PROFIBUS DP, pre-assembled			
ROFIBUS bus connector 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit 1 (6ES7 972-0BA52-0XA0) 6ES7 972-0BA52-0XB0 6ES7	with 2 x 9-pin Sub-D connector, 3 m		Single license J	2XV9 450-1SL03-0YX0
### Space of the cutlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit 1 to 12 Mbi			· ·	2XV9 450-1SL03-0YX4
resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit - 1 unit - 10 units 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit - 1 unit - 10 units 90° cable outlet, FastConnect terminating resistor with solating function, without PG socket, up to 12 Mbit/s; 1 unit - 1 un	90° cable outlet, terminating	6ES7 972-0BA12-0XA0		
12 Mbit/s 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s; 10 unit 11 unit 12 unit 13 unit 14 unit 15 unit 15 unit 15 unit 15 unit 16 unit 17 unit 18 unit 19 unit 19 unit 10 unit	resistor with isolating function,			
printer; 10 units petrol light-beige petrol light-beig	12 Mbit/s			
petrol light-beige petrol light p	• 90° cable outlet, terminating	6ES7 972-0BB12-0XA0		
12 Mbit/s			•	6ES7 302-2AV10-0AA0
yellow feed feers 392-2CX10-0AA0 feed fees 392-2DX10-0AA0 feed fees 392-2DX10-0AA0 feed fees 392-2DX10-0AA0 feed fees 392-2DX10-0AA0 feed feed feed fees 392-2DX10-0AA0 feed feed feed feed fees 392-2DX10-0AA0 feed feed feed feed feed feed feed fee	12 Mbit/s		•	
isolating function, without PG socket, up to 12 Mbit/s; 1 unit - 2 unit - 1 unit - 2 unit - 3 unit - 4 unit - 4 unit - 5 unit - 5 unit - 5 unit - 6 ES7 398-8FA10-8AA0 - 6 ES7	90° cable outlet, FastConnect		0 0	
socket, up to 12 Mbit/s; 1 unit - 100 units 90° cable outlet, FastConnect terminating resistor with soldating function, with PG socket, up to 12 Mbit/s; 1 unit - 100 units IN rail for active bus modules for at swapping function at swapping funct	isolating function, without PG		•	
- 1 unit - 100 units - 100 uni	socket, up to 12 Mbit/s;			
- 100 units 90° cable outlet, FastConnect terminating resistor with soldating function, with PG socket, up to 12 Mbit/s; 1 unit - 100 units 6ES7 972-0BB52-0XA0 - 1 unit - 100 units 6ES7 972-0BB52-0XB0 IN rail for active bus modules or max. 5 active bus modules for bus wapping function to swapping function 483 mm long 6ES7 195-1GA00-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG00-0XA0 6ES7 195-1GG00-0XA0 6ES7 195-1GG00-0XA0 6ES7 195-1GG00-0XA0 6ES7 195-1GG00-0XA0 6ES7 195-1GC00-0XA0 Crive bus module BM 2x40 Us module for accepting 2 IO odules each 40 mm wide For F modules; L+ and M connections, 5 units S7-300 manual Design, CPU data, module data, instruction list German 6ES7 398-8FA10-8AA0 6ES7 398-8FA10-8BA0 SIMATIC manual collection J 6ES7 998-8XC01-8YE0 Electronic manuals on DVD, multillingual: LOGO!, SIMATIC bus components, SIMATIC PC Based Automation, SIMATIC PC Based Automation, SIMATIC PC Based Automation, SIMATIC TDC SIMATIC Software, SIMATIC TDC SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD and the three subsequent		6FS7 972-0RΔ52-0XΔ0	LK 393 cable guide	6ES7 393-4AA10-0AA0
S7-300 manual Design, CPU data, module data, instruction list German Gerran German Ge	- 100 units	*		
Design, CPU data, module data, instruction list	90° cable outlet, FastConnect			
socket, up to 12 Mbit/s; 1 unit - 1 uni	terminating resistor with isolating function, with PG			
German Ges7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0 IN rail for active bus modules r max. 5 active bus modules for ot swapping function 483 mm long 6ES7 195-1GA00-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG0-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0 Ges9 mm long 6ES7 195-7HB00-0XA0 Ges9 mm long 6ES7 195-7HB00-0XA0 Ges9 mm long 6ES7 195-1GC00-0XA0 Ges9 mm long 6ES7 195-1GC00-0XA0 Ges9 mm long 6ES7 195-1GC00-0XA0 Ges9 mm long 6ES7 195-1GF30-0XA0 Ges9 mm long 6ES7 195-1GG30-0XA0 Ges9 mm long 6ES7 195-1GC00-0XA0 Ges9 mm long 6ES7 195-1GA00-0XA0 Ges9 mm l	socket, up to 12 Mbit/s;			
Figure 100 units		6FS7 972-0RR52-0YA0	German	6ES7 398-8FA10-8AA0
SIMATIC manual collection J 6ES7 998-8XC01-8YE0 Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC Dus components, SIMATIC Dus components, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC December 2 IO odules each 40 mm wide SIMATIC manual collection J 6ES7 998-8XC01-8YE0 Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC distributed I/O, SIMATIC December 2 IO odules each 40 mm wide SIMATIC manual collection J 6ES7 998-8XC01-8YE0 Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC distributed I/O, SIMATIC December 2 IN INTRODUCTION SIMATIC December 3 IN INTRODUCTION SIMATIC December 3 IN INTRODUCTION DECEMBER 3	- 100 units		English	6ES7 398-8FA10-8BA0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HIII, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC S7, SIMATIC	DIN rail for active bus modules			6ES7 998-8XC01-8YE0
tot swapping function 483 mm long 6ES7 195-1GA00-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC	for max. 5 active bus modules for			
530 mm long 6ES7 195-1GF30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0 6ES7 195-7HB00-0XA0 SIMATIC C7, SIMÁTIC distributed I/O, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PCS 7, SIMATIC Software, SIMATIC TDC SIMATIC C7, SIMÁTIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PCS 7, SIMATIC SOftware, SIMATIC TDC SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD and the three subsequent	hot swapping function		multilingual: LOGO!, SIMADYN,	
6ES7 195-1GG30-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0	• 483 mm long • 530 mm long			
2000 mm long 6ES7 195-1GC00-0XA0 6ES7 195-7HB00-0XA0	• 620 mm long		I/O, SIMATIC HMI, SIMATIC	
Citive bus module BM 2x40 Us module for accepting 2 IO odules each 40 mm wide 6ES7 195-7HB00-0XA0 PCS 7, SIMATIC PG/PC, SIMATIC S7, SIM	• 2000 mm long			
us module for accepting 2 IO odules each 40 mm wide TDC SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD and the three subsequent	Active bus module BM 2x40	6ES7 195-7HB00-0XA0	PCS 7, SIMATIC PG/PC, SIMATIC	
SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD and the three subsequent Current "Manual Collection" DVD	Bus module for accepting 2 IO			
Current "Manual Collection" DVD and the three subsequent	modules each 40 mm wide		SIMATIC manual collection	6ES7 998-8XC01-8YE2
and the three subsequent			•	
updates			and the three subsequent	
			updates	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

F digital / analog modules

Isolation module

Overview



- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M when Cat. 4 or SIL 3 has to be achieved.
- The isolation module is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respectively.

When Cat. 4/SIL 3 is required, the isolation module must be implemented in the following situations:

Application	Isolation module must be used
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP	
Only fail-safe modules in the tier	Yes, behind the CPU
Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack	
Only fail-safe modules in the tier	Yes, after the IM 36x
Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with copper connection	
Only fail-safe modules in the station	Yes, after the IM 153-2
Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with fiber-optic connection	
Only fail-safe modules in the station	No
Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module

	6ES7 195-7KF00-0XA0
Dimensions and weight	
Weight	
 Weight, approx. 	10 g

Ordering data	Order No.
Isolation module	6ES7 195-7KF00-0XA0
for simultaneous operation of fail- safe and standard modules in an ET 200M	
Isolation bus module	6ES7 195-7HG00-0XA0
for accommodating the isolating module in an ET 200M	

SIPLUS F digital/analog modules
SIPLUS SM 326 F digital input module Safety Integrated

Overview



- Digital inputs for the fail-safe SIPLUS S7 systems
- For connecting:
- Switches and 2-wire proximity switchesSensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
 Centrally: with S7-31xF-2 DP
 Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 326-1BK02- 2AB0	6AG1 326-1RF00- 4AB0
Order No. based on	6ES7 326-1BK02- 0AB0	6AG1 326-1RF00- 0AB0
Ambient temperature range	- 25 + 60 °C	0 + 60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100%, condensation allowed	

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 326 F digital input	
(extended temperature range and medial exposure)	
24 inputs, 24 V DC	6AG1 326-1BK02-2AB0
8 inputs, 24 V DC, NAMUR	6AG1 326-1RF00-4AB0
Accessories	See SIMATIC SM 326 F digital input, page 5/154

H: Subject to export regulations AL: 91999 and ECCN: EAR99H L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS F digital/analog modules SIPLUS F digital output module SM 326 - Safety Integrated

Overview



- Digital outputs for the fail-safe SIMATIC S7 systems
- For connection of solenoid valves, DC contactors and indicator lights
- · With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
 - Centrally: With S7-31xF-2 DP
 - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 326-2BF41- 2AB0	6AG1 326-2BF41- 2AY0
Order No. based on	6ES7 326-2BF41- 0AB0	6ES7 326-2BF41- 0AB0
Ambient temperature range	-25 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data		f the standard product e ambient conditions
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No Yes	
Ambient conditions		
Relative humidity	5 100%, condensa	ation allowed

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS SM 326 F digital output module		
(extended temperature range and medial exposure)		
8 outputs, 24 V DC, 2 A	Н	6AG1 326-2BF41-2AB0
8 outputs, 24 V DC, 2 A (according to EN 50155)	Н	6AG1 326-2BF41-2AY0
Accessories		See SIMATIC SM 326 F digital output module, page 5/157

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

SIPLUS F digital/analog modules
SIPLUS SM 336 F analog input module Safety Integrated

Overview



- Analog inputs for the fail-safe SIPLUS S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIPLUS S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
 - 6 analog inputs with galvanic isolation between channels and backplane bus
 - Input ranges: 0 mA to 20 mA, 4 mA to 20 mA
 - Short-circuit proof power supply of 2 or 4-wire transmitter via the module
 - External encoder supply possible
 - Applicable in safety mode
 - HART communication
 - Firmware update using HW Config
 - Identification data

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 336-4GE00-4AB0
Order No. based on	6ES7 336-4GE00-0AB0
Ambient temperature range	0 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity 5 100%, condensation allow	
The technical documentation	on SIPLUS can be found here:

Ordering data	Order No.
SIPLUS SM 336 F analog input module	
(medial exposure)	
6 inputs, 15 bit, 0/4 - 20 mA HART	6AG1 336-4GE00-4AB0
Accessories	See SIMATIC SM 336 F analog input module, page 5/159

www.siemens.com/siplus-extreme

SIPLUS F digital/analog modules

SIPLUS isolation module

Overview



- Permits combined operation of fail-safe signal modules in safety mode and standard S7-300 modules in the same ET 200M system.
- The isolation module is not required if the safety class SIL 3 or safety category < Cat. 4 is to be achieved.

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-300 isolation module		
Order No.	6AG1 195-7KF00-2XA0	
Order No. based on	6ES7 195-7KF00-0XA0	
Ambient temperature range	- 25 + 60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100%, condensation allowed	

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS isolation module	6AG1 195-7KF00-2XA0
for simultaneous operation of fail-safe and standard modules in the same ET 200M	
Accessories	See SIMATIC S7-300 isolation module, page 5/160

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Ex digital modules

Ex digital input modules

Overview



- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Diagnostics and diagnostic alarm programmable

	6ES7 321-7RD00-0AB0
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
Current consumption	
from load voltage L+ (without load), max.	50 mA
from backplane bus 5 V DC, max.	80 mA
Power losses	
Power loss, typ.	1.1 W
Connection method	
required front connector	20-pin
Digital inputs	
Number of NAMUR inputs	4
Input voltage	
Rated value, DC	8.2 V; from internal power circuit supply
Input current	
• on wire break, max.	0.1 mA
on short -circuit, max.	8.5 mA
• for NAMUR encoders	
- for signal "0"	0.35 to 1.2 mA
- for signal "1"	2.1 to 7 mA
Input delay (for rated value of input voltage)	
Input frequency (with a time	2 kHz
delay of 0.1 ms), max.	
for NAMUR inputs	
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms
	(plus 0.25 ms preparation time)
Cable length	
Cable length unshielded, max.	200 m
Encoder supply	
Output voltage	via the inputs

	6ES7 321-7RD00-0AB0
Encoder	
Connectable encoders	
NAMUR encoder	Yes; Two-wire connection
Ex(i) characteristics	
Max. values of input circuits (per channel)	
 Co (permissible external capacity), max. 	3 μF
 lo (short-circuit current), max. 	14.1 mA
 Lo (permissible external inductivity), max. 	100 mH
 Po (power of load), max. 	33.7 mW
• Uo (output no-load voltage), max.	10 V
Alarms/diagnostics/status infor-	
mation	
Diagnostics	
Diagnostic information readable	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	Yes
 between the channels, in groups of 	1
Standards, approvals, certificates	
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection acc. to FM	Class II, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2094X
Dimensions and weight	
Weight	
Weight, approx.	230 g
- · · · ·	_

SIMATIC S7-300 Ex digital modules

Ex digital input modules

Ordering data	Order No.		Order No.
Ex digital input module 4 inputs, isolated, NAMUR	6ES7 321-7RD00-0AB0	Labeling sheets for machine inscription	
Front connectors 20-pin, with screw contacts	SEST SET THESE SALE	For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
• 1 unit • 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	petrol light-beige	6ES7 392-2AX00-0AA0 6ES7 392-2BX00-0AA0
Front door, elevated design e.g. for 32 channel modules; enables connection of	6ES7 328-0AA00-7AA0	yellow red	6ES7 392-2CX00-0AA0 6ES7 392-2DX00-0AA0
1.3 mm ² /16 AWG wires LK 393 cable guide	6ES7 393-4AA00-0AA0	SIMATIC manual collection J Electronic manuals on DVD,	6ES7 998-8XC01-8YE0
Mandatory for operation in Ex- hazard areas		multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
Labeling strips 10 units (spare part), for modules with 20-pin front connector	6ES7 392-2XX00-0AA0	I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC	
Label cover 10 units (spare part), for modules	6ES7 392-2XY00-0AA0	S7, SIMATIC Software, SIMATIC TDC	
with 20-pin front connector S7 SmartLabel V3.0		SIMATIC manual collection D update service for 1 year	6ES7 998-8XC01-8YE2
Software for automatic labeling of modules direct from the STEP 7 project		Current "Manual Collection" DVD and the three subsequent updates	
Single license	2XV9 450-1SL03-0YX0		
Upgrade single license	2XV9 450-1SL03-0YX4		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-300 Ex digital modules

Ex digital output modules

Overview



- Digital outputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DO 24 V DC/10mA or 4 DO 15 V DC/20 mA
- 4 digital outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostic alarm programmable
- Substitute value behavior programmable

	6ES7 322-5SD00-0AB0	6ES7 322-5RD00-0AB0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
Current consumption		
from load voltage L+ (without load), max.	160 mA	160 mA
from backplane bus 5 V DC, max.	70 mA	70 mA
Power losses		
Power loss, typ.	3 W	3 W
Connection method		
required front connector	20-pin	20-pin
Digital outputs		
Number of digital outputs	4	4
Short-circuit protection	Yes; Electronic	Yes; Electronic
 Response threshold, typ. 	Output current with short-circuit protection,	Output current with short-circuit protection,
	min. 10 mA + 10 %	min. 20.5 mA + 10 %
Output voltage		
Rated value (DC)	24 V	15 V
Output current		
• for signal "1" permissible range for 0 to 60 °C,	10 mA; +/-10 %	20 mA; +/-10 %
max.		
Switching frequency	100 11	400.11
with resistive load, max.	100 Hz	100 Hz
Load resistance range	000 O T	000 O T
• upper limit	390 Ω; Two-wire connection	200 Ω; Two-wire connection
Cable length	200	000
Cable length unshielded, max.	200 m	200 m
Ex(i) characteristics		
Max. values of output circuits (per channel)	00. 5	500 F
Co (permissible external capacity), max.	90 nF	500 nF
lo (short-circuit current), max.	70 mA	85 mA
Lo (permissible external inductivity), max.	6.7 mH	5 mH
Po (power of load), max.	440 mW 25.2 V	335 mW
Uo (output no-load voltage), max.	25.2 V	15.75 V
Alarms/diagnostics/status information		
Diagnostics • Diagnostic information readable	Voo	Voo
Diagnostic information readable Short circuit	Yes Yes	Yes Yes
Short circuit Group error	Yes	Yes
• Group error	169	162

SIMATIC S7-300 Ex digital modules

Ex digital output modules

	6ES7 322-5SD00-0AB0	6ES7 322-5RD00-0AB0
Galvanic isolation		
Galvanic isolation digital outputs		
Galvanic isolation digital outputs	Yes	Yes
 between the channels, in groups of 	1	1
Standards, approvals, certificates		
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	AIS CL.1, DIV 1, GP A, B, C, D; CL.I, DIV 2, GP A, B,C, D T4
Test number PTB	Ex-96.D.2093X	Ex-96.D.2102X
Dimensions and weight		
Weight		
Weight, approx.	230 g	230 g

Ordering data	Order No.		Order No.
Ex digital output modules 4 outputs, isolated, 24 V DC,	6ES7 322-5SD00-0AB0	Labeling sheets for machine inscription	
10 mA 4 outputs, isolated, 15 V DC,	6ES7 322-5RD00-0AB0	For 16-channel signal modules, DIN A4, for printing with laser	
20 mA		printer; 10 units	6ES7 392-2AX00-0AA0
Front connectors		'	
20-pin, with screw contacts		light-beige	6ES7 392-2BX00-0AA0
• 1 unit	6ES7 392-1AJ00-0AA0	yellow	6ES7 392-2CX00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0	red	6ES7 392-2DX00-0AA0
Front door, elevated design		SIMATIC manual collection J	6ES7 998-8XC01-8YE0
e.g. for 32 channel modules; enables connection of 1.3 mm ² /16 AWG wires	6ES7 328-0AA00-7AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
LK 393 cable guide	6ES7 393-4AA00-0AA0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
Mandatory for operation in Ex-hazard areas		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC	
Labeling strips	6ES7 392-2XX00-0AA0	PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
10 units (spare part), for modules with 20-pin front connector		TDC SIMATIC manual collection D	6ES7 998-8XC01-8YE2
Label cover	6ES7 392-2XY00-0AA0	update service for 1 year	0E37 990-0AC01-01E2
10 units (spare part), for modules with 20-pin front connector		Current "Manual Collection" DVD and the three subsequent	
S7 SmartLabel V3.0		updates	
Software for automatic labeling of modules direct from the STEP 7 project			
Single license J	2XV9 450-1SL03-0YX0		
Upgrade single license J	2XV9 450-1SL03-0YX4		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Ex analog input modules

Overview



- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 8 or 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel.
- Diagnostics and diagnostic alarm programmable
- Programmable threshold alarm
- HART-compatible inputs (only 6ES7331-7RD00-0AB0)

	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
Power supply to the transmitters		
• present	Yes	
• Rated value (DC)	13 V; at 22 mA	
No-load voltage (DC)	25.2 V	
Current consumption		
from backplane bus 5 V DC, max.	60 mA	120 mA
from supply voltage L+, max.	150 mA	
Power losses		
Power loss, typ.	3 W	0.6 W
Connection method		
required front connector	20-pin	20-pin
Analog inputs		
Number of analog inputs	4	8; 8x thermocouples; 4x RTD thermal sensors
Cable length, shielded, max.	200 m	200 m; TC: 50m
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 to 20 mA	Yes	
Input ranges (rated values), thermoelements		
• Type B		Yes
• Type E		Yes
• Type J		Yes
• Type K		Yes
• Type L		Yes
• Type N		Yes
Type RType S		Yes Yes
• Type T		Yes
• Type U		Yes
Input ranges (rated values), resistance thermom-		
eters		
• Ni 100		Yes
• Pt 100		Yes
• Pt 200		Yes
Current input	40. 4	
permissible input current for current input (destruction limit) may	40 mA	
(destruction limit), max.		

Ex analog input modules

recrifical specifications (continued)	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Analog value creation		
Measurement principle	Sigma Delta	Sigma Delta
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign),	16 bit: 10 to 15 bits + sign	16 bit; 10 to 15 bits + sign
max.	,	,
 Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz 	Yes; 2.5 to 100 ms 10 to 400 Hz	Yes; 2.5 to 100 ms 10 to 400 Hz
Encoder Connection of signal encoders • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer	Yes Yes	Yes Yes
Ex(i) characteristics Max. values of input circuits (per channel) • Co (permissible external capacity), max. • Io (short-circuit current), max. • Lo (permissible external inductivity), max. • Po (power of load), max. • Ri, max. • Uo (output no-load voltage), max.	90 nF 68.5 mA 7.5 mH 431 mW 50 Ω 25.2 V	43 μF 28.8 mA 40 mH 41.4 mW
Errors/accuracies Temperature error (relative to input area)		Temperature error: 0.001 to 0.002%/K
Operational limit in overall temperature range • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0,45 %	0.09 to 0.04%
Basic error limit (operational limit at 25 °C) • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0,1 %	+/- 0,1 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • Series mode interference (peak value of interference < rated value of input range), min. • Common mode interference, min.	60 dB 130 dB	60 dB 130 dB
Alarms/diagnostics/status information Diagnostics • Diagnostic information readable • Overrange • Wire break in signal transmitter cable • Short circuit of the signal encoder cable	Yes Yes Yes Yes	Yes Yes Yes Yes
Galvanic isolation Galvanic isolation analog inputs • Galvanic isolation analog inputs	Yes	Yes
Permissible potential difference between the inputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in the NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in the NON-hazardous area
between inputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in the NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in the NON-hazardous area
Standards, approvals, certificates Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	Class I, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2092X	Ex-96.D.2108X
Dimensions and weight Weight		
Weight, approx.	290 g	210 g

Ex analog input modules

Ordering data	Order No.		Order No.
Ex analog input modules	CEC7 224 7DD00 0AD0	Labeling sheets for machine inscription	
4 inputs, isolated, 0/4 to 20 mA, 15 bit	6ES7 331-7RD00-0AB0	For 16-channel signal modules,	
8/4 inputs, isolated, for thermo- couples and Pt100, Pt200, Ni100	6ES7 331-7SF00-0AB0	DIN A4, for printing with laser printer; 10 units	
Front connectors		petrol	6ES7 392-2AX00-0AA0
20-pin, with screw contacts		light-beige	6ES7 392-2BX00-0AA0
• 1 unit	6ES7 392-1AJ00-0AA0	yellow	6ES7 392-2CX00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0	red	6ES7 392-2DX00-0AA0
Front door, elevated design		SIMATIC manual collection	6ES7 998-8XC01-8YE0
e.g. for 32 channel modules; enables connection of 1.3 mm ² /16 AWG wires	6ES7 328-0AA00-7AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
LK 393 cable guide	6ES7 393-4AA00-0AA0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
Mandatory for operation in Ex-hazard areas		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC	
Labeling strips	6ES7 392-2XX00-0AA0	PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
10 units (spare part), for modules with 20-pin front connector		TDC SIMATIC manual collection D	6ES7 998-8XC01-8YE2
Label cover	6ES7 392-2XY00-0AA0	update service for 1 year	0L37 330-0X001-01L2
10 units (spare part), for modules with 20-pin front connector		Current "Manual Collection" DVD and the three subsequent	
S7 SmartLabel V3.0		— updates	
Software for automatic labeling of modules direct from the STEP 7 project			
Single license J	2XV9 450-1SL03-0YX0		
Upgrade single license J	2XV9 450-1SL03-0YX4		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Ex analog modules

Ex analog output modules

Overview



- Analog outputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostic alarm programmable

-	6ES7 332-5RD00-0AB0
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
Current consumption	400 4
from load voltage L+ (without load), max.	180 mA
from backplane bus 5 V DC, max.	80 mA
Power losses	
Power loss, typ.	4 W
Connection method required front connector	20-pin
Analog outputs	
Number of analog outputs	4
Cable length, shielded, max.	200 m
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	70 mA
Current output, no-load voltage, max.	14 V
Output ranges, current	
• 0 to 20 mA	Yes
• 4 to 20 mA	Yes
Connection of actuators • for current output 2-conductor connection	Yes
Load impedance (in rated range	
of output)	500.0
• with current outputs, max.	500 Ω
Analog value creation Integrations and conversion time/	
resolution per channel	
 Resolution with overrange (bit including sign), max. 	15 bit
Basic conversion time, ms	2.5 ms
Ex(i) characteristics	
Max. values of output circuits (per channel)	
 Co (permissible external capacity), max. 	850 nF
• Io (short-circuit current), max.	70 mA

	6ES7 332-5RD00-0AB0
Lo (permissible external inductivity), max.	6.6 mH
Po (power of load), max.	440 mW
• Uo (output no-load voltage), max.	14 V
Errors/accuracies Operational limit in overall temperature range	
Current, relative to output area	+/- 0,55 %
Basic error limit (operational limit at 25 °C)	
Current, relative to output area	+/- 0,2 %
Alarms/diagnostics/status infor-	
mation Diagnostics	
Diagnostic information readable	Yes
Overrange	Yes
Wire break in actuator cable	Yes
• Group error	Yes
Galvanic isolation	
Galvanic isolation analog outputs	
Galvanic isolation analog outputs	Yes
Permissible potential difference	
between outputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/ 250 V AC when used in NON- hazardous area
between the outputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/ 250 V AC when used in NON- hazardous area
Standards, approvals, certificates	
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2026X
Dimensions and weight	
Weight	
Weight, approx.	280 g

Ex analog output modules

Ordering data	Order No.		Order No.
Ex analog output module 4 outputs, isolated, 0/4 to 20 mA	6ES7 332-5RD00-0AB0	Labeling sheets for machine inscription	
Front connectors	0E37 332-9ND00-0AD0	For 16-channel signal modules, DIN A4, for printing with laser	
20-pin, with screw contacts • 1 unit	6ES7 392-1AJ00-0AA0	printer; 10 units	6ES7 392-2AX00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0	light-beige	6ES7 392-2BX00-0AA0
Front door, elevated design		yellow	6ES7 392-2CX00-0AA0
e.g. for 32 channel modules; enables connection of	6ES7 328-0AA00-7AA0	red	6ES7 392-2DX00-0AA0
1.3 mm ² /16 AWG wires		SIMATIC manual collection	6ES7 998-8XC01-8YE0
LK 393 cable guide	6ES7 393-4AA00-0AA0	Electronic manuals on DVD,	
Mandatory for operation in Ex-hazard areas		multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
Labeling strips	6ES7 392-2XX00-0AA0	I/O, SIMATIĆ HMI, SIMATIC	
10 units (spare part), for modules with 20-pin front connector		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7. SIMATIC PG/PC. SIMATIC	
Label cover	6ES7 392-2XY00-0AA0	S7, SIMATIC Software, SIMATIC	
10 units (spare part), for modules with 20-pin front connector		SIMATIC manual collection D	6ES7 998-8XC01-8YE2
S7 SmartLabel V3.0		update service for 1 year	
Software for automatic labeling of modules direct from the STEP 7 project		Current "Manual Collection" DVD and the three subsequent updates	
Single license	2XV9 450-1SL03-0YX0		
Upgrade single license	2XV9 450-1SL03-0YX4		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 350-1 counter module

Overview



- One-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs to output the response upon reaching the comparison value.
- Operating modes:
 - Continuous counting
 - One-shot counting
 - Periodic counting
- Special functions:
 - Set counter
 - Latch counter
- Start/stop counter with gate function

Note:

Incremental encoders and pre-assembled connecting cables for counting and positioning functions are offered under SIMODRIVE Sensor or Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 350-1AH03-0AE0	
Supply voltages		
Aux. voltage 1L+, load voltage 2 L+		
Rated value (DC)	24 V	
Permissible range (ripple		
included) - dynamic, lower limit (DC)	18.5 V	
- dynamic, lower limit (DC) - dynamic, upper limit (DC)	30.2 V	
- static, lower limit (DC)	20.4 V	
- static, upper limit (DC)	28.8 V	
 non-periodic skip 		
- Duration	500 ms	
- Recovery time	50 s	
- Value	35 V	
Current consumption	40 4	
from load voltage 1L+ (without load), max.	40 mA	
from backplane bus 5 V DC, max.	160 mA	
Power losses		
Power loss, typ.	4.5 W	
Connection method		
required front connector	1x 20-pin	
Digital inputs		
Number of digital inputs	3	
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter	
Input voltage		
• for signal "0"	-28.8 to +5 V	
• for signal "1"	+11 to +28.8 V	
Input current		
• for signal "1", typ.	9 mA	
Digital outputs	0	
Number of digital outputs	2	
Short-circuit protection	Yes; electronically switched	
Limitation of inductive shutdown voltage to	2L+ (-39 V)	
Output voltage	0.14	
• for signal "0" (DC), max.	3 V	
• for signal "1", min.	2L+ (-1.5 V)	

	6ES7 350-1AH03-0AE0
Output current • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C, min. • for signal "1" permissible range	0.5 A 5 mA 0.6 A
for 0 to 60 °C, max. Output delay with resistive load • 0 to "1", max.	300 µs
Encoder supply 5 V encoder supply • 5 V • Output current, max.	Yes; 5.2 V +/-2% 300 mA
24 V encoder supply • 24 V • Output current, max.	Yes; 1L+ (-3 V) 400 mA
Encoder Connectable encoders Incremental encoder (symmetrical) Incremental encoder (asymmetrical) 24 V initiator 24 V directional element	Yes; With 2 pulse trains offset by 90° Yes Yes Yes; 1 pulse train, 1 direction level
Counter Number of counter inputs	1
Counting range, description Minimum pulse width, adjustable	32 bit or +/-31 bit Yes; 2.5 or 25 μs
Counter input 5 V Type Terminating resistor Differential input voltage Counter frequency, max. Counter input 24 V Input voltage, for signal "0" Input voltage, for signal "1" Input current, for signal "1", typ. Counter frequency, max. Minimum pulse width	RS 422 220 Ω 1.3 V 500 kHz -28.8 to +5 V +11 to +28.8 V 9 mA 200 kHz 2.5 μs

FM 350-1 counter module

	6ES7 350-1AH03-0AE0
Isolation	
Isolation checked with	500 V
Galvanic isolation	
Galvanic isolation digital inputs • between the channels and the backplane bus	Yes; Optocoupler
Galvanic isolation digital outputs • between the channels and the backplane bus	Yes; Optocoupler
Galvanic isolation counter • between the channels and the backplane bus	Yes; Optocoupler

	6ES7 350-1AH03-0AE0
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weight	
 Weight, approx. 	250 g
	_

Ordering data	Order No.		Order No.
FM 350-1 counter module with 1 channel, max. 500 kHz;	6ES7 350-1AH03-0AE0	Connectable incremental encoders 6FX2 001-2	See the Industry Mall under SIMODRIVE Sensors or Motion
for incremental encoder			Connect 500 (see also www.siemens.com/ simatic-
Coding plug - Range card for analog inputs	6ES7 974-0AA00-0AA0		technology)
Spare part		Signal cable	
Front connector		Preassembled for HTL and TTL encoder, without Sub-D	6FX5 002-2CA12- 0
20-pin, with screw contacts		connector, UL/DESINA	
• 1 unit	6ES7 392-1AJ00-0AA0	Length code:	
• 100 units	6ES7 392-1AJ00-1AB0	0 m	1
20-pin, with spring-loaded		100 m	2
contacts • 1 unit	6ES7 392-1BJ00-0AA0	200 m	3
• 100 units	6ES7 392-1BJ00-1AB0	0 m	A
20-pin, with FastConnect		10 m	В
• 1 unit	6ES7 392-1CJ00-0AA0	20 m	С
Bus connectors	6ES7 390-0AA00-0AA0	30 m	D
1 unit (spare part)		40 m	E
Labeling strips	6ES7 392-2XX00-0AA0	50 m	F
10 units (spare part)		60 m	G
S7 SmartLabel V3.0		70 m	н
Software for automatic labeling of		80 m	J
modules based on data of the STEP 7 project		90 m	K
Single license J	2XV9 450-1SL03-0YX0	0 m	Α
Upgrade single license J	2XV9 450-1SL03-0YX4	1 m	В
Labeling sheets for machine inscription	See "Accessories", page 5/308	2 m 3 m	C
Slot number label	6ES7 912-0AA00-0AA0	4 m	E
Spare part		5 m	F
Shield connection element	6ES7 390-5AA00-0AA0	6 m	G
80 mm wide, with 2 rows for 4 terminals each		7 m	H
Terminal elements		8 m	J
2 units		9 m	К
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0		
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0		
For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0		

J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 350-2 counter module

Overview



- 8-channel intelligent counter module for universal counting and measuring
- To directly connect 24 V incremental encoders, direction sensors, initiators or NAMUR encoders.
- Check function with preselectable set points (number depends on mode)
- Integrated digital outputs to output the response when the setpoint is reached
- Modes:
 - Continuous/one-off/periodic counting Frequency/speed measurement

 - Cycle duration measurement
 - Dosing

Note:

Incremental encoder and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 350-2AH01-0AE0
Supply voltages Aux. voltage 1L+, load voltage 2 L+ • Rated value (DC) • permissible range, lower limit (DC)	24 V 20.4 V
 permissible range, upper limit (DC) 	28.8 V
Current consumption	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
Power losses	
Power loss, typ.	10 W
Connection method required front connector	1x 40-pin
Digital inputs Number of digital inputs	8
Functions	1 each for gate start/ gate stop
Input voltage • for signal "0" • for signal "1"	-3 to +5 V 11 to 30.2 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", typ.	2 mA 9 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", max.	F0.110
Cable length Cable length, shielded, max.	50 μs 100 m
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-40 V)
Output voltage • for signal "1", min.	L+ (-0.8 V)

	6ES7 350-2AH01-0AE0
Output current • for signal "1" rated value • for signal "0" residual current, max.	0.5 A 0.5 mA
Output delay with resistive load • 0 to "1", max.	300 µs
Switching frequency • with resistive load, max. • with inductive load, max.	500 Hz 0.5 Hz
Aggregate current of outputs (per group) • horizontal installation - up to 40 °C, max up to 60 °C, max. • all other mounting positions - up to 40 °C, max.	4 A 2 A 2 A
Cable length Cable length, shielded, max. Cable length unshielded, max.	600 m 100 m
Encoder supply Output voltage	NAMUR-encoder supply: 8.2 V +/-2%
Output current, rated value	200 mA
Short-circuit protection	Yes
Encoder Connectable encoders Incremental encoder (asymmetrical) 24 V initiator 24 V directional element NAMUR encoder 2-wire BEROS	Yes Yes Yes Yes Yes Yes
NAMUR encoder Number of NAMUR inputs Input signal Input current, for signal "0", max. Input current, for signal "1", min. Input delay, max. Input frequency, max. Cable length, shielded, max.	8 to DIN 19 234 1.2 mA 2.1 mA 50 µs 20 kHz 100 m

FM 350-2 counter module

	6ES7 350-2AH01-0AE0
Counter	
Counter input 24 V	
Number	8; 32 bit or +/-31 bit
 Input voltage, for signal "0" 	-3 to +5 V
 Input voltage, for signal "1" 	11 to 30.2 V
 Input current, for signal "0", max. (permissible quiescent current) 	2 mA
• Input current, for signal "1", typ.	9 mA
 Input delay, max. 	50 µs
Counter frequency, max.	20 kHz; Incremental encoder: 10 kHz
 Cable length, max. 	100 m
Alarms/diagnostics/status information	
Alarms	
Diagnostic alarm	Yes; Parameterizable
• Process alarm	Yes; Parameterizable
Diagnostics	
Diagnostic functions	Yes; Diagnostic information readable

	6ES7 350-2AH01-0AE0
Galvanic isolation	
Galvanic isolation digital inputs	
 between the channels and the backplane bus 	Yes; and shielding
 between the channels and the backplane bus (NAMUR) 	yes, against backplane bus and shielding
Galvanic isolation digital outputs • between the channels and the backplane bus	Yes; and shielding
Galvanic isolation counter • between the channels and the backplane bus	Yes; and shielding
Dimensions and weight	
Dimensions	
• Width	80 mm
Height	125 mm
Depth	120 mm
Weight	
 Weight, approx. 	460 g

Ordering data	Order No.		Order No.
FM 350-2 counter module	6ES7 350-2AH01-0AE0	For 1 cable with 3 mm to 8 mm	6ES7 390-5BA00-0AA0
With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configu-		diameter For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0
ration package and electronic documentation on CD		Signal cable	
Front connector		Pre-assembled for HTL and TTL encoder, without sub D	6FX5 002-2CA12- 0
40-pin, with screw contacts		connector, UL/DESINA	
• 1 unit	6ES7 392-1AM00-0AA0	Length code:	
• 100 units	6ES7 392-1AM00-1AB0	0 m	1
40-pin with spring-loaded contacts		100 m	2
• 1 unit	6ES7 392-1BM01-0AA0	200 m	3
• 100 units	6ES7 392-1BM01-1AB0	0 m	A
40-pin, with FastConnect		10 m	В
1 unit	6ES7 392-1CM00-0AA0	20 m	C
Bus connectors	6ES7 390-0AA00-0AA0	30 m	D
I unit (spare part)		40 m	E
_abeling strips	6ES7 392-2XX10-0AA0	50 m	F
10 units (spare part)			
67 SmartLabel V3.0		60 m	G
Software for automatic labeling of		70 m	H
modules based on data of the STEP 7 project		80 m	J
Single license J	2XV9 450-1SL03-0YX0	90 m	K
Jpgrade single license J		0 m	A
_abeling sheets for machine	See "Accessories", page 5/308	1 m	В
nscription	See Accessories, page 5/300	2 m	С
Slot number label	6ES7 912-0AA00-0AA0	3 m	D
Spare part		4 m	E
Shield connection element	6ES7 390-5AA00-0AA0	5 m	F
30 mm wide, with 2 rows for		6 m	G
4 terminals each		7 m	Н
Terminal elements		8 m	J
2 units		9 m	K
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0		
		I. Culpinat to august requilations Al.	NI and ECCNI, EADOOC

Function modules

FM 351 positioning module

Overview



- Two-channel positioning module for rapid-traverse/creepspeed drives
- 4 digital outputs per channel for motor control
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature positionmeasuring systems and preassembled connecting cables for counting and positioning functions.

www.siemens.com/simatic-technology

	6ES7 351-1AH02-0AE0
Supply voltages Rated value	
• 24 V DC	Yes
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Load voltage L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Current consumption	
Current consumption, max.	350 mA
from backplane bus 5 V DC, max.	150 mA; max.
Connection method	
required front connector	1x 20-pin
Digital inputs Number of digital inputs	8
Functions	Reference cams, reversing cams, flying actual value setting, start/ stop positioning
Input voltage	
Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for 2-wire BERO	
- for signal "0", typ.	2 mA
- for signal "1", typ.	6 mA

	6ES7 351-1AH02-0AE0
Digital outputs	
Number of digital outputs	8
Functions	Rapid traverse, creep, run right, run left
Short-circuit protection	Yes
Output voltage Rated value (DC) for signal "1", min.	24 V UP - 0.8 V
Output current • for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
\bullet for signal "0" residual current, max.	0.5 mA
Encoder supply 5 V encoder supply • 5 V • Output current, max. • Cable length, max.	Yes 350 mA 32 m
24 V encoder supply24 VOutput current, max.Cable length, max.	Yes 400 mA; per channel 100 m

FM 351 positioning module

•	,
	6ES7 351-1AH02-0AE0
Encoder	
Connectable encoders	
 Incremental encoder (symmetrical) 	Yes
 Incremental encoder (asymmetrical) 	Yes
 Absolute encoder (SSI) 	Yes
• 2-wire BEROS	Yes
 permissible quiescent current (2-wire BEROS), max. 	2 mA; on signal "0", max. 2 mA; on signal "1", max. 6 mA
Encoder signals, incremental encoder (symmetrical)	
 Trace mark signals 	A, notA, B, notB
 Zero mark signal 	N, notN
• Input signal	5 V difference signal (phys. RS 422)
 Input frequency, max. 	0.5 MHz
Encoder signals, incremental encoder (asymmetrical)	
 Trace mark signals 	A, B
 Zero mark signal 	N
 Input voltage 	24 V
Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length

	6ES7 351-1AH02-0AE0
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
Data signal	DATA, notDATA
 Clock signal 	CL, notCL
Telegram length	13 or 25 bit
 Clock frequency, max. 	1.5 MHz
Gray code	Yes
 Cable length, shielded, max. 	200 m; At max. 188 kHz
Galvanic isolation Galvanic isolation digital inputs	
Galvanic isolation digital inputs	Yes
Galvanic isolation digital outputs	
 Galvanic isolation digital outputs 	Yes
Dimensions and weight	
Dimensions	
Width	80 mm
Height	125 mm
Depth	120 mm
Weight	
Weight, approx.	550 g

FM 351 positioning module

Ordering data	Order No.		Order No.
FM 351 positioning module	6ES7 351-1AH02-0AE0	Signal cables	
for rapid traverse and creep speed drives		Pre-assembled for HTL encoder, UL/DESINA	6FX5 0 2-2AL00-
Front connectors		Pre-assembled for SSI absolute	6FX5 0 2-2CC11-
20-pin, with screw contacts 1 unit	6ES7 392-1AJ00-0AA0	encoder, UL/DESINA Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	6FX5 0 ■ 2-2CD01- ■ ■ ■
100 units 20-pin, with spring-loaded	6ES7 392-1AJ00-1AB0	Pre-assembled for TTL encoder 24 V, UL/DESINA	6FX5 0 2-2CD24-
contacts • 1 unit • 100 units	6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0		
20-pin, with FastConnect		Not crimped Module end crimped, connector	0 1
• 1 unit	6ES7 392-1CJ00-0AA0	case supplied	
Bus connectors 1 unit (spare part)	6ES7 390-0AA00-0AA0	Motor end crimped, connector case supplied	4
Labeling strips	6ES7 392-2XX00-0AA0	0 m	1
10 units (spare part)		100 m	2
Slot number label	6ES7 912-0AA00-0AA0	200 m	3
S7 SmartLabel V3.0		0 m	A
Software for automatic labeling of		10 m	В
modules based on data of the		20 m	С
STEP 7 project	0VV0 4E0 1CL02 0VV0	30 m	D
Single license J	2XV9 450-1SL03-0YX0	40 m	E
Upgrade single license J	2XV9 450-1SL03-0YX4	50 m	F
Labeling sheets for machine inscription	See "Accessories", page 5/308	60 m	G
Spare part		70 m	Н
Shield connection element	6ES7 390-5AA00-0AA0	80 m	J
80 mm wide, with 2 rows for 4 terminals each		90 m 0 m	K
Terminal elements		1 m	В
2 units		2 m	C
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0	3 m	D
For 1 cable with 3 mm to 8 mm	6ES7 390-5BA00-0AA0	4 m	E
diameter		5 m	F
For 1 cable with 4 mm to 13 mm	6ES7 390-5CA00-0AA0	6 m	G
diameter		7 m	н
		8 m	J
		0 m	K
		0.0 m	0
		0.1 m	1
		0.2 m	2
		0.3 m	3
		0.4 m	4
		0.5 m	5
		0.6 m	6
		0.7 m	7
		0.8 m	8

J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 352 cam controller

Overview



- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

www.siemens.com/simatic-technology

	6ES7 352-1AH02-0AE0
Supply voltages	
Rated value	.,
• 24 V DC	Yes
Current consumption from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	100 mA
Connection method required front connector	1x 20-pin
Digital inputs Number of digital inputs	4
Functions	Reference point switch, set floating actual value/length measurement, brake release, enable track output no. 3
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -30 to +5 V 11 to 30 V
Input current • for 2-wire BERO - for signal "0", typ for signal "1", typ.	2 mA 7 mA
Digital outputs Number of digital outputs	13
Functions	Cam track
Short-circuit protection	Yes
Output voltage Rated value (DC) for signal "1", min.	24 V UP - 0.8 V
Output current • for signal "1" permissible range for 0 to 60 °C, min. • for signal "1" permissible range for 0 to 60 °C, max. • for signal "0" residual current, max.	5 mA; with UPmax 600 mA; with UPmax 0.5 mA

	6ES7 352-1AH02-0AE0
Encoder supply	
5 V encoder supply • 5 V	Yes
	300 mA
Output current, max.Cable length, max.	32 m
	02 III
24 V encoder supply • 24 V	Yes
Output current, max.	300 mA
Cable length, max.	100 m
	100 111
Encoder Connectable encoders	
Incremental encoder	Yes
(symmetrical)	103
Incremental encoder	Yes
(asymmetrical)	
Absolute encoder (SSI)	Yes
• 2-wire BEROS	Yes
 permissible quiescent current (2-wire BEROS), max. 	2 mA
Encoder signals, incremental encoder (symmetrical)	
Trace mark signals	A, notA, B, notB
Zero mark signal	N. notN
• Input signal	5 V difference signal
	(phys. RS 422)
 Input frequency, max. 	1 MHz
Encoder signals, incremental	
encoder (asymmetrical)	. 5
Trace mark signals	A, B
Zero mark signal	N 24 V
Input voltageInput frequency, max.	50 kHz; 50 kHz for 25 m cable
• input frequency, max.	length; 25 kHz for 100 m cable
	length
Encoder signals, absolute encoder (SSI)	
Data signal	DATA, notDATA
Clock signal	CL, notCL
Telegram length	13 or 25 bit
Clock frequency, max.	1 MHz
Gray code	1
 Cable length, shielded, max. 	320 m; at max. 125 kHz

FM 352 cam controller

	6ES7 352-1AH02-0AE0
Galvanic isolation Galvanic isolation digital inputs • Galvanic isolation digital inputs	No
Galvanic isolation digital outputs • Galvanic isolation digital outputs	No

	6ES7 352-1AH02-0AE0
Dimensions and weight	
Dimensions	
• Width	80 mm
Height	125 mm
Depth	120 mm
Weight	
 Weight, approx. 	550 g

Ordering data		Order No.
FM 352 electronic cam controller		6ES7 352-1AH02-0AE0
Sub-D connector		6ES5 750-2AA21
15-pin, male		
Front connector		
20-pin, with screw contacts1 unit100 units		6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0
20-pin, with spring-loaded contacts1 unit100 units		6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0
20-pin, with FastConnect • 1 unit		6ES7 392-1CJ00-0AA0
Bus connectors		6ES7 390-0AA00-0AA0
1 unit (spare part)		
Labeling strips		6ES7 392-2XX00-0AA0
10 units (spare part)		
S7 SmartLabel V3.0	Ī	
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	J	2XV9 450-1SL03-0YX0
Upgrade single license	J	2XV9 450-1SL03-0YX4
Labeling sheets for machine inscription		See "Accessories", page 5/308

	Order No.
Slot number label	6ES7 912-0AA00-0AA0
Spare part	
Shield connection element	6ES7 390-5AA00-0AA0
80 mm wide, with 2 rows for 4 terminals each	
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0
For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0
Signal cable	
Pre-assembled for HTL encoder, UL/DESINA	6FX5 0 2-2AL00-
Pre-assembled for SSI absolute encoder, UL/DESINA	6FX5 0 2-2CC11-
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	6FX5 0 2-2CD01-
Pre-assembled for TTL encoder 24 V, UL/DESINA	6FX5 0 2-2CD24-
Length code:	See FM 351, page 5/180

J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 352-5 high-speed Boolean processor

Overview



- The FM 352-5 high-speed Boolean processor provides extremely fast binary control and also some of the fastest switching processes ever possible (cycle time: 1 μs).
- Programming is possible with LAD or FBD.
- The available set of statements comprises bit statements (partial statement set of STEP 7), timers, counters, frequency dividers, frequency generators, shift registers.
- 12 integral DI / 8 integral DO.
- 2 versions: Current sinking or current sourcing digital outputs.
- 1 channel for connection of a 24-V incremental encoder, a 5-V incremental encoder (RS422) or an SSI absolute-value sensor.

Micro memory card required for use of the FM 352-5

Note:

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 352-5AH01-0AE0	6ES7 352-5AH11-0AE0
Supply voltages		
Rated value		
• 24 V DC	Yes	Yes
Load voltage L+		
Rated value (DC)	24 V	24 V
 permissible range, lower limit (DC) 	20.4 V	20.4 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes
Current consumption		
from load voltage1L+, max.	150 mA; typ. 60 mA	150 mA; typ. 60 mA
from load voltage 2L+ (without load), max.	200 mA; typ. 60 mA, DI/DO supply	200 mA; typ. 60 mA, DI/DO supply
from load voltage 3L+ (with encoder), max.	600 mA; typ. 80 mA plus encoder supply	600 mA; typ. 80 mA plus encoder supply
from load voltage 3L+ (without encoder), max.	200 mA; typ. 80 mA	200 mA; typ. 80 mA
from backplane bus 5 V DC, max.	135 mA; typically	135 mA; typically
Power losses		
Power loss, typ.	6.5 W	6.5 W
Memory		
Memory card, RAM	128 kbyte; required for operation, MMC	128 kbyte; required for operation, MMC
Interfaces		
Updating time	PLC interface: 1.7 ms	PLC interface: 1.7 ms
Connection method		
required front connector	1x 40-pin	1x 40-pin
Programming		
Program cycle time (scan)	1 µs	1 μs

FM 352-5 high-speed Boolean processor

	6ES7 352-5AH01-0AE0	6ES7 352-5AH11-0AE0	
Digital inputs Number of digital inputs	8; standard and up to 12 at 24 V DC encoder inputs as digital inputs	8; standard and up to 12 at 24 V DC encoder inputs as digital inputs	
Input voltage	inputs as digital inputs	inputs as digital inputs	
Rated value, DC for signal "0" for signal "1"	24 V -30 to +5 V 11 to 30 V	24 V -30 to +5 V 11 to 30 V	
Input current • for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA	
• for signal "1", typ.	3.8 mA	3.8 mA	
Input delay (for rated value of input voltage) • Input frequency (with a time delay of 0.1 ms), max.	200 kHz	200 kHz	
 Programmable digital filter delay Minimum pulse width for program reactions for standard inputs 	None, 5 μs, 10 μs, 15 μs, 20 μs, 50 μs, 1.6 ms 1 μs, 5 μs, 10 μs, 15 μs, 20 μs, 50 μs, 1.6 ms	None, 5 μs, 10 μs, 15 μs, 20 μs, 50 μs, 1.6 ms 1 μs, 5 μs, 10 μs, 15 μs, 20 μs, 50 μs, 1.6 ms	
- at "0" to "1", max.	3 μs; typ. 1.5 μs	3 μs; typ. 1.5 μs	
Cable length Cable length, shielded, max. Cable length unshielded, max.	600 m 100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms	600 m 100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms	
Digital outputs Number of digital outputs	8	8	
Current-sinking	Yes	No	
Current-sourcing	No	Yes	
Short-circuit protection Response threshold, typ.	Yes; Overvoltage protection, thermal protection 1.7 to 3.5 A	Yes; Overvoltage protection, thermal protection 1.7 to 3.5 A	
Limitation of inductive shutdown voltage to	2M -45 V typ., (-40 to -55 V); comment: no protection against inductive kickback >55mJ	2M -45 V typ., (-40 to -55 V); comment: no protection against inductive kickback >55mJ	
Lamp load, max.	5 W	5 W	
Controlling a digital input	No	Yes	
Output voltage Rated value (DC) for signal "0" (DC), max. for signal "1" (DC), max.	24 V 28.8 V 0.5 V	24 V 28.8 V 0.5 V	
Output current • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C,	0.5 A; At 60 °C 5 mA	0.5 A; At 60 °C 5 mA	
min. • for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA	
• for signal "0" residual current, max.	1 mA	1 mA	
Output delay with resistive load O to "1", max. 1 to "0", max.	1 μs; 0.6 μs 50 mA / 1.0 μs 0.5 A 1.5 μs; 1.7 μs 50 mA / 1.5 μs 0.5 A	1 μs; 0.6 μs 50 mA / 1.0 μs 0.5 A 1.5 μs; 1.7 μs 50 mA / 1.5 μs 0.5 A	
Parallel switching of 2 outputs • for increased power	Yes; 2	Yes; 2	
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A 2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes 10 Hz	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A 2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes 10 Hz	
Cable length Cable length, shielded, max. Cable length unshielded, max.	600 m 100 m	600 m 100 m	

FM 352-5 high-speed Boolean processor

	6ES7 352-5AH01-0AE0	6ES7 352-5AH11-0AE0
Encoder supply		
5 V encoder supply	V	V
• 5 V • Short-circuit protection	Yes Yes; Electronic overload protection; no protection on applying a normal or counter voltage.	Yes Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	250 mA	250 mA
24 V encoder supply		
• 24 V	Yes	Yes
Short-circuit protection	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage
Output current, max.	400 mA	400 mA
Encoder		
Connectable encoders		
 Incremental encoder (symmetrical) 	Yes	Yes
Incremental encoder (asymmetrical)	Yes	Yes
Absolute encoder (SSI)	Yes	Yes
• 2-wire BEROS	Yes	Yes
 permissible quiescent current (2-wire BEROS), max. 	1.5 mA	1.5 mA
Encoder signals, incremental encoder (symmetrical)		
Trace mark signals	A, notA, B, notB	A, notA, B, notB
 Zero mark signal 	N, notN	N, notN
Input signal	5 V difference signal (phys. RS 422)	5 V difference signal (phys. RS 422)
• Input frequency, max.	500 kHz	500 kHz
Cable length, shielded, max.	100 m; 100 m at 24 V supply and 500 kHz; 32 m at 5 V supply and 500 kHz	100 m; 100 m at 24 V supply and 500 kHz; 32 m at 5 V supply and 500 kHz
Encoder signals, incremental encoder (asymmetrical)		
Trace mark signals	A. B	A. B
Zero mark signal	N	N
Input voltage	24 V	24 V
• Input frequency, max.	200 kHz	200 kHz
 Cable length, shielded, max. 	50 m; Cable length, HTL incremental encoder,	50 m; Cable length, HTL incremental encoder,
	Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.	Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.
Encoder signals, absolute encoder (SSI)		
Data signal	DATA, notDATA	DATA, notDATA
Clock signal	CK, notCK	CK, notCK
Telegram length	13 or 25 bit	13 or 25 bit
 Clock frequency, max. 	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz
Cable length, shielded, max.	320 m; At 125 kHz	320 m; At 125 kHz
Monoflop time	settable: 16/32/48/64 µs	settable: 16/32/48/64 µs
Listening mode Multiture	Yes; one or two stations	Yes; one or two stations
• Multiturn	Yes; 25 bit message frame	Yes; 25 bit message frame
Encoder signal evaluation	Von	Voo
Counting direction, forward Counting direction, backward	Yes Yes	Yes Yes
 Counting direction, backward 	। তও	100

FM 352-5 high-speed Boolean processor

5 V input to 24 V output, 0 filter: 1 to 4 μs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 μs (typ.) Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range) -2147480000	5 V input to 24 V output, 0 filter: 1 to 4 μs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 μs (typ.) Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)
24 V input to 24 V output, 0 filter: 2 to 6 μs (typ.) Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)	24 V input to 24 V output, 0 filter: 2 to 6 μs (typ.) Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647
to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)	to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647
to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)	to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647
-2147480000	
	-2147480000
2 147 480 000	2 147 480 000
Yes	Yes
Yes	Yes
Yes	Yes
Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow
Yes; 8 available; for generation by user program	Yes; 8 available; for generation by user program
Yes	Yes
Yes	Yes
Yes	Yes
Yes; 75 V DC/ 60 V AC	Yes; 75 V DC/ 60 V AC
Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
Yes; Yes CPU, E/A and sensor units are separated	Yes; Yes CPU, E/A and sensor units are separated
80 mm	80 mm
	125 mm
120 mm	120 mm
434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)
	Yes Yes Yes Yes Yes Yes Yes Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow Yes; 8 available; for generation by user program Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

FM 352-5 high-speed Boolean processor

Ordering data	Order No.		Order No.
FM 352-5 high-speed Boolean		Signal cables	
processor with current sinking digital outputs	6ES7 352-5AH01-0AE0	To HTL and TTL encoders, preassembled, without Sub-D connector	6FX5 002-2CA12-
with current sourcing digital outputs	6ES7 352-5AH11-0AE0	To SSI absolute encoders 6FX2 001-5, preassembled,	6FX5 002-2CC12-
Micro Memory Card		without Sub-D connector	
128 KB	6ES7 953-8LG20-0AA0	Length code:	See FM 351, page 5/180
512 KB	6ES7 953-8LJ20-0AA0		
2 MB	6ES7 953-8LL20-0AA0		
Front connectors			
40-pin, with screw contacts			
• 1 unit	6ES7 392-1AM00-0AA0		
• 100 units	6ES7 392-1AM00-1AB0		
40-pin with spring-loaded contacts			
• 1 unit	6ES7 392-1BM01-0AA0		
• 100 units	6ES7 392-1BM01-1AB0		
40-pin, with FastConnect			
• 1 unit	6ES7 392-1CM00-0AA0		

FM 353 positioning module

Overview



- Positioning module for stepper motors in machines with high clock-pulse rates
- Can be used for simple point-to-point positioning and for complex traversing profiles

·	0507.050.441104.0450
	6ES7 353-1AH01-0AE0
Supply voltages	
Rated value	Van
24 V DCpermissible range,	Yes 20.4 V
lower limit (DC)	20.4 V
• permissible range,	28.8 V
upper limit (DC)	
Current consumption	
Current consumption, max.	300 mA
Connection method	
required front connector	1x 20-pin
Digital inputs	
Number of digital inputs	4; (+ 1 input for message signal)
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
Input voltage	
Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
 for signal "0", max. (permissible quiescent current) 	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA
Digital outputs	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
Short-circuit protection	Yes
Output voltage	
Rated value (DC)	24 V
• for signal "1", min.	UP - 3 V

	6ES7 353-1AH01-0AE0
Output current	
 for signal "1" permissible range for 0 to 55 °C, max. 	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA
Drive interface	
Signal input I	
• Function	"Power section ready"
Signal output I	
• Type	5 V difference signal (phys. RS 422)
• Function	Direction, enable, clock pulse, current control
Differential output voltage, min.	2 V; RL = 100 Ohm
Differential output voltage for	1 V; Io = 20 mA
signal "0", max.	
 Differential output voltage, for signal "1", min. 	3.7 V; Io = -20 mA
Cable length, max.	35 m
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	No
Galvanic isolation digital outputs	
Galvanic isolation digital outputs	No
Dimensions and weight	
Dimensions	
• Width	80 mm
Height	125 mm
• Depth	118 mm
Weight	
 Weight, approx. 	500 g
3 - 11	

FM 353 positioning module

Ordering data	Order No.		Order No.
FM 353 positioning module	6ES7 353-1AH01-0AE0	Bus connectors	6ES7 390-0AA00-0AA0
For stepper motors; incl. configuration package on CD-ROM		1 unit (spare part)	
(Ge, En, Fr, It) comprising		Labeling strips	6ES7 392-2XX00-0AA0
FM 353 manual, electronic Standard function blocks		10 units (spare part)	
(STEP 7 interface software)		S7 SmartLabel V3.0	
 Screen form-based configuration software for FM 353 Standard interactive screen forms for OP7/OP17 		Software for automatic labeling of modules based on data of the STEP 7 project	
FM 353 manual		Single license J	2XV9 450-1SL03-0YX0
German	6ES7 353-1AH01-8AG0	Upgrade single license J	2XV9 450-1SL03-0YX4
English	6ES7 353-1AH01-8BG0	Labeling sheets for machine inscription	see "Accessories", page 5/308
French	6ES7 353-1AH01-8CG0	Slot number label	6ES7 912-0AA00-0AA0
talian	6ES7 353-1AH01-8EG0	Spare part	
Edit FM	6FC5 263-0AA03-0AB0	Shield connection element	6ES7 390-5AA00-0AA0
Program editor for editing, oading and saving NC programs with the standard programming		80 mm wide, with 2 rows for 4 terminals each	
device/PC; German/English, on CD-ROM		Terminal elements	
Connecting cables		2 units	
To stepper motor power section	6FX8 0 2-3AC02-	For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0
Length code:	See FM 351, page 5/180	For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0
Connecting cables and encoders	See Catalog NC 60, CA 01 or in the Industry Mall	For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0
Sub-D connector	6ES5 750-2AB21		
15-pin, socket			
Front connector			
20-pin, with screw contacts 1 unit 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0		
20-pin, with spring-loaded	OLOT OOL TABOUTABO		
contacts 1 unit	6ES7 392-1BJ00-0AA0		
• 100 units	6ES7 392-1BJ00-1AB0		
20-pin, with FastConnect			

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Function modules

FM 354 positioning module

Overview



- Positioning module for servo motors in machines with high clock pulse rates
- Can be used for point-to-point positioning tasks and for complex traversing patterns

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

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	6ES7 354-1AH01-0AE0
Supply voltages	
Rated value	
• 24 V DC	Yes
Current consumption	
Current consumption, max.	350 mA
Connection method	
required front connector	1x 20-pin
Digital inputs	
Number of digital inputs	4
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
Input voltage	
Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current • for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA
Digital outputs	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
Short-circuit protection	Yes
Output voltage	
Rated value (DC)	24 V
• for signal "1", min.	UP - 3 V
Output current	
• for signal "1" permissible range for 0 to 55 °C, max.	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA

	6ES7 354-1AH01-0AE0
Encoder supply	
5 V encoder supply	
• 5 V	Yes
 Output current, max. 	220 mA
Cable length, max.	35 m
24 V encoder supply	
• 24 V	Yes
 Output current, max. 	300 mA
Cable length, max.	100 m
Encoder	
Connectable encoders	
Incremental encoder (symmet-	Yes
rical) • Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical) Trace mark signals Zero mark signal Input signal Input frequency, max.	A, notA, B, notB N, notN 5 V difference signal (phys. RS 422) 1 MHz
Encoder signals, absolute encoder (SSI)	
Input signal	5 V difference signal
	(phys. RS 422)
Data signal	DATA, notDATA
Clock signal	CL, notCL
Telegram length	13, 21 or 25 bit
Clock frequency, max.	1.25 Mbit/s
 Cable length, shielded, max. 	100 m; 10 m at 1.25 Mbit/s, 100 m at max. 125 kbit/s
	100 m at max. 120 kbiya

FM 354 positioning module

	6ES7 354-1AH01-0AE0
Drive interface	
Signal input I	
• Туре	Input loop controller message, isolated (optocoupler)
• Function	"Drive ready"
 Input voltage, rated value (DC) 	24 V
 Input voltage, for signal "0" 	-3 to +5 V
Input voltage, for signal "1"	15 to 30 V
Input current, for signal "1"	2 to 6 mA
Signal output II	
• Type	Output closed-loop controller enable (contact)
• Function	Drive disconnection for operation via contact relay
• Load	1 A/50 V/30 VA DC
Signal output III	
• Type	Analog output
 Function 	Setpoint output for drive
Output voltage	-10 to +10 V
Output current	-3 to +3 mA
 Cable length, max. 	35 m

	6ES7 354-1AH01-0AE0
Galvanic isolation Galvanic isolation digital inputs Galvanic isolation digital inputs	No
Galvanic isolation digital outputs Galvanic isolation digital outputs	No
Dimensions and weight Dimensions • Width • Height • Depth	80 mm 125 mm 118 mm
Weight • Weight, approx.	550 g

FM 354 positioning module

Ordering data	Order No.		Order No.
FM 354 positioning module G	6ES7 354-1AH01-0AE0	Encoders	see Catalogs NC 60, CA 01 or in the Industry Mall
for servo motors, incl. configuration package on CD-ROM		Front connector	the moustry Mail
(Ge, En, Fr, It) comprising • FM 354 manual, electronic		20-pin, with screw contacts	
 Standard function blocks (STEP 7 interface software) 		• 1 unit	6ES7 392-1AJ00-0AA0
Screen form-based configu- ration software for FM 354		 100 units 20-pin, with spring-loaded 	6ES7 392-1AJ00-1AB0
 Standard interactive screen 		contacts	
forms for OP7/OP17 FM 354 manual		• 1 unit • 100 units	6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0
German	6ES7 354-1AH01-8AG0	20-pin, with FastConnect	
English	6ES7 354-1AH01-8BG0	• 1 unit	6ES7 392-1CJ00-0AA0
French	6ES7 354-1AH01-8CG0	Bus connectors	6ES7 390-0AA00-0AA0
Italian	6ES7 354-1AH01-8EG0	1 unit (spare part)	
Edit FM	6FC5 263-0AA03-0AB0	Labeling strips	6ES7 392-2XX00-0AA0
Program editor for editing,		10 units (spare part)	
loading and saving NC programs with the standard programming		S7 SmartLabel V3.0 Software for automatic labeling of	
device/PC; German/English, on CD-ROM		modules direct from the STEP 7 project	
Connecting cables		Single license J	2XV9 450-1SL03-0YX0
To SSI absolute encoders 6FX2 001-5, preassembled	6FX5 0 2-2CC11-	Upgrade single license J	2XV9 450-1SL03-0YX4
To incremental encoders 6FX2 001-1, preassembled	6FX5 0 2-2CD01-	Labeling sheets for machine inscription	see "Accessories", page 5/308
For 24 V incremental encoders,	6FX5 0 2-2CD24-	Slot number label	6ES7 912-0AA00-0AA0
preassembled	CEVE 0=0 00 100 =====	Spare part	
To SIMODRIVE 611A, preassembled	6FX5 0 2-2CJ00-	Shield connection element	6ES7 390-5AA00-0AA0
To SIMODRIVE 611U,	6FX5 0 2-2CJ10-	80 mm wide, with 2 rows for 4 terminals each	
preassembled To SSI absolute encoders 6FX2	6FX5 002-2CC12-	Terminal elements	
001-5, preassembled, without	0170 002 200 12	2 units	
Sub-D connector To SSI absolute encoders 6FX2	6FX8 0 2-2CC11-	For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0
001-5, preassembled, suitable for trailing	31 70 3 2 2 2 3 3 1 1	For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0
To incremental encoders 6FX2 001-2, preassembled, suitable for trailing	6FX8 0 2-2CD01-	For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0
To SIMODRIVE 611A, preassembled, suitable for trailing	6FX8 0 2-2CJ00-		
To SIMODRIVE 611U, preassembled, suitable for trailing, 1 free end	6FX8 0 2-2CJ10-		
To SIMODRIVE 611A, preassembled, suitable for trailing, free ends	6FX8 0 2-3AB01-		
Length code:	see FM 351, page 5/180		
- g			

G: Subject to export regulations AL: N and ECCN: EAR99APP J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 357-2 positioning module

Overview



- Path and positioning control for intelligent motion control of up to 4 axes
- Comprehensive range of application, from independent single positioning axes right up to interpolatory multi-axis path control
- For controlling stepper drives and controlled servo drive axes
- User-friendly commissioning with convenient parameterization tool
- Interface for SIMODRIVE 611U and MASTERDRIVES MC via isochronous PROFIBUS (not for FM 357-2H in conjunction with HT6)

Note:

Position measuring systems and preassembled connecting cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

Additional information is available on the Internet at:

www.siemens.com/simatic-technology

	6ES7 357-4AH01-0AE0
Supply voltages	
Rated value • 24 V DC	Yes
Current consumption	100
from backplane bus 5 V DC, max.	100 mA
Power consumption, typ.	24 W
Memory NC program memory	750 Kibyte
	750 Kibyte
Connection method required front connector	1x 40-pin
Digital inputs Number of digital inputs	18
Functions	4 Bero, 2 probes, 12 for any use
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -3 to +5 V 11 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", typ.	2 mA 6 mA; 6 to 30 mA
Digital outputs Number of digital outputs	8
Functions	8 for any use
Output voltage • Rated value (DC) • for signal "1", min.	24 V UP - 3 V
Output current • for signal "1" permissible range for 0 to 55 °C, max.	0.5 A; with UPmax
• for signal "0" residual current, max.	2 mA
Encoder supply 5 V encoder supply 5 V Output current, max. Cable length, max.	Yes 210 mA 35 m

	6ES7 357-4AH01-0AE0
24 V encoder supply	
• 24 V	Yes
 Output current, max. 	300 mA
 Cable length, max. 	100 m
Encoder	
Connectable encoders	
Incremental encoder	Yes
(symmetrical)	
Absolute encoder (SSI)	Yes
Encoder signals, incremental	
encoder (symmetrical) • Trace mark signals	A notA B notB
Zero mark signal	A, notA, B, notB N. notN
Input signal	5 V difference signal
• Input signal	(phys. RS 422)
• Input frequency, max.	1 MHz
Encoder signals, absolute encoder	
(SSI)	
Input signal	5 V difference signal
D	(phys. RS 422)
Data signal	DATA, notDATA
Clock signal Talagraph langth	CL, notCL
Telegram length Clock froguency may	13, 21 or 25 bit 1.5 Mbit/s
Clock frequency, max.Cable length, shielded, max.	250 m; at max. 187.5 kBit/s
	250 III, at IIIax. 167.5 KBII/S
Positioning	1 000 /
Programmable traverse speed, max.	1 000 m/min
Drive interface	
Signal output I	
• Type	5 V difference signal
Туре	(phys. RS 422)
• Function	Direction, enable, clock pulse
Differential output voltage, min.	2 V; RL = 100 Ohm
Differential output voltage for	1 V; Io = 20 mA
signal "0", max.	,
Differential output voltage, for	3.7 V; lo = -20 mA
signal "1", min.	750.111
Pulse frequency	750 kHz
Cable length, max.	50 m; 35 m in hybrid mode with servo axes
	SCI VU dXCS

FM 357-2 positioning module

Technical specifications (continued)

	6ES7 357-4AH01-0AE0	
Signal output II		
• Type	Controller release (contact), FM-READY output (contact)	
• Function	Drive disconnection for operation via contact relay, Data set ready for link with Emergency STOP	
• Load	1 A/50 V/30 VA DC	
Signal output III		
• Type	Analog output	
• Function	Drive interface for analog drives: setpoint output for drive	
 Output voltage 	-10 to +10 V	
Output current	-3 to +3 mA	
Cable length, max.	35 m	

	6ES7 357-4AH01-0AE0
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	Yes
Galvanic isolation digital outputs	
 Galvanic isolation digital outputs 	Yes
Dimensions and weight	
Dimensions	
Width	200 mm
Height	125 mm
Depth	118 mm
Weight	
 Weight, approx. 	1 200 g

Ordering data	Order No.	
FM 357-2 positioning module G	6ES7 357-4AH01-0AE0	Connec
Basic unit		encode
System firmware		Front co
incl. configuration package on CD-ROM, German, English, French, Italian, consisting of		40-pin, v • 1 unit • 100 ur
equipment manual (electronic), configuring software (parameter- ization screenforms, standard blocks, operator control and monitoring screenforms for OP17/OP27)		40-pin w contacts • 1 unit • 100 ur
FM 357-2L system firmware	6ES7 357-4AH03-3AE0	40-pin, \ • 1 unit
On memory card		Back-up
FM 357-2LX system firmware	6ES7 357-4BH03-3AE0	Li-lon, 3
With additional functions; on memory card		Signal o
FM 357-H system firmware	6ES7 357-4CH03-3AE0	Pre-asse encoder
With additional functions for the handling sector; on memory card		Pre-asse 6FX200
FM 357-2 manual		Pre-asse
German	6ES7 357-4AH00-8AG0	24 V, UL
English	6ES7 357-4AH00-8BG0	
French	6ES7 357-4AH00-8CG0	Length of
Italian	6ES7 357-4AH00-8EG0	
Edit FM	6FC5 263-0AA03-0AB0	
Program editor for editing, loading and saving NC programs with the standard programming device/PC;German/English, on CD-ROM		

Order No.
See catalog NC 60, CA 01 or in the Industry Mall
6ES7 392-1AM00-0AA0 6ES7 392-1AM00-1AB0
6ES7 392-1BM01-0AA0 6ES7 392-1BM01-1AB0
6ES7 392-1CM00-0AA0
6ES7 971-1AA00-0AA0
6FX5 0 2-2CC11-
6FX5 0 2-2CD01-
6FX5 0 2-2CD24-
see FM 351, page 5/180

G: Subject to export regulations AL: N and ECCN: EAR99APP

FM 355 controller module

Overview



- 4-channel closed-loop control module for universal control tasks
- Can be used for temperature, pressure, flow and level controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
 - FM 355 C as continuous controller;
- FM 355 S as step or pulse controller
- With 4 analog outputs (FM 355 C) or 8 digital outputs (FM 355 S) for direct control of the most common actuators
- Continuation of control mode also possible with CPU stop or failure

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
 permissible range, lower limit (DC) 	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from load voltage L+ (without load), max.	310 mA; typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Power losses		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
Connection method		
required front connector	2x 20-pin	2x 20-pin
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve acc. to IEC 1131, Type 2	Yes	Yes
Input voltage		
 Rated value, DC 	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• Cable length, shielded, max.	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output voltage		
• for signal "1", min.		L+ (-2.5 V)

FM 355 controller module

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Output current		
• for signal "1" rated value		100 mA
• for signal "1" permissible range for 0 to 60 °C,		5 mA
min.		
• for signal "1" permissible range for 0 to 60 °C,		150 mA
max.		
for signal "0" residual current, max.		0.5 mA
Parallel switching of 2 outputs		
for logic links		Yes
Switching frequency		
 with resistive load, max. 		100 Hz
 with inductive load, max. 		0.5 Hz
• on lamp load, max.		100 Hz
Aggregate current of outputs (per group)		
• up to 60 °C, max.		400 mA
		100 11111
Load resistance range		240.0
• lower limit		240 Ω
• upper limit		4 kΩ
Cable length		
 Cable length, shielded, max. 		1 000 m
 Cable length unshielded, max. 		600 m
Analog inputs		
Number of analog inputs	4	4
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
		zee iii, ee iii at ee iii aha memeedapiee
Input ranges (rated values), voltages	V	V
• 0 to +10 V	Yes	Yes
• -1.75 to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 to +23.5 mA	Yes	Yes
• 4 to 20 mA	Yes	Yes
Input ranges (rated values), thermoelements		
• Type B	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
		100
Input ranges (rated values), resistance thermometers		
• Pt 100	Yes	Yes
	163	103
Voltage input		
permissible input voltage for voltage input	30 V	30 V
(destruction limit), max.		
Current input		
 permissible input current for current input 	40 mA	40 mA
(destruction limit), max.		
Characteristic linearization		
parameterizable	Yes	Yes
• for thermocouples	Type B, J, K, R, S	Type B, J, K, R, S
• for resistance thermometer	Pt100 (standard)	Pt100 (standard)
	,	
Temperature compensation	Von	Voc
 internal temperature compensation external temperature compensation with Pt100 	Yes Yes	Yes Yes
	IES	IES

FM 355 controller module

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Analog outputs Number of analog outputs	4	
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
Output ranges, voltage • 0 to 10 V • -10 to +10 V	Yes Yes	
Output ranges, current • 0 to 20 mA • 4 to 20 mA	Yes Yes	
Connection of actuators • for voltage output 2-conductor connection • for current output 2-conductor connection	Yes Yes	
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max.	1 kΩ 1 μF 500 Ω 1 mH	
Analog value creation Measurement principle	integrating	integrating
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel)	14 bit; 12 or 14 bit, parameterizable 16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz	14 bit; 12 or 14 bit, parameterizable 16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz
Settling time • for resistive load • for capacitive load • for inductive load	0.2 ms 3.3 ms 0.5 ms	0.1 ms 3.3 ms 0.5 ms
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 4-wire transducer Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes Yes 1.5 mA	Yes Yes 1.5 mA
Errors/accuracies Linearity error (relative to input area)	+/- 0.05 %	+/- 0.05 %
Temperature error (relative to input area)	+/- 0.005 %/K	+/- 0.005 %/K
Linearity error (relative to output area)	+/- 0.05 %	
Temperature error (relative to output area)	+/- 0.02 %/K	
Operational limit in overall temperature range • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0.6 %; +/-0.6 to +/-1% +/- 0.6 %; +/-0.6 to +/-1% +/- 0.6 %; +/-0.6 to +/-1%	+/- 0.6 %; +/-0.6 to +/-1% +/- 0.6 %; +/-0.6 to +/-1% +/- 0.6 %; +/-0.6 to +/-1%
Voltage, relative to output area Current, relative to output area	+/- 0,5 % +/- 0,6 %	

FM 355 controller module

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Basic error limit (operational limit at 25 °C)		
Voltage, relative to input area	+/- 0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%	+/- 0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%
 Current, relative to input area 	+/- 0.4 %; +/-0.4 to +/-0.6%	+/- 0.4 %; +/-0.4 to +/-0.6%
Resistance-type thermometer, relative to input area	+/- 0.4 %; +/-0.4 to +/-0.6%	+/- 0.4 %; +/-0.4 to +/-0.6%
 Voltage, relative to output area 	+/- 0.3 %	
 Current, relative to output area 	+/- 0.5 %	
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency		
 Series mode interference (peak value of interference < rated value of input range), min. 	40 dB	40 dB
• common mode voltage (USS < 2.5 V) , min.	70 dB	70 dB
Control technology		
Number of closed-loop controllers	4	4
Alarms/diagnostics/status information		
Substitute values connectable	Yes; parameterizable	Yes; parameterizable
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
Galvanic isolation controller		
 between the channels 	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight	70 1 20 7 00 1 7 10	70 1 20 7 00 1 7 10
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weight		
Weight, approx.	470 g	470 g
	• 9	5

FM 355 controller module

Ordering data	Order No.		Order No.
FM 355 C controller module	6ES7 355-0VH10-0AE0	S7 SmartLabel V3.0	
with 4 analog outputs for 4 continuous controllers		Software for automatic labeling of modules based on data of the	
FM 355 S controller module	6ES7 355-1VH10-0AE0	STEP 7 project	
with 8 digital outputs for 4 step or		Single license J	2XV9 450-1SL03-0YX0
pulse controllers		Upgrade single license J	2XV9 450-1SL03-0YX4
Front connector		Labeling sheets for machine inscription	See "Accessories", page 5/308
20-pin, with screw contacts1 unit	6ES7 392-1AJ00-0AA0	Slot number label	6ES7 912-0AA00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0	Spare part	
20-pin, with spring-loaded contacts		Shield connection element	6ES7 390-5AA00-0AA0
• 1 unit	6ES7 392-1BJ00-0AA0	80 mm wide, with 2 rows for 4 terminals each	
• 100 units	6ES7 392-1BJ00-1AB0		
20-pin, with FastConnect		Terminal elements	
• 1 unit	6ES7 392-1CJ00-0AA0	2 units	
Bus connectors	6ES7 390-0AA00-0AA0	For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0
1 unit (spare part)		For 1 cable with 3 mm to 8 mm	6ES7 390-5BA00-0AA0
Labeling strips	6ES7 392-2XX00-0AA0	diameter	0E01 000-0DA00-0AA0
10 units (spare part)		For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0

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Function modules

FM 355-2 temperature controller module

Overview



- 4-channel closed-loop controller module specifically for temperature controls
- Including integrated and easy-to-use online self-optimization
- Heating and cooling controllers as well as combined controllers with heating and active cooling function feasible
- Ready-to-use controller structures
- 2 versions:
 - FM 355-2 C as a continuous controller;
 - FM 355-2 S as step or pulse controllers
- With 4 analog outputs (FM 355-2 C) or 8 digital inputs (FM 355-2 S) to directly control the most common final control elements
- It is possible to continue closed-loop control operation even if the CPU stops or fails

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from load voltage L+ (without load), max.	310 mA; typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Power losses		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
Connection method		
required front connector	2x 20-pin	2x 20-pin
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve acc. to IEC 1131, Type 2	Yes	Yes
Input voltage		
Rated value, DC	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
 Cable length, shielded, max. 	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output voltage		
• for signal "1", min.		L+ (-2.5 V)

FM 355-2 temperature controller module

Technical specifications (continued)		
	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Output current		
• for signal "1" rated value		0.1 A
• for signal "1" permissible range for 0 to 60 °C,		5 mA
min.		
 for signal "1" permissible range for 0 to 60 °C, max. 		150 mA
• for signal "0" residual current, max.		0.5 mA
Parallel switching of 2 outputs		0.0
• for logic links		Yes
Switching frequency		
with resistive load, max.		100 Hz
with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
Aggregate current of outputs (per group)		
• up to 60 °C, max.		400 mA
Load resistance range		
• lower limit		240 Ω
• upper limit		4 kΩ
Cable length		
Cable length, shielded, max.		1 000 m
 Cable length unshielded, max. 		600 m
Analog inputs		
Number of analog inputs	4	4
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 to +11.75 V	Yes	Yes
Input ranges (rated values), currents	\ <u>'</u>	v
0 to 20 mA0 to 23.5 mA	Yes Yes	Yes Yes
• -3.5 to +23.5 mA	Yes	Yes
• 4 to 20 mA	Yes	Yes
Input ranges (rated values), thermoelements		
• Type B	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
Type S	Yes	Yes
Input ranges (rated values), resistance thermometers		
• Pt 100	Yes	Yes
Voltage input		100
permissible input voltage for voltage input	20 V	20 V
(destruction limit), max.	20 •	20 1
Current input		
permissible input current for current input	40 mA	40 mA
(destruction limit), max.		
Characteristic linearization		
• parameterizable	Yes	Yes
• for thermocouples	Type B, E, J, K, R, S	Type B, E, J, K, R, S
for resistance thermometer	Pt100 (standard)	Pt100 (standard)
Temperature compensation	Voc	Voo
internal temperature compensationexternal temperature compensation with Pt100	Yes Yes	Yes Yes
	100	100
Analog outputs Number of analog outputs	4	
Namber of analog outputs	1	

FM 355-2 temperature controller module

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
Output ranges, voltage • 0 to 10 V • -10 to +10 V	Yes Yes	
Output ranges, current • 0 to 20 mA • 4 to 20 mA	Yes Yes	
Connection of actuators • for voltage output 2-conductor connection • for current output 2-conductor connection	Yes Yes	
Load impedance (in rated range of output) with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, inductive load, max.	1 kΩ 1 μF 500 Ω 1 mH	
Analog value creation Measurement principle	integrating	integrating
Integrations and conversion time/ resolution per channel		
 Resolution with overrange (bit including sign), max. 	14 bit	14 bit
Conversion time (per channel)	100 ms; at 50/60 Hz	100 ms; at 50/60 Hz
Settling time • for resistive load • for capacitive load • for inductive load	0.2 ms 3.3 ms 0.5 ms	0.1 ms 3.3 ms 0.5 ms
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 4-wire transducer	Yes Yes	Yes Yes
Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1.5 mA	Yes 1.5 mA
Errors/accuracies Linearity error (relative to input area)	+/- 0.05 %	+/- 0.05 %
Temperature error (relative to input area)	+/- 0.005 %/K	+/- 0.005 %/K
Linearity error (relative to output area)	+/- 0.05 %	
Temperature error (relative to output area)	+/- 0.02 %/K	
Operational limit in overall temperature range • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0.6 %; +/-0.6 to +/-0.7% +/- 0.6 %; +/-0.6 to +/-0.7% +/- 0.6 %; +/-0.6 to +/-0.7%	+/- 0.06 %; +/-0.06 to +/-0.7% +/- 0.06 %; +/-0.06 to +/-0.7% +/- 0.06 %; +/-0.06 to +/-0.7%
Voltage, relative to output areaCurrent, relative to output area	+/- 0.5 % +/- 0.6 %	
Basic error limit (operational limit at 25 °C) • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0.04 %; +/-0.04 to +/-0.5% +/- 0.04 %; +/-0.04 to +/-0.5% +/- 0.04 %; +/-0.04 to +/-0.5%	+/- 0.04 %; +/-0.04 to +/-0.5% +/- 0.04 %; +/-0.04 to +/-0.5% +/- 0.04 %; +/-0.04 to +/-0.5%
Voltage, relative to output areaCurrent, relative to output area	+/- 0.4 % +/- 0.5 %	

FM 355-2 temperature controller module

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• common mode voltage (USS < 2.5 V) , min.	70 dB	70 dB
Control technology		
Number of closed-loop controllers	4	4
Alarms/diagnostics/status information		
Substitute values connectable	Yes; parameterizable	Yes; parameterizable
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
Galvanic isolation controller		
 between the channels 	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight		
Dimensions		
• Width	80 mm	80 mm
Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weight		
 Weight, approx. 	470 g	470 g

Ordering data	Order No.
FM 355-2 C temperature controller module	6ES7 355-2CH00-0AE0
with 4 analog outputs for 4 continuous controllers	
FM 355-2 S temperature controller module	6ES7 355-2SH00-0AE0
with 8 digital outputs for 4 step or pulse controllers	
Front connector	
20-pin, with screw contacts1 unit100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0
20-pin, with spring-loaded contacts • 1 unit	6ES7 392-1BJ00-0AA0
• 100 units	6ES7 392-1BJ00-1AB0
20-pin, with FastConnect	
1 unit	6ES7 392-1CJ00-0AA0
Bus connectors	6ES7 390-0AA00-0AA0
1 unit (spare part)	
Labeling strips	6ES7 392-2XX00-0AA0
10 units (spare part)	

	Order No.
S7 SmartLabel V3.0	
Software for automatic labeling of modules based on data of the STEP 7 project	
Single license J	2XV9 450-1SL03-0YX0
Upgrade single license J	2XV9 450-1SL03-0YX4
Labeling sheets for machine inscription	See "Accessories", page 5/308
Slot number label	6ES7 912-0AA00-0AA0
Spare part	
Shield connection element	6ES7 390-5AA00-0AA0
80 mm wide, with 2 rows for 4 terminals each	
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	6ES7 390-5AB00-0AA0
For 1 cable with 3 mm to 8 mm diameter	6ES7 390-5BA00-0AA0
For 1 cable with 4 mm to 13 mm diameter	6ES7 390-5CA00-0AA0

J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

SM 338 POS input module

Overview



- Interface between max. 3 absolute-value sensors (SSI) and the CPU
- For provision of the displacement encoder values for further processing in STEP 7 programs
- Enables direct response of controller to encoder values in moving systems

Note:

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 338-4BC01-0AB0
Supply voltages	
Load voltage L+	2414
Rated value (DC)	24 V
 permissible range, lower limit (DC) permissible range, upper limit (DC) 	20.4 V 28.8 V
	20.0 V
Current consumption from load voltage L+ (without load), max.	10 mA
from backplane bus 5 V DC, max.	160 mA
Power losses	
Power loss, typ.	3 W
Connection method	
required front connector	20-pin
Digital inputs	
Input voltage	
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30.2 V
Input current	
 for signal "0", max. (permissible quiescent current) 	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
 for standard inputs 	
- at "0" to "1", min.	300 µs
Cable length	
 Cable length, shielded, max. 	600 m

	6ES7 338-4BC01-0AB0
Encoder supply	
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
 Output current, max. 	900 mA
Encoder	
Number of connectable encoders, max.	3
Connectable encoders	
 Absolute encoder (SSI) 	Yes
• 2-wire BEROS	Yes
Encoder signals, absolute encoder (SSI)	
Cable length, shielded, max.	320 m; 320 m at 125 kHz; 160 m at 250 kHz; 60 m at 500 kHz; 20 m at 1 MHz
Alarms/diagnostics/status information	
Alarms	
Diagnostic alarm	Yes
Galvanic isolation	
Galvanic isolation	No
Dimensions and weight	
Dimensions	
• Width	40 mm
Height	125 mm
Depth	120 mm
Weight	
Weight, approx.	235 g

SM 338 POS input module

Ordering data	Order No.		Order No.
SM 338 POS input module	6ES7 338-4BC01-0AB0	SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
For position sensing with 3 SSI encoders		Current "Manual Collection" DVD	
Front connectors		and the three subsequent updates	
20-pin, with screw contacts	- 	S7-300 manual	
• 1 unit • 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	Design, CPU data, module data, instruction list	
20-pin, with spring-loaded contacts		German	6ES7 398-8FA10-8AA0
• 1 unit	6ES7 392-1BJ00-0AA0	English	6ES7 398-8FA10-8BA0
• 100 units	6ES7 392-1BJ00-1AB0	French	6ES7 398-8FA10-8CA0
20-pin, with FastConnect		Spanish	6ES7 398-8FA10-8DA0
• 1 unit	6ES7 392-1CJ00-0AA0	Italian	6ES7 398-8FA10-8EA0
Front door, elevated design	6ES7 328-0AA00-7AA0	Signal cable	
e.g. for 32-channel modules; for connecting 1.3 mm ² /16 AWG conductors		Pre-assembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA	6FX5 002-2CC12-
SIMATIC manual collection	6ES7 998-8XC01-8YE0	oub b connector, objective	
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		Length code:	see FM 351, page 5/180

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

IM 174 PROFIBUS module

Overview



- For connecting up to 4 drives with analog setpoint interface or pulse-direction interface to a controller
- Operation with isochronous PROFIBUS DP
- Connectable drives:
 - Electrical drivesHydraulic drives

 - Stepper drives
- Can be used with:
 - SIMATIC CPU 41x-2 DP, CPU 31x-2 DP, CPU 31xT-2 DP, WinAC RTX 2008
 - SIMOTION C2xx, SIMOTION P350, SIMOTION D4x5
- Can also be used with external encoders

Supply voltages Rated value • 24 V DC • permissible range, lower limit (DC) • permissible range, upper limit (DC) • permissible range, upper limit (DC) Current consumption Current consumption, max. 500 mA from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mode Isochronous mode Yes Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current) • for signal "1", typ. 8 mA		6ES7 174-0AA10-0AA0
• 24 V DC • permissible range, lower limit (DC) • permissible range, upper limit (DC) • permissible range, upper limit (DC) • permissible range, upper limit (DC) Current consumption Current consumption, max. 500 mA from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mode Isochronous mode Yes Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current) Pess Yes Yes 12 W	Supply voltages	
permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Current consumption Current consumption, max. 500 mA from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mode Isochronous mode Yes Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage for signal "0" -3 to +5 V for signal "1" 11 to 30 V Input current for signal "0", max. (permissible quiescent current) Page 12 28.8 V 28.8 V 28.8 V 28.8 V 28.8 V 20 40-pin	Rated value	
(DC) • permissible range, upper limit (DC) Current consumption Current consumption, max. 500 mA from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode I	• 24 V DC	Yes
Current consumption Current consumption, max. 500 mA from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous m		20.4 V
Current consumption, max. from backplane bus 5 V DC, max. Power losses Power loss, typ. 12 W Connection method required front connector Isochronous mode I		28.8 V
from backplane bus 5 V DC, max. 100 mA Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mod	Current consumption	
Power losses Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mode Isochronous mode Yes Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current)	Current consumption, max.	500 mA
Power loss, typ. 12 W Connection method required front connector 40-pin Isochronous mode Isochronous mode Isochronous mode Yes Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current)	from backplane bus 5 V DC, max.	100 mA
Connection method required front connector Isochronous mode Isochronous m	Power losses	
required front connector Isochronous mode Item Isochronous Inputs Item Isochronous Input voltage Input voltage Input voltage Input voltage Input voltage Input current Inp	Power loss, typ.	12 W
Isochronous mode Inputs Inputs Inputs Input voltage Input v	Connection method	
Isochronous mode Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" • for signal "1" Input current • for signal "0", max. (permissible quiescent current)	required front connector	40-pin
Shortest clock pulse 1.5 ms Digital inputs Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current)	Isochronous mode	
Digital inputs Number of digital inputs 10 Input voltage • for signal "0" • for signal "1" Input current • for signal "0", max. (permissible quiescent current) 2 mA	Isochronous mode	Yes
Number of digital inputs 10 Input voltage • for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current)	Shortest clock pulse	1.5 ms
Input voltage • for signal "0" • for signal "1" Input current • for signal "0", max. (permissible quiescent current) Input voltage -3 to +5 V 11 to 30 V 2 mA	Digital inputs	
• for signal "0" -3 to +5 V • for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current)	Number of digital inputs	10
• for signal "1" 11 to 30 V Input current • for signal "0", max. (permissible quiescent current) 2 mA	Input voltage	
Input current • for signal "0", max. (permissible quiescent current) 2 mA	• for signal "0"	-3 to +5 V
• for signal "0", max. (permissible quiescent current)	• for signal "1"	11 to 30 V
(permissible quiescent current)	Input current	
, ,		2 mA
▼ IOI SIGNAL I , typ. 6 INA		8 m A
	▼ IOI SIGNAL I , typ.	OTIIA

	6ES7 174-0AA10-0AA0
Input delay (for rated value of input voltage)	
• for standard inputs	46
- at "0" to "1", min.	15 µs
Cable length Cable length, shielded, max.	100 m
Digital outputs Number of digital outputs	8
Short-circuit protection	Yes
Switching capacity of the outputs	
with resistive load, max.	1 A
• on lamp load, max.	30 W
Lamp load, max.	30 W
Output voltage Rated value (DC)	24 V; L+
• for signal "1", min.	L+ (-3 V)
• for signal "1" (DC), max.	3 V
Output current • for signal "1" permissible range	5 mA
for 0 to 55 °C, min. • for signal "1" permissible range	300 mA
for 0 to 55 °C, max. • for signal "0" residual current,	0.4 mA
max.	
Output delay with resistive load • 0 to "1", max.	500 μs
Switching frequency	
with resistive load, max. with including load, max.	500 Hz
• with inductive load, max.	0.5 Hz
Cable lengthCable length, shielded, max.	600 m
Relay outputs	
Number of relay outputs	4
Number of operating cycles	50 000
Switching capacity of contacts • with resistive load, max.	1 A
Analog outputs Number of analog outputs	4
Output ranges, voltage	
• -10 to +10 V	Yes
Analog value creation	
Integration and conversion time/ resolution per channel	
Resolution with overrange (bit including sign), max.	15 bit
Encoder supply	
5 V encoder supply	
• 5 V	Yes
Output current, max.	1.2 A
• Cable length, max.	25 m
24 V encoder supply • 24 V	Yes
Output current, max.	1.4 A
Cable length, max.	100 m
Absolute encoder (SSI) encoder	
supplyAbsolute encoder (SSI)	Yes
Cable length, max.	.55
- Short-circuit protection	Yes

IM 174 PROFIBUS module

Technical specifications (continued)

reclinical specifications (conti	inded)
	6ES7 174-0AA10-0AA0
Encoder	
Number of connectable encoders, max.	4
Connectable encoders	
 Incremental encoder (symmetrical) 	Yes
Absolute encoder (SSI)2-wire BEROS	Yes Yes
 permissible quiescent current (2-wire BEROS), max. 	2 mA
Encoder signals, incremental encoder (symmetrical)	
Trace mark signals	A, notA, B, notB
Zero mark signal	N, notN
Input signal	5 V difference signal
1, 1, 1, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	(phys. RS 422)
 Input frequency, max. 	1 MHz
Cable length, shielded, max.	35 m; 35 m at max. 500 kHz; 10 m at max. 1 MHz
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
Data signal	DATA, notDATA
Clock signal	CL, notCL
Telegram length	13, 21, 24 bit
Clock frequency, max.	187.5 KHz 1.5 MHz (parameterizable)
Binary code	1
Gray code	1
Cable length, shielded, max.	250 m; 250 m at 187.5 kHz, 10 m at 1.5 MHz
Drive interface Number of drive interfaces	4
-	4
Analog drive	
Setpoint signal	
- Short circuit proof	Yes; max. 45 mA, min. 3.3 kOhm load impedance
- Range of rated voltage	-10.5 V to +10.5 V
- Output current	-3 to +3 mA
Output controller release	
- Number of relay contacts	4
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V·A
- Number of switching cycles,	50 000; at 30 V DC, 1 A
min Cable length (shielded), max.	35 m
S (= = = = //	

	6ES7 174-0AA10-0AA0
Signal output I	
Type Number of valous contacts	0
 Number of relay contacts Differential output voltage, min. 	2
- Switching voltage, max.	30 V
Differential output voltage for	00 V
signal "0", max.	
- Switching current, max.	1 A
Differential output voltage, for	
signal "1", min Switching capacity, max.	30 V·A
 Switching capacity, max. Number of switching cycles, 	at 30 V DC, 1 A
min.	at 00 v D0, 17t
 Load impedance 	
- Cable length (shielded), max.	35 m
Signal output II	
 Differential output voltage, min. 	2 V; R = 100 Ohm
Differential output voltage for	3.7 V; $3.7 V$ at $I = -20 mA$;
signal "1", min.	4.5 V at I = -100 μA,
 Differential output voltage for signal "0", max. 	1 V; if I = -20 mA
• Load resistance, min.	55 Ω
Output current, max.	60 mA
Signal output III	
Pulse frequency	750 kHz
 Cable length (shielded), max. 	50 m; in hybrid operation with
	analog axes 35 m, in asymmetrical transmission 10 m
Alarma/diagnostics/status infor	
Alarms/diagnostics/status infor- mation	
Alarms	
Diagnostic alarm	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	Yes; to encoders, analog outputs
	DP interface; no to other DI/DOs
Galvanic isolation digital outputs	
Galvanic isolation digital outputs	Yes; to encoders, analog outputs DP interface; no to other DI/DOs
Dimensions and weight	2
Dimensions and weight Dimensions	
• Width	160 mm
• Height	125 mm
Depth	118 mm
Weight	
Weight, approx.	1 kg

Ordering data

IM 174 PROFIBUS module	6ES7
PROFIBUS module for	

PROFIBUS module for connecting analog drives and stepper drives to a controller

6ES7 174-0AA10-0AA0

Setpoint cable

for the connection between IM 174 and SIMODRIVE 611-A

for the connection between IM 174 with 3 stepper drives and one SIMODRIVE (end of cable cut off)

Length code:

6FX2 002-3AD01-

6FX2 002-3AD02-

see FM 315, page 5/180

I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

SIWAREX U

Overview



SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Complete data access is then possible via the SIMATIC.

SIWAREX U weighing electronics

SIWAREX U	
Integration in automation systems:	
S7-300	Direct integration
S7-400 (H)	Via ET 200M
PCS 7 (H)	Via ET 200M
C7	Via IM or ET 200M
Automation systems from other vendors	Via ET 200M
Stand-alone (without SIMATIC CPU)	Possible with IM 153-1
Communication interfaces	• SIMATIC S7 (P bus) • RS 232 • TTY
Connection of remote displays (through TTY serial interface)	Gross, channel 1, 2 or default value 1, 2
Adjustment of scales settings	over SIMATIC (P bus) or PC using SIWATOOL U (RS 232)
Measuring properties	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
Internal resolution ADC Data format of weight values	65535 2 byte (fixed-point)
Number of measurements/ second	50
Digital filter	0.05 - 5 Hz (in 7 steps), mean-value filter
Weighing functions	
Weight values	Gross
Limit values	2 (min./max.)
Zero setting function	Per command
Load cells	Strain gages in 4-wire or 6-wire system

SIWAREX U	
Load cell powering	
Supply voltage $U_{\rm S}$ (rated value)	6 V DC ¹⁾
Max. supply current	≤ 150 mA per channel
Permissible load impedance	
• R _{Lmin}	> 40 Ω per channel
• R _{Lmax}	< 4010 Ω
• R _{Lmin}	With Ex(i) interface: $> 87 \Omega$ per channel
• R _{Lmax}	< 4010 Ω
Permissible load cell	Up to 4 mV/V
characteristic	
Max. distance of load cells	500 m ²⁾
	150/500 m for gas group IIC 500 m ²⁾ for gas group IIB
	(see SIWAREX IS Manual)
Intrinsically-safe load cell powering	Optional (Ex interface) with SIWAREX IS
Supply voltage 24 V DC	
Rated voltage	24 V DC
Max. current consumption	150 mA (single-channel) / 240 mA (two-channel)
Voltage supply from backplane bus	≤ 100 mA
Certification	ATEX 95, FM, cUL _{US} Haz. Loc.
IP degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{\min{(IND)}}$ to $T_{\max{(IND)}}$ (operating temperature)	
Vertical installation	0 +60 °C
Horizontal installation	0 +40 °C
EMC requirements according to	NAMUR NE21, Part 1
	EN 61326
Dimensions	40 x 125 x 130 mm

 $^{^{1)}\,}$ Supply of load cells compared to 7MH4601-1AA01 or. ... 1BA01 changed to 6 V DC.

Up to 1000 m possible under certain conditions, provided the recommended cable is used (see Accessories).

SIWAREX U

Ordering data	Order No.	<u> </u>	Order No.
SIWAREX U for SIMATIC S7 and ET 200M,		Shield connection terminal	6ES7 390-5CA00-0AA0
ncl. bus connector, weight 0.3 kg • Single-channel version 1) D) for	7MH4 950-1AA01	Contents: 2 units (suitable for cable with diameter 4 13 mm)	
connecting one scale	/WIN4 950-1AA01	Note: one shield connection terminal	
Two-channel version ^{2) D)} for connecting two scales	7MH4 950-2AA01	each is required for:	
SIWAREX U manual		Scale connection RS 485 interface	
available in a range of languages		• RS 232 interface	
Free download on the Internet at:		S7 DIN rail	CEO7 000 1 A DC0 0 A A 0
www.siemens.com/weighing- echnology		160 mm	6ES7 390-1AB60-0AA0
SIWAREX U configuration	7MH4 950-1AK01	480 mm 530 mm	6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0
package for SIMATIC S7 version 5.4 or higher		830 mm	6ES7 390-1AJ30-0AA0
suitable for 7MH4950-1AA01 and		2000 mm	6ES7 390-1BC00-0AA0
7MH4950-2AA01		Accessories (optional)	0L3/ 390-1DC00-0AA0
on CD-ROM • PC SIWATOOL U software		PS 307 load power supplies	
(available in a range of		(only required if 24 V DC is not	
languages), new design • Sample program "Getting		available)	
started" – ready to use application for SIMATIC S7		120/230 V AC; 24 V DC, incl. power connector	
SIWAREX U Manual on CD		PS 307-1B; 2 A	6ES7 307-1BA00-0AA0
(in a range of languages), new design		PS 307-1E; 5 A	6ES7 307-1EA00-0AA0
 HSP Hardware Support 		PS 307-1K; 10 A	6ES7 307-1KA00-0AA0
Package for integrating SIWAREX U in STEP 7		Labeling strips	6ES7 392-2XX00-0AA0
SIWAREX U configuration	7MH4 683-3BA64	(10 units, spare part)	
package for PCS 7, version 6.x		Remote displays (option)	
suitable for 7MH4601-1*A01 and 7MH4950-*AA01 In German and English on CD-		The digital remote displays can be connected directly to SIWAREX U through a TTY	
ROM, module for the CFC and faceplate		interface. The following remote displays can	
SIWAREX U configuration	7MH4 950-3AK61	be used:	
package for PCS7 S7 version 7.0 and V7.1		S102, S302	
suitable for 7MH4950-1AA01 and		Siebert Industrieelektronik GmbH P.O. Box 1180	
7MH4950-2AA01		D-66565 Eppelborn	
on CD-ROM • HSP Hardware Support		Tel.: +49 6806/980-0 Fax: +49 6806/980-999	
 Package for integration of 		Internet: www.siebert.de	
SIWAREX U in STEP 7 • Function block for the CFC		Detailed information available from manufacturer.	
chart		SIWAREX JB junction box,	7MH4 710-1BA
FaceplateSIWATOOL U setting software		aluminium housing	THILLY TO TOA
• Manual		for connecting up to 4 load cells in parallel, and for connecting	
SIWATOOL connecting cable D	7MH4 607-8CA	several junction boxes	
of SIWAREX U/CS with serial PC nterface, for 9-pin PC interfaces (RS 232), length 3 m		SIWAREX JB junction box, stainless steel housing	7MH4 710-1EA
Installation material		for connecting up to 4 load cells in parallel	
(mandatory) 20-pin front plug with screw		Ex interface, type SIWAREX Pi	7MH4 710-5AA
contacts		With UL and FM approvals, but	
(required for each SIWAREX module)		without ATEX approval for intrinsically-safe connection of	
Shield contact element	6ES7 392-1AJ00-0AA0	load cells,	
Sufficient for two SIWAREX U	3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3	suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules.	
nodules			
modules		Not approved for use in the EU.	
nodules		Not approved for use in the EU.	

I: Subject to export regulations AL: N and ECCN: EAR99H

SIWAREX U

Ordering data	Order No.		Order No.
Manual for Ex interface type SIWAREX Pi	C71000-T5974-C29	Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY,	7MH4 702-8AF
SIWAREX IS Ex interface With ATEX approval, but without UL and FM approvals, for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.		blue sheath to connect the junction box (JB) or extension box (EB) in a poten- tially explosive area to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C	
With short-circuit current < 199 mA DC With short-circuit current < 137 mA DC	7MH4 710-5BA 7MH4 710-5CA	Cable LiYCY 4 x 2 x 0.25 mm ² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	7MH4 407-8BD0
Cable (optional)		. ,	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C	7MH4 702-8AG		

¹⁾ compatible with 7MH4601-1AA01; supply of load cells changed to 6 V DC.
2) compatible with 7MH4601-1BA01; supply of load cells changed to 6 V DC.

I: Subject to export regulations AL: N and ECCN: EAR99H

The SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used for automatic and non-automatic

weighing, e.g. for the production of mixtures, filling, loading, monitoring and bagging. It has been assigned appropriate scale approvals and is also

Function modules

SIWAREX FTA

Overview



The SIWAREX FTA function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

suitable for calibration plants.

SIWAREX FTA weighing module

SIWAREX FTA	
Use in automation systems	
S7-300	Directly or via ET 200M
S7-400 (H)	Via ET 200M
PCS 7 (H)	Via ET 200M
Communication interfaces	
S7	Through backplane bus
RS 232	For Siwatool or printer connection
RS 485	For remote display or digital load cell
Module parameterization	Using SIMATIC S7
	Using SIWATOOL FTA software (RS 232)
Measuring properties	
EU type approval as non- automatic weighing machine, trade class III	3 x 6000 d ≥ 0.5 μV/e
Internal resolution	16 million parts
Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 20 Hz), mean-value filter
Weighing functions	
Non-automatic weighing machine	OIML R76
Automatic weighing machine	OIML R51, R61, R107
Load cells	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
Supply voltage $U_{\mathbb{S}}$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• R _{Lmin}	> 56 Ω > 87 Ω with Ex interface
• R _{Lmax}	$\leq 4010 \Omega$

SIWAREX FTA		
Max. distance of load cells		
When using the recommended cable:		
Standard	1000 m (500 m legal-for-trade)	
In hazardous area ¹⁾		
For gases of group IIC	300 m	
For gases of group IIB	1000 m	
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface	
Ex approvals zone 2 and safety	ATEX 95, FM, cUL _{US} Haz. Loc.	
Power supply		
Rated voltage	24 V DC	
Max. current consumption	500 mA	
Current consumption from backplane bus	Typ. 55 mA	
Inputs/outputs		
Digital inputs	7 DI electrically isolated	
Digital outputs	8 DO electrically isolated	
Counter input	Up to 10 kHz	
Analog output		
Current range	0/4 20 mA	
Updating rate	100 Hz	
Approvals	EU type approval (CE, OIML R76)	
	EU prototype test to MID (OIML R51, R61, R107)	
Degree of protection to EN 60529; IEC 60529	IP20	
Climatic requirements		
$T_{\min (IND)} \cdots T_{\max (IND)}$ (operating temperature)		
Vertical installation	-10 60 °C	
Horizontal installation	-10 40 °C	
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1	
Dimensions	80 x 125 x 130 mm	
Weight	600 g	
1) For further details, see Ex interfa	ace type SIWAREX IS	

¹⁾ For further details, see Ex interface, type SIWAREX IS

SIWAREX FTA

Ordering data	Order No.		Order No.
EIWAREX FTA Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: proportioning, iilling, bagging, loading. Note: Observe approval condi- ions for applications with	7MH4 900-2AA01	SIWAREX Multiscale STEP 7 software for SIWAREX FTA. Control of one or more scales for a scalable number of components and any number of recipes. Applications: batching plants, mixers in production process, CD-ROM	7MH4 900-2AL01
obligation of verification. We recommend using our calibration set and contacting our SIWAREX hotline. SIWAREX FTA Manual		SIWAREX Multifill STEP 7 software for SIWAREX FTA. Control of filling and bagging processes for one or more filling	7MH4 900-2AM01
 available in a range of languages Free download from the Internet at: www.siemens.com/weighing- 		stations and any number of materials, CD-ROM SIWATOOL connecting cable from SIWAREX FTA with serial PC interface, for 9-pin PC interfaces	
echnology SIWAREX FTA "Getting started" Sample software shows		(RS 232) • 2 m long • 5 m long	7MH4 702-8CA 7MH4 702-8CB
beginners how to program the scales in STEP 7. Free download from the Internet at: www.siemens.com/weighing-		40-pin front plug with screw contacts (required for each SIWAREX module), alternatively with springloaded contacts	6ES7 392-1AM00-0AA0
SIWAREX FTA configuration package for SIMATIC S7 on CD-ROM • HSP Hardware Support	7MH4 900-2AK01	40-pin front plug with spring- loaded contacts (required for each SIWAREX module), alternatively with screw contacts	6ES7 392-1BM01-0AA0
Package for integrating SIWAREX FTA/FTC in STEP 7 • SIWAREX FTA "Getting started" • SIWATOOL FTA commissioning		Shield contact element Sufficient for one SIWAREX FTA module	6ES7 390-5AA00-0AA0
software Software for legal-for-trade display in WinCC flexible Manual		Shield connection terminal Contents: 2 units (suitable for cable with diameter 4 13 mm)	6ES7 390-5CA00-0AA0
SIWAREX FTA configuration package for PCS 7 V6.x on CD-ROM HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 Function block for CFC Faceplate SIWATOOL FTA commissioning software Manual	7MH4 900-2AK61	Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface S7 DIN rail • 160 mm • 480 mm • 530 mm • 830 mm	6ES7 390-1AB60-0AA0 6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0
SIWAREX FTA configuration package for PCS 7 V7.0 on CD-ROM • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate	7MH4 900-2AK62	2000 mm PS 307 load power supply (only required if 24 V DC is not available) 120/230 V AC; 24 V DC PS 307-1B; 2 A PS 307-1E; 5 A	6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0 6ES7 307-1BA00-0AA0 6ES7 307-1EA00-0AA0
 SIWATOOL FTA commissioning software Manual 		• PS 307-1K; 10 A MMC memory	6ES7 307-1EA00-0AA0 7MH4 900-2AY20
Calibration set for SIWAREX FTA For verification of up to 5 scales comprising: 3 x inscription foil for labeling 1 x protection foil 10 x EU verification marks (black M on green background) Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on	7MH4 900-2AY10	for data recording up to 16 MB	

SIWAREX FTA

Ordering data	Order No.		Order No.
Remote display (optional)		Cable (optional)	
The Siebert S102 and S302 remote digital display can be directly connected to the SIWAREX FTA via an RS 485		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath	7MH4 702-8AG
interface. Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: www.siebert.de Detailed information available from manufacturer.		to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C	
SIWAREX JB junction box, aluminium housing		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath	7MH4 702-8AF
for connecting up to 4 load cells in parallel, and for connecting several junction boxes		to connect the junction box (JB) or extension box (EB) in a potentially explosive area to the Ex	
SIWAREX JB junction box, stainless steel housing	7MH4 710-1BA	interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath,	
for connecting up to 4 load cells in parallel		approx. 10.8 mm outer diameter, for ambient temperature	
Ex interface, type SIWAREX Pi	7MH4 710-1EA	-40 +80 °C	
With UL and FM approvals, but without ATEX approval for intrinsically-safe connection of load cells, suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules. Not approved for use in the EU.	7MH4 710-5AA	Cable LiYCY 4 x 2 x 0.25 mm ² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	7MH4 407-8BD0
Manual for Ex interface type SIWAREX Pi	C71000-T5974-C29		
Ex interface, type SIWAREX IS			
With ATEX approval, but without UL and FM approvals for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.	714114 740 5704		
 With short-circuit current 199 mA DC With short-circuit current 	7MH4 710-5BA 7MH4 710-5CA		
< 137 mA DC	7		

I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

SIWAREX FTC

Overview



SIWAREX FTC weighing module

The SIWAREX FTC (Flexible Technology for Continuous Weighing) is a versatile and flexible weighing module for conveyor scales, loss-in-weigh scales and bulk flow meters. It can also be used to record weights and measure force. The SIWAREX FTC function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

SIWAREX FTC	
Use in automation systems	
S7-300	Directly or via ET 200M
S7-400 (H)	Via ET 200M
PCS 7 (H)	Via ET 200M
Communication interfaces	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
Module parameterization	Using SIMATIC S7
	Using SIWATOOL FTC software (RS 232)
Measuring properties	
Accuracy to EN 45501	$3 \times 6000 \text{ d} \ge 0.5 \mu\text{V/e}$
Internal resolution	+/- 8 million parts
Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 20 Hz), mean-value filter

SIWAREX FTC	
Weighing functions	
	Non-automatic weighing
	machine, force measurement
	Conveyor scale
	 Differential proportioning weigher
	Bulk flow meter
Load cells	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
Supply voltage $U_{\mathbb{S}}$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	50.0
• R _{Lmin}	> 56 Ω > 87 Ω with Ex interface
• R _{Lmax}	≤ 4010 Ω
Max. distance of load cells	
When using the recommended cable:	
Standard	1000 m
In hazardous area ¹⁾	
For gases of group IIC For gases of group IIP	300 m
For gases of group IIB Connection to load cells in	1000 m
Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL _{US} Haz. Loc.
Power supply	
Rated voltage	24 V DC
Max. current consumption	500 mA
Current consumption from backplane bus	Typ. 55 mA
Inputs/outputs	
Digital inputs	7 DI electrically isolated
Digital outputs	8 DO electrically isolated
Counter input	Up to 10 kHz
Analog output	
Current rangeUpdating rate	0/4 20 mA 100 Hz
Degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{\text{min (IND)}} \dots T_{\text{max (IND)}}$ (operating temperature)	
Vertical installation	-10 60 °C
Horizontal installation	-10 40 °C
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions	80 x 125 x 130 mm
Weight	600 g
4)	

¹⁾ For further details, see Ex interface, type SIWAREX IS

SIWAREX FTC

Ordering data	Order No.		Order No.
SIWAREX FTC Weighing electronics for S7-300 and ET 200M. Applications: Belt scales, force measurement, loss-in-weight scales and bulk flow meters	7MH4 900-3AA01	SIWAREX FTC_L configuration package for SIMATIC S7 on CD-ROM (bulk flow meter, loss-in-weight feeder) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7	7MH4 900-3AK02
SIWAREX FTC_B Manual for belt scales • Available in a range of languages Free download from the Internet at: www.siemens.com/weighing-technology SIWAREX FTC_L Manual for		"Getting started" for bulk flow meters "Getting started" for loss-in-weight feeders Commissioning software SIWATOOL_L for bulk flow meters and loss-in-weight feeders Manual	
bulk flow meters and loss-in- weight scales • Available in a range of languages Free download from the Internet at: www.siemens.com/weighing- technology SIWAREX FTC "Getting started" for belt scales Sample software shows		SIWAREX FTC_B configuration package for PCS 7 V6.x on CD-ROM (belt scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Commissioning software SIWATOOL FTC_B for belt scales • Manual	7MH4 900-3AK61
beginners how to program the scales in STEP 7 for belt scale mode Free download from the Internet at: www.siemens.com/weighing-technology SIWAREX FTC "Getting started" for bulk flow meters		SIWAREX FTC_B configuration package for PCS 7 V7.0 on CD-ROM (belt scale) HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 Function block for CFC Faceplate Commissioning software	7MH4 900-3AK63
Sample software shows beginners how to program the scales in STEP 7 for bulk flow meter mode Free download from the Internet at: www.siemens.com/weighing-technology		SIWATOOL FTC_B for belt scales Manual SIWAREX FTC_L configuration package for PCS 7 V7.0 and V7.1 on CD-ROM (loss-in-	7MH4 900-3AK64
SIWAREX FTC "Getting started" for loss-in-weight scales Sample software shows beginners how to program the scales in STEP 7 for loss-in-weight scale mode Free download from the Internet at: www.siemens.com/weighing-technology		weight feeder) HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 Function block for CFC Faceplate Commissioning software SIWATOOL FTC_L for bulk flow meters and loss-in-weight feeders Manual	
SIWAREX FTC_B configuration package for SIMATIC S7 on CD-ROM (belt scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • "Getting started" for belt scales • Commissioning software SIWATOOL FTC_B for belt scales • Manual	7MH4 900-3AK01	SIWATOOL connecting cable from SIWAREX FTC with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long • 5 m long 40-pin front plug with screw contacts (required for each SIWAREX module), alternatively with spring-loaded contacts	7MH4 702-8CA 7MH4 702-8CB 6ES7 392-1AM00-0AA0

SIWAREX FTC

Ordering data	Order No.		Order No.
40-pin front plug with	6ES7 392-1BM01-0AA0	Ex interface, type SIWAREX Pi	7MH4 710-5AA
spring-loaded contacts (required for each SIWAREX module), alternatively with screw contacts		With UL and FM approvals, but without ATEX approval for intrinsically-safe connection of load cells,	
Shield contact element Sufficient for one SIWAREX FTC module	6ES7 390-5AA00-0AA0	suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules.	
Shield connection terminal	6ES7 390-5CA00-0AA0	Not approved for use in the EU. Manual for Ex interface type	C71000-T5974-C29
Contents: 2 units (suitable for cable with diameter 4 13 mm)		SIWAREX PI	
Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface		Ex interface, type SIWAREX IS With ATEX approval, but without UL and FM approvals for intrinsically-safe connection of load cells, including manual,	
S7 DIN rail 160 mm 480 mm 530 mm 830 mm 2000 mm	6ES7 390-1AB60-0AA0 6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0 6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0	suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU. With short-circuit current < 199 mA DC With short-circuit current	7MH4 710-5BA 7MH4 710-5CA
PS 307 load power supply		< 137 mA DC	
(only required if 24 V DC is not available) 120/230 V AC; 24 V DC • PS 307-1B; 2 A	6ES7 307-1BA00-0AA0	Cable (optional) Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath	7MH4 702-8AG
PS 307-1E; 5 APS 307-1K; 10 A	6ES7 307-1EA00-0AA0 6ES7 307-1KA00-0AA0	to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the	
MMC memory for data recording up to 16 MB	6ES7 953-8LG11-0AA0	junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying,	
Remote display (optional) The Siebert S102 and S302 remote digital display can be directly connected to the		occasional bending permitted, 10.8 mm outer diameter, for ambient temperature - 40 +80 °C	
silwAREX FTC via an RS 485 interface (not suitable for mode "Belt scale").		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath	7MH4 702-8AF
Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: www.siebert.de Detailed information available from manufacturer.		to connect the junction box (JB) or extension box (EB) in a potentially explosive area to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -	
SIWAREX JB junction box,	7MH4 710-1BA	40 +80 °C	7MU4 407 9DD9
aluminium housing for connecting up to 4 load cells in parallel, and for connecting several junction boxes		for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	7MH4 407-8BD0
SIWAREX JB junction box, stainless steel housing	7MH4 710-1EA		
for connecting up to 4 load cells in parallel			

I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

SIFLOW FC070

Overview



SIFLOW FC070 is based on the latest developments within the digital processing technology – engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain.

SIFLOW FC070 is available in two versions:

- SIFLOW FC070 Standard
- SIFLOW FC070 Ex

The SIFLOW FC070 transmitter delivers true multi-parameter measurements i.e. mass flow, volume flow, density, temperature and fraction.

SIFLOW FC070 is designed for integration in a variety of automation systems, i.e.:

- Central mounted in S7-300, C7
- Decentralized in ET 200M for use with S7-300 and S7-400 as PROFIBUS DP masters
- Decentralized in ET 200M for use with any automation system using standardized PROFIBUS DP masters
- Stand-alone via a Modbus RTU master, i.e. SIMATIC PDM

The SIFLOW FC070 transmitter can be connected to all sensors of types MASS 2100, MC2, FCS200 and FC300.

Measurement of	Mass flow, volume flow, density,	Digital output 1 and 2	
	sensor temperature, fraction A flow, fraction B flow, fraction A in %	Functions	 Output 1: Pulse, frequency, quadrature pulse, quadrature frequency
Measurement functions			2-stage batch, batch
• Totalizer 1	Totalization of mass flow, volume flow, fraction A, fraction B		 Output 2: Quadrature pulse, quadrature frequency, 2-stage batch
• Totalizer 2	Totalization of mass flow, volume flow, fraction A, fraction B	Voltage supply	3 30 V DC (passive output)
 Single and 2-stage batch function 	Batching function with the use of one or two outputs for dosing in	Switching current	Max. 30 mA at 30 V DC
	high and low speed	Voltage drop	≤ 3 V DC at max. current
4 programmable limits	4 programmable high/low limits for mass flow, volume flow, density, sensor temperature,	Leakage current	≤ 0.4 mA at max. voltage 30 V DC
	fraction A flow, fraction B flow,	Load resistance	1 10 kΩ
	fraction A in %. Limits will generate an alarm if reached.	Switching frequency	0 12 kHz 50 % duty cycle
Digital input		Functions	Pulse, frequency, quadrature pulse, quadrature frequency
Functions	Start batch, stop batch, start/stop batch, hold/continue batch, reset totalizer 1, reset totalizer 2, reset totalizer 1 and 2, zero adjust, force frequency output, freeze frequency output		2-stage batch, batch
		Communication	
		Modbus RS 232C	Max. baudrate: 115 200 baudMax. line length: 15 m at 115 200 baud
	 Nominal voltage: 24 V DC Lower limit: 15 V DC 		 Signal level: according to EIA-RS 232C
	Upper limit: 30 V DCCurrent: 2 15 mA	Modbus RS 485	Max. baudrate: 115 200 baudMax. line length: 1200 m at
Low signal	 Nominal voltage: 0 V DC Lower limit: -3 V DC Upper limit: 5 V DC Current: -15 15 mA 		 115 200 baud Signal level: according to EIA-RS 485 Bus termination: Integrated. Can be enabled by inserting
Input	Approx. 10 kΩ		wire jumpers.
Switching	Max. 100 Hz	Galvanic isolation	All inputs, outputs and communication interfaces are galvanically isolated. Isolation voltage: 500 V.

SIFLOW FC070

Power	
Supply	24 V DC nominal
Tolerance	20.4 V DC 28.8 V DC
Consumption	Max. 6 W
Fuse	T1 A/125 V, not replaceable by operator
Ambient conditions	
Ambient temperature	 Storage -40 °C +70 °C (-40 °F +158 °F) Operation 0 °C +60 °C (32 °F 140 °F)
Operation conditions	Horizontally mounted rail. For vertically mounted rail, the maximum operating temperature is +45 °C (+113 °F).
Height	Operation: -1000 2000 m (pressure 795 1080 hPa)
Enclosure	
Material	Noryl, color: anthracite
Rating	IP20/NEMA 2 according to IEC 60529
Mechanical load	According to SIMATIC standards (S7-300 devices)

Approvals	
SIFLOW FC070 Standard	CE, C-UL, ATEX II 3G EEx nA IIC
SIFLOW FC070 Ex	CE, C-UL, UL Haz.Loc., FM, ATEX II 3 G EEx nA II T4 and II (1) G [EEx ia] IIC
Electromagnetic compatibility	Requirements of EMC law; Noise immunity according to IEC 61000-6-2, tested according to: IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6 Emitted interference according to EN 50081-2, tested according to: EN 55011, class A, group 1
NAMUR	Within the limits according to "General requirements" with error criteria A in accordance with NE21
Programming tools	
SIMATIC S7	Configuration trough backplane P-BUS and PLC program
SIMATIC PCS7	Configuration trough backplane P-BUS and PLC/WinCC faceplates
SIMATIC PDM	Through Modbus port RS 232C and RS 485

SIFLOW FC070

Ordering data	Order No.		Order No.
SIFLOW FC070 flow transmitter Remember to order 40 pin front plug connector.	7ME4 120-2DH20-0EA0	SIMATIC S7-300 rail The mechanical mounting rack of the SIMATIC S7-300 • 160 mm (6.3")	6ES7 390-1AB60-0AA0
40 pin front plug with screw contacts	6ES7 392-1AM00-0AA0	• 482 mm (18.9")	6ES7 390-1AE80-0AA0
40 pin plug with spring contacts	6ES7 392-1BM01-0AA0	• 530 mm (20.8")	6ES7 390-1AF30-0AA0 6ES7 390-1AJ30-0AA0
SIFLOW FC070 Ex flow transmitter Remember to order 20 pin front	7ME4 120-2DH21-0EA0	• 830 mm (32.7") • 2000 mm (78.7")	6ES7 390-1BC00-0AA0
plug connector.		Shield connecting element - For mounting on S7-300 rail.	6ES7 390-5AA00-0AA0
20 pin front plug with screw contacts	6ES7 392-1AJ00-0AA0	80 mm wide with 2 rows for 4 shield terminal elements each	
20 pin plug with spring contacts	6ES7 392-1BJ00-0AA0	(no shield terminal elements included)	
Accessories		Shield terminal element for	6ES7 390-5BA00-0AA0
Cable with multiplug for connecting MASS 2100, FCS200 and FC300 sensors		1 cable with 3 to 8 mm in dia. 2 units	
• 5 m (16.4 ft)	FDK:083H3015	Shield terminal element for 1 cable with 4 to 13 mm in dia.	6ES7 390-5CA00-0AA0
• 10 m (32.8 ft)	FDK:083H3016	2 units	
• 25 m (82 ft)	FDK:083H3017	SIFLOW FC070 Demo suitcase	A5E01075465
• 50 m (164 ft)	FDK:083H3018	Power supply	6ES7 307-1BA00-0AA0
• 75 m (246 ft)	FDK:083H3054	Operating instructions for SITRANS F C SIFLOW FC070	
• 150 m (492 ft)	FDK:083H3055	• English	A5E00924779
Cable without multiplug for connecting MC2 sensors		German	A5E00924776
• 10 m (32.8 ft)	FDK:083H3001	Operating instructions for SITRANS F C SIFLOW FC070	
• 25 m (82 ft)	FDK:083H3002	with S7	
• 75 m (246 ft)	FDK:083H3003	• English	A5E02254228
• 150 m (492 ft)	FDK:083H3004	German	A5E02665536
		• French	A5E02591639

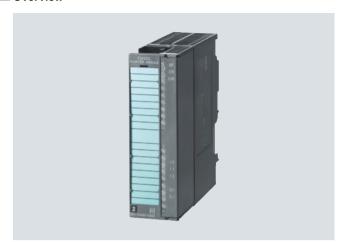
This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at: www.siemens.com/flowdocumentation

SIPLUS function modules

SIPLUS FM 350-1 counter module

Overview



- Single-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 definable comparison values
- Integrated digital outputs for output of the response on reaching the comparison value
- · Operating modes:
 - Continuous counting
 - Single count
 - Periodic count
- Special functions:
- Set counterLatch counter
- Start/stop counter by gate function

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS FM 350-1	SIPLUS FM 350-1			
Order No.	6AG1 350-1AH03- 2AE0	6AG1 350-1AH03- 2AY0		
Order No. based on	6ES7 350-1AH03- 0AE0	6ES7 350-1AH03- 0AE0		
Ambient temperature range	-25 +60 °C	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions.			
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	No Yes			
Ambient conditions				
Relative humidity	5 100%, condensation allowed			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m), see ambient temperature range 795658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000m) derating 20 K			

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOx < 5.2 ppm

 Threshold/ limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOx < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS FM 350-1 counter module	
(extended temperature range and medial exposure)	
with 1 channel, max. 500 kHz; for incremental encoder	
without conformity to EN 50155	6AG1 350-1AH03-2AE0
Conformity to EN 50155	6AG1 350-1AH03-2AY0
Accessories	See SIMATIC S7-300 FM 350-1 counter module, page 5/175

SIMATIC S7-300 SIPLUS function modules

SIPLUS FM 350-2 counter module

Overview



- · 8-channel intelligent counter module for universal counting and measuring tasks
- For the direct connection of 24 V incremental encoders, directional encoders, initiators or NAMUR encoders
- Comparison function with predefined benchmarks (number depending on operating mode)
- Integrated digital outputs for the reaction outcome upon reaching the benchmark
- Operating modes:
 Infinity / Once / Periodic counting
 - Frequency and speed control
 - Period measurement
 - Dose

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS FM 350-2 counter module	
Order number	6AG1 350-2AH01-4AE0
Order number based on	6ES7 350-2AH01-0AE0
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	0 +60 °C
Ambient conditions	Suitable for extraordinary medial exposure (e.g. chlorine sulfur atmosphere)
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100%, condensation allowed
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold, fungus, and sponge spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temper- ature range specified)	1080795 hPa (-1000 +2000 m) see ambient temperature range 795658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K
41	

- I) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm;
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Technical documentation on SIPLUS is available under:

www.siemens.com/siplus-extreme

Ordering data	(Order No.
SIPLUS FM 350-2 counter module	Н	6AG1 350-2AH01-4AE0
(medial exposure)		
With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configu- ration package and electronic documentation on CD		
Accessories		See SIMATIC FM 350-2 counter module, page 5/177

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

SIMATIC S7-300 SIPLUS function modules

SIPLUS SIWAREX U

Overview



SIPLUS electronic weighing system SIWAREX U

SIPLUS SIWAREX U is a flexible weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIPLUS automation systems without any problems.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SIWAREX U electronic weighing system		
Order No.	6AG1 950-2AA01-4AA0	
Order No. based on	7MH4 950-2AA01	
Range of ambient temperature	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100%, condensation allowed	

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SIWAREX U	6AG1 950-2AA01-4AA0
(medial exposure)	
Electronic weighing system for SIMATIC S7 and ET 200M, incl. bus connector	
Accessories	see SIWAREX U, page 5/209

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-300 SIPLUS function modules

SIPLUS DCF 77 radio clock module

Overview



This module can be used to synchronize the real-time clock of the SIMATIC S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC and SIPLUS together with a software driver included in the scope of delivery (function block FB). The function blocks are available on the Internet for downloading.

www.siemens.com/siplus - Support - Tools and Downloads!

Technical specifications

SIPLUS DCF 77 radio clock module		
Radio frequency	77.5 Hz	
Power supply	24 V DC (20.4 to 28.8 DC)	
Power consumption, typ.	50 mA	
Dimensions (W x H x D)	75 mm x 125 mm ¹⁾ x 75 mm	

Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

Ordering data

Order No.

SIPLUS DCF 77 radio clock

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig

6AG1 057-1AA03-0AA0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Special modules

SM 374 simulator

Overview



- Simulator module for program testing during commissioning and ongoing operation
- For the simulation of sensor signals using switches
- For display of signal conditions on the outputs using LED
- Simulation of
 - 16 inputs or
 - 16 outputs or
 - 8 inputs and 8 outputs
- Function can be directly adjusted on the module using a screwdriver

Technical specifications

	6ES7 374-2XH01-0AA0
Current consumption	
from backplane bus 5 V DC, max.	80 mA
Power losses	
Power loss, typ.	0.35 W
Digital inputs	
Number of digital inputs	16; Switch
Digital outputs	
Number of digital outputs	16; LEDs
Galvanic isolation	
Galvanic isolation digital inputs	
between the channels and the	No
backplane bus	

	6ES7 374-2XH01-0AA0
Galvanic isolation digital outputs • between the channels and the backplane bus	No
Dimensions and weight Dimensions • Width • Height • Depth	40 mm 125 mm 120 mm
Weight • Weight, approx.	190 g

Order No.
6ES7 374-2XH01-0AA0
6ES7 390-0AA00-0AA0
6ES7 392-2XX00-0AA0
6ES7 392-2XY00-0AA0
2XV9 450-1SL03-0YX0
2XV9 450-1SL03-0YX4

	Order No.
Labeling sheets for machine inscription	
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	6ES7 392-2AX00-0AA0
light-beige	6ES7 392-2BX00-0AA0
yellow	6ES7 392-2CX00-0AA0
red	6ES7 392-2DX00-0AA0

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-300 Special modules

DM 370 placeholder module

Overview



- Dummy module for reserving slots for non-parameterized signal modules
- Structure and address allocation is retained when replaced with a signal module

Technical specifications

	6ES7 370-0AA01-0AA0
Current consumption	
from backplane bus 5 V DC, max.	5 mA
Power losses	
Power loss, max.	0.03 W
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0

	6ES7 370-0AA01-0AA0
Dimensions and weight	
Dimensions	
• Width	40 mm
Height	125 mm
• Depth	120 mm
Weight	
Weight, approx.	180 g

Ordering data		Order No.
DM 370 dummy module	Ī	6ES7 370-0AA01-0AA0
incl. bus connectors, labeling strips		
Bus connectors		6ES7 390-0AA00-0AA0
1 unit, spare part		
Labeling strips		6ES7 392-2XX00-0AA0
10 units (spare part)		
Label cover	Ī	6ES7 392-2XY00-0AA0
10 units (spare part)		
S7 SmartLabel V3.0	Ī	
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license J	J	2XV9 450-1SL03-0YX0
Upgrade single license J	J	2XV9 450-1SL03-0YX4

	Order No.
Labeling sheets for machine inscription	
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	6ES7 392-2AX00-0AA0
light-beige	6ES7 392-2BX00-0AA0
yellow	6ES7 392-2CX00-0AA0
red	6ES7 392-2DX00-0AA0

J: Subject to export regulations AL: N and ECCN: EAR99S

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Communication

CP 340

Overview



- The economical complete solution for serial communication via point-to-point links.
- 3 versions with different transmission interfaces:
 RS 232C (V.24)
 20 mA (TTY)
 RS 422/RS 485 (X.27)
- Implemented protocols:
 - ASCII
 - 3964 (R) (not for RS 485)
 - Printer driver
- Simple parameterization via a parameterization tool integrated into STEP 7

	6ES7 340-1AH02-0AE0	6ES7 340-1BH02-0AE0	6ES7 340-1CH02-0AE0
Supply voltages			
Rated value			
• 24 V DC	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V
Current consumption			
From backplane bus 5 V DC, max.	165 mA	190 mA	165 mA
Power losses			
Power loss, typ.	0.6 W	0.85 W	0.6 W
Power loss, max.	0.85 W	0.95 W	0.85 W
nterfaces			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Interface physics, 20 mA (TTY)		Yes	
Interface physics, RS 232C (V.24)	Yes		
Interface physics, RS 422/RS 485 (X.27)			Yes
Transmission rate, max.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Transmission speeds, min.	2.4 kbit/s	2.4 kbit/s	2.4 kbit/s
Connection method			
PtP	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
Power supply	over backplane bus	over backplane bus	over backplane bus
Point-to-point			
Cable length, max.	15 m	1 000 m; (100 m active, 1000 m passive)	1 200 m
Supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined
ntegrated protocol driver			
3964 (R)	Yes	Yes	Yes
ASCII	Yes	Yes	Yes
customer-specific drivers reloadable	No	No	No
• RK512	No	No	No
Telegram length, max.			
• 3964 (R)	1 024 byte	1 024 byte	1 024 byte
• ASCII	1 024 byte	1 024 byte	1 024 byte

SIMATIC S7-300 Communication

CP 340

	6ES7 340-1AH02-0AE0	6ES7 340-1BH02-0AE0	6ES7 340-1CH02-0AE0
Transmission speed, 20 mA (TTY) • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max.,		19.2 kbit/s 9.6 kbit/s 9.6 kbit/s	
Transmission speed, RS 422/485 • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max.,			19.2 kbit/s 9.6 kbit/s 9.6 kbit/s
Transmission speed, RS232 • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max.,	19.2 kbit/s 9.6 kbit/s 9.6 kbit/s		
Software Block • FB length in RAM, max.	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving
Dimensions and weight Dimensions • Width • Height • Depth	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm
Weight • Weight, approx.	300 g	300 g	300 g

Ordering data	Order No.		Order No.
CP 340 communication processor	6ES7 340-1AH02-0AE0	CP 340 communication processor	6ES7 340-1CH02-0AE0
With one RS 232 C (V.24) interface		With one RS 422/485 (X.27) interface	
RS 232 connecting cable		RS 422/485 connecting cable	
For linking to SIMATIC S7		For linking to SIMATIC S7	
5 m	6ES7 902-1AB00-0AA0	5 m	6ES7 902-3AB00-0AA0
10 m	6ES7 902-1AC00-0AA0	10 m	6ES7 902-3AC00-0AA0
15 m	6ES7 902-1AD00-0AA0	50 m	6ES7 902-3AG00-0AA0
CP 340 communication processor	6ES7 340-1BH02-0AE0		
With one 20 mA (TTY) interface			
20 mA (TTY) connecting cable			
For linking to SIMATIC S7			
5 m	6ES7 902-2AB00-0AA0		
10 m	6ES7 902-2AC00-0AA0		
50 m	6ES7 902-2AG00-0AA0		

Communication

CP 341

Overview



- For quick, high-performance data exchange via point-to-point coupling
- 3 versions with different transmission physics:
 RS 232C (V.24),
 20 mA (TTY),
 RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512
- The following protocols can also be loaded: Modbus RTU
- Easy configuration using a parameterizing tool integrated in STEP 7

	6ES7 341-1AH02-0AE0	6ES7 341-1BH02-0AE0	6ES7 341-1CH02-0AE0
Product type designation	CP341 V2 RS232	CP341 V2 TTY	CP341 V2 RS422/485
Supply voltages			
Rated value			
• 24 V DC	Yes	Yes	Yes
Current consumption			
rom backplane bus 5 V DC, max.	70 mA	70 mA	70 mA
rom supply voltage L+, max.	100 mA	100 mA	100 mA
Power losses			
Power loss, typ.	1.6 W	1.6 W	1.6 W
Power loss, max.	2.4 W	2.4 W	2.4 W
Interfaces			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
nterface physics, 20 mA (TTY)		Yes	
nterface physics, RS 232C (V.24)	Yes		
Interface physics, RS 422/RS 485 (X.27)			Yes
ransmission rate, max.	115.2 kbit/s	19.2 kbit/s	115.2 kbit/s
ransmission speeds, min.	0.3 kbit/s	0.3 kbit/s	0.3 kbit/s
Connection method			
PtP	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
Power supply	3 screw terminals: L+, M, GND	3 screw terminals: L+, M, GND	3 screw terminals: L+, M, GND
Point-to-point			
Cable length, max.	15 m	1 000 m	1 200 m
Supported printers	Serial printers	Serial printers	Serial printers
ntegrated protocol driver			
3964 (R)	Yes	Yes	Yes; not with RS 485
ASCII	Yes	Yes	Yes
RK512	Yes	Yes	Yes; not with RS 485
Telegram length, max.			
3964 (R)	4 096 byte	4 096 byte	4 096 byte
ASCII	4 096 byte	4 096 byte	4 096 byte
RK 512	4 096 byte	4 096 byte	4 096 byte

CP 341

	6ES7 341-1AH02-0AE0	6ES7 341-1BH02-0AE0	6ES7 341-1CH02-0AE0
Transmission speed, 20 mA (TTY) • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max., • with RK 512 protocol, max.		19.2 kbit/s 19.2 kbit/s 19.2 kbit/s 19.2 kbit/s	
Transmission speed, RS 422/485 • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max., • with RK 512 protocol, max.			115.2 kbit/s 115.2 kbit/s 115.2 kbit/s 115.2 kbit/s
Transmission speed, RS232 • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max., • with RK 512 protocol, max.	115.2 kbit/s 115.2 kbit/s 115.2 kbit/s 115.2 kbit/s		
Software			
FB length in RAM, max.	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving
Dimensions and weight Dimensions • Width • Height • Depth	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm	40 mm 125 mm 120 mm
Weight • Weight, approx.	300 g	300 g	300 g

Ordering data	Order No.		Order No.
CP 341 communication processor	6ES7 341-1AH02-0AE0	CP 341 communication processor	6ES7 341-1CH02-0AE0
With one RS 232 C (V.24) interface		With one RS 422/485 (X.27) interface	
RS 232 connecting cable		RS 422/485 connecting cable	
For linking to SIMATIC S7		For linking to SIMATIC S7	
5 m	6ES7 902-1AB00-0AA0	5 m	6ES7 902-3AB00-0AA0
10 m	6ES7 902-1AC00-0AA0	10 m	6ES7 902-3AC00-0AA0
15 m	6ES7 902-1AD00-0AA0	50 m	6ES7 902-3AG00-0AA0
CP 341 communication processor	6ES7 341-1BH02-0AE0	Loadable drivers for CP 341	
With one 20 mA (TTY) interface		Modbus master (RTU format) • Single license	6ES7 870-1AA01-0YA0
20 mA (TTY) connecting cable		Single license, without software or documentation	6ES7 870-1AA01-0YA1
For linking to SIMATIC S7			
5 m	6ES7 902-2AB00-0AA0	Modbus slave (RTU format) • Single license	6ES7 870-1AB01-0YA0
10 m	6ES7 902-2AC00-0AA0	Single license, without software	6ES7 870-1AB01-0YA1
50 m	6ES7 902-2AG00-0AA0	or documentation	

Communication

Loadable drivers for CP 441-2 and CP 341

Overview

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7 441-2AA04-0AE0)

Parameterization software	Loadable drivers for CP 441-2 and CP 341
Type of license	Simple license, copy license
Target system	SIMATIC CP 341, SIMATIC CP 441-2

Technical specifications	Modbus Master
	Modbus protocol with RTU format
	Master/slave coupling: SIMATIC S7 is master
	• Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11,12,15,16
	 No V.24 control and signal lines
	• CRC polynomial: $x^{16} + x^{15} + x^2 + 1$
	 Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire
	 Receive mailbox specified on BRCV
	 Character delay time 3.5 characters or multiple thereof
	Broadcast message possible
Adjustable parameters	 Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
	Character frame
	 With/without RS 485 operation for 2-wire connections
	 With/without modem operation (ignore smudge characters)
	 Response monitoring time 100 ms to 25.5 s in steps of 100 ms
	• Factor for the character delay time 1-10
	 Default setting of receive line when using the X.27 interface module

Medhua alaya
Modbus slave
Modbus protocol with RTU format
 Master/slave coupling: SIMATIC S7 is slave
• Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16
 No V.24 control and signal line
• CRC polynomial: $x^{16} + x^{15} + x^2 + 1$
 Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire
Communications FB 180, instance DB 180 (use of a multi-instance)
 Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters
Character delay time 3.5 characters or multiple thereof
Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
Character frame
 Slave address of CP (1 to 255)
With/without RS 485 operation for 2-wire connection
 With/without modem operation (ignore smudge characters)
 Factor for the character delay time 1-10
 Number of work DB (for FB processing)
 Enabling of memory areas for writing by the master
Default setting of receive line when using the X.27 interface module
Conversion of Modbus addresses to S7 data areas

Loadable drivers for CP 441-2 and CP 341

Ordering data	Order No.		Order No.
Modbus Master V3.1		SIMATIC manual collection J	6ES7 998-8XC01-8YE0
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as master Requirements: CP 341 or CP 441-2; STEP 7 V4.02 and higher Type of delivery: Driver program/documentation, English, German, French		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC S0ftware, SIMATIC	
Single license	6ES7 870-1AA01-0YA0	TDC	
Single license, without software and documentation	6ES7 870-1AA01-0YA1	SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
Modbus Slave V3.1		Current "Manual Collection" DVD and the three subsequent	
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as slave Requirements: CP 341 or CP 441-2; STEP 7 V4.02 and higher Type of delivery: Driver program/ documentation, English, German, French		updates	
Single license	6ES7 870-1AB01-0YA0		
Single license, without software and documentation	6ES7 870-1AB01-0YA1		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Communication

CP 343-2 P, CP 343-2

Overview



CP 343-2 P

The CP 343-2P is the AS Interface Master for the

SIMATIC S7-300 and the local peripheral ET 200M with comfortable parameterization possibilities.

The CP 343-2 is the basic version of the module.

The CP343-2P / CP 343-2 performs the following features:

- · Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission (all analog profiles)
- Support for all AS Interface Master functions according to
- AS-Interface specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front plate
- Fault indications (e. . AS-Interface voltage fault, configuration fault) by means of LEDs in the front plate
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-i Power24V (from product status 2 / Firmware-Version 3.1) and Standard AS-i (30 V)
- With CP343-2P additionally: Supports the configuration of the AS-Interface-network with STEP 7 V5.2 and higher

Design

The CP343-2P / CP 343-2 is connected like an I/O module to the S7-300. It has:

- two terminal connections for direct connection of the AS-Interface cable
- LEDs in the front plate for indicating the operating state and the readiness for operation of all connected and activated slaves
- Pushbuttons for switching over the operating state and for adopting the existing ACTUAL configuration as the DESIRED configuration

Function

The CP 343-2P / CP 343-2 supports all specified functions of the AS-Interface Specification V3.0.

The CP 343-2P occupies 16 bytes each in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves are saved in this area. The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data record.

If required, master calls can be performed with the command interface FC ASI_3422, e.g. read/write parameters, read/write configuration. The FC including a STEP7 sample program can be downloaded from the Internet at

http://support.automation.siemens.com/WW/view/en/5581657

Configuration

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

With CP 343-2P additionally

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7 V5.2 and higher. Specifying the AS-i configuration in HW-Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

CP 343-2 P, CP 343-2

Technical specifications			
Order No.	6GK7 343-2AH11-0XA0		
Product type description	CP 343-2 P		
Interfaces			
Version of electrical connection of the AS-Interface	S7-300 front connector with terminal connection		
Supply voltage			
Supply voltage from backplane bus	5 V		
Current consumption • from 5 V DC backplane bus, max. • from AS-Interface cable, max.	200 mA 100 mA		
Effective power loss			
Effective power loss	2 W		
Permitted ambient conditions			
Ambient temperature • during operation • during storage • during transport	0 60 °C -40 +70 °C -40 +70 °C		
Maximum relative humidity at 25 °C during operation	95 %		
Design, dimensions and weight			
Module format	S7-300 design		
Width	40 mm		
Height	125 mm		
Depth	120 mm		
Net weight	190 g		
Number of slots required	1		
Standards and specifications			
Version of the AS-Interface specification	V 3.0		
Bus cycle time of the AS-Interface • with 31 slaves • with 62 slaves	5 ms 10 ms		
Performance data			
Data volume • of the address area of the inputs as allocation in the PLC	16 byte		
of the address area of the outputs as allocation in the PLC	16 byte		
Configuration			
Configuration software included in scope of delivery of STEP 7 V5.2 or higher	Yes		

Ordering data	Order No.
CP 343-2 P communication processor	6GK7 343-2AH11-0XA0
for the connection of SIMATIC S7-300 and ET 200M to AS-Interface; configuration of the AS-i network by means of SET-key or via STEP 7 (V5.2 or higher); including manual on CD-ROM (German, English, French, Spanish, Italian); without front plate connector; complies with AS-Interface specification V3.0; dimensions (W x H x D/ mm): 40 x 125 x 120	
CP 343-2 communication processor	6GK7 343-2AH01-0XA0
Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface; configuration of the AS-i network by means of SET-key; incl. manual on CD-ROM (German, English, French, Spanish, Italian); without front connector; complies with AS-Interface specification V3.0; dimensions (W x H x D / mm); 40 x 125 x 120	
Front connector, 20-pin	6ES7 392-1AJ00-0AA0
with screw contacts	
Front connector, 20-pin	6ES7 392-1BJ00-0AA0
with spring terminal	

Communication

CP 342-5

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•	•		•	•	G_K10,XX_10148

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 and the SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)
- Communication services:
 PROFIBUS DP
 PG/OP communication (OP multiplexing)
 S7 communication (client, server)

 - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Order No.	6GK7 342-5DA02-0XE0	
Product type designation	CP 342-5	
Transmission rate		
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s	
Interfaces		
Number of electrical connections • at interface 1 in accordance with PROFIBUS	1	
for power supply	1	
Design of electrical connection • at interface 1 in accordance with PROFIBUS	9-pin D-sub socket (RS485)	
 for power supply 	4-pin terminal strip	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Power supply • 1 from backplane bus • External	5 V 24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	15 %	
Current consumed • from backplane bus at 5 V DC, typical • from external power supply with	0.15 A	
24 V DC - Typical - Maximum	0.25 A	
Effective power loss	6.75 W	

Order No.	6GK7 342-5DA02-0XE0
Product type designation	CP 342-5
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-300 compact module, single-width
Width Height Depth	40 mm 125 mm 120 mm
Net weight	0.3 kg
Type of mounting: S7-300 DIN rail mounting	Yes
Product properties, functions, components in general	
Maximum number of modules per CPU	4
Number of modules - Note	-

CP 342-5

Order No.	6GK7 342-5DA02-0XE0
Product type designation	CP 342-5
Performance data	
Performance data Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	16
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	240 byte
Performance data PROFIBUS DP	
Service as DP master DPV0	Yes
Number of DP slaves operable on DP master	124
Data volume • of address area of inputs as DP master, total	2 160 byte
 of address area of outputs as DP master, total 	2 160 byte
 of address area of inputs per DP slave 	244 byte
 of address area of outputs per DP slave 	244 byte
 of address area of diagnostics data per DP slave 	240 byte
Service as DP slave	V
DPV0DPV1	Yes -
Data volume • of address area of inputs as DP slave, total	240 byte
 of address area of outputs as DP slave, total 	240 byte
Performance data S7 communication	
Maximum number of possible connections for S7 communication	16
Number of possible connections for S7 communication - Note	-
Performance data Multiprotocol operation	
Number of active connections in	
multiprotocol mode • Maximum without DP	32
Maximum with DP	28
Product functions Management, configuration, programming	
Configuration software required	STEP 7 V5.1 SP2 or higher

Communication

CP 342-5 FO

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•	•		•	•	G_K10,XX_10148

- PROFIBUS DP master or slave with optical interface for connecting the SIMATIC S7-300 and the SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)
- Direct connection to the optical PROFIBUS network over the integrated fiber-optic interface for plastic and PCF fiber-optic cables
- Communication services:
 - PROFIBUS DP-V0
 - PG/OP communication (OP multiplexing)

 - S7 communication (client, server) Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Order No.	6GK7 342-5DF00-0XE0	
Product type designation	CP 342-5 FO	
Transmission rate		
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s	
Interfaces		
Number of optical connections at interface 1 in accordance with PROFIBUS	2	
Number of electrical connections for power supply	1	
Design of optical connection at interface 1 in accordance with PROFIBUS	Duplex socket	
Design of electrical connection for power supply	4-pin terminal strip	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Power supply 1 from backplane bus External	5 V 24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	15 %	
Current consumed • from backplane bus at 5 V DC, typical • from external power supply with 24 V DC	0.15 A	
TypicalMaximum	0.25 A -	
Effective power loss	6.75 W	

Order No.	6GK7 342-5DF00-0XE0
Product type designation	CP 342-5 FO
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	Compact module
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Product properties, functions, components General	
Maximum number of modules per CPU	4
Number of modules - Note	-
Cable lengthWith polymer cladded fiber cable, maximum	300 m
 With plastic optical fiber cable, maximum 	50 m

CP 342-5 FO

Technical specifications (conti	inued)	Ordering data	
Order No.	6GK7 342-5DF00-0XE0	CP 342-5 FO communication	6GK7 342-5DF00-0XE0
Product type designation	CP 342-5 FO	processor	
Performance data		 Communication processor for optical connection of SIMATIC 	
Performance data Open communication		S7-300 to PROFIBUS to 12 Mbit/s with electronic manual on CD-ROM	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	16	STEP 7 Version 5.4	
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	240 byte	Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows 2000 Prof./XP Prof. Type of delivery: German,	
Performance data PROFIBUS DP		English, French, Spanish, Italian;	
Service as DP master DPV0	Yes	incl. 3.5" authorization diskette, without documentation	
Number of DP slaves operable on DP master	124	Floating license on CD Rental license for 50 hours	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6
Data volume ■ of address area of inputs as DP master, total	2 160 byte	Software Update Service on CD (requires current software version)	6ES7 810-4BC01-0YX2
of address area of outputs as DP master, total	2 160 byte	 Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD 	6ES7 810-4CC08-0YE5
of address area of inputs per DP slave	244 byte	 Trial License STEP 7 V5.4; on CD, runs for 14 days 	6ES7 810-4CC08-0YA7
of address area of outputs per DP slave	244 byte	Manual for PROFIBUS networks	
 of address area of diagnostics 	240 byte	Paper version	
data per DP slave		Network architecture, components (OLM (V3), OBT, ILM),	
Service as DP slave DPV0	Yes	configuring and installation	
DPV1	-	• German	6GK1 970-5CA20-0AA0
Data volume		• English	6GK1 970-5CA20-0AA1
• of address area of inputs as DP slave, total	240 byte	PROFIBUS Plastic Fiber Optic, Simplex connector/polishing set	6GK1 901-0FB00-0AA0
 of address area of outputs as DP slave, total 	240 byte	100 simplex connectors and 5 polishing sets for assembling	
Performance data S7 communi- cation		PROFIBUS plastic fiber optic cables for the optical PROFIBUS	
Maximum number of possible connections for S7 communication	16	PROFIBUS Plastic Fiber Optic,	6GK1 905-6PA10
Number of possible connections or S7 communication - Note	-	stripping tool set Tools for removing the outer	
Performance data Multiprotocol operation		sheath or core sheath of Plastic Fiber Optic cables	
Number of active connections in		Plug-in adapter	6ES7 195-1BE00-0XA0
multiprotocol mode	00	For assembling the plastic	
Maximum without DPMaximum with DP	32 28	Simplex connector in combination with CP 342-5 FO, IM 467 FO,	
Product functions Management,	20	IM 153-2 FO and IM 151 FO 50 units	
Configuration, programming Configuration software required	STEP 7 V5.1 SP2 or higher	30 3	
Johnguration Software required	STEF / VO. 1 SFZ OF HIGHER		

I: Subject to export regulations AL: N and ECCN: EAR99H

Communication

CP 343-5

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
		•	•	•	6. K10.XX, 10148

Connection of SIMATIC S7-300 and SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)

- Communication services:
 - PG/OP communication
 - S7 communication
 - Open communication (SEND/RECEIVE)
- PROFIBUS FMS
- Easy configuration and programming over PROFIBUS
- Can be easily integrated into the S7-300 system
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Order No.	6GK7 343-5FA01-0XE0	
Product type designation	CP 343-5	
Transmission rate		
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s	
Interfaces		
Number of electrical connections • at interface 1 in accordance with PROFIBUS	1	
 for power supply 	1	
Design of electrical connection • at interface 1 in accordance with PROFIBUS	9-pin D-sub socket (RS485)	
 for power supply 	4-pin terminal strip	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Power supply 1 from backplane bus External	5 V 24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	15 %	
Current consumed • from backplane bus at 5 V DC, typical • from external power supply with	0.15 A	
24 V DC - Typical	0.25 A	
- Maximum	-	
Effective power loss	6.75 W	

Order No.	6GK7 343-5FA01-0XE0
Product type designation	CP 343-5
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-300 compact module, single-width
Width Height Depth	40 mm 125 mm 120 mm
Net weight	0.3 kg
Type of mounting: S7-300 DIN rail mounting	-
Product properties, functions, components General	
Maximum number of modules per CPU	4
Number of modules - Note	-

CP 343-5

Technical specifications (conti	nued)	Ordering data	Oı
Order No.	6GK7 343-5FA01-0XE0	CP 343-5 communication	
Product type designation	CP 343-5	processor	
Performance data		Communication processor for connection of S7-300 to	
Performance data Open communication		PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	16	CD-RÓM STEP 7 Version 5.4	
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	240 byte	Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows 2000 Prof./XP Prof. Type of delivery: German,	
Performance data FMS functions		English, French, Spanish, Italian;	
Number of possible connections with FMS connection, maximum	16	incl. 3.5" authorization diskette, without documentation	
Data volume of variables • Maximum with READ request • Maximum with WRITE and REPORT requests	237 byte 233 byte	 Floating license on CD Rental license for 50 hours Software Update Service on CD (requires current software version) 	
Number of variables • Configurable from server to FMS partner • Loadable from server onto FMS	256 256	 Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD Trial License STEP 7 V5.4; on CD, runs for 14 days 	
partner	200	RS485 PROFIBUS FastConnect	
Performance data S7 communication		bus connector	
Maximum number of possible connections for S7 communication	16	With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
Number of possible connections for S7 communication - Note	-	Without PG interfaceWith PG interface	_
Performance data Multiprotocol operation		PROFIBUS bus connector IP20 With connection to PPI, MPI,	
Number of active connections in multiprotocol mode	48	With Collinear to PFI, MPI, PROFIBUS Without PG interface With PG interface	
Product functions Management, configuration, programming		12M PROFIBUS bus terminal	
Configuration software required	STEP 7 V5.1 SP3 and higher and NCM S7 for PROFIBUS	Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	
		SIMATIC S7-300 DM 370	ł
		Dummy module; used for module replacement	

Communication

CP 343-1 Lean

Overview



Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE) and PROFINET communication.

Communication processor for connecting the SIMATIC S7-300 powerline to Industrial Ethernet networks, also as a PROFINET IO device.

ISO TCP/ PN MRP IT IP-R PG/OP S7/S5

Order No.	6GK7 343-1CX10-0XE0	
	CP 343-1 Lean	
Transmission rate		
Transmission rate at interface 1	10 100 Mbit/s	
Interfaces		
Number of electrical connections • at interface 1 in accordance with Industrial Ethernet	2	
for power supply	1	
Design of electrical connection • at interface 1 in accordance with Industrial Ethernet	RJ45 port	
for power supply	2-pin plug-in terminal strip	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Power supply 1 from backplane bus External	5 V 24 V	
Relative positive tolerance at 24 V DC	20 %	
Relative negative tolerance at 24 V DC	15 %	
Current consumed • from backplane bus at 5 V DC, typical	0.2 A	
 from external power supply with 24 V DC 		
- Typical - Maximum	0.16 A 0.2 A	
Effective power loss	5.8 W	

Order No.	6GK7 343-1CX10-0XE0
	CP 343-1 Lean
Permitted ambient conditions	
Ambient temperature	
 With vertical installation during operating phase 	0 40 °C
 With horizontal installation during operating phase 	0 60 °C
During storage	-40 +70 °C
 During transport 	-40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-300 compact module, single-width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Performance data	
Performance data Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	8

CP 343-1 Lean

recnnical specifications (continued)			
Order No.	6GK7 343-1CX10-0XE0		
	CP 343-1 Lean		
Data volume			
 as user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum 	8 KB		
 as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum 	2 KB		
Number of multicast stations	8		
Performance data S7 communication			
Maximum number of possible connections for S7 communication	4		
Number of possible connections for S7 communication - Note	-		
Performance data Multiprotocol operation			
Number of active connections in multiprotocol mode	12		
Performance data PROFINET communication as PN IO device			
Product function: PROFINET IO device	Yes		
Data volume			
 As user data for input variables as PROFINET IO device, maximum 	512 byte		
 As user data for output variables as PROFINET IO device, maximum 	512 byte		
As user data for input variables per submodule as PROFINET IO device	240 byte		
As user data for output variables per submodule as PROFINET IO device	240 byte		
As user data for the consistency area per submodule	240 byte		
Number of submodules per PROFINET IO device	32		

Order No.	6GK7 343-1CX10-0XE0
	CP 343-1 Lean
Product functions Management, configuration, programming	
Product function: MIB support	Yes
Protocol is supported • SNMP v1 • DCP • LLDP	Yes Yes Yes
Configuration software required	STEP 7 V5.4 and higher
Product functions Diagnostics	
Product function: Web-based diagnostics	Yes
Product functions Switch	
Product feature: Switch	Yes
Product function • Switch-managed • Configuration with STEP 7	No Yes
Product functions Redundancy	
Product function • Ring redundancy • Redundancy procedure MRP	Yes Yes
Product functions Security	
Product function Switching-off non-required services	Yes
Blocking of communication via physical ports	Yes
Product functions Time	
Product function SICLOCK support Passing-on of time synchronization	Yes Yes
NTP Protocol is supported	Yes

CP 343-1 Lean

Ordering data	Order No.		Order No.
CP 343-1 Lean communication	6GK7 343-1CX10-0XE0	SOFTNET Edition 2008 for	
processor For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, MRP, integrated 2-port switch		Industrial Ethernet for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English up to 64 connections	
ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM		 Single license for 1 installation 1-year Software Update Service, with automatic extension; requirement: Current software version 	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0
IE FC TP standard cable GP 2x2	6XV1 840-2AH10	 Upgrade from Edition 2006 to V8.0 	6GK1 704-1CW00-3AE0
4-core, shielded TP installation cable for connection to IE	0AVI 040-2ANIO	 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE1
FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter		SOFTNET S7 Lean Edition V8 for Industrial Ethernet	
CSM 377 compact switch	6GK7 377-1AA00-0AA0	up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0
module		SOFTNET S7 Lean Edition 2008	
Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ-45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module		for Industrial Ethernet up to 8 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0
including electronic Manual on CD-ROM		 Upgrade from Edition 2006 to V8.0 	6GK1 704-1LW00-3AE0
IE FC RJ-45 Plug 145		 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1LW00-3AE1
RJ-45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet; 1 pack = 1 unit 1 pack = 10 units 1 pack = 50 units	6GK1 901-1BB30-0AA0 6GK1 901-1BB30-0AB0 6GK1 901-1BB30-0AE0	STEP 7 Version 5.4 Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Professional, Vista Ultimate, Vista Business Type of dlivery: German, English, French, Spanish, Italian, including license key on USB flash drive,	
IE FC stripping tool	6GK1 901-1GA00	with electronic documentation	
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables		Floating license on DVD Rental license for 50 hours Software Update Service on DVD (require purpose sections)	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6 6ES7 810-4BC01-0YX2
SOFTNET S7 for Industrial Ethernet		DVD (requires current software version)	6ES7 010 4CC00 0VEF
Software for S7 and open communication, including OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A		 Floating license upgrade 3.x/4.x/5.x to V5.4; on DVD Trial license STEP 7 V5.4; on DVD, operational for 14 days 	6ES7 810-4CC08-0YE5 6ES7 810-4CC08-0YA7
SOFTNET V8.0 for Industrial Ethernet			
for 32-bit Windows 7 Professional/ Ultimate; German/English			
up to 64 connections • Single license for 1 installation	6GK1 704-1CW80-3AA0		

The HSP for the CP 343-1 Lean (6GK7-343-1CX10 0XE0) can be directly downloaded and installed from the Internet through STEP 7 and is already included from STEP 7 Version V5.4 SP1.

Communication

CP 343-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
•	•	•	•			•	O KIO XX JUG

Communication processor for connecting the SIMATIC S7-300/ SINUMERIK 840D powerline to Industrial Ethernet networks, also as a PROFINET IO controller or IO device.

Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE) and PROFINET communication

Order No.	6GK7 343-1EX30-0XE0		
	CP 343-1		
Transmission rate			
Transmission rate at interface 1	10 100 Mbit/s		
Interfaces			
Number of electrical connections • at interface 1 in accordance with Industrial Ethernet	2		
 for power supply 	1		
Design of electrical connection • at interface 1 in accordance with Industrial Ethernet	RJ45 port		
• for power supply	2-pin plug-in terminal strip		
Supply voltage, current consumption, power loss			
Type of power supply	DC		
Power supply 1 from backplane bus External	5 V 24 V		
Relative positive tolerance at 24 V DC	20 %		
Relative negative tolerance at 24 V DC	15 %		
Current consumed • from backplane bus at 5 V DC, typical • from external power supply with 24	0.2 A		
V DC - Typical - Maximum	0.16 A 0.2 A		
Effective power loss	5.8 W		

Order No.	6GK7 343-1EX30-0XE0
	CP 343-1
Permitted ambient conditions	
Ambient temperature	
 with vertical installation during operating phase 	0 40 °C
 with horizontal installation during operating phase 	0 60 °C
During storage	-40 +70 °C
During transport	-40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-300 compact module, single-width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Type of mounting: S7-300 DIN rail mounting	Yes

CP 343-1

Technical specifications (continued)					
Order No.	6GK7 343-1EX30-0XE0				
	CP 343-1				
Performance data					
Performance data Open communication					
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	16				
Data volume					
 as user data per ISO connection for open communication by means of SEND/RECEIVE blocks, maximum 	8 KB				
as user data per ISO on TCP connection for open communi- cation by means of SEND/ RECEIVE blocks, maximum	8 KB				
as user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum	8 KB				
 as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum 	2 KB				
Number of multicast stations	16				
Performance data S7 communi-					
cation Maximum number of possible connections for S7 communication	16				
Number of possible connections for S7 communication - Note	-				
Performance data Multiprotocol operation					
Number of active connections in multiprotocol mode	32				
Performance data PROFINET communication as PN IO Controller					
Total number of PN IO devices which can be operated on the PROFINET IO controller	32				
Number of external PN IO lines with PROFINET, per rack	1				
Data volume • As user data for input variables as PROFINET IO controller, maximum	1 KB				
As user data for output variables as PROFINET IO controller, maximum	1 KB				
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte				
As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte				
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte				
As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte				

Yes (alternatively to PN IO controller) 512 byte 512 byte 240 byte 240 byte 240 byte 32
IO controller) 512 byte 512 byte 240 byte 240 byte 240 byte 32
IO controller) 512 byte 512 byte 240 byte 240 byte 240 byte 32
IO controller) 512 byte 512 byte 240 byte 240 byte 240 byte 32
512 byte 240 byte 240 byte 240 byte 32
512 byte 240 byte 240 byte 240 byte 32
240 byte 240 byte 240 byte 32
240 byte 240 byte 240 byte 32
240 byte 240 byte 32
240 byte 240 byte 32
240 byte 32
240 byte 32
240 byte 32
32
32
Yes
Yes
Yes
100
Yes
Yes
Yes
STEP 7 version V5.4 SP2 and higher
-
Yes
Yes
No
Yes
Voc
Yes No
Yes
Yes
Yes
Yes
No
V
Yes Yes
100
Yes

CP 343-1

Ordering data	Order No.		Order No.
CP 343-1 communication	6GK7 343-1EX30-0XE0	IE FC RJ-45 Plug 145	
For connection of SIMATIC S7-300 to Industrial Ethernet over SO and TCP/IP; PROFINET O controller or PROFINET O device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through		RJ-45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 145° cable outlet • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units SOFTNET S7 for Industrial Ethernet Software for S7 and open commu-	6GK1 901-1BB30-0AA0 6GK1 901-1BB30-0AB0 6GK1 901-1BB30-0AE0
P access list, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD	6XV1 840-2AH10	nication, including OPC server, PG/OP communication and NCM PC, runtime software, software	
GP 2x2 4-core. shielded TP installation	OAVI OTO-ZAIIIO	and electronic manual on CD- ROM, license key on a USB stick, Class A	
cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL		SOFTNET V8.0 for Industrial Ethernet	
approval; sold by the meter FO standard cable GP (50/125)	6XV1 873-2A	for 32-bit Windows 7 Professional/ Ultimate; German/English	
Standard cable, splittable, UL approval, sold by the meter	0AV1 073-2A	up to 64 connections • Single license for 1 installation	6GK1 704-1CW80-3AA0
C-PLUG	6GK1 900-0AB00	SOFTNET Edition 2008 for Industrial Ethernet	
Removable media for easy device replacement upon failure, for receiving configuration or projects and application data, may be used in SIMATIC NET products with C-PLUG slot		for 32-bit Windows XP Profes- sional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English	
ndustrial Ethernet Switch SCALANCE X204-2 ndustrial Ethernet switches with	6GK5 204-2BB10-2AA3	 up to 64 connections Single license for 1 installation 1-year Software Update Service, 	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0
ntegral SNMP access, online diagnostics, copper cable diagnostics and PROFINET		with automatic extension; requirement: Current software version • Upgrade from Edition 2006 to	6GK1 704-1CW00-3AE0
diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ-45 ports and two fiber-optic cable ports		• Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0	6GK1 704-1CW00-3AE1
CSM 377 compact switch	6GK7 377-1AA00-0AA0	SOFTNET S7 Lean Edition V8 for Industrial Ethernet	
Unmanaged switch for connection of a SIMATIC S7-300-		up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0
CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100		SOFTNET S7 Lean Edition 2008 for Industrial Ethernet	
Ethernet operating at 10/100 Mbit/s; 4 x RJ-45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic Manual on CD-ROM		up to 8 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0
		 Upgrade from Edition 2006 to V8.0 	6GK1 704-1LW00-3AE0
		 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1LW00-3AE1

I: Subject to export regulations AL: N and ECCN: EAR99H

CP 343-1

Ordering data	Order No.		Order No.
S7-1613		STEP 7 Version 5.4	
Software for S7 and open, including PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A; for CP 1613/CP 1613 A2/CP 1623;		Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Professional, Vista Ultimate, Vista Business Type of delivery: German, English, French,	
S7-1613 V8.0		Spanish, Italian, including license key on USB flash drive, with	
for 32-bit Windows 7 Professional/ Ultimate; German/English • Single license for 1 installation	6GK1 716-1CB80-3AA0	electronic documentation • Floating license on DVD • Rental license for 50 hours • Software Update Service on	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6 6ES7 810-4BC01-0YX2
S7-1613 Edition 2008		DVD (requires current software version)	
for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English		Floating license upgrade 3.x/4.x/5.x to V5.4; on DVD Trial license STEP 7 V5.4; on DVD, operational for 14 days	6ES7 810-4CC08-0YE5 6ES7 810-4CC08-0YA7
 Single license for 1 installation 1-year Software Update Service, with automatic extension; requirement: Current software version 	6GK1 716-1CB71-3AA0 6GK1 716-1CB00-3AL0		
 Upgrade S7-1613, Edition 2006 or higher, to S7-1613 Edition 2008 	6GK1 716-1CB00-3AE0		
 Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to S7-1613 V8.0 	6GK1 716-1CB00-3AE1		

The HSP for the CP 343-1(EX30) can be directly downloaded and installed from the Internet through STEP 7 and is already included from STEP 7 Version 5.4 SP2.

Communication

CP 343-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
•	•	•	•	•	•	•	G KIO XX 10148

Communication processor for connecting the SIMATIC S7-300/ SINUMERIK 840D powerline to Industrial Ethernet networks, also as a PROFINET IO controller or IO device.

Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE), PROFINET communication as well as IT communication. Furthermore, the CP 343-1 Advanced, with its e-mail option and web pages that can be created by the user, offers ideal support for maintenance and quality assurance. The Internet functions such as FTP even permit coupling to a wide variety of PC-based systems. Therefore, for the S7-300, this CP is the bridge between the field level and the control level. The CP 343-1 Advanced seamlessly connects to the security structures of the office and IT world.

Order No.	6GK7 343-1GX30-0XE0		
	CP 343-1 Advanced		
Transmission rate			
Transmission rate • at interface 1 • at interface 2	10 1 000 Mbit/s 10 100 Mbit/s		
Interfaces			
Number of electrical connections • at interface 1 in accordance with Industrial Ethernet • at interface 2 in accordance with	1		
Industrial Ethernet for power supply	1		
Design of electrical connection	'		
at interface 1 in accordance with Industrial Ethernet	RJ45 port		
 at interface 2 in accordance with Industrial Ethernet 	RJ45 port		
 for power supply 	2-pin plug-in terminal strip		
Design of swap medium C-Plug	Yes		
Supply voltage, current consumption, power loss			
Type of power supply	DC		
Power supply 1 from backplane bus External	5 V 24 V		
Relative positive tolerance at 24 V DC	20 %		
Relative negative tolerance at 24 V DC	15 %		
Current consumed • from backplane bus at 5 V DC, typical • from external power supply with 24 V DC	0.14 A		
- Typical	0.48 A		
- Maximum	0.62 A		
Effective power loss	14.7 W		

Order No.	6GK7 343-1GX30-0XE0
	CP 343-1 Advanced
Permitted ambient conditions	
Ambient temperature	
 with vertical installation during operating phase 	0 40 °C
 with horizontal installation during operating phase 	0 60 °C
During storageDuring transport	-40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.6 kg
Type of mounting: S7-300 DIN rail mounting	Yes
Performance data	
Performance data Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	16

CP 343-1 Advanced

Technical specifications (continued)			
Order No.	6GK7 343-1GX30-0XE0	Order	
	CP 343-1 Advanced		
Data volume • as user data per ISO connection for open communication by means of SEND/RECEIVE blocks, maximum	8 KB	Data von As us per F PROI maxio	
 as user data per ISO on TCP connection for open communi- cation by means of SEND/ RECEIVE blocks, maximum 	8 KB	• As us PN IO IO co • As us	
 as user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum 	8 KB	per F IO co Perforr commi	
 as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum 	2 KB	Produc IO dev	
Number of multicast stations	16	• As us	
Performance data S7 communi- cation		as PF maxi	
Maximum number of possible connections for S7 communication	16	 As us as PF maxi 	
Number of possible connections for S7 communication - Note	-	• As us per s	
Performance data Multiprotocol		- IO de • As us	
operation Number of active connections in multiprotocol mode	48	per s IO de • As us	
Performance data IT functions Number of possible connections • as client with FTP, maximum • as server	10	Number PROFI	
- with FTP, maximum	2	Perform	
 with HTTP, maximum as e-mail client, maximum 	4	Numbe partne	
Data volume as user data for e-mail, maximum	8 KB	Total n PROFI	
Storage capacity of user memory as flash memory file system as RAM	28 Mibyte 30 Mibyte	Data v	
Number of possible write cycles of	100 000	• As us PROI	
Performance data PROFINET communication as PN IO controller		• As us with I • As us	
Total number of PN IO devices which can be operated on the PROFINET IO controller	128	types - with PRO - with	
Number of PN IO IRT Devices which can be operated on the PROFINET IO controller	32	PRO - with PRO	
Number of external PN IO lines with PROFINET, per rack	1	Perforr remote	
Data volume As user data for input variables as PROFINET IO controller, maximum	4 KB	Send of with action of the second control of	
 As user data for output variables as PROFINET IO controller, maximum 	4 KB	Number input v mission	
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte	Maxim Numbe output mission maxim	
		παλιπ	

Order No.	6GK7 343-1GX30-0XE0
	CP 343-1 Advanced
Data volume • As user data for output variables per PN IO device as PROFINET IO controller,	240 byte
As user data for input variables per PN IO device as PROFINET	240 byte
O controller, maximum As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte
Performance data PROFINET communication as PN IO device	
Product function: PROFINET IO device	Yes
Data volume • As user data for input variables as PROFINET IO device, maximum	1 024 byte
 As user data for output variables as PROFINET IO device, maximum 	1 024 byte
As user data for input variables per submodule as PROFINET IO device	240 byte
As user data for output variables per submodule as PROFINET IO device	240 byte
As user data for the consistency area per submodule	240 byte
Number of submodules per PROFINET IO device	32
Performance data PROFINET CBA	
Number of remote connection partners with PROFINET CBA	64
Total number of connections with PROFINET CBA	1 000
Data volume • As user data for digital inputs with	8 KB
PROFINET CBA, maximum As user data for digital outputs with PROFINET CBA, maximum As user data for arrays and data	8 KB
types - with acyclic transmission with	8 KB
PROFINET CBA, maximum - with cyclic transmission with	250 byte
PROFINET CBA, maximum - with local connection with PROFINET CBA, maximum	2 400 byte
Performance data PROFINET CBA remote connection with acyclic transmission	
Send cycle of remote connections with acyclic transmission with PROFINET CBA	100 ms
Number of remote connections with input variables with acyclic transmission with PROFINET CBA, maximum	128
Number of remote connections with output variables with acyclic transmission with PROFINET CBA, maximum	128

CP 343-1 Advanced

Technical specifications (continued)			
Order No.	6GK7 343-1GX30-0XE0		
	CP 343-1 Advanced		
Data volume • as user data for remote connections with input variables with acyclic transmission with PROFINET CBA	8 KB		
as user data for remote connec- tions with output variables with acyclic transmission with PROFINET CBA	8 KB		
Performance data PROFINET CBA remote connection with cyclic transmission			
Send cycle of remote connections with cyclic transmission with PROFINET CBA	8 ms		
Number of remote connections with input variables with cyclic transmission with PROFINET CBA, maximum	200		
Number of remote connections with output variables with cyclic transmission with PROFINET CBA, maximum	200		
Data volume • as user data for remote connections with input variables with cyclic transmission with PROFINET CBA, maximum	2 000 byte		
 as user data for remote connections with output variables with cyclic transmission with PROFINET CBA, maximum 	2 000 byte		
Performance data PROFINET CBA HMI variables via PROFINET, acyclic			
Number of HMI stations for logging- on for HMI variables with acyclic transmission with PROFINET CBA	3		
Send cycle of HMI variables with acyclic transmission with PROFINET CBA	500 ms		
Number of HMI variables with acyclic transmission with PROFINET CBA, maximum	200		
Data volume as user data for HMI variables with acyclic transmission with PROFINET CBA, maximum	8 KB		
Performance data PROFINET CBA device-internal connections			
Maximum number of internal connections with PROFINET CBA	256		
Data volume of internal connections with PROFINET CBA, maximum	2 400 byte		
Maximum number of connections with constants with PROFINET CBA	200		
Data volume as user data for connections with constants with PROFINET CBA, maximum	4 096 byte		
Performance data PROFINET CBA PROFIBUS proxy functionality			
Performance data with PROFINET CBA PROFIBUS proxy functionality	No		

Order No.	6GK7 343-1GX30-0XE0
	CP 343-1 Advanced
Product functions Management,	
configuration, programming	
Product function: MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
Required Required for PROFINITY ORA	STEP 7 V5.4 SP4 and higher
Required for PROFINET CBA	SIMATIC IMAP V3.0 SP1 and higher
Product functions Diagnostics	g
Product function: Web-based	Yes
diagnostics	163
Product functions Switch	
Product feature: Switch	Yes
Product function	
Switch-managed	No
with IRT PROFINET IO Switch	Yes
 Configuration with STEP 7 	Yes
Product functions Redundancy	
Product function	
Ring redundancy	Yes
Redundancy manager	Yes
 Redundancy procedure MRP 	Yes
Product functions Security	
Product function	
 Password protection for Web 	Yes
applications	
• ACL - IP based	Yes
ACL - IP based for PLC/routing Switching off pop required.	Yes Yes
 Switching-off non-required services 	res
Blocking of communication via	Yes
physical ports	
Log file for unauthorized access	No
Product functions Time	
Product function	
SICLOCK support	Yes
 Passing-on of time synchroni- zation 	Yes
NTP Protocol is supported	Yes

CP 343-1 Advanced

Ordering data	Order No.		Order No.
CP 343-1 Advanced communication processor	6GK7 343-1GX31-0XE0	SOFTNET S7 Lean Edition 2008 for Industrial Ethernet	
For the connection of SIMATIC S7-300 to Industrial Ethernet; PROFINET IO controller and IO device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communi- cation (SEND/RECEIVE), FETCH/		up to 8 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0
WRITE, with and without RFC 1006, diagnostics expansions, multicast, web server, HTML diagnostics,		 Upgrade from Edition 2006 to V8.0 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1LW00-3AE0 6GK1 704-1LW00-3AE1
FTP server, FTP client, e-mail client, setting of CPU's clock using SIMATIC and NTP procedures,		IE FC TP standard cable GP 2 x 2 (Type A)	6XV1 840-2AH10
access protection through IP access list, SNMP, DHCP, initial- ization over LAN 10/100 Mbit/s; with electronic manual on DVD; C-PLUG included in scope of supply		4-core, shielded TP installation cable for connection to IE FC RJ45 outlet / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
Ethernet		IE FC TP standard cable GP 4 x 2	
Software for S7 and open communication, including OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A		8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal appli- cation; with UL approval; sold by the meter; max quantity 1000 m, minimum order 20 m	
SOFTNET V8.0 for Industrial		 AWG 22, for connection to IE FC RJ45 Modular Outlet 	6XV1 870-2E
Ethernet for 32-bit Windows 7 Professional/		AWG 24, for connection to IE FC RJ45 Plug 4 x 2	6XV1 878-2A
Ultimate; German/English		IE FC RJ-45 Plug 180	
up to 64 connections • Single license for 1 installation	6GK1 704-1CW80-3AA0	RJ-45 plug connector for Industrial Ethernet with a rugged metal	
SOFTNET Edition 2008 for Industrial Ethernet		housing and integrated insulation- displacement/terminal contacts for	
for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/ Ultimate SP1; Windows 2008 Server; German/English		connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	SCV1 001 1PP10 2AA0
up to 64 connections		1 pack = 1 unit1 pack = 10 units	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0
Single license for 1 installation	6GK1 704-1CW71-3AA0	• 1 pack = 50 units	6GK1 901-1BB10-2AE0
 1-year Software Update Service, with automatic extension; requirement: Current software 	6GK1 704-1CW00-3AL0	IE FC RJ-45 Plug 4 x 2	
 Upgrade from Edition 2006 to V8.0 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE0 6GK1 704-1CW00-3AE1	RJ-45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial	
SOFTNET S7 Lean Edition V8 for Industrial Ethernet		Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with	
up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0	Industrial Ethernet interface 1 pack = 1 unit 1 pack = 10 units 1 pack = 50 units	6GK1 901-1BB11-2AA0 6GK1 901-1BB11-2AB0 6GK1 901-1BB11-2AE0

I: Subject to export regulations AL: N and ECCN: EAR99H

CP 343-1 Advanced

Ordering data	Order No.		Order No.
IE FC stripping tool	6GK1 901-1GA00	SIMATIC iMap V3.0	
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables		for configuring PROFINET CBA, Requirements:	
CSM 377 compact switch module	6GK7 377-1AA00-0AA0	Windows 2000 Prof. with Service	
Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ-45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic Manual on CD-ROM		Pack 4 or later or Windows XP Prof. with Service Pack 1 or later or Windows 2003 Server with Service Pack 1 or later; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or later with Service Pack 3, PN OPC Server V6.3 or later Type of delivery:	
Industrial Ethernet Switch SCALANCE X308-2	6GK5 308-2FL00-2AA3	German, English, with electronic documentation • Single license D	6ES7 820-0CC04-0YA5
2 x 1000 Mbit/s multimode fiberoptic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ-45 port, 7 x 10/100 Mbit/s RJ-45 ports; for glass fiber-optic cable (multimode) up to max. 750 m		Software Update Service Upgrade to V3.0, Single license	6ES7 820-0CC01-0YX2
STEP 7 Version 5.4			
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Professional, Vista Ultimate, Vista Business Type of delivery: German, English, French, Spanish, Italian, including license key on USB flash drive, with electronic documentation			
Floating license on DVD	6ES7 810-4CC08-0YA5		
 Rental license for 50 hours Software Update Service on DVD (requires current software version) 	6ES7 810-4CC08-0YA6 6ES7 810-4BC01-0YX2		
 Floating license upgrade 3.x/4.x/ 5.x to V5.4; on DVD 	6ES7 810-4CC08-0YE5		
Trial license STEP 7 V5.4; on DVD, operational for 14 days	6ES7 810-4CC08-0YA7		

D: Subject to export regulations AL: N and ECCN: 5D992

Communication

CP 343-1 ERPC

Overview



ISO TCP/ PN MRP IT IP-R PG/OP S7/S5

The communication processor CP 343-1 ERPC (Enterprise Connect) for connecting the SIMATIC S7-300 to Industrial Ethernet networks.

Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE) and ERPC communication.

Support of a data base connection of SIMATIC S7-300 to various database systems for vertical integration using a firmware upgrade (to order separately) of the company ILS-Technology.

Order No.	6GK7 343-1FX00-0XE0
Product type designation	CP 343-1 ERPC
Data transmission rate	
Transmission rate at interface 1	10 1 000 Mbit/s
Interfaces	
Number of electrical connections • at interface 1 in accordance with Industrial Ethernet	1
For power supply	1
Design of electrical connection • at interface 1 in accordance with Industrial Ethernet	RJ45 port
• For power supply	2-pin plug-in terminal strip
Design of the swap medium C-Plug	Yes
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply 1 from backplane bus External	5 V 24 V
Relative positive tolerance at 24 V DC	20 %
Relative negative tolerance at 24 V DC	15 %
Current consumed • from backplane bus at 5 V DC, typical	0.3 A
 Maximum from external power supply for 24 V DC 	0.6 A
Effective power loss	14.7 W

Order No.	6GK7 343-1FX00-0XE0
Product type designation	CP 343-1 ERPC
Permitted ambient conditions	
Ambient temperature • with vertical installation during operating phase	0 40 °C
 with horizontal installation during operating phase 	0 60 °C
During storageDuring transport	-40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm 120 mm
Depth	. =
Net weight Type of mounting: S7-300 DIN rail mounting	0.8 kg Yes

CP 343-1 ERPC

Order No.	6GK7 343-1FX00-0XE0	
Product type designation	CP 343-1 ERPC	
Performance data		
Performance data Open communication		
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	8	
Data volume • As user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks, maximum	8 KB	
 As user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum 	8 KB	
As user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum	2 KB	
Number of multicast stations	8	
Performance data S7 communication		
Maximum number of possible connections for S7 communication	8	
Number of possible connections for S7 communication - Note	plus 2 PG/OP connections and 1 diagnostics connection	
Performance data Multiprotocol operation		
Number of active connections in multi-protocol mode	32	
Performance data IT functions		
Number of possible write cycles of flash memory cells	100 000	
Performance data ERPC functions		
Number of configurable ERPC symbols for database access • Per CPU, maximum	2 000	
Per logical trigger, maximum	255	
Data quantity as user data and header information per logical trigger	8 KB	

6GK7 343-1FX00-0XE0
CP 343-1 ERPC
Yes
Yes Yes Yes
STEP 7 version V5.4 SP5 and higher plus HSP
Yes
No
No
Yes Yes Yes
Yes Yes
Yes

CP 343-1 ERPC

Ordering data	Order No.		Order No.
Communication processor CP 343-1 ERPC (Enterprise	6GK7 343-1FX00-0XE0	Industrial Ethernet Switch SCALANCE X308-2	6GK5 308-2FL00-2AA3
For the connection of SIMATIC S7-300 to Industrial Ethernet and for the support of the database connection of the SIMATIC S7-300 to various databases;		2 x 1000 Mbit/s multimode fiberoptic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ-45 port, 7 x 10/100 Mbit/s RJ-45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	
TCP/UDP, S7 communication, open communication (SEND/RECEIVE), with and without RFC 1006, multicast, web server, setting of CPU's clock using SIMATIC procedures and NTP, access protection via IP access list, SNMP, DHCP, initialization over LAN 10/100/1000 Mbit/s; with electronic manual on DVD, C-PLUG included in scope of		IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for universal use; with UL approval; sold by the meter max. length 1000 m; minimum order quantity 20 m • AWG 22,	6XV1 870-2E
delivery SOFTNET S7 for Industrial Ethernet		for connection to IE FC RJ-45 Modular Outlet • AWG 24, for connection to IE FC RJ-45	6XV1 878-2A
Software for S7 and open commu-		Plug 4 x 2	
nication, including OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A		IE FC RJ45 Plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a rugged metal housing and integrated insulation displacement contacts for	
SOFTNET V8.0 for Industrial Ethernet for 32-bit Windows 7 Professional/		connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial	
Ultimate; German/English up to 64 connections • Single license for 1 installation	6GK1 704-1CW80-3AA0	Ethernet interface 1 pack = 1 unit 1 pack = 10 units	6GK1 901-1BB11-2AA0 6GK1 901-1BB11-2AB0 6GK1 901-1BB11-2AE0
SOFTNET Edition 2008 for Industrial Ethernet		• 1 pack = 50 units IE FC stripping tool	6GK1 901-1GA00
for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English		Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables STEP 7 Version 5.4	
up to 64 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0	Target system: SIMATIC S7-300/- 400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Professional, Vista Ultimate, Vista Business	
Upgrade from Edition 2006 to V8.0	6GK1 704-1CW00-3AE0	Type of delivery: German, English, French, Spanish, Italian, including license key on USB	
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE1	flash drive, with electronic documentation	
SOFTNET S7 Lean Edition V8 for Industrial Ethernet		Floating license on DVD Rental license for 50 hours Software Update Service on	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6 6ES7 810-4BC01-0YX2
up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0	DVD (requires current software version)	OLOT GIV-4DOUT-UTAZ
SOFTNET S7 Lean Edition 2008 for Industrial Ethernet		Floating license upgrade 3.x/ 4.x/5.x to V5.4; on DVD	6ES7 810-4CC08-0YE5
up to 8 connections		 Trial license STEP 7 V5.4; on DVD, operational for 14 days 	6ES7 810-4CC08-0YA7
 Single license for 1 installation 1-year Software Update Service, with automatic extension; requirement: Current software 	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0	deviceWISE Embedded Edition for SIMATIC S7	Please see deviceWISE Embedded Edition for SIMATIC S7
version • Upgrade from Edition 2006 to V8.0	6GK1 704-1LW00-3AE0	Firmware expansion for database connection of the SIMATIC S7- 300 complete with CP 343-1	
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1LW00-3AE1	ERPC to various ERP or MES systems	

Communication

CSM 377 unmanaged

Overview



- Unmanaged switch for the connection of a SIMATIC S7-300 with integral PROFINET interface or with an Industrial Ethernet CP or ET 200M to an Industrial Ethernet in an electrical linear, tree or star structure
- As many as three additional nodes can be connected
- As an unmanaged switch, the CSM 377 is used for integrating small machines into existing automation networks or for the standalone operation of the machines
- Simple, space-saving attachment to S7-300 mounting rail due to design as single-width module in S7-300 format
- Low-cost solution for implementing small, local Ethernet networks
- Rugged, industry-standard node connections with PROFINETcompliant RJ45 connectors that latch onto the enclosure to offer additional strain and bending relief

Order No.	6GK7 377-1AA00-0AA0
	CSM 377
Transmission rate	
Transmission rate 1	10 Mbit/s
Transmission rate 2	100 Mbit/s
Interfaces	
Maximum number of electrical/ optical connections for network components or terminal equipment	4
Number of electrical connections • for network components or terminal equipment	4
for signaling contactfor power supply	- 1
Design of electrical connection • for network components or terminal equipment	RJ45 port
for signaling contactfor power supply	- 2-pin terminal block
Supply voltage, current consumption, power loss	
Number of optical connections	
Design of optical connection	
Type of power supply	DC
External power supply Minimum Maximum	24 V 19.2 V 28.8 V
Current consumed, maximum	0.07 A
Product component: fusing at power supply input	Yes
Design of fusing at input for power supply	0.5 A / 60 V
Effective power loss at 24 V with DC	1.6 W
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C

Order No.	6GK7 377-1AA00-0AA0
	CSM 377
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Design	SIMATIC S7-300 design
Width Height Depth	40 mm 125 mm 118 mm
Net weight • 35 mm DIN rail mounting • Wall mounting • S7-300 rail mounting	0.2 kg No No Yes
Type of mounting	-
Product properties, functions, components General	
Cascading with star topology	-
Product function: Switch-managed	No
Standards, specifications, approvals	
Standard	
for EMC of FM For hazardous zone	FM3611: Class 1, Division 2, Group A, B, C, D / T, CL.1, Zone 2, GP. IIC, T Ta EN 60079-15, II 3 G Ex nA II T
- 1 of Hazardodo zone	KEMA 06 ATEX 0021 X
 For CSA and UL safety for hazardous zone of CSA and UL 	UL 508, CSA C22.2 No. 142 UL 1604 and UL 2279-15 (Hazardous Location)
For emitted interferenceFor noise immunity	EN 61000-6-4 (Class A) EN 61000-6-2
Certificate of suitability CE mark C-Tick	EN 61000-6-2, EN 61000-6-4 Yes Yes

CSM 377 unmanaged

Ordering data	Order No.		Order No.
CSM 377 compact switch module		IE FC RJ45 Plug 180 2 x 2 RJ45 plug connector for Industrial	
Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-300 module including electronic manual on CD-ROM	6GK7 377-1AA00-0AA0	Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface • 1 pack = 1 unit	6GK1 901-1BB10-2AA0
Accessories		• 1 pack = 10 units	6GK1 901-1BB10-2AB0
IE FC TP standard cable GP 2 x 2 (Type A)		• 1 pack = 50 units IE FC stripping tool	6GK1 901-1BB10-2AE0 6GK1 901-1GA00
4-core, shielded TP installation cable for connection to IE FC outlet RJ45/ IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	6XV1 840-2AH10	Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	

TIM 3V-IE for WAN and Ethernet

Overview



- SINAUT communication module TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data
- Simple configuration and operation without specialist IT knowledge

Order No.	6NH7 800-3BA00
Product type designation	TIM 3V-IE
Transmission rate • With Industrial Ethernet • In accordance with RS 232	10 100 Mbit/s 50 38 400 bit/s
Interfaces	
Number of interfaces in accordance with Industrial Ethernet	1
Number of electrical connections • For external data transmission in accordance with RS 232 • For power supply	1
Design of electrical connection • of the Industrial Ethernet interface • at interface 1 for external data transmission • at interface 2 for external data transmission • For power supply	RJ45 port 9-pin D-sub male connector (RS232) - 2-pin, pluggable terminal strip
Design of the swap medium C-Plug	No
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply • Minimum • Maximum	24 V 20.4 V 28.8 V
Current consumed • Maximum from backplane bus for 24 V DC	0.2 A
 Maximum from external power supply for 24 V DC 	0.2 A
Effective power loss	5.8 W
Product expansion: optional backup battery	No
Battery type	-
Backup current typical	-
Backup current maximum	-

Order No.	6NH7 800-3BA00
Product type designation	TIM 3V-IE
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP20
Design, dimensions and weights	
Module format	S7-300 compact module, single-width
Width Height Depth	40 mm 125 mm 120 mm
Net weight	0.2 kg
Product properties, functions, components General	
Number of modules - Note	Number of TIM per S7-300: 1
Cable length Maximum with RS232 interface Maximum with RS485 interface	6 m
Performance data	
Performance data S7 communication	
Number of possible connections for S7 communication	
 Maximum Maximum with PG connections For OP connections, maximum 	12 4 8
Service	
 SINAUT ST7 using S7 communication 	Yes
PG/OP communication	Yes

TIM 3V-IE for WAN and Ethernet

recnnical specifications (conti	nueu)
Order No. 6NH7 800-3BA00	
Product type designation	TIM 3V-IE
Performance data Multiprotocol operation Number of active connections in	12
multiprotocol mode	
Performance data Telecontrol	
Suitability for use	NI-
TIM node station TIM station	No Yes
TIM control center	No
Suitability for use - Note	RS232 and Industrial Ethernet cannot be used simultaneously
Protocol is supported	
• TCP/IP	Yes
DNP3SINAUT ST1 protocol	No Yes
• SINAUT ST7 protocol	Yes
Storage capacity of S7 CPU's work	100
memory	
 Required on CPU for TD7onCPU mode data blocks 	20 Kibyte
 Required on TIM for TD7onTIM mode data blocks 	0 Kibyte
Storage capacity - Note	TD7onCPU: at least 20 KB, actual requirement depends on data quantity and functional scope TD7onTIM: 0 bytes in most favorable case
Product property: buffered message frame memory	No
Transmission format	
 11 bits for SINAUT ST1 protocol with polling 	Yes
 10 or 11 bits for SINAUT ST1 protocol with spontaneous polling 	Yes
 10 bits for SINAUT ST7 protocol with multi-master polling 	Yes
10 or 11 bits for SINAUT ST7 protocol with polling or sponta- neous polling	Yes
Operating mode with scanning of data transmission	
With dedicated line/radio link	
- With SINAUT ST1 protocol	Polling, polling with time slot procedure
- With SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
With dial-up network With SINAUT ST1 protocol	Chantanagua
 With SINAUT ST1 protocol With SINAUT ST7 protocol 	Spontaneous Spontaneous
Hamming distance	-1
• For SINAUT ST1 protocol	4
For SINAUT ST7 protocol	4

Order No.	6NH7 800-3BA00
Product type designation	TIM 3V-IE
Product functions Management, configuration, programming	
Configuration software • Required for CPU configuration: SINAUT TD7 block library for CPU	Yes
 Required for PG configuration: SINAUT ST7 configuration software for PG 	Yes
Storage location of TIM configuration data	On the CPU
Product functions Security Virtual Private Network	
Suitability for use of Virtual Private Network	Yes
Product function • Password protection for VPN • MSC client via GPRS modem with MSC capability	Yes Yes
MSC protocol is supported	No
Number of possible connections • As MSC client with VPN connection • As MSC server with VPN	1
connection MSC protocol supported with Virtual	-
Private Network Key length for MSC with Virtual Private Network	128 bits
Type of authentication with Virtual Private Network PSK	Yes
Virtual Private Network mode - Note	VPN mode as MSC client with MSC protocol and password protection only possible together with GPRS modem with MSC capability
Product function Time	
Product component hardware real time clock	No

TIM 3V-IE for WAN and Ethernet

Ordering data	Order No.		Order No.
TIM 3V-IE communication	6NH7 800-3BA00	IE FC Stripping Tool	6GK1 901-1GA00
module With an RS232 interface for SINAUT communication via a conventional WAN or an IP-based		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
network (WAN or LAN)		Connecting cable	6NH7 701-4AL
SINAUT ST7 engineering software, V5.1 on CD-ROM, comprising:	6NH7 997-0CA51-0AA0	For connecting a TIM (RS232) with a SINAUT ST7 MD2, MD3 or MD4 (RS232) modem; cable length 1.5 m	
SINAUT ST7 engineering		Connecting cable	6NH7 701-5AN
software V5.1 for the programming device • SINAUT TD7 function block library V2.2 for the CPU • Electronic manual in German and English		For connecting a TIM (RS232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS232 interface; cable length 2.5 m	
SINAUT ST7 Engineering Software Edition 09/2009	6NH7 997-0CA50-0GA0	Connecting cable	6NH7 701-4BN
(Upgrade) for STEP 7 V5.4 SP4, for owners of older versions of SINAUT ST7 engineering software		with one end open for connecting a TIM (RS232) to a third-party modem or radio unit (RS232); cable length 2.5 m	
Accessories		Connecting cable	6NH7 701-0AR
IE FC TP standard cable GP 2 x 2 (Type A)	6XV1 840-2AH10	For connecting two TIM modules via their RS232 interface without modems ("null modem");	
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m		cable length 6 m	
IE FC RJ45 Plug 180			
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface			
• 1 pack = 10 units	6GK1 901-1BB10-2AA0		
1 pack = 10 units1 pack = 50 units	6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0		

J: Subject to export regulations AL: N and ECCN: EAR99S

Communication

TIM 3V-IE Advanced

Overview



- SINAUT communication module TIM for SIMATIC S7-300 for use in wide area network (WAN) as station, node station, and control center
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Order-No.	6NH7 800-3CA00
Product type designation	TIM 3V-IE Advanced
Transmission rate	
Transmission rate with Industrial Ethernet	10 100 Mbit/s
Transmission rate in accordance with RS 232	50 38 400 bit/s
Interfaces	
Number of interfaces in accordance with Industrial Ethernet	1
Number of electrical connections • For external data transmission in accordance with RS 232 • For power supply	1
Design of electrical connection • of the Industrial Ethernet interface	RJ45 port
 at interface 1 for external data transmission at interface 2 for external data transmission 	9-pin D-sub male connector (RS232) -
• For power supply	2-pin, pluggable terminal strip
Design of the swap medium C-Plug	No
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply • Minimum • Maximum	24 V 20.4 V 28.8 V
Current consumed • Maximum from backplane bus for 24 V DC	0.2 A
Maximum from external power supply for 24 V DC	0.2 A
Effective power loss	5.8 W
Product expansion: optional backup battery	No

Order-No.	6NH7 800-3CA00	
Product type designation	TIM 3V-IE Advanced	
Permitted ambient conditions		
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C	
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %	
IP degree of protection	IP20	
Design, dimensions and weights		
Module format	S7-300 compact module, single-width	
Width Height Depth	40 mm 125 mm 120 mm	
Net weight	0.2 kg	
Product properties, functions,		
components General Number of modules - Note	Number of TIM per S7-300: several, number depends on connection resources of S7-300 CPU	
Cable length Maximum with RS232 interface Maximum with RS485 interface	6 m	
Performance data		
Performance data S7 communication		
Number of possible connections for S7 communication Maximum Maximum with PG connections For OP connections, maximum	24 4 20	
Number of possible connections for S7 communication Note	-	

TIM 3V-IE Advanced

Technical specifications (continued)			
Order-No.	6NH7 800-3CA00		
Product type designation	TIM 3V-IE Advanced		
Service • SINAUT ST7 using S7 communication	Yes		
PG/OP communication	Yes		
Performance data Multiprotocol operation			
Number of active connections in multiprotocol mode	24		
Performance data Telecontrol			
Suitability for use TIM node station TIM station	Yes Yes		
• TIM control center	Yes		
Suitability for use - Note	RS232 and Industrial Ethernet can be used simultaneously		
Protocol is supported			
• TCP/IP	Yes		
DNP3SINAUT ST1 protocol	No Yes		
• SINAUT ST7 protocol	Yes		
Product function data buffering with connection termination	Yes		
Product function data buffering with connection termination Note	32000 Data message frame		
Storage capacity of S7 CPU's work			
memory • Required on CPU for TD7onCPU mode data blocks	20 Kibyte		
Required on TIM for TD7onTIM mode data blocks	0 Kibyte		
Storage capacity - Note	TD7onCPU: at least 20 KB, actual requirement depends on data quantity and functional scope TD7onTIM: 0 bytes in most favorable case		
Product property: buffered message frame memory	No		
Transmission format • 11 bits for SINAUT ST1 protocol with polling	Yes		
10 or 11 bits for SINAUT ST1 protocol with spontaneous	Yes		
10 bits for SINAUT ST7 protocol with multi-master polling	Yes		
with multi-master polling 10 or 11 bits for SINAUT ST7 protocol with polling or spontaneous polling	Yes		
Operating mode with scanning of data transmission			
With dedicated line/radio link			
With SINAUT ST1 protocolWith SINAUT ST7 protocol	Polling, polling with time slot procedure Polling, polling with time slot		
	procedure, multi-master polling with time slot procedure		

Product type designation With dial-up network - With SINAUT ST1 protocol - With SINAUT ST7 protocol Spontaneous Hamming distance For SINAUT ST1 protocol For SINAUT ST7 configuration: SINAUT TD7 block library for CPU Required for CPU configuration: SINAUT ST7 Session:	Order-No.	6NH7 800-3CA00
- With SINAUT ST1 protocol - With SINAUT ST7 protocol Spontaneous Hamming distance For SINAUT ST1 protocol For SINAUT ST1 protocol For SINAUT ST7 protocol Product functions Management, configuration, programming Configuration software Required for CPU configuration: SINAUT ST7 configuration: SINAUT ST7 configuration: SINAUT ST7 configuration software for PG Storage location of TIM configuration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported NSC protocol is supported Nash SSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real No	Product type designation	TIM 3V-IE Advanced
Hamming distance For SINAUT ST1 protocol For SINAUT ST7 protocol For SINAUT ST7 protocol Product functions Management, configuration, programming Configuration software Required for CPU configuration: SINAUT TD7 block library for CPU Required for PG configuration: SINAUT ST7 configuration software for PG Storage location of TIM configuration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported MSC protocol is supported Ves Number of possible connections As MSC client with VPN connection As MSC server with VPN connection Connection TCP/IP Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	- With SINAUT ST1 protocol	
Product functions Management, configuration, programming Configuration software Required for CPU configuration: SINAUT TD7 block library for CPU Required for PG configuration: SINAUT ST7 configuration software for PG Storage location of TIM configuration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	Hamming distance For SINAUT ST1 protocol	4
Configuration software Required for CPU configuration: SINAUT TD7 block library for CPU Required for PG configuration: SINAUT ST7 configuration software for PG Storage location of TIM configuration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported Number of possible connections As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	Product functions Management,	·
SINAUT ST7 configuration software for PG Storage location of TIM configuration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function • Password protection for VPN • MSC client via GPRS modem with MSC capability MSC protocol is supported Ves Number of possible connections • As MSC client with VPN connection • As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	Configuration software Required for CPU configuration: SINAUT TD7 block library for CPU	
ration data Product functions Security Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported Yes Number of possible connections As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	SINAUT ST7 configuration	Yes
Virtual Private Network Suitability for use of Virtual Private Network Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real		On the CPU
Product function Product function Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported Product functions As MSC client with VPN Connection As MSC server with VPN Connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real		
Password protection for VPN MSC client via GPRS modem with MSC capability MSC protocol is supported Yes Number of possible connections As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real Yes Yes No		Yes
Number of possible connections • As MSC client with VPN connection • As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real	Password protection for VPNMSC client via GPRS modem with	
As MSC client with VPN connection As MSC server with VPN connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real 1 CP/IP TCP/IP Yes TCP/IP Yes	MSC protocol is supported	Yes
connection MSC protocol supported with Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real No	As MSC client with VPN	1
Virtual Private Network Key length for MSC with Virtual Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real No	 As MSC server with VPN 	0
Private Network Type of authentication with Virtual Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real No		TCP/IP
Private Network PSK Virtual Private Network mode - Note Product functions time Product component hardware real No		128 bits
Note Product functions time Product component hardware real No		Yes
Product component hardware real No		-
	Product functions time	
		No

TIM 3V-IE Advanced

Ordering data	Order No.		Order No.
TIM 3V-IE Advanced	6NH7 800-3CA00	IE FC stripping tool	6GK1 901-1GA00
communication module With an RS232 interface and an RJ45 interface for SINAUT		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
communication via a conventional WAN and an IP-based network (WAN or LAN)		Connecting cable For connecting a TIM (RS232)	6NH7 701-4AL
SINAUT ST7 engineering software, V5.1	6NH7 997-0CA51-0AA0	with a SINAUT ST7 MD2, MD3 or MD4 (RS232) modem; cable length 1.5 m	
on CD-ROM, comprising:		Connecting cable	6NH7 701-5AN
 SINAUT ST7 engineering software V5.1 for the programming device SINAUT TD7 function block library V2.2 for the CPU Electronic manual in German and English 		For connecting a TIM (RS232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS232 interface; cable length 2.5 m	
SINAUT ST7 engineering J	6NH7 997-0CA50-0GA0	Connecting cable	6NH7 701-4BN
software Edition 09/2009 (Upgrade) for STEP 7 V5.4 SP4, for owners of older versions of SINAUT ST7		with one end open for connecting a TIM (RS232) to a third-party modem or radio unit (RS232); cable length 2.5 m	
engineering software		Connecting cable	6NH7 701-0AR
Accessories	0/0/4 040 041140	For connecting two TIM modules via their RS232 interface without	
IE FC TP standard cable GP 2 x 2 (Type A)	6XV1 840-2AH10	modems ("null modem"); cable length 6 m	
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m		Sable length of the	
IE FC RJ45 Plug 180			
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface			
• 1 pack = 1 unit	6GK1 901-1BB10-2AA0		
1 pack = 10 units1 pack = 50 units	6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0		

J: Subject to export regulations AL: N and ECCN: EAR99S

TIM 4R-IE for WAN and Ethernet

Overview



- SINAUT communication module TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in the wide area network (WAN)
- For universal use in a SINAUT station, node station and control center.
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Order-No.	6NH7 800-4BA00
Product type designation	TIM 4R-IE
Data transmission rate	
Data transmission rate • With Industrial Ethernet • In accordance with RS 232	10 100 Mbit/s 50 38 400 bit/s
Interfaces	
Number of interfaces in accordance with Industrial Ethernet	2
Number of electrical connections • For external data transmission in accordance with RS 232 • For power supply	2
Design of electrical connection • of the Industrial Ethernet interface • at interface 1 for external data transmission • at interface 2 for external data transmission • For power supply	RJ45 port 9-pin D-sub connector, RS232 switchable to RS485 9-pin D-sub connector, RS232 switchable to RS485 2-pin, pluggable terminal strip
Design of the swap medium C-Plug	Yes
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply • Minimum • Maximum	24 V 20.4 V 28.8 V
Current consumed • Maximum from backplane bus for 24 V DC	0.2 A
 Maximum from external power supply for 24 V DC 	0.17 A
Effective power loss	4.6 W
Product expansion: optional backup battery	Yes
Type of battery	Lithium AA / 3.6 V / 2.3 Ah

6NH7 800-4BA00 TIM 4R-IE 100 μA 160 μA 0 60 °C -40 +70 °C -40 +70 °C 95 %
0 60 °C -40 +70 °C -40 +70 °C 95 %
0 60 °C -40 +70 °C -40 +70 °C 95 %
0 60 °C -40 +70 °C -40 +70 °C 95 %
-40 +70 °C -40 +70 °C 95 %
-40 +70 °C -40 +70 °C 95 %
-40 +70 °C -40 +70 °C 95 %
-40 +70 °C 95 %
95 %
00 /0
IP20
Compact module S7-300 double width
80 mm
125 mm
120 mm
0.4 kg
Number of TIM 4R-IE per S7-300/S7-400: several, number depends on connection resources of CPU
6 m
30 m
64
2
62

TIM 4R-IE for WAN and Ethernet

Technical specifications (continued)	
Order-No.	6NH7 800-4BA00
Product type designation	TIM 4R-IE
Number of possible connections for S7 communication Note	-
Service SINAUT ST7 using S7 communication PG/OP communication	Yes Yes
Performance data Multiprotocol	100
operation Number of active connections in multiprotocol mode	128
Performance data Telecontrol	
Suitability for use TIM node station TIM station TIM control center	Yes Yes Yes
Suitability for use - Note	-
Protocol is supported TCP/IP DNP3 SINAUT ST1 protocol SINAUT ST7 protocol	Yes No Yes Yes
Product function data buffering with connection termination	Yes
Product function data buffering with connection termination Note	56000 data message frames
Storage capacity of S7 CPU's work memory Required for TD7onCPU mode data blocks on CPU Required for TD7onTIM mode data blocks on TIM	20 Kibyte 0 Kibyte
Storage capacity - Note	TD7onCPU: at least 20 KB, actual requirement depends on data quantity and functional scope TD7onTIM: 0 bytes in most favorable case
Product property: buffered message frame memory	Yes
Transmission format 11 bits for SINAUT ST1 protocol with polling 10 or 11 bits for SINAUT ST1 protocol with spontaneous polling 10 bits for SINAUT ST7 protocol with multi-master polling 10 or 11 bits for SINAUT ST7 protocol with polling or spontaneous polling	Yes Yes Yes
Operating mode with scanning of data transmission • With dedicated line/radio link - With SINAUT ST1 protocol - With SINAUT ST7 protocol	Polling, polling with time slot procedure Polling, polling with time slot procedure, multi-master polling with time slot procedure

Order-No.	6NH7 800-4BA00
Product type designation	TIM 4R-IE
Operating mode with scanning of data transmission With dial-up network	
- With SINAUT ST1 protocol - With SINAUT ST7 protocol	Spontaneous Spontaneous
Hamming distance • For SINAUT ST1 protocol • For SINAUT ST7 protocol	4 4
Product functions Management, configuration, programming	
Configuration software	
Required for CPU configuration: SINAUT TD7 block library for CPU	Yes
 Required for PG configuration: SINAUT ST7 configuration software for PG 	Yes
Storage location of TIM configu- ration data	On TIM-internal flash memory or on TIM in optional C-PLUG or on MMC of S7-300 CPU if TIM fitted in S7-300 PLC
Product functions Security Virtual Private Network	
Suitability for use of Virtual Private Network	Yes
Product function • Password protection for VPN • MSC client via GPRS modem with MSC capability	Yes Yes
MSC protocol is supported	Yes
Number of possible connections As MSC client with VPN connection	1
 As MSC server with VPN connection 	128
MSC protocol supported with Virtual Private Network	TCP/IP
Key length for MSC with Virtual Private Network	128 bits
Type of authentication with Virtual Private Network PSK	Yes
Virtual Private Network mode - Note	-
Product functions Time	
Product component: hardware real-time clock	Yes
Product property: buffered hardware real-time clock	Yes
Maximum accuracy of hardware real-time clock per day	4 s

TIM 4R-IE for WAN and Ethernet

Ordering data	Order No.		Order No.
TIM 4R-IE communication	6NH7 800-4BA00	IE FC stripping tool	6GK1 901-1GA00
module With two combined RS232/RS485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
		Connecting cable	6NH7 701-4AL
		For connecting a TIM (RS232) with a SINAUT ST7 MD2, MD3 or	
SINAUT ST7 engineering software V5.1	6NH7 997-0CA51-0AA0	MD4 (RS232) modem; cable length 1.5 m	
on CD-ROM, comprising:		Connecting cable	6NH7 701-4DL
 SINAUT ST7 engineering software V5.1 for PG SINAUT TD7 function block library V2.2 for the CPU 		For connecting a TIM (RS485) with a SINAUT ST7 MD2, MD3 or MD4 (RS485) modem; cable length 1.5 m	
Electronic manual in German And English		Connecting cable	6NH7 701-5AN
and English SINAUT ST7 engineering software Edition 09/2009 (Upgrade) for STEP 7 V5.4 SP4. for owners	6NH7 997-0CA50-0GA0	For connecting a TIM (RS232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS232 interface;	
of older versions of SINAUT ST7		cable length 2.5 m	
engineering software		Connecting cable	6NH7 701-4BN
Accessories		with one end open for connecting a TIM (RS232) to a third-party	
Backup battery 3.6 V/2.3 Ah for TIM 4R-IE	6ES7 971-0BA00	modem or radio unit (RS232); cable length 2.5 m	
IE FC TP standard cable GP 2 x 2 (Type A)	6XV1 840-2AH10	Connecting cable	6NH7 701-0AR
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug;		For connecting two TIM modules via their RS232 interface without modems ("null modem"); cable length 6 m	
PROFINET-compatible; with UL approval;		SITOP compact 24 V/ 0.6 A	6EP1 331-5BA00
sold by the meter; max. length 1000 m, minimum order quantity 20 m		1-phase power supply with wide-range input 85 264 V AC/110 300 V DC,	
IE FC RJ45 Plug 180		stabilized output voltage 24 V, rated output current value	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal		0,6 A, slim design	
housing and integrated insulation		SITOP compact 24 V/ 0.6 A	6EP1 331-5BA00
displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface		1-phase power supply with wide-range input 85 264 V AC/110 300 V DC, stabilized output voltage 24 V, rated output current value 0,6 A, slim design	
• 1 pack = 1 unit	6GK1 901-1BB10-2AA0		
1 pack = 10 units1 pack = 50 units	6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0		

J: Subject to export regulations AL: N and ECCN: EAR99S

Communication

TIM 3V-IE DNP3

Overview



In an S7 station, the communication module TIM 3V-IE DNP3 (**T**elecontrol **I**nterface **M**odule) processes the data traffic for the S7-CPU to the assigned master system SIMATIC PCS7 TeleControl V7.1 SP2 using the open protocol DNP3 (**D**istributed **N**etwork **P**rotocol).

- With the S7-300 housing, it can be fully integrated into the S7-300 system
- RS232 interface for connecting an external modem for data transmission via a conventional WAN
- RJ45 interface for data transmission via IP-based networks

Technical specifications

Order-No.	6NH7 803-3BA00-0AA0	
Product type designation	TIM 3V-IE DNP3	
Transmission rate		
Transmission rate with Industrial Ethernet	10 100 Mbit/s	
Transmission rate in accordance with RS 232	300 38 400 bit/s	
Interfaces		
Number of interfaces in accordance with Industrial Ethernet	1	
Number of electrical connections • For external data transmission in accordance with RS 232	1	
• for power supply	1	
Design of electrical connection • of the Industrial Ethernet interface • at interface 1 for external data transmission	RJ45 port 9-pin Sub-D connector (RS232)	
 at interface 2 for external data transmission 	-	
• for power supply	2-pin, plug-in terminal strip	
Design of swap medium C-Plug	No	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Supply voltage	24 V	
Minimum Maximum	20.4 V 28.8 V	
Current consumed	20.0 V	
Maximum from backplane bus for 24 V DC	0.2 A	
 From external supply voltage at 24 V DC max. 	0.2 A	
Effective power loss	5.8 W	
Product expansion: optional backup battery	No	
Type of battery	-	
Backup current, typical	-	
Backup current, maximum	-	

Order-No.	6NH7 803-3BA00-0AA0 TIM 3V-IE DNP3	
Product type designation		
Permissible ambient conditions		
Ambient temperature • During operating phase • During storage • During transport	0 60°C -40 +70°C -40 +70°C	
Relative humidity at 25°C without condensation during operating phase, maximum	95%	
IP degree of protection	IP20	
Design, dimensions and weights		
Module format	Compact module S7-300 single-width	
Width Height Depth	40 mm 125 mm 120 mm	
Net weight	0.2 kg	
Product properties, functions, components General		
Number of modules - Note	Number of TIMs per S7-300: 1	
Cable length • With RS232 interface, maximum • With RS485 interface, maximum	6 m	
Performance data		
Performance data S7 communication		
Number of possible connections for S7 communication Maximum For PG connections, maximum For OP connections, maximum	3 2 1	
Number of possible connections for S7 communication - Note	Only via LAN	
Service • SINAUT ST7 via S7 communication • PG/OP communication	- Yes	

TIM 3V-IE DNP3

Technical specifications (continued)

Order-No.	6NH7 803-3BA00-0AA0
Product type designation	TIM 3V-IE DNP3
Performance data multiprotocol operation	
Number of active connections in multiprotocol mode	+
Performance data Telecontrol	
Suitability for use TIM node station TIM station TIM control center	No Yes No
Suitability for use - Note	-
Protocol is supported TCP/IP DNP3 SINAUT ST1 protocol SINAUT ST7 protocol	No Yes No No
Number of data frames which can be saved on the TIM	r
Product function: data buffering if connection is aborted	Yes
Product function: data buffering if connection is aborted - Note	50,000 data points with one master
Storage capacity of S7 CPU RAM Data blocks required on CPU for TD7onCPU mode Data blocks required on TIM for TD7onTIM mode	-
Storage capacity - Note	-
Product property: buffered message frame memory	-

Order-No.	6NH7 803-3BA00-0AA0
Product type designation	TIM 3V-IE DNP3
Data transfer format • For SINAUT ST1 protocol with polling 11 bits	-
• For SINAUT ST1 protocol with spontaneous 10 bits or 11 bits	-
 For SINAUT ST7 protocol with multi-master polling 10 bits 	-
 For SINAUT ST7 protocol with polling or spontaneous 10 bits or 11 bits 	-
Operating mode for scanning of data transmission	
With dedicated line/radio link With CINALIT CT4 counts and	
 With SINAUT ST1 protocol With SINAUT ST7 protocol 	-
With dial-up network	
- With SINAUT ST1 protocol	-
- With SINAUT ST7 protocol	-
Hamming distanceWith SINAUT ST1 protocol	
• for SINAUT ST7 protocol	-
Product functions Management, configuration, programming	
Configuration software	
Required	SINAUT ST7 ES
Storage location of TIM configuration data	On the CPU or TIM
Product functions Time	
Product component: hardware real-time clock	Yes
Product property: buffered hardware real-time clock	Yes
Maximum accuracy of hardware real-time clock per day	4 s

TIM 3V-IE DNP3

Ordering data	Order No.		Order No.
TIM 3V-IE DNP3 communication module	6NH7 803-3BA00-0AA0	IE FC RJ45 Plug 180	
With an RS232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)		RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC	
SINAUT ST7 engineering software V5.1	6NH7 997-0CA51-0AA0	installation cables; with 180° cable outlet; for network components and CPs/	
on CD-ROM, comprising: • SINAUT ST7 engineering		CPUs with Industrial Ethernet interface	
software V5.1 for the PG		• 1 pack = 1 unit	6GK1 901-1BB10-2AA0
• SINAUT TD7 block library V2.2		 1 pack = 10 units 1 pack = 50 units 	6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0
 Electronic manual in German and English 		IE FC stripping tool	6GK1 901-1GA00
SINAUT ST7 engineering software V5.1 Update from Version V5.0 to V5.1	Software download	Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
SINAUT ST7 engineering	6NH7 997-0CA50-0GA0	Connecting cable	6NH7 701-4AL
software V5.0 Edition 09/2009 (Upgrade) for STEP 7 V5.4 SP4, for owners of older versions of SINAUT ST7		For connecting a TIM (RS232) with a SINAUT ST7 MD2, MD3 or MD4 (RS232) modem; cable length 1.5 m	
engineering software		Connecting cable	6NH7 701-5AN
Accessories IE FC TP standard cable GP 2 x 2 (Type A) 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet / IE FC RJ45 plug;	6XV1 840-2AH10	For connecting a TIM (RS232) with the GSM modem MD720-3; also suitable for third-party modems or wireless equipment with standard RS232 interface; cable length 2.5 m	
PROFINET-compliant; with UL		Connecting cable	6NH7 701-4BN
approval; sold by the meter; max. quantity 1000 m, minimum order quantity 20 m		with one end open for connecting a TIM (RS232) to a third-party modem or wireless device (RS232); cable length 2.5 m	
		Connecting cable	6NH7 701-0AR
		For connecting two TIM modules via their RS232 interface without modems ('Null modem'). Cable length 6 m	

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

TIM 4R-IE DNP3

Overview



In an S7 station, the communication module TIM 4R-IE DNP3 (**T**elecontrol **I**nterface **M**odule) processes the data traffic for the S7-CPU to the assigned master system SIMATIC PCS7 TeleControl V7.1 SP2 using the open protocol DNP3 (**D**istributed **N**etwork **P**rotocol).

- With the double-width S7-300 housing, can be fully integrated into the S7-300 system
- Can be connected as a stand-alone to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS232/RS485 interfaces for the connection of an external modem for data transmission via a conventional WAN
- Two RJ45 interfaces for data transmission via IP-based networks
- By the use of physically separate connection paths, the module permits media redundancy without loss of data during the switchover

Technical specifications

Order-No.	6NH7 803-4BA00-0AA0	
Product type designation	TIM 4R-IE DNP3	
Transmission rate		
Transmission rate • for Industrial Ethernet • in accordance with RS 232	10 100 Mbit/s 300 115 200 bit/s	
Interfaces		
Number of interfaces in accordance with Industrial Ethernet	2	
Number of electrical connections • For external data transmission in accordance with RS 232	2	
 for power supply 	1	
Design of electrical connection • of the Industrial Ethernet interface	RJ45 port	
 at interface 1 for external data transmission at interface 2 for external data transmission for power supply 	9-pin Sub-D connector, RS232 switchable to RS485 9-pin Sub-D connector, RS232 switchable to RS485 2-pin, plug-in terminal strip	
Design of swap medium C-Plug	Yes	
Supply voltage, current consumption, power loss		
Type of power supply	DC	
Supply voltage	24 V	
• Minimum	20.4 V	
Maximum	28.8 V	
Current consumed • Maximum from backplane bus for 24 V DC	0.2 A	
 From external supply voltage at 24 V DC max. 	0.17 A	
Effective power loss	4.6 W	
Product expansion: optional backup battery	Yes	
Type of battery	Lithium AA / 3.6 V / 2.3 Ah	

6NH7 803-4BA00-0AA0
TIM 4R-IE DNP3
100 μA 160 μA
0 60°C -40 +70°C -40 +70°C
95%
IP20
Compact module S7-300 double-width
80 mm 125 mm 120 mm
0.4 kg
Number of TIMs per S7-300 / S7-400: 1
6 m 30 m
5 2 1

TIM 4R-IE DNP3

Technical specifications (continued)

Order-No.	6NH7 803-4BA00-0AA0
Product type designation	TIM 4R-IE DNP3
Number of possible connections for S7 communication - Note	Only via LAN
Service SINAUT ST7 via S7 communication PG/OP communication	- Yes
	res
Performance data multiprotocol operation	
Number of active connections in multiprotocol mode	-
Performance data Telecontrol	
Suitability for use TIM node station TIM station TIM control center	No Yes No
Suitability for use - Note	-
Protocol is supported TCP/IP DNP3 SINAUT ST1 protocol SINAUT ST7 protocol	No Yes No No
Number of data frames which can be saved on the TIM	-
Product function: data buffering if connection is aborted	Yes
Product function: data buffering if connection is aborted - Note	200,000 data points with one master
Storage capacity of S7 CPU RAM • Data blocks required on CPU for TD7onCPU mode	-
 Data blocks required on TIM for TD7onTIM mode 	-
Storage capacity - Note	-
Product property: buffered message frame memory	-

Order-No.	6NH7 803-4BA00-0AA0
Product type designation	TIM 4R-IE DNP3
Data transfer format For SINAUT ST1 protocol with polling 11 bits For SINAUT ST1 protocol with spontaneous 10 bits or 11 bits For SINAUT ST7 protocol with multi-master polling 10 bits For SINAUT ST7 protocol with polling or spontaneous 10 bits or 11 bits	- - -
Operating mode for scanning of data transmission • With dedicated line/radio link - With SINAUT ST1 protocol - With SINAUT ST7 protocol • With dial-up network - With SINAUT ST1 protocol - With SINAUT ST7 protocol Hamming distance • With SINAUT ST1 protocol	· ·
• for SINAUT ST7 protocol	-
Product functions Management, configuration, programming	
Configuration software • Required	SINAUT ST7 ES
Storage location of TIM configuration data	On the CPU
Product functions Time	
Product component: hardware real-time clock	Yes
Product property: buffered hardware real-time clock	Yes
Maximum accuracy of hardware real-time clock per day	4 s

TIM 4R-IE DNP3

Ordering data	Order No.		Order No.
TIM 4R-IE DNP3	6NH7 803-4BA00-0AA0	IE FC stripping tool	6GK1 901-1GA00
with two combined RS232/RS485 interfaces for SINAUT communi-		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
cation via conventional WANs and two RJ45 interfaces for		Connecting cable	6NH7 701-4AL
SINAUT communication via IP- based networks (WAN or LAN)		For connecting a TIM (RS232) with a SINAUT ST7 MD2, MD3 or	
SINAUT ST7 engineering J software V5.1	6NH7 997-0CA51-0AA0	MD4 (RS232) modem; cable length 1.5 m	
on CD-ROM, comprising:		Connecting cable	6NH7 701-4DL
 SINAUT ST7 engineering software V5.1 for the PG SINAUT TD7 block library V2.2 		For connecting a TIM (RS485) with a SINAUT ST7 MD2, MD3 or MD4 (RS485) modem; cable length 1.5 m	
 Electronic manual in German and English 		Connecting cable	6NH7 701-5AN
SINAUT ST7 engineering software V5.1 Update from Version V5.0 to V5.1	Software download	For connecting a TIM (RS232) with the GSM modern MD720-3; also suitable for third-party moderns or wireless equipment	
SINAUT ST7 engineering software V5.0 Edition 09/2009 (Upgrade)	6NH7 997-0CA50-0GA0	with standard RS232 interface; cable length 2.5 m	
for STEP 7 V5.4 SP4, for owners		Connecting cable	6NH7 701-4BN
of older versions of SINAUT ST7 engineering software		with one end open for connecting a TIM (RS232) to a third-party modem or wireless device	
Accessories		(RS232);	
Backup battery		cable length 2.5 m Connecting cable	6NH7 701-0AR
3.6 V/2.3 Ah for TIM 4R-IE DNP3		For connecting two TIM modules	ONITY TOT-DAIL
IE FC TP standard cable GP 2 x 2 (Type A) 4-core, shielded TP installation	6XV1 840-2AH10	via their RS232 interface without modems ('Null modem'). Cable length 6 m	
cable for connection to IE FC RJ45 outlet / IE FC RJ45 plug;		SITOP compact 24 V/ 0.6 A	6EP1 331-5BA00
PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order quantity 20 m		1-phase power supply with wide- range input 85 to 264 V AC/ 110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	
IE FC RJ45 Plug 180		SITOP compact 24 V/ 0.6 A	6EP1 331-5BA00
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		1-phase power supply with wide- range input 85 to 264 V AC/ 110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	
 1 pack = 1 unit 1 pack = 10 units 1 pack = 50 units 	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0		

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

ASM 475

Overview



The ASM 475 is a low-cost module for connecting the MOBY D, U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

Technical specifications

Communication modules	ASM 475	ASM 475 (with MOBY U file handler)	
Serial interface to the reader	RS422		
Connection point for reader	Max. 2 units via screw or spring-loaded terminals in the front connector		
Interface/cable length, max. connectable length	RS422 / 1 000 m, depending on reader and cable type		
Readers that can be connected	MOBY U/D, RF 200 / RF300 / RF600, MV400 MOBY U		
Interface for 24 V DC	Via screw terminals in front connector		
SIMATIC S7 function blocks	FC/FB45, FC55 (multitag)	FC56	
Transponder addressing	Direct access via addresses	Access via DOS-like file system	
Commands	Initialize transponder, read data from transponder, write data to transponder, etc.	Format transponder, read file, write file, etc.	
Supply voltage • Rated value • Permissible range	24 V DC 20 30 V DC		
Electrical isolation between S7-300 and MOBY	Yes		
Current consumption from S7 bus terminal, max.	100 mA		
Power loss, typically	1 W		
Ambient temperature			
During operation • Horizontal configuration of SIMATIC • Vertical configuration of SIMATIC	0 +60 °C 0 +40 °C		
During transportation and storage	-40 +70 °C		
Dimensions W x H x D (mm)	40 x 125 x 120		
Weight	Approx. 0.2 kg		

ASM 475

Ordering data	Order No.		Order No.
MOBY ASM 475 communication module	6GT2 002-0GA10	SIMATIC RF200 / RF300 / RF600 / MV400 connecting	
For SIMATIC S7-300 and ET 200M, parameterizable		cable preassembled, between the ASM 475 and RF200 / RF300 /	
Accessories		RF600 / MV400, IP65, straight	
Front connector (1 x per ASM 475) • with screw terminals • with spring-loaded terminals	6ES7 392-1AJ00-0AA0 6ES7 392-1BJ00-0AA0	 connector, PUR material, suitable for cable carriers, CMG approval, in the following lengths ¹⁾: 2 m 	6GT2 891-4EH20
MOBY U connecting cable preassembled, between the ASM 475 and reader, angled connector, PUR material, in the following lengths:		Extension cable SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable	6GT2 891-4EH50
2 m	6GT2 091-4EH20	carriers, straight connector	COTO 004 451100
5 m	6GT2 091-4EH50	2 m	6GT2 891-4FH20
10 m	6GT2 091-4EN10	5 m	6GT2 891-4FH50
20 m	6GT2 091-4EN20	10 m	6GT2 891-4FN10
50 m	6GT2 091-4EN50	20 m	6GT2 891-4FN20
pre-assembled, between ASM 475 and reader, straight connector, PUR material, in the following lengths:		50 m DVD "RFID Systems Software & J Documentation"	6GT2 891-4FN50 6GT2 080-2AA20
2 m	6GT2 091-6EH20		
5 m	6GT2 091-6EH50		
10 m	6GT2 091-6EN10		
50 m	6GT2 091-6EN50		
MOBY D connecting cable preassembled, between ASM 475 and reader D1xS, 9-pole Sub-D plug, PUR material, CMG approved, suitable for cable carriers, in the following lengths:			
5 m	6GT2 491-4EH50		
20 m	6GT2 491-4EN20		
50 m	6GT2 491-4EN50		

¹⁾ The connecting cables can be extended using the RF300 connecting cables of type 6GT2891-0Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-300 SIPLUS communication

SIPLUS CP 340

Overview



- The low-cost, complete solution for serial communication over a point-to-point connection
- RS 232C (V.24) and RS 422/485 (X.27)
- Implemented protocols:
 - ASCII
- 3964 (R) (not for RS 485)
- Printer driver
- Simple parameterization using tool integrated in STEP 7

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 340 version	RS 232 (V.24)		RS 422/485 (X.27)		
Order No.	6AG1 340-1AH02-2AE0	6AG1 340-1AH02-2AY0	6AG1 340-1CH02-2AE0		
Order No. based on	6ES7 340-1AH02-0AE0	6ES7 340-1AH02-0AE0	6ES7 340-1CH02-0AE0		
Ambient temperature range	-25 +60 °C	-25 +60 °C	-25 +60 °C		
Conformal coating	Coating of the printed circuit boa	rds and the electronic components			
Technical specifications	The technical data of the standar	d product applies except for the ambi-	ent conditions.		
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	Yes	No		
Ambient conditions					
Relative humidity	5 100%, condensation allowed				
Biologically active substances	Conformity with EN 60721-3-3, C	lass 3B2 mold and fungal spores (exc	ept fauna)		
Chemically active substances	Conformity with EN 60721-3-3, C	lass 3C4 incl. salt mist and ISA-S71.04	severity level G1; G2; G3; GX 1) 2)		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾				
Air pressure (depending on the highest positive temperature range specified)	1080795 hPa (-1000 +2000 m), see ambient temperature range 795658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000m) derating 20 K				

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CP 340 communication processor		Accessories	See SIMATIC CP 340. page 5/227
(extended temperature range and medial exposure)			
with one RS 232C interface (V.24) L	6AG1 340-1AH02-2AE0		
with one RS 232C interface (V.24); I compliant with EN 50155	6AG1 340-1AH02-2AY0		
with one RS 422/485 interface L (X.27)	6AG1 340-1CH02-2AE0		

- I: Subject to export regulations AL: N and ECCN: EAR99H
- L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-300 SIPLUS communication

SIPLUS CP 341

Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- 2 versions with different physical transmission characteristics:
 - RS 232C (V.24),
 - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customized protocols (can be reloaded)
- Simple parameterization using tool integrated in STEP 7

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 341	RS 232C interface (V.24)	RS 422/485 (X.27) interface			
Order No.	6AG1 341-1AH02-7AE0	6AG1 341-1CH02-7AE0			
Order No. based on	6ES7 341-1AH02-0AE0	6ES7 341-1CH02-0AE0			
Ambient temperature range	-25 +70 °C	-25 +70 °C			
Conformal coating	Coating of the printed circuit boards and	the electronic components			
Technical specifications	The technical data of the standard product applies except for the ambient conditions.				
Ambient conditions					
Relative humidity	5 100%, condensation allowed				
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)				
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4	incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust 2)				
Air pressure (depending on the	1080 795 hPa (-1000 +2000 m), see ambient temperature range				
highest positive temperature range specified)	795658 hPa (+2000 +3500 m) derating 10 K				
specifica)	658 540 hPa (+3500 +5000m) derating 20 K				

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ <4.8 ppm; H $_2$ S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O $_3$ <0.1 ppm; NOx <5.2 ppm
Threshold/ limit value (max. 30 min/d): SO $_2$ < 17.8 ppm; H $_2$ S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3$ < 1.0 ppm; NOx < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CP 341 communication processor		Accessories	See SIMATIC CP 341, page 5/229
(extended temperature range and medial exposure)			
with RS 232C interface (V.24) with RS 422/485 (X.27) interface I	6AG1 341-1AH02-7AE0 6AG1 341-1CH02-7AE0		

I: Subject to export regulations AL: N and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIPLUS communication

SIPLUS CP 342-5

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•	•		•	•	6.K10,XX,10148

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 and the SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
 - PROFIBUS DP-V0
 - PG/OP communication (OP multiplexing)
 - S7 communication (client, server)
 - S5-compatible communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 342-5DA02- 2XE0	6AG1 342-5DA02- 4XE0			
Order No. based on	6GK7 342-5DA02- 0XE0	6GK7 342-5DA02- 0XE0			
Ambient temperature range	-25 +60 °C	0 +60 °C			
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents			
Technical data	The technical data of the standard product applies except for the ambient conditions.				
Ambient conditions					
Relative humidity	5 100 % Condensation permissible				
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)				
Chemically active substances	Conformity with EN 3C4 incl. salt mist a severity level G1; G	ind ISA-S71.04			
Mechanically active substances	Conformity with EN 3S4 including cond				
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1 see ambient tempe 795 658 hPa (+2) derating 10 K 658 540 hPa (+3) derating 20 K	rature range 000 +3500 m)			

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOx < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS CP 342-5 communication processor	
(extended temperature range and medial exposure)	
Communication processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s, with electronic manual on CD-ROM	
Ambient temperature range L -25 +60 °C	6AG1 342-5DA02-2XE0
Ambient temperature range L 0 +60 °C, only medial exposure	6AG1 342-5DA02-4XE0
Accessories	See SIMATIC CP 342-5 communication processor, page 5/235

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-300 SIPLUS communication

SIPLUS CP 343-1 Lean

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	•	•	•			•	• K10 XX 014

- Interface for the SIMATIC S7-300 to Industrial Ethernet (not for SINUMERIK)
 - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection (with autosensing for automatic switchover and autocrossover function)
 - Integral 2-port real-time switch ERTEC
 - Multi-protocol operation with TCP and UDP transport protocol and PROFINET I/O
 - Keep Alive function
- Communication services:
 - Open communication (TCP/IP and UDP):
 - PG/OP communication
 - S7 communication (server)
 - PROFINET IO device
- · Multicast by UDP
- Remote programming and initial commissioning is possible over Industrial Ethernet
- IT communication
 - Web function
- Integration into network management through SNMP
- Configuration with STEP 7
- Cross-network programming device/operator panel communication through S7 routing
- Diagnostics possibilities in STEP 7 and Web browser

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 343- 6AG1 343- 1CX10-2XE0 1CX10-4XE0		
Order No. based on	6GK7 343-1CX	10-0XE0	
Ambient temperature range	-25 +60 °C	0 +60 °C	
Conformal coating	Coating of the p boards and the components		
Technical data	The technical daystandard production for the ambient	ct applies except	
Ambient conditions			
Relative humidity	5 100 % Condensation p	ermissible	
Biologically active substances	Conformity with Class 3B2 mold spores (except	and fungal	
Chemically active substances	Conformity with Class 3C4 incl. ISA–S71.04 sev G2; G3; GX ^{1) 27}	salt mist and	
Mechanically active substances	Conformity with Class 3S4 inclu- sand, dust ²⁾	EN 60721-3-3, ding conductive	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 see ambient ter 795 658 hPa (+2000 +350 derating 10 K 658 540 hPa (+3500 +500 derating 20 K	0 m) nperature range 0 m)	

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; H2S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H2S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOx < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering Data	Order No.
SIPLUS CP 343-1 Lean communication processor	
(extended temperature range and medial exposure)	
For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, integral 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM	
Ambient temperature 0 +60 °C	6AG1 343-1CX10-4XE0
Ambient temperature -25 +60 °C	6AG1 343-1CX10-2XE0
Accessories	See SIMATIC CP 343-1 Lean communication processor, page 5/242

SIPLUS communication

SIPLUS CP343-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
•	•	•	•			•	G,K10,XX,1047

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
 - 2 x RJ-45 interface for 10/100 Mbit/s full/half-duplex connection with auto-sensing/auto-negotiation and autocrossover function
 - Integrated 2-port real-time switch ERTEC
 - Multi-protocol operation with ISO, TCP, UDP transport protocol and PROFINET IO
 - Adjustable keep alive function
- · Communication services:
 - Open communication (ISO, TCP/IP, and UDP)
 - PROFINET IO-Controller or PROFINET IO-Device
 - PG/OP communication: Cross-network by means of S7 routing
 - S7 communication (client, server, multiplexing)
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- Multicast by UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- · Access protection via configurable access list
- Remote programming and commissioning via Industrial Ethernet
- Configuration with STEP 7
- Automatic setting of CPU clock setting over Ethernet with NTP or SIMATIC procedure
- Web diagnostics
- Integration in network management systems via SNMP (MIB2 diagnostics information)
- Diagnostics possibilities in STEP 7 and Web browser

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 343-1			
Order No.	6AG1 343-1EX30- 4XE0	6AG1 343-1EX30- 7XE0	
Order No. based on	6GK7 343-1EX30- 0XE0	6GK7 343-1EX30- 0XE0	
Ambient temperature range	0 +60 °C	-25 +70 °C	
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents	
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on the highest positive temper- ature range specified)	1080 795 hPa (-1000 +2000 m)		

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOx < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

SIMATIC S7-300 SIPLUS communication

SIPLUS CP343-1

Ordering data	Order No.		Order No.
SIPLUS CP 343-1 communication processor		Accessories	See SIMATIC CP 343-1 cc cation processor, page 5/
(extended temperature range and medial exposure)			
for connecting SIMATIC S7-300 to Industrial Ethernet via ISO and TCP/IP; PROFINET IO-Controller or PROFINET IO-Device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE with or without RFC 1006, multicast, DHCP, CPU clock set via SIMATIC procedure and NTP, diagnostics, SNMP, access control via IP access list, initialization over LAN 10 /100 Mbit/s; with electronic manual on DVD			
Ambient temperature 0 +60 °C	6AG1 343-1EX30-4XE0		
Ambient temperature -25 +70 °C	6AG1 343-1EX30-7XE0		

SIPLUS communication

SIPLUS CP343-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5	
•	•	•	•	•	•	•	G.K10.XX,10146	

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
 - Multi-protocol operation with TCP and UDP transport protocol
 - Adjustable keep alive function
- Two separate interfaces (integrated network separation):
 - Gigabit interface with one RJ45 port with 10/100/1000 Mbit/ s full/half-duplex with auto-sensing capability
 - PROFINET interface with two RJ45 ports with 10/100 Mbit/s full/half-duplex with auto-sensing and auto-crossover functionality via integrated 2-port switch
- Communication services via both interfaces:
 - Open communication (TCP/IP and UDP): Multicast with UDP, including routing between both interfaces
 - PG/OP communication: Cross-network by means of S7
 - S7 communication (client, server, multiplexing) including routing between both interfaces
 - IT communication: HTTP communication supports access to process data via own Web pages; e-mail client function, sending of e-mails directly from user program; FTP communication supports program-controlled FTP client communication; access to data blocks through FTP server
- Communication services via PROFINET interfaces:
 - PROFINET IO-Controller and IO-Device with real-time properties (RT and IRT)¹⁾
 - PROFINET CBA
 - IP address assignment via DHCP, simple PC tool or via program block (e.g. for HMI)
 - Configuration with STEP 7
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- · Access protection by means of configurable IP access list
- Module replacement without programming device; all information is stored on the C-PLUG (also file system for IT functions)
- · Extensive diagnostics functions for all modules in the rack
- IT communication
 - Web function
 - E-mail function
 - FTP

- Integration into network management systems through the support of SNMP V1 MIB-II
- Possible combinations in parallel mode:
 IO-Controller with IRT and IO-Device with RT
- IO-Controller with RT and IO-Device using IRT

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 343-1GX30-4XE0	
Order No. based on	6GK7 343-1GX30-0XE0	
Ambient temperature range	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies excep for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOx < 10.4 ppm

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-300 SIPLUS communication

SIPLUS CP343-1 Advanced

Ordering data	Order No.		Order No.
SIPLUS CP 343-1 Advanced Lommunication processor	6AG1 343-1GX30-4XE0	Accessories	See SIMATIC CP 343-1 Advanced communication processor,
(medial exposure)			page 5/250
for connecting the SIMATIC S7-300 to Industrial Ethernet, PROFINET IO-Controller and IO-Device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE with or without RFC 1006, diagnostics extensions, multicast, Web server, HTML diagnostics, FTP server, FTP client, e-mail client, CPU clock set via SIMATIC procedure and NTP, access control via IP access List, SNMP, DHCP, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD; C-PLUG included			

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS communication

SIPLUS TIM 3V-IE for WAN and Ethernet

Overview



- SINAUT communication module SIPLUS TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- · Message frame memory for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS TIM 3V-IE		
Order number	6AG1 800-3BA00-7AA0	
Order No. based on	6NH7 800-3BA00	
Ambient temperature range	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies excep for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; CI < 0.66 ppm; CI < 0.12 ppm; CI < 4.9 ppm; CI < 0.12 ppm; CI < 4.9 ppm; CI < 4.0 ppm; CI < 4.0
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.	
SIPLUS TIM 3V-IE communication module	6AG1 800-3BA00-7AA0	
With an RS232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)		
Accessories	see TIM 3V-IE for WAN and Ethernet, page 5/259	

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-300 SIPLUS communication

SIPLUS TIM 4R-IE for WAN and Ethernet

Overview



- SINAUT communication module SIPLUS TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in a wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS TIM 4R-IE	
Order number	6AG1 800-4BA00-7AA0
Order No. based on	6NH7 800-4BA00
Ambient temperature range	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; CI < 4.9 ppm; CI < 0.12 ppm; CI < 4.0 ppm; CI < 4.
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS TIM 4R-IE communication module	6AG1 800-4BA00-7AA0
With two combined RS232/RS485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	
Accessories	see TIM 4R-IE for WAN and Ethernet, page 5/265

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-300 Connection methods

Front connectors

Overview



- For the simple and user-friendly connection of sensors and actuators to the S7-300 I/O modules
- For maintaining the wiring when replacing modules ("permanent wiring")
- With mechanical coding to avoid errors when replacing modules

Ordering data	Order No.		Order No.
Front connectors		40-pin, with spring-loaded contacts	
20-pin, with screw contacts 1 unit 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	• 1 unit • 100 units	6ES7 392-1BM01-0AA0 6ES7 392-1BM01-1AB0
20-pin, with spring-loaded contacts		40-pin, with FastConnect • 1 unit	6ES7 392-1CM00-0AA0
• 1 unit	6ES7 392-1BJ00-0AA0	Front door, elevated design	6ES7 328-0AA00-7AA0
• 100 units	6ES7 392-1BJ00-1AB0	e.g. for 32 channel modules; enables connection of 1.3 mm ² /	
20-pin, with FastConnect • 1 unit	6ES7 392-1CJ00-0AA0	enables connection of 1.3 mm ² / 16 AWG wires	
40-pin, with screw contacts			
• 1 unit	6ES7 392-1AM00-0AA0		
• 100 units	6ES7 392-1AM00-1AB0		

SIMATIC S7-300 Connection methods

SIMATIC TOP connect for SIMATIC S7

Overview

Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet manufacture, procurement and ease of service.

With SITOP TOP connect system cabling, this connection is established for your SIMATIC S7-300/400 simply, quickly and reliably.

With the SIMATIC TOP connect **configuration tool**, you can configure the connection between the SIMATIC S7 interface and the I/O per mouse click. The program automatically checks for plausibility and generates a parts list for the selected connection components.

www.siemens.com/simatic-tc-configurator

Design

Two cabling versions are available for the most diverse control cabinet concepts:

Fully modular connection

Each component is individually inserted.

The system consists of:

- Front connector module
- · Connecting cable
- Connection modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is minimized. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced as cables sold by the meter that are either pre-assembled or that can be assembled easily can be used.

Flexible connection

Consisting of:

- Front connector with screw-type or crimp connection
- Front connector with fixed single cores
- Single cores also available with UL/CSA-certified cores

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus, no complex pre-assembly of up to two times 46 single cores per module is necessary.

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Overview



The fully modular connection is the standard connection for the SIMATIC S7-300/400. The fully modular connection allows the peripherals to be conveniently and quickly connected to the SIMATIC S7-300/400 without errors.

Benefits

- Easy plugging in of front connector module, connecting cable and connection module
- Fast and low-cost wiring
- Supply voltage connectable to front connector module or connection module for digital and analog signals
- · Reduction in wiring errors, clear control cabinet wiring
- · Distribution of digital signals by byte or by double-byte
- Each component can be replaced individually.
- Every cable length can be configured without cutting, or preassembled cables can be used

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector. The front connector modules are available in many different versions. For the SIMATIC S7-300 and SIMATIC S7-400, digital or analog. The connecting cables are plugged into these front connector modules.

Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pole round cable (shielded or unshielded) up to a length of 5 m, or the 16-pole round-sheath ribbon cable (with or without shield), which can be easily assembled by the user, or as 2 x 16-pole round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (to be ordered separately). The cable transmits $8 \text{ or } 2 \times 8$ channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the connection module.

Connection module

The system has digital and analog connection modules for connecting the I/O signals. These are snapped onto the standard mounting rail.

The connection modules are available for two connection methods: with spring-loaded or screw-type terminals

Basic module:

Connection modules with basic functionality for getting the signal from the field to the module or from the module to the field quickly and easily. For digital or analog signals.

Signal module:

Expands the digital basic module with LEDs for signaling the active high signal. This makes commissioning easier for you, and you always have an overview of the signal states of your I/O. One LED signals the availability of the supply voltage.

Function module:

Digital connection modules that are fitted with relays or optocouplers.

If other voltage or power levels are required in the field , the connection module for output signals TPRo or TPOo is used. For the TPRo connection module, relays are used for the implementation. For the TPOo connection module, opto couplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay connection module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency here.

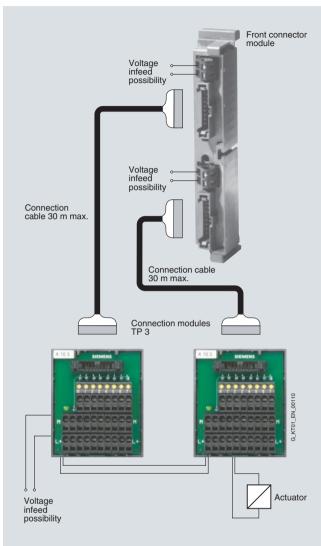
Shield plate

The shield plate is latched onto the connection module for 3-core initiators or optionally onto the connection module for analog signals and then snapped onto the mounting rail with the connection module. With the terminal elements, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded mounting rail.

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Design (continued)



Design of the fully modular connection (16-channel in example)

Technical specifications

Technical data of front connector module				
Rated operating voltage	24 V DC			
Max. permissible operating voltage	60 V DC			
Max. permissible continuous current • per connector pin	1 A			
Max. permissible summation current	4 A/byte			
Permissible ambient temperature	0 to + 60°C			
Test voltage	0.5 kV, 50 Hz, 60 sec.			
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2			

Wiring rules for front connector modules

Front connector module S connection for potential in		t,	
	Spring connection	Screw connection	
	Modules up to 4 c	onnections	
Connectable cable cross-sections			
solid cablesflexible cables with/without wire end ferrule	No 0,25 to 1.5 mm ²		
Number of wires per connection	1 or a combination of 2 conductors up to 1.5 mm ² (total) in a common wire end ferrule		
Max. diameter of the cable insulation	3.1 mm		
Stripping length of the cables			
without insulating collarwith insulating collar	6 mm -		
Wire-end ferrules in acc. with DIN 46228			
 without insulating collar with insulating collar 0.25 to 1.0 mm² 	Form A; 5 to 7 mm long		
 with insulating collar 1.5 mm² 	-		
Blade width of the screw- driver	3.5 mm (cylindrical shape)		
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm	

	Spring connection	Screw connection
	Modules up to 8 c	onnections
Connectable cable cross-sections • solid cables	No	
• flexible cables with/without wire end ferrule	0.25 to 0.75 mm ²	
Number of cables per connection	1 or a combination of 2 wires up to 0.75 mm ² (total) in a common wire enferrule	
Max. diameter of the cable insulation	2.0 mm	
Stripping length of the cables		
without insulating collarwith insulating collar	6 mm -	
Wire-end ferrules in acc. with DIN 46228 • without insulating collar • with insulating collar 0.25 to 1.0 mm ² • with insulating collar 1.5 mm ²	Form A; 5 to 7 mm long -	
Blade width of the screw- driver	3.5 mm (cylindrical	shape)
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

TPA connection module

Max. operating voltage

SIMATIC S7-300

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Technical specifications connecting cable

recommon operations connecting capie		
Technical data of connecting cable from SIMATIC S7 to connection module		
Operating voltage	60 V DC	
Continuous current per signal conductor	1 A	
Max. summation current	4 A/byte	
Operating temperature	0 to +60°C	
Outer diameter of pre-assembled round cable in mm, unshielded/shielded	Approx. 6.5/7.0	
Outer diameter of round-sheath ribbon cable in mm, 16-pole/2 x 16-pole	Approx. 9.5/11.5	

1 A Continuous current signal conductor Operating temperature 0 to + 60°C Mounting position Any IEC Report 664, IEC 664 A, Air gaps and creepage distances IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3 Dimensions (W x H x D) in mm • for 2 analog modules Approx. 68 x 43.2 x 80 6ES7 924-0CC10-0A_0

60 V DC

Technical specifications basic module

TP1, TP3 and TPK connection module		
Max. operating voltage	60 V DC	
Continuous current per signal	1 A	
Max. summation current (voltage infeed)	4 A/byte	
Operating temperature	0 to + 60°C	
Mounting position	Any	
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3	
Dimensions (W x H x D) in mm • 1-wire connection 6ES7 924-0AA10-0A_0 • for 3-wire initiators 6ES7 924-0CA10-0A_0 • for 2 x 8 signals 6ES7 924-1AA10-0A_0	Approx. 55 x 43.2 x 63 Approx. 68 x 43.2 x 80 Approx. 100 x 43.2 x 80	

Wiring	rules	for ti	he	connect	tion	modules
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TPA, TP1, TP2, TP3, TPK connection module			
	Spring connection	Screw connection	
Connectable cable cross-se	ctions		
 solid cables 	No		
 flexible cables without wire end ferrule 	0.5 to 2.5 mm ²		
flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)	
 flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4 	0.5 to 1.5 mm ²		
Number of cables per connection	1 or a combination of 2 cables up to the cross-sections specified above(total) in a shared wire end ferrule		
Blade width of the screwdriver	3.5 mm (cylindrical shape)		
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm	

TP2 connection module 60 V DC Max. operating voltage Continuous current signal 2 A conductor Operating temperature 0 to + 60°C Any Mounting position IEC Report 664, IEC 664 A, IEC 1131 T2, Air gaps and creepage distances CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3 Dimensions (W x H x D) in mm • for 2 ampere modules Approx. 68 x 43.2 x 80 6ES7 924-0BB10-0A_0

Technical specifications signal module

TP1, TP3 and TPK connection module with LED		
Max. operating voltage	24 V DC	
Continuous current per signal	1 A	
Max. summation current (voltage infeed)	4 A/byte	
Operating temperature	0 to + 60 °C	
Mounting position	Any	
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3	
Dimensions (W x H x D) in mm • 1-wire connection with LED 6ES7 924-0AA10-0B_0 • for 3-wire initiators with LED 6ES7 924-0CA10-0B_0 • for 2 x 8 signals with LED 6ES7 924-1AA10-0B_0	Approx. 55 x 43.2 x 63 Approx. 68 x 43.2 x 80 Approx. 100 x 43.2 x 80	

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Technische Daten Signalmodul (continued)

TP2 connection module with LED			
Max. operating voltage	24 V DC		
Continuous current per signal conductor	2 A		
Operating temperature	0 to + 60 °C		
Mounting position	Any		
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3		
Dimensions (W x H x D) in mm • for 2-ampere modules with LED 6ES7924-0BB10-0B_0	Approx. 68 x 43.2 x 80		

Wiring rules for the connection modules

TP1 LED, TPK LED, TP2 LED, TP3 LED connection module		
	Spring connection	Screw connection
Connectable cable cross-sect	tions	
 solid cables 	No	
 flexible cables without wire end ferrule 	0.5 to 2.5 mm ²	
flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)
flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm ²	
Number of wires per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared wire end ferrule	
Blade width of the screw- driver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Technical specifications function module

Connection module with relay for outputs (TPRo)		
Energizing side		
Operating voltage for coil	24 V DC	
Input circuit	Reverse polarity protection and freewheeling diodes	
Contact side		
Number of relay outputs	8 (NO contacts)	
Contact design	Single contact, 1 NO contact	
Switching capacity (resistive load)	max. 4 A/250 V AC max. 3 A/30 V DC max. 0.6 A/48 V DC max. 0.4 A/60 V DC recommended minimum load ≥ 10 mA	
Switching frequency	20 cycles/minute	
Service life • Mechanical • Electrical	5×10^6 switching cycles 3×10^4 operating cycles at 230 V AC/2 A/ cos $\Upsilon = 1$	

Connection module with relay for outputs (TPRo)		
Operating temperature	0 +60 °C	
Mounting position	Any	
Clearance and creepage distances	Basic standard IEC 60664-1; UL 508; Cul (Reference CSA C22.2 No. 142) Overvoltage category III Pollution degree 2	
Dimensions (W x H x D) in mm		
6ES7924-0BD10-0B_0	Approx. 100 x 45 x 80	

Connection module with optocou Input data	. , ,
Power supply	
Potential connection (L1/M1)	24 V DC (20.4 28.8 V DC)
Status indicator "L1"	Green LED
	Green LED
Switching inputs	
Number	8 channels (channel 0 7) with reverse polarity protection
Input voltage "off"	0 V DC (0 5 V DC)
Input voltage "on"	24 V DC (15 28.8 V DC)
Input current	min. 5 mA with 20 V DC, per channel
Status indicator "on"	Green LED per channel
Output data	
Power supply	
Operating voltage <i>U</i> _B (L2/M2, L3/M3)	24 V DC (20 30 V DC) per group of 4 one V _B
U _B conditionally protected against polarity reversal ¹⁾	Up to 30 V DC
Current consumption	approx. 10 mA for 24 V DC + output currents per group of 4
Aggregate current	max. 8 A per group of 4
Switching outputs	
Number	8 channels (channel 0 7)
Short-circuit protection ²⁾	for $U_{\rm B}$ < 24 V DC or 24 30 V DC/max. 20 A
Output voltage	typ. $U_B - 1 \text{ V (for input "on")}$
Output current	Max. 4 A per channel
Lamp load	max. 20 W at 24 V per channel
Demand factor per group of 4	50 %, max. 2 outputs active under full load (4 A)
Short-circuit response	Clocked output signal (approx. 2 20 ms)
On/off-delay	typ. 100 μs/250 μs with resistive load
Switching frequency	max. 500 Hz with 4 A resistive load (square wave voltage, pulse/pause 1:1)
"Overload" fault indication • Wire break indication	Red LED per channel, in the eve of wire breakage or short-circuit Active $l_{\rm out}$ < 0.1 A/inactive $l_{\rm out}$ \geq 0.9 A
1) =	1.00

¹⁾ Protected against polarity reversal, if the ground potential of the output load is directly connected to the 0 V supply of the power supply unit

²⁾ Not sustained short-circuit-proof, max. duration approx. 60 min.

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Technical specifications (continued)

Connection module with optocou	pler for outputs (TPOo)
Group fault messages SF1, SF2	
Monitored channels	SF1: Channels 0 3, SF2: for channels 4 7
Voltage <i>U</i> _{SF1} , <i>U</i> _{SF2} • No error at the switching output • Wire break at the switching output • Short-circuit at the switching output	typ. $U_{\rm B}$ – 2 V Approx. 0 V 0 V to $U_{\rm B}$, clocked
Current I _{SF1} , I _{SF2}	min. 4 mA/max. 200 mA
General data	
Degree of protection	IP20
Operating temperature	0 60 °C
Mounting position	Any, except overhead
Connecting terminals	Screw-type or spring-loaded terminals
Stripped length	9 mm
Conductor cross-section • Finely stranded without end sleeve	0.5 2.5 mm ²
 with end sleeve for screw-type terminals 	0.5 2.5 mm ² according to DIN 46228-1
 with end sleeve for spring-loaded terminals 	0.5 1.5 mm ² according to DIN 46228-1 and DIN 46228-4
Screwdriver	according to DIN 5264 B 0.6 x 3.5 mm
Tightening torque of screw-type terminals	0.4 Nm
Weight	Approx. 400 g
Dimensions (W x H x D) in mm	134 x 84 x 77

Connection module with relay for inputs (TPRi) Energizing side Operating voltage for coil 230 V AC from 207 - 280 V AC Input circuit Varistors Contact side Number of relay outputs 8 (NO contacts) Contact design Single contact, 1 NO contact Switching capacity (resistive load) max. 50 A/24 V DC, max. 50 mA/48 V DC max. 50 mA/60 V DC recommended minimum load ≥ 5 mA Switching frequency 200 cycles/minute Service life 10×10^6 switching cycles • Mechanical 3×10^6 operating cycles at 230 V AC/50 mA/cos $\Upsilon = 1$ Electrical Operating temperature 0 ... +60 °C Mounting position Any Basic standard IEC 60664-1; UL 508; Cul (Reference CSA C22.2 No. 142) Overvoltage category III Clearance and creepage distances Pollution degree 2 Dimensions (W x H x D) in mm 6ES7924-0BE10-0B_0 Approx. 130 x 45 x 80

Wiring rules for the connection modules

TPRo and TPRi connection i	TPRo and TPRi connection modules		
	Spring-loaded connection	Screw-type connection	
Connectable cable cross-see	ctions		
 Solid conductors 	No		
• Flexible cables without end sleeve	0.5 2.5 mm ²		
Flexible cables with end sleeve according to DIN 46228/1	0.5 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)	
 Flexible cables with end sleeve and plastic collar according to DIN 46228/4 	0.5 1.5 mm ²		
Number of conductors per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared end sleeve		
Blade width of the screwdriver	3.5 mm (cylindrical design)		
Tightening torque for connecting the cables	-	0.4 0.7 Nm	

Ordering data Front connect. module Order No.

Front connector module (digital 2 x 8 I/O)	
Power supply via	
Spring-loaded terminals	6ES7 921-3AA00-0AA0
Screw terminals	6ES7 921-3AB00-0AA0
Front connector module (digital 4 x 8 I/O)	
Power supply via	
 Spring-loaded terminals 	6ES7 921-3AA20-0AA0
Screw terminals	6ES7 921-3AB20-0AA0
Front connector module (1 x 8 outputs) for 2 ampere digital outputs	
Power supply via	
 Spring-loaded terminals 	6ES7 921-3AC00-0AA0
Screw terminals	6ES7 921-3AD00-0AA0
Front connector module 20-pin (analog)	
Power supply via	
 Spring-loaded terminals 	6ES7 921-3AF00-0AA0
Screw terminals	6ES7 921-3AG00-0AA0
Front connector module 40-pin (analog)	
Power supply via	
 Spring-loaded terminals 	6ES7 921-3AF20-0AA0
Screw terminals	6ES7 921-3AG20-0AA0
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I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-300 Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Ordering data Connect. cable	Order No.	Ordering data Basic module	Order No.
Pre-assembled round cable		TP1 connection module	
16-pole, 0.14 mm ²		for 1-wire initiators	
Unshielded		Packaging unit (1 unit)	
0.5 m	6ES7 923-0BA50-0CB0	Spring terminals	6ES7 924-0AA10-0AB0
1.0 m	6ES7 923-0BB00-0CB0	• Screw terminals	6ES7 924-0AA10-0AA0
1.5 m	6ES7 923-0BB50-0CB0	TP3 connection module	
2.0 m	6ES7 923-0BC00-0CB0	for 3-wire initiators	
2.5 m	6ES7 923-0BC50-0CB0	Packaging unit (1 unit) • Spring terminals	6ES7 924-0CA10-0AB0
3.0 m	6ES7 923-0BD00-0CB0	Screw terminals	6ES7 924-0CA10-0AA0
4.0 m	6ES7 923-0BE00-0CB0	TPK connection module	
5.0 m	6ES7 923-0BF00-0CB0	for 2 x 8 signals	
Shielded		Packaging unit (1 unit)	
1.0 m	6ES7 923-0BB00-0DB0	 Spring terminals 	6ES7 924-1AA10-0AB0
2.0 m	6ES7 923-0BC00-0DB0	Screw terminals	6ES7 924-1AA10-0AA0
2.5 m	6ES7 923-0BC50-0DB0	TP2 connection module	
3.0 m	6ES7 923-0BD00-0DB0	for 2 A modules	
4.0 m	6ES7 923-0BE00-0DB0	for 2-wire initiators	
5.0 m	6ES7 923-0BF00-0DB0	Packaging unit (1 unit) • Spring terminals	6ES7 924-0BB10-0AB0
Round-sheath ribbon cable		Screw terminals	6ES7 924-0BB10-0AB0
16-pole, 0.14 mm ²		TPA connection module	
Unshielded		for analog signals	
30 m	6ES7 923-0CD00-0AA0	Packaging unit (1 unit)	
60 m	6ES7 923-0CG00-0AA0	 Spring terminals 	6ES7 924-0CC10-0AB0
Shielded		Screw terminals	6ES7 924-0CC10-0AA0
30 m	6ES7 923-0CD00-0BA0	Accessories	
60 m	6ES7 923-0CG00-0BA0	Labeling plates for connection modules	
Round-sheath ribbon cable		Insertable labeling plate	6ES7 928-2AB00-0AA0
2 x 16-pole, 0.14 mm ²		PU = 200 units	JEST VEG ENESS VAINS
Unshielded		Self-adhesive labeling plate	6ES7 928-2BB00-0AA0
30 m	6ES7 923-2CD00-0AA0	PU = 200 units	
60 m	6ES7 923-2CG00-0AA0	Shield plate	6ES7 928-1BA00-0AA0
Connector (female ribbon connector)	6ES7 921-3BE10-0AA0	for analog connection module (4 units)	
16-pole, insulation displacement system, with strain relief devices; packing unit: 8 connectors and 8 cable grips Accessories		Shield connection terminal for shield plate, 2 units, with cable diameter • 2 to 6 mm (2 cables) • 3 to 8 mm • 4 to 13 mm	6ES7 390-5AB00-0AA0 6ES7 390-5BA00-0AA0 6ES7 390-5CA00-0AA0
Manual pliers	6ES7 928-0AA00-0AA0		
For preparing the connectors (female ribbon connector)			

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SIMATIC S7-300
Connection methods
SIMATIC TOP connect for SIMATIC S7
Fully modular connection

Ordering data Signal module	Order No.	Ordering data Function module Order No.	
TP1 connection module with LED		TPRo connection module for output signals	
for 1-wire initiators		for 2-wire connection	
Packaging unit (1 unit) • Spring terminals • Screw terminals	6ES7 924-0AA10-0BB0 6ES7 924-0AA10-0BA0	Packaging unit 1 unit • Spring-loaded terminals • Screw-type terminals	6ES7 924-0BD10-0BB0 6ES7 924-0BD10-0BA0
TP3 connection module with LED		Connection module optocoupler	
for 3-wire initiators Packaging unit (1 unit) • Spring terminals	6ES7 924-0CA10-0BB0	Packaging unit 1 unit Spring-loaded terminals Screw-type terminals	6ES7 924-0BF10-0BB0 6ES7 924-0BF10-0BA0
Screw terminals TPK connection module with	6ES7 924-0CA10-0BA0	TPRi connection module for input signals	
LED		for 2-wire connection	
for 2 x 8 signals Packaging unit (1 unit) • Spring terminals • Screw terminals	6ES7 924-1AA10-0BB0 6ES7 924-1AA10-0BA0	Packaging unit 1 unit • Spring-loaded terminals • Screw-type terminals	6ES7 924-0BE10-0BB0 6ES7 924-0BE10-0BA0
TP2 connection module with LED		Accessories	
		Labels for connection modules	
for 2 A modules for 2-wire initiators		Insertable labels PU = 200 units	6ES7 928-2AB00-0AA0
Packaging unit (1 unit) Spring terminals Screw terminals	6ES7 924-0BB10-0BB0 6ES7 924-0BB10-0BA0	Self-adhesive labels PU = 200 units	6ES7 928-2BB00-0AA0
Accessories	0E37 924-UDD1U-UDAU	Replacement relay for relay connection module	
Labeling plates for connection		PU = 4 units	
modules		Replacement relay for TPRi	6ES7 928-3BA00-4AA0
Insertable labeling plate PU = 200 units	6ES7 928-2AB00-0AA0	Replacement relay for TPRo	6ES7 928-3AA00-4AA0
Self-adhesive labeling plate PU = 200 units	6ES7 928-2BB00-0AA0	Optocoupler DC alternative for relay in the case of TPRo PU = 4 units	6ES7 928-3DA00-4AA0
		Optocoupler AC alternative for relay in the case of TPRo PU = 4 units	6ES7 928-3CA00-4AA0

Connection methods

SIMATIC TOP connect for SIMATIC S7 Flexible connection

Overview



The flexible connection guarantees a fast and direct connection from the input/output modules of the SIMATIC S7-300/400 to the individual elements in the cabinet.

Already attached single cores reduce the wiring effort.

The core cross-sections of 0.5 mm² also allow higher currents.

Technical specifications

Front connector with single cores for 16 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	20
Core cross-section	0.5 mm ² ; Cu
Bundle diameter in mm	approx. 15
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw-type or crimp contacts

Front connector with single cores for 32 channels		
Rated operating voltage	24 V DC	
Permissible continuous current with simultaneous load of all wires, max.	1.5 A	
Permissible ambient temperature	0 to 60 °C	
Core type	H05V-K or with UL 1007/1569; CSA TR64	
Number of single cores	40	
Core cross-section	0.5 mm ² ; Cu	
Bundle diameter in mm	approx. 17	
Core color	Blue, RAL 5010	
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)	
Assembly	Screw-type or crimp contacts	

SIMATIC S7-300
Connection methods
SIMATIC TOP connect for SIMATIC S7
Flexible connection

Ordering data	Order No.		Order No.
Front connector with single cores for 16-channel digital modules SIMATIC S7-300, 20 x 0.5 mm ²		Front connector with single cores for 32-channel digital modules SIMATIC S7-300, 40 x 0.5 mm ²	
Core type H05V-K		Core type H05V-K	
Screw-type version		Screw-type version	
Packaging unit: 1 unit Length: • 2.5 m • 3.2 m • 5 m • Custom lengths Packaging unit: 5 units Length: • 2.5 m • 3.2 m	6ES7922-3BC50-0AB0 6ES7922-3BD20-0AB0 6ES7922-3BF00-0AB0 On request 6ES7922-3BC50-5AB0 6ES7922-3BD20-5AB0	Packaging unit: 1 unit Length: • 2.5 m • 3.2 m • 5.0 m • Custom lengths Packaging unit: 5 units Length: • 2.5 m • 3.2 m	6ES7922-3BC50-0AC0 6ES7922-3BD20-0AC0 6ES7922-3BF00-0AC0 On request 6ES7922-3BC50-5AC0 6ES7922-3BD20-5AC0
• 5.0 m Crimp version	6ES7922-3BF00-5AB0	• 5.0 m Crimp version	6ES7922-3BF00-5AC0
Packaging unit: 1 unit Length: • 2.5 m • 3.2 m • 5.0 m • Custom lengths	6ES7922-3BC50-0AF0 6ES7922-3BD20-0AF0 6ES7922-3BF00-0AF0 On request	Packaging unit: 1 unit Length: • 2.5 m • 3.2 m • 5.0 m • Custom lengths	6ES7922-3BC50-0AG0 6ES7922-3BD20-0AG0 6ES7922-3BF00-0AG0 On request
Core type UL/CSA-certified		Core type UL/CSA-certified	
Screw-type version Packaging unit: 1 unit Length: • 3.2 m • 5.0 m	6ES7922-3BD20-0UB0 6ES7922-3BF00-0UB0	Screw version Packaging unit: 1 unit Length: • 3.2 m • 5.0 m	6ES7922-3BD20-0UC0 6ES7922-3BF00-0UC0

SIMATIC S7-300 Interface modules

IM 360/361/365 interface modules

Overview



- For connecting mounting racks in multi-tier SIMATIC S7-300 configurations
- IM 365: For design of central controller and max. 1 expansion unit. Limited use of modules in the expansion unit (e.g. no CPs or FMs)
- IM 360/IM 361: For design of central controller and max.
 3 expansion units. No limitation in selection of modules in the expansion unit

Technical specifications

	6ES7 360-3AA01-0AA0	6ES7 361-3CA01-0AA0	6ES7 365-0BA01-0AA0
Supply voltages Rated value			
• 24 V DC		Yes	
Current consumption from backplane bus 5 V DC, max.	350 mA		100 mA
from supply voltage L+, max.		500 mA	
Power losses			
Power loss, typ.	2 W	5 W	0.5 W
Hardware configuration			
Number of interfaces per CPU, max.	1	3	1; 1 pair
Dimensions and weight			
Dimensions			
 Width 	40 mm	80 mm	40 mm
Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weight			
 Weight, approx. 	225 g	505 g	580 g

Ordering data	Order No.		Order No.
IM 360 interface module	6ES7 360-3AA01-0AA0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
for expanding the S7-300 with max. 3 EUs; can be plugged into CC		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
IM 361 interface module	6ES7 361-3CA01-0AA0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC	
for expanding the S7-300 with max. 3 EUs; can be plugged into EU		Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC	
Connecting cable		TDC	
between IM 360 and IM 361 or IM 361 and IM 361		SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
1 m	6ES7 368-3BB01-0AA0	Current "Manual Collection" DVD	
2.5 m	6ES7 368-3BC51-0AA0	and the three subsequent	
5 m	6ES7 368-3BF01-0AA0	updates S7-300 manual	
10 m	6ES7 368-3CB01-0AA0		
IM 365 interface module	6ES7 365-0BA01-0AA0	Design, CPU data, module data, instruction list	
for expanding the S7-300 with		German	6ES7 398-8FA10-8AA0
max. 1 EU; 2 modules with permanent connecting cable		English	6ES7 398-8FA10-8BA0
(1 m)		D: Subject to export regulations AL:	N and ECCN: 5D992

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS interface modules

SIPLUS IM 365 interface module

Overview



 SIPLUS IM 365: For configuration of 1 central controller and max. 1 expansion unit

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

6AG1 365-0BA01-2AA0
6ES7 365-0BA01-0AA0
-25 +60 °C
Coating of the printed circuit boards and the electronic components
The technical data of the standard product applies except for the ambient conditions.
5 100 % Condensation permissible
Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)
Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust 25
1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa
(+2000 +3500 m) derating 10 K
658 540 hPa (+3500 +5000 m) derating 20 K

- $\begin{array}{ll} \text{1)} & \text{ISA-S71.04 severity level GX: Long-term load: } SO_2 < 4.8 \text{ ppm;} \\ & \text{H}_2\text{S} < 9.9 \text{ ppm; } \text{CI} < 0.2 \text{ ppm; } \text{HCI} < 0.66 \text{ ppm; } \text{HF} < 0.12 \text{ ppm;} \\ & \text{NH} < 49 \text{ ppm; } O_3 < 0.1 \text{ ppm; } \text{NOx} < 5.2 \text{ ppm} \\ & \text{Limit value (max. } 30 \text{ min/d): } SO_2 < 17.8 \text{ ppm; } \text{H}_2\text{S} < 49.7 \text{ ppm;} \\ & \text{CI} < 1.0 \text{ ppm; } \text{HCI} < 3.3 \text{ ppm; } \text{HF} < 2.4 \text{ ppm; } \text{NH} < 247 \text{ ppm;} \\ & O_3 < 1.0 \text{ ppm; } \text{NOx} < 10.4 \text{ ppm} \\ \end{array}$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 365 interface module L	6AG1 365-0BA01-2AA0
(extended temperature range and medial exposure)	
for expansion of S7-300 with max. 1 EU; 2 modules with fixed connection cable (1 m)	

L: Subject to export regulations AL: 91999 and ECCN: N

Power supplies

The S7-300 version

Application area



The proven power supply in SIMATIC S7-300 design; with PS-CPU connecting comb and mounting direct on the S7 rail.

Technical specifications 1-phase, 24 DC V/2 A

Power supply, type	2 A
Order No.	6ES7 307-1BA01-0AA0
Input	1-phase AC
Rated voltage V _{in rated}	120/230 V AC Automatic range switchover
Voltage range	85 132 V/170 264 V
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
Mains buffering at Iout rated	$>$ 20 ms at $U_{\rm in}$ = 93/187 V
Rated line frequency; rated line frequency range	50/60 Hz, 47 63 Hz
Rated current I _{in rated}	0.9/0.5 A
Making current limitation (+25°C)	< 22 A, < 3 ms
₽t	< 1.0 A ² s
Built-in incoming fuse	T 1.6 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	3 A, characteristic C
Output	Controlled, isolated DC voltage
Rated voltage Vout rated	24 V DC
Total tolerance • Static line compensation • Static load compensation	±3% Approx. 0.1% Approx. 0.2%
Residual ripple	$< 50 \text{ mV}_{pp} \text{ (typ.} < 5 \text{ mV}_{pp} \text{)}$
Spikes (bandwidth: 20 MHz)	$< 150 \text{ mV}_{pp} \text{ (typ. } < 20 \text{ mV}_{pp} \text{)}$
Adjustment range	-
Status indicator	24 V OK = green LED
On/Off behavior	No overshoot of $U_{\rm out}$ (soft start)
Startup delay / voltage rise	< 2 s/typ. 10 ms

Power supply, type	2 A
Rated current I _{out rated}	2 A
Current range • Up to +60°C • Derating	0 2 A
Dynamic overcurrent on Power-up on short-circuit Short-circuit during operation	Typ. 9 A for 90 ms Typ. 9 A for 90 ms
Parallel switching for enhanced performance	Yes
Efficiency	
Efficiency at $V_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 84%
Power loss at $V_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 9 W
Closed-loop control	
Dynamic line compensation $(V_{\text{in rated}} \pm 15\%)$	Typ. ±0.1% <i>U</i> _{out}
Dynamic load compensation (<i>I</i> _{out} : 50/100/50%)	Typ. ±0.8% <i>U</i> _{out}
Load step settling time 50 to 100% 100 to 50%	< 1 ms (typ. 0.5 ms) < 1 ms (typ. 0.5 ms)
Protection and monitoring	
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	2.2 2.6 A
Short-circuit protection	Electronic shutdown, automatic restart
Sustained short-circuit current rms value	< 2 A
Overload/short-circuit indicator	-

SIMATIC S7-300 Power supplies

The S7-300 version

Technical specifications 1-phase, 24 DC V/2 A (continued)

Power supply, type	2 A
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	< 3.5 mA (typ. 0.5 mA)
Safety test	Yes
CE mark	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Protection against explosion	ATEX EX II 3G Ex nA II T4; UL 1604 Class I Div. 2 Group A, B, C, D
FM approval	Class I Div. 2 Group A, B, C, D T4
Marine approval	In S7-300 system
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	Not applicable
Noise immunity	EN 61000-6-2

Power supply, type	2 A
Operating data	
Ambient temperature range	0 +60°C with natural convection
Transport and storage temperature range	-40 +85°C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections	
 Supply input L, N, PE (DC input: L+1, M1, PE) Output + 	One screw-type terminal each for 0.5 2.5 mm ² solid/finely stranded 2 screw-type terminals for
• Output -	0.5 2.5 mm ² 2 screw-type terminals for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	40 x 125 x 120
Weight, approx.	0.4 kg
Mounting	Can be mounted on S7 rail
Accessories	Mounting adapter for standard mounting rail (6EP1 971-1BA00)

Technical specifications 1-phase, 24 DC V/5 A

Power supply, type	5 A
Order No.	6ES7 307-1EA01-0AA0
Input	1-phase AC
Rated voltage U _{in rated}	120/230 V AC Automatic range switchover
Voltage range	85 132 V/170 264 V
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
Mains buffering at Iout rated	$>$ 20 ms at U_{in} = 93/187 V
Rated line frequency; rated line frequency range	50/60 Hz; 47 63 Hz
Rated current I _{in rated}	2.3/1.2 A
Making current limitation (+25°C)	< 20 A, < 3 ms
$ eps_t $	< 1.2 A ² s
Built-in incoming fuse	T 3.15 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	From 6 A, C characteristic
Output	Controlled, isolated DC voltage
Rated voltage Uout rated	24 V DC
Total tolerance	±3 %
Static line compensationStatic load compensation	Approx. 0.1% Approx. 0.5%
Residual ripple	1.1
Spikes (bandwidth: 20 MHz)	< 50 mV _{pp} (typ. 10 mV _{pp})
,	$< 150 \text{ mV}_{pp} \text{ (typ. 20 mV}_{pp})$
Adjustment range	-

Status indicator On/Off behavior No overshoot of \$U_{out}\$ (soft start) Startup delay/voltage rise Rated current \$I_{out rated}\$ Current range Up to +60°C Derating Dynamic overcurrent on Power-up on short-circuit Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency at \$U_{out rated}\$, \$I_{out rated}\$, \$I_	Power supply, type	5 A
Startup delay/voltage rise Rated current I _{out rated} Current range • Up to +60°C • Derating Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency Efficiency at U _{out rated} , I _{out rated} I _{out rated} Power loss at U _{out rated} , I _{out rated} I _{out rated} Closed-loop control Dynamic line compensation (U _{in rated} ±15%) Dynamic load compensation (I _{out} : 50/100/50%) Load step settling time • 50 to 100% O 5 A O 5 A Typ. 20 A for 100 ms Typ. 20 A for 10	Status indicator	24 V OK = green LED
Rated current I _{out rated} Current range • Up to +60°C • Derating Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency at U _{out rated} , I _{out rated} I _{out rated} Power loss at U _{out rated} , I _{out rated} I _{out rated} Closed-loop control Dynamic line compensation (U _{in rated} ±15%) Dynamic load compensation (I _{out} : 50/100/50%) Load step settling time • 50 to 100% O 5 A O 5 A O 5 A Typ. 20 A for 100 ms Typ. 20 A for 100	On/Off behavior	No overshoot of U_{out} (soft start)
Current range • Up to +60°C • Derating Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency at $U_{\text{out rated}}$, $U_{$	Startup delay/voltage rise	< 2 s/typ. 10 ms
• Up to +60°C • Derating Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency Efficiency at $U_{\text{out rated}}$, $U_{out ra$	Rated current Iout rated	5 A
 Power-up on short-circuit Short-circuit during operation Parallel switching for enhanced performance Efficiency Efficiency at Uout rated, Jout rated Power loss at Uout rated, Jout rated Vout rated Closed-loop control Dynamic line compensation (Uin rated ±15%) Dynamic load compensation (Iout: 50/100/50%) Load step settling time 50 to 100% Yes Approx. 87% Approx. 18 W Typ. ±0.1% Uout Typ. ±0.1% Uout Typ. ±1% Uout Typ. ±1% Uout Typ. 0.3 ms 	• Up to +60°C	0 5 A
enhanced performance Efficiency Efficiency at $U_{\text{out rated}}$, $I_{\text{out rated}}$	Power-up on short-circuitShort-circuit during	* *
Efficiency at $U_{\text{out rated}}$, $I_{\text{out rated}}$, $I_{out ra$		Yes
Vout rated Power loss at Uout rated, Vout rated Vout rated Closed-loop control Dynamic line compensation (Un rated ±15%) Dynamic load compensation (Iout: 50/100/50%) Load step settling time • 50 to 100% Approx. 18 W Typ. ±0.1% Uout Upout Typ. ±1% Uout Typ. 0.3 ms	Efficiency	
Iout rated Closed-loop control Dynamic line compensation (U _{in rated} ±15%) Dynamic load compensation (I _{out} : 50/100/50%) Load step settling time • 50 to 100% Typ. ±0.1% U _{out} Typ. ±1% U _{out} Typ. 0.3 ms		Approx. 87%
Dynamic line compensation $(U_{\rm in\ rated}\pm15\%)$ Typ. $\pm0.1\%\ U_{\rm out}$ Typ. $\pm1\%\ U_{\rm out}$ Typ. $\pm1\%\ U_{\rm out}$ Load step settling time \bullet 50 to 100% Typ. 0.3 ms		Approx. 18 W
($U_{\text{in rated}} \pm 15\%$) Dynamic load compensation ($I_{\text{out}} \cdot 50/100/50\%$) Load step settling time • 50 to 100% Typ. 0.3 ms	Closed-loop control	
(I _{out} : 50/100/50%) Load step settling time • 50 to 100% Typ. 0.3 ms		Typ. ±0.1% <i>U</i> _{out}
• 50 to 100% Typ. 0.3 ms		Typ. ±1% U _{out}
	• 50 to 100%	71

SIMATIC S7-300 Power supplies

The S7-300 version

Technical specifications 1-phase, 24 DC V/5 A (continued)

Teeninean opeomoations	phace, 24 be to A (continued)
Power supply, type	5 A
Protection and monitoring	
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	5.5 6.5 A
Short-circuit protection	Electronic shutdown, automatic restart
Sustained short-circuit current rms value	< 7 A
Overload/short-circuit indicator	-
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	< 3.5 mA (typ. 0.5 mA)
Safety test	Notified body
CE mark	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX EX II 3G Ex nA II T4; UL 1604 Class I Div. 2 Group A, B, C, D
FM approval	Class I Div. 2 Group A, B, C, D, T 4
Marine approval	In S7-300 system
Degree of protection (EN 60529)	IP20

Power supply, type	5 A
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	0 +60°C with natural convection
Transport and storage temperature range	-40 +85°C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections	
• Supply input L, N, PE	One screw-type terminal each for 0.5 2.5 mm ² solid/finely stranded
• Output +	3 screw terminals for 0.5 2.5 mm ²
Output -	3 screw terminals for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	60 x 125 x 120
Weight, approx.	0.6 kg
Mounting	Can be mounted on S7 rail
Accessories	Mounting adapter for standard mounting rail (6EP1 971-1BA00)

Technical specifications 1-phase, 24 DC V/10 A

Power supply, type	10 A
Order No.	6ES7 307-1KA02-0AA0
nput	1-phase AC
Rated voltage $V_{\text{in rated}}$	120/230 V AC Automatic range switchover
/oltage range	85 132 V/170 264 V
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
Mains buffering at Iout rated	$>$ 20 ms at $U_{\rm in}$ = 93/187 V
Rated line frequency; rated ine frequency range	50/60 Hz; 47 63 Hz
Rated current I _{in rated}	4.2/1.9 A
Making current limitation +25°C)	< 55 A, < 3 ms
² t	< 3.3 A ² s
Built-in incoming fuse	T 6.3 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in he mains power input	From 10 A, C characteristic

Power supply, type	10 A
Output	Controlled, isolated DC voltage
Rated voltage $V_{\rm out\ rated}$	24 V DC
Total tolerance • Static line compensation • Static load compensation	±3% Approx. 0.1% Approx. 0.5%
Residual ripple	< 50 mV _{pp} (typ. 15 mV _{pp})
Spikes (bandwidth: 20 MHz)	$< 150 \text{ mV}_{pp} \text{ (typ. 60 mV}_{pp})$
Adjustment range	-
Status indicator	24 V OK = green LED
On/Off behavior	No overshoot of U_{out} (soft start)
Startup delay/voltage rise	< 2 s/typ. 10 ms
Rated current Iout rated	10 A
Current range • Up to +60°C • Derating	0 10 A
Dynamic overcurrent on • Power-up on short-circuit • Short-circuit during operation	Typ. 38 A for 80 ms Typ. 38 A for 80 ms
Parallel switching for enhanced performance	Yes

Power supplies

The S7-300 version

Technical specifications 1-phase, 24 DC V/10 A (continued)

recillical specifications	1-priase, 24 DC V/10 A (Continued)
Power supply, type	10 A
Efficiency	
Efficiency at $V_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 90%
Power loss at $V_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 27 W
Closed-loop control	
Dyn. line compensation $(V_{\text{in rated}} \pm 15\%)$	Typ. ±0.1% <i>U</i> _{out}
Dynamic load compensation (<i>I</i> _{out} : 50/100/50%)	Typ. ±2% U _{out}
Load step settling time	
• 50 to 100%	< 0.1 ms
• 100 to 50%	< 0.1 ms
Protection and monitoring	
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	11 12 A
Short-circuit protection	Electronic shutdown, automatic restart
Sustained short-circuit current rms value	< 12 A
Overload/short-circuit indicator	-
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	< 3.5 mA (typ. 0.6 mA)
Safety test	Yes
CE mark	Yes
GE Mark	res

	40.4
Power supply, type	10 A
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX EX II 3G Ex nA II T4; UL 1604 Class I Div. 2 Group A, B, C, D
FM approval	Class I Div. 2, Group A, B, C, D, T4
Marine approval	In S7-300 system
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	0 +60°C with natural convection
Transport and storage temperature range	-40 +85°C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections	
• Supply input L, N, PE	One screw-type terminal each for 0.5 2.5 mm ² solid/finely stranded
• Output +	4 screw-type terminals for 0.5 2.5 mm ²
• Output -	4 screw-type terminals for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	80 x 125 x 120
Weight, approx.	0.8 kg
Mounting	Can be mounted on S7 rail
Accessories	Mounting adapter for standard mounting rail (6EP1 971-1BA00)

Technical specifications 1-phase, 24 DC V/5 A (Outdoor)

Power supply, type	5 A
Order No.	6ES7 307-1EA80-0AA0 ¹⁾
Input	1-phase AC
Rated voltage U _{in rated}	120/230 V AC Set by means of selector switch on device
Voltage range	93 132 V/187 264 V
Overvoltage strength	$2.3 \times U_{\text{in rated}}$, 1.3 ms
Mains buffering at Iout rated	$>$ 20 ms at U_{in} = 93/187 V
Rated line frequency; rated line-frequency range	50/60 Hz, 47 63 Hz
Rated current I _{in rated}	2.1/1.2 A
Switch-on current limitation (+25 °C)	< 45 A, < 3 ms
l ² t	$< 1.8 A^2 s (typ. 1.2 A^2 s)$

Power supply, type	5 A
Built-in incoming fuse	T 3.15 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	10 A or higher, Characteristic C or 6 A or higher, Characteristic D
Output	Controlled, isolated DC voltage
Rated voltage Uout rated	24 V DC
Total tolerance • Static line compensation • Static load compensation	±3 % Approx. ±0.2% Approx. ±0.4%
Residual ripple	$< 150 \text{ mV}_{pp} \text{ (typ. 40 mV}_{pp})$
Spikes (bandwidth: 20 MHz)	< 240 mV _{pp} (typ. 90 mV _{pp})
Adjustment range	-
Status indicator	24 V OK = green LED

SIPLUS module 6AG1 307-1EA80-2AA0 for temperature range -25°C to +60°C and use under medium loading (e.g. chlorine-sulfate atmosphere). This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).

SIMATIC S7-300 Power supplies

The S7-300 version

Technical specifications 1-phase, 24 DC V/5 A (Outdoor) (continued)

Power supply, type	5 A	Power supply, type
On/Off behavior		Safety
On/On benavior	No overshoot of U_{out} (soft start)	Primary/secondary isolat
Startup delay/voltage rise	< 3 s/typ.100 ms	Trimai y/secondary isolat
Rated current Iout rated	5 A	
Current range • Up to +60°C • Derating	0 5 A 0 5 A (up to +70°C)	Safety class
Dynamic overcurrent on		Leakage current
Power-up on short-circuit	Typ. 20 A for 180 ms	Safety test CE marking
 Short-circuit during operation 	Typ. 20 A for 80 ms	UL/cUL (CSA) approval
Parallel switching for	Not permitted	OLJOOL (OOA) apploval
enhanced performance		Protection against explos
Efficiency		FM approval
Efficiency at U _{out rated} ,	Approx. 84%	Marine approval
lout rated		Degree of protection (EN 60529)
Power loss at $U_{\text{out rated}}$, $I_{\text{out rated}}$	Approx. 23 W	EMC
Closed-loop control		Emitted interference
Dyn. line compensation (<i>U</i> in rated ±15%)	Typ. ±0.3% <i>U</i> _{out}	Supply harmonics limitat
Dynamic load compensation	Typ. ±3% <i>U</i> _{out}	Noise immunity
(I _{out} : 50/100/50 %)	Typ. ±3 % Cout	Operating data
Load step settling time		Ambient temperature ran
• 50 to 100% • 100 to 50%	< 5 ms (typ. 0.2 ms) < 5 ms (typ. 0.2 ms)	Transport and storage temperature range
Protection and monitoring	,	Humidity class
Output overvoltage	Additional control loop, shutdown at	
protection	approx. 30 V, automatic restart	Mechanics
Current limitation	5.5 6.5 A	Connections
Short-circuit protection	Electronic shutdown, automatic restart	 Supply input L, N, PE
Sustained short-circuit current rms value	< 5 A	• Output +
Overload/short-circuit indicator	-	• Output -
		Dimensions (W x H x D) mm
		Weight, approx.
		Mounting
		Accessories

Power supply, type	5 A
Safety	
Primary/secondary isolation	Yes, safety extra low output voltage $U_{\rm out}$ according to EN 60950 and EN 50178, creepages and clearances > 8 mm
Safety class	Class I
Leakage current	< 3.5 mA (typ. 0.3 mA)
Safety test	Yes
CE marking	Yes
UL/cUL (CSA) approval	UL-listed (UL 508) File E143289, CSA (CSA C22.2 No.
Protection against explosion	-
FM approval	-
Marine approval	-
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55011 Class A
Supply harmonics limitation	-
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	-25 +70°C with natural convection
Transport and storage temperature range	-40 +85°C
Humidity class	Climate class 3K5 according to EN 60721, transient condensation permitted
Mechanics	
Connections • Supply input L, N, PE	One screw-type terminal each for 0.5 2.5 mm ² solid/finely stranded
• Output +	3 screw terminals for 0.5 2.5 mm ²
• Output -	3 screw terminals for 0.5 2.5 mm ²
Dimensions (W x H x D) in mm	80 x 125 x 120
Weight, approx.	0.57 kg
Mounting	Snaps onto S7 rail
Accessories	Mounting adapter for standard mounting rail (6ES7 390-6BA00-0AA0)

SIMATIC S7-300 Power supplies

The S7-300 version

	SIMATIC S7-300 Outdoor	05050545400044
	Chinytric Cr CCC Cutacci	6ES7 307-1EA80-0AA
	Stabilized power supply	
6ES7 307-1BA01-0AA0	Output: 24 V DC/5 A	
6ES7 307-1EA01-0AA0	-25+70 °C with conformal	6AG1 307-1EA80-2AA
6ES7 307-1KA02-0AA0	EN 50155 certified based on 6ES7 307-1EA80-0AA0	
	Input: 120/230 V AC	
6EP1 971-1BA00	Output: 24 V DC/5 A	
	Accessories	
	SIMATIC S7-300 mounting adapter	6ES7 390-6BA00-0AA0
	for snap mounting of the PS 307 onto 35 mm DIN rails	
	6ES7 307-1EA01-0AA0 6ES7 307-1KA02-0AA0	SIPLUS S7-300 PS 307 L

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS S7-300 PS 305

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-300 PS 305		
Order number	6AG1 305-1BA80-2AA0	
Order No. based on	6ES7 305-1BA80-0AA0	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Ambient temperature range	-25 +70 °C	
Ambient conditions	Suitable for extraordinary medial exposure (e.g. chlorine sulfur atmosphere)	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes	

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS S7-300 PS 305 load power supply	
for temperature range -25 to +70 °C and use under medial load (e.g. sulfur chloride atmosphere). Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	
24-110 V DC/24 V DC; 2 A	6AG1 305-1BA80-2AA0

L: Subject to export regulations AL: 91999 and ECCN: N

5/303

SIPLUS S7-300 PS 307, 5 A

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-300 PS 307, 5 A	
Order number	6AG1 307-1EA01-7AA0
Order number based on	6ES7 307-1EA01-0AA0
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 +70 °C
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes

Ambient conditions		
Relative humidity	5 100%, condensation allowed	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B3 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71,04 severity level G1; G2; G3; GX ¹⁾²⁾	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 14.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS S7-300 PS 307 load power supply, 5 A	6AG1 307-1EA01-7AA0
Incl. connection bracket 120/230 V AC; 24 V DC Output current 5 A (dimensions 60 x 125 x 120)	

SIPLUS S7-300 PS 307, 5 A outdoor

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 307-1EA80-2AA0
Order number based on	6ES7 307-1EA80-0AA0
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 +70 °C
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	Yes

Ambient conditions		
Relative humidity	5 100%, condensation allowed	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m)	
	derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	

 $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; $H_2S < 9.9$ ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 < 0.1$ ppm; NOx < 5.2 ppm Limit value (max. 30 min/d): SO $_2 < 14.8$ ppm; $H_2S < 49.7$ ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 < 1.0$ ppm; NOx < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see: www.siemens.com/siplus-extreme

Ordering data SIPLUS S7-300 PS 307 load power supply, 5 A, outdoor For temperature range -25 °C to +70 °C and use under medial exposure (e.g. sulfur chloride atmosphere). Compliant with standard for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1). 120/230 V AC / 24 V DC; 5 A Corder No. Order No. 6AG1 307-1EA80-2AA0

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS S7-300 PS 307, 10 A

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-300 PS 307, 10 A		
Order number	6AG1 307-1KA02-7AA0	
Order number based on	6ES7 307-1KA02-0AA0	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Ambient temperature range	-25 +70 °C	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	

Ambient conditions			
Relative humidity	5 100%, condensation allowed		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71,04 severity level G1; G2; G3; GX ¹⁾²⁾		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range		
	795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K		

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm;
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

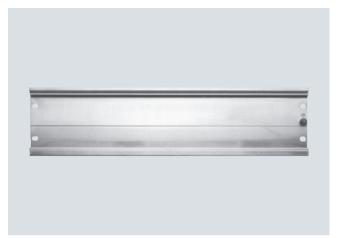
For further technical documentation on SIPLUS, see: www.siemens.com/siplus-extreme

Ordering data	Order No.	
SIPLUS S7-300 PS 307 load power supply, 10 A	6AG1 307-1KA02-7AA0	
Incl. connection bracket 120/230 V AC; 24 V DC Output current 10 A (dimensions 80 x 125 x 120)		

SIMATIC S7-300 Accessories

Mounting rail

Overview



- The mechanical mounting rack of the SIMATIC S7-300
- For accommodating the modules
- Can be screwed onto the wall

Ordering data	Order No.
DIN rail	
160 mm	6ES7 390-1AB60-0AA0
482 mm	6ES7 390-1AE80-0AA0
530 mm	6ES7 390-1AF30-0AA0
830 mm	6ES7 390-1AJ30-0AA0
2000 mm	6ES7 390-1BC00-0AA0

SIMATIC S7-300

Accessories

Labeling sheets

Overview

Labeling sheets

- Film sheets for application-specific labeling of SIMATIC S7-300 I/O modules with commercial laser printers
- Single-color films, tear-resistant, dirt-resistant
- Easy handling:
 - Pre-perforated labeling sheets in DIN A4 format to allow easy separation of the labeling strips
 - easy separation of the labeling strips

 The separated strips can be inserted directly into the I/O modules
- Different colors for distinction between module types or preferred areas of application: The labeling sheets are available in the colors petrol, light beige, red and yellow. Yellow is reserved for failsafe systems.

Labeling strips

- Petrol-colored writable plastic strips
- For insertion in the front connector
- Spare part, 10 units

Label cover

- Petrol-colored film
- To cover and hold user-made labeling strips on normal paper
- · Accessories, 10 units

Technical specifications

Labeling sheets for S7-300	
Dimensions	DIN A4
Labeling strips per sheet, pre-perforated	10
Weight, approx.	0.1 kg

Ordering data	Order No.
Labeling sheets	
for 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	6ES7 392-2AX00-0AA0
light-beige	6ES7 392-2BX00-0AA0
yellow	6ES7 392-2CX00-0AA0
red	6ES7 392-2DX00-0AA0
for 32-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	6ES7 392-2AX10-0AA0
light-beige	6ES7 392-2BX10-0AA0
yellow	6ES7 392-2CX10-0AA0
red	6ES7 392-2DX10-0AA0
Labeling strips	
10 units (spare part)	
for modules with 20-pin front connector	6ES7 392-2XX00-0AA0
for modules with 40-pin front connector	6ES7 392-2XX10-0AA0
Label cover	
10 units (spare part)	
for modules with 20-pin front connector	6ES7 392-2XY00-0AA0
for modules with 40-pin front connector	6ES7 392-2XY10-0AA0

6

SIMATIC S7-400



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Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/ printmaterial

Siemens ST 70 · 2011

SIMATIC S7-400

Introduction

S7-400/S7-400H/S7-400F/FH

Overview

The S7-400 is the most powerful PLC in the family of SIMATIC controllers. It enables successful automation solutions with Totally Integrated Automation (TIA). The S7-400 is an automation platform for system solutions in production and process engineering, and it is characterized primarily by its modularity and performance reserves.



S7-400

- The power PLC for the mid to high-end performance ranges.
- The solution for even the most demanding tasks.
- With a comprehensive range of modules and performancegraded CPUs for optimal adaptation to the automation task.
- Flexible in use through simple implementation of distributed structures; user-friendly connections.
- · Optimal communication and networking options.
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase.
- Multicomputing: Simultaneous operation of several CPUs in one S7-400 central controller. Multicomputing distributes the overall performance power of an S7-400. For example, complex tasks can be divided into technologies such as open-loop control, computing or communication, and assigned to different CPUs. And every CPU can be assigned its own local I/O.
- Modularity: The powerful backplane bus of the S7-400 and the communication interfaces that can be connected direct to the CPU enable high-performance operation of a host of communication lines. This enables, for example, division into one communication path for HMI and programming tasks, one for high-performance and equidistant motion control components, and one for a "normal" I/O fieldbus. Additionally required connections to MES/ERP systems or the Internet can also be implemented.
- Engineering and diagnostics: The S7-400 is configured and programmed extremely efficiently together with the SIMATIC Engineering Tools particularly in the case of extensive automation solutions with a high engineering component. For this purpose, high-level languages such as SCL and graphical engineering tools for sequential controls, state graph programs and technology-oriented diagrams are available, for example.



S7-400H

- Fault-tolerant automation system with redundant design.
- For applications with high fail-safety requirements. Processes with high restart costs, expensive downtimes, little supervision, and few maintenance options.
- · Redundant central functions.
- Increases availability of I/O: switched I/O configuration.
- Also possible to use I/Os with standard availability: singlesided configuration.
- Hot stand-by: automatic reaction-free switching to the standby unit in the event of a fault.
- Configuration with two separate or one divided central rack.
- Connection of switched I/O via redundant PROFIBUS DP.

SIMATIC S7-400 Introduction

S7-400/S7-400H/S7-400F/FH

Overview (continued)



S7-400F/FH

- Failsafe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 in accordance with IEC 61508, AK6 in accordance with DIN V 19250 and Cat. 4 in accordance with EN 954-1
- If required, also fault tolerant through redundant design
- Without additional wiring of the safety-related I/O:
- Safety-relevant communication via PROFIBUS DP with PROFIsafe profile
- Based on S7-400H and ET 200M with fail-safe modules
- Standard modules for non-safety-related applications can also be used in the automation system
- Isolation module for joint use of fail-safe and standard modules in safety mode in one ET 200M

Technical specifications

General technical specifications	
Degree of protection	IP20
Ambient temperature	0 to 60 °C
Relative humidity	5 to 95%, no condensation
Atmospheric pressure	1080 to 795 hPa (corresponds to an altitude of 1000 m to 2000 m)
Electromagnetic compatibility • Interference immunity • Emitted interference	According to EN 61000-6-2 According to EN 61000-6-4
Mechanical load • Vibration, test according to / tested with • Shock, test according to / tested with	IEC 60068-2-6 (sine) 10 to 58 Hz; constant amplitude 0.075 mm; 58 to 500 Hz; constant acceleration 1 g; duration of oscillation: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes IEC 60068-2-27 Type of shock: Half-sine; strength of the shock 10 g (peak value), duration 6 ms direction of shock: 100 shocks in each of the 3 mutually perpendicular axes.

For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

Overview



- The low-cost starter solution for the medium performance
- Can be used in small and medium-sized systems with requirements of the medium performance range

Technical specifications

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Product type designation	CPU 412-1	CPU 412-2	CPU 412-2 PN
Product version Hardware product version	03	03	01
Firmware version	V5.3	V5.3	V6.0
Associated programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher/iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
Supply voltages Rated value • 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
Feeding of external backup voltage to CPU	5 to 15 V DC	5 to 15 V DC	5 to 15 V DC
Current consumption from backplane bus 5 V DC, max.	0.6 A	1.1 A	1.3 A
from interface 5 V DC, max.	90 mA	90 mA; At each DP interface	90 mA; At the DP interface
Power losses Power loss, typ.	2.5 W	4.5 W	5.5 W
Power loss, max.	3 W	5 W	6.5 W
Backup battery Battery operation • Backup current, typ. • Backup current, max.	not relevant 125 μA; (up to 40 °C) 300 μA	not relevant 125 μA; (up to 40 °C) 550 μA	not relevant 125 μA; (up to 40 °C) 450 μA
Memory Work memory • integrated (for program) • integrated (for data) • expandable	144 Kibyte 144 Kibyte No	256 Kibyte 256 Kibyte No	0.5 Mbyte 0.5 Mbyte No
Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte
Backup • present • with battery • without battery	Yes Yes; All data No	Yes Yes; All data No	Yes Yes; All data No

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
CPU-blocks			
DB			
Number, max.	1 500; Number range: 1 to 16,000	3 000; Number range: 1 to 16,000	3 000; Number range: 1 to 16,000
Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
Number, max.	750; Number range: 0 to 7999	1 500; Number range: 0 to 7999	1 500; Number range: 0 to 7999
Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
Number, max.	750; Number range: 0 to 7999	1 500; Number range: 0 to 7999	1 500; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
OB			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth			
 per priority class 	24	24	24
 additional within an error OB 	1	1	1
CPU processing times			
for bit operations, min.	75 ns	75 ns	75 ns
for word operations, min.	75 ns	75 ns	75 ns
for fixed point arithmetic, min.	75 ns	75 ns	75 ns
for floating point arithmetic, min.	225 ns	225 ns	225 ns
Counters, timers and their			
retentivity			
S7 counter			
Number	2 048	2 048	2 048
 Retentivity 			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	Z 0 to Z 7	Z 0 to Z 7	Z 0 to Z 7
Counting range	0	0	0
- lower limit	0 999	0 999	0 999
- upper limit	999	999	999
IEC counter	V	V	V
• present	Yes	Yes SFB	Yes SFB
TypeNumber	SFB		Unlimited (limited only by work
Number	Unlimited (limited only by work memory)	Unlimited (limited only by work memory)	memory)
S7 times		,,	
Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	No times retentive	No times retentive	No times retentive
Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Number	Unlimited (limited only by work	Unlimited (limited only by work	Unlimited (limited only by work
	memory)	memory)	memory)

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Data areas and their retentivity			
retentive data area, total	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)
Flag			
Number, max.	4 Kibyte; Size of bit memory address area	4 Kibyte; Size of bit memory address area	4 Kibyte; Size of bit memory address area
 Retentivity available 	Yes	Yes	Yes
 Number of clock memories 	8; (in 1 memory byte)	8; (in 1 memory byte)	8; (in 1 memory byte)
Data blocks			
 Number, max. 	1 500; Number range: 1 to 16,000	3 000; Number range: 1 to 16,000	3 000; Number range: 1 to 16,000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Local data			
adjustable, max.	8 Kibyte	8 Kibyte	8 Kibyte
• preset	4 Kibyte	4 Kibyte	4 Kibyte
Address area			
I/O address area			
• overall	4 Kibyte	4 Kibyte	4 Kibyte
• Outputs	4 Kibyte	4 Kibyte	4 Kibyte
of which, distributed	.,	.,	.,
- MPI/DP interface, inputs	2 Kibyte	2 Kibyte	2 Kibyte
- MPI/DP interface, outputs	2 Kibyte	2 Kibyte	2 Kibyte
- DP interface, inputs	•	4 Kibyte	•
- DP interface, outputs		4 Kibyte	
- PN interface, inputs			4 Kibyte
- PN interface, outputs			4 Kibyte
Process image			
• Inputs, adjustable	4 Kibyte	4 Kibyte	4 Kibyte
Outputs, adjustable	4 Kibyte	4 Kibyte	4 Kibyte
• Inputs, preset	128 byte	128 byte	128 kbyte
Outputs, preset	128 byte	128 byte	128 Kibyte
Consistent data, max.	244 byte	244 byte	244 byte
 Access to consistent data in 	Yes	Yes	Yes
process image			
Subprocess images			
 Number of subprocess images, 	15	15	15
max.			
Digital channels			
• Inputs	32 768	32 768	32 768
Outputs	32 768	32 768	32 768
 Inputs, of which central 	32 768	32 768	32 768
Outputs, of which central	32 768	32 768	32 768
Analog channels			
• Inputs	2 048	2 048	2 048
Outputs	2 048	2 048	2 048
 Inputs, of which central 	2 048	2 048	2 048
 Outputs, of which central 	2 048	2 048	2 048

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Hardware configuration			
connectable OPs	31	31	47
Central devices, max.	1	1	1
Expansion devices, max.	21	21	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules			
 Number of connectable IMs (total), max. 	6	6	6
 Number of connectable IM 460s, max. 	6	6	6
 Number of connectable IM 463s, max. 	4; IM 463-2	4; IM 463-2	4; IM 463-2
Number of DP masters			
• integrated	1	2	1
• via IM 467	4	4	4
• via CP	10; CP 443-5 Extended	10; CP 443-5 Extended	10; CP 443-5 Extended
Mixed mode IM + CP permitted	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)
via interface module	0	0	0
Number of pluggable S5 modules (via adapter capsule in central device), max.	6	6	6
Number of IO controllers			
• integrated	0	0	1
• via CP	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller
Number of operable FMs and CPs			
(recommended)			
• FM	Limited by number of slots and	Limited by number of slots and	Limited by number of slots and
	number of connections	number of connections	number of connections
CP, point-to-point	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connection
PROFIBUS and Ethernet CPs	14; Of which 10 CPs max. or IMs as DP master, 4 PN controller maximum	14; Of which 10 CPs max. or IMs as DP master, 4 PN controller maximum	14; In total max. 10 CPs as DP master and PN controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PN controller
Time			
Clock			
Hardware clock (real-time clock)	Yes	Yes	Yes
• battery-backed and synchronizable	Yes	Yes	Yes
Resolution	1 ms	1 ms	1 ms
Runtime meter Number	16	16	16
Clock synchronization			
• supported	Yes	Yes	Yes
• to MPI, master	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
• to DP, master	Yes	Yes	Yes
• to DP, slave	Yes	Yes	Yes
• in AS, master	Yes	Yes	Yes
• in AS, slave	Yes	Yes	Yes
on Ethernet via NTP	No; Via CP	No; Via CP	Yes; as client
• to IF 964 DP	No, via Gr No	No. Via Gr	100, ao Giorit
▼ 10 II 304 DF	INO	INO	

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
S7 message functions Number of login stations for message functions, max.	31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC)	31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC)	47; Max. 47 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes	Yes	Yes
SCAN procedure	Yes	Yes	Yes
Number of messages • overall, max.	512	512	512
Block related messages	Yes	Yes	Yes
Process diagnostic messages	Yes	Yes	Yes
Alarm 8-blocks	Yes	Yes	Yes
Process control messages	Yes	Yes	Yes
Test commissioning functions Status/control • Status/control variable Forcing • Forcing	Yes; Up to 16 variable tables Yes	Yes; Up to 16 variable tables Yes	Yes; Up to 16 variable tables Yes
Status block	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously	Yes; Up to 16 simultaneously
Single step	Yes	Yes	Yes
Number of breakpoints	4	4	16
Diagnostic buffer • present • Number of entries, max. - adjustable - preset	Yes 200 Yes 120	Yes 400 Yes 120	Yes 400 Yes 120
Service data • can be read out			Yes
Communication functions PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
Routing	Yes; S7 routing	Yes; S7 routing	Yes; S7 routing
Global data communication • supported • Size of GD packets, max. S7 basic communication	Yes 54 byte	Yes 54 byte	Yes 54 byte
supportedUser data per job, max.	Yes 76 byte	Yes 76 byte	Yes 76 byte
97 communication • supported • as server • as client • User data per job, max.	Yes Yes Yes 64 Kibyte	Yes Yes Yes 64 Kibyte	Yes Yes Yes 64 Kibyte
S5-compatible communication • supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
User data per job, max. Standard communication (FMS) supported	8 Kibyte Yes; Via CP and loadable FB	8 Kibyte Yes; Via CP and loadable FB	8 Kibyte Yes; Via CP and loadable FB

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Web server • supported • Number of HTTP clients • User-defined websites	No	No	Yes 5 Yes
Open IE communication • TCP/IP			Yes; Via integrated PROFINET interface and loadable FBs
Number of connections, max.Data length, max.Several passive connections per port, supported			46 32 Kibyte Yes
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
Number of connections, max. Data length, max.	1452 bytes via CP 443-1 Adv.	1452 bytes via CP 443-1 Adv.	46 32 Kibyte; 1452 bytes via CP 443-1 Adv.
Number of connections, max. Data langth, may.			Yes; Via integrated PROFINET interface and loadable FBs 46
- Data length, max.			1 472 byte
Number of connections • overall	32	32	48
PROFINET CBA (at set setpoint communication load)			
Number of remote interconnection partners			32
Number of functions, master/slave Total of all Master/Slave connections			150 4 500
Data length of all incoming connections master/slave, max.			45 000 byte
Data length of all outgoing connections master/slave, max.			45 000 byte
Number of device-internal and PROFIBUS interconnections			1 000
Data length of device-internal and PROFIBUS interconnections, max.			16 000 byte
Data length per connection, max.			2 000 byte
 Remote interconnections with acyclic transmission 			
- Sampling frequency: Sampling time, min.			200 ms; Depending on preset communcation load, number of interconnections and data length used
- Number of incoming interconnections			250
- Number of outgoing interconnections			250
 Data length of all incoming interconnections, max. 			8 000 byte
 Data length of all outgoing interconnections, max. 			8 000 byte
- Data length per connection, max.			2 000 byte

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Remote interconnections with cyclic transmission			
- Transmission frequency: Transmission interval, min.			1 ms; Depending on preset communication load, number of interconnections and data length used
 Number of incoming interconnections 			300
 Number of outgoing interconnections 			300
 Data length of all incoming interconnections, max. 			4 800 byte
 Data length of all outgoing interconnections, max. 			4 800 byte
Data length per connection, max.HMI variables via PROFINET			450 byte
(acyclic) - Number of stations that can log on			2x PN OPC/1x iMap
for HMI variables (PN OPC/iMap) - HMI variable updating			500 ms
- Number of HMI variables			1 000
 Data length of all HMI variables, max. 			32 000 byte
PROFIBUS proxy functionality			
- supported			Yes; 32 PROFIBUS slaves max. connectable
- Data length per connection, max.			240 byte; Slave-dependent
1st interface			
Type of interface	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
Isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA	150 mA
Number of connection resources	MPI: 32, DP: 16	MPI: 32, DP: 16	MPI: 32, DP: 16
Functionality			
• MPI	Yes	Yes	Yes
DP master DP places	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
MPI • Number of connections	32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1	32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1	32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
S7 communicationS7 communication, as client	Yes Yes	Yes Yes	Yes Yes
- S7 communication, as client	Yes	Yes	Yes
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
,	, .		

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
DP master	113,011-0		
Number of connections, max.	16; if a diagnostic repeater is used	16; if a diagnostic repeater is used	16; if a diagnostic repeater is used
	on the line, the number of connection resources on the line is reduced by 1	on the line, the number of connection resources on the line is reduced by 1	on the line, the number of connection resources on the line is reduced by 1
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	No	No	No
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	Yes	Yes	Yes
- S7 communication, as server	Yes Yes	Yes	Yes
- Equidistance mode support	Yes	Yes Yes	Yes Yes
Isochronous modeSYNC/FREEZE	Yes	Yes	Yes
- Activation/deactivation of DP	Yes	Yes	Yes
slaves			
- Direct data exchange (slave-to-slave communication)	Yes	Yes	Yes
- DPV1	Yes	Yes	Yes
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
 Number of DP slaves, max. 	32	32	32
Address area			
- Inputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
- Outputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
User data per DP slave	044 5. 4-	044 - +-	044 - +
- User data per DP slave, max.	244 byte	244 byte	244 byte
- Inputs, max.	244 byte	244 byte	244 byte
Outputs, max.Slots, max.	244 byte 244	244 byte 244	244 byte 244
- per slot, max.	128 byte	128 byte	128 byte
DP slave	120 byto	120 byte	120 byte
Number of connections	16	16	16
Services	10	10	10
- PG/OP communication	Yes; with interface active	Yes; with interface active	Yes; with interface active
- S7 routing	Yes; With interface active	Yes; With interface active	Yes; With interface active
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	Yes	Yes	Yes
- S7 communication, as server	Yes	Yes	Yes
- Direct data exchange (slave-to-slave communication)	No	No	No
- DPV1	No	No	No
• GSD file	http://support.automation.siemens.com/WW/view/en/113652	http://support.automation.siemens.com/WW/view/en/113652	http://support.automation.siemens.com/WW/view/en/113652
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Automatic baud rate search	No	No	No
Transfer memory			
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
Address area, max.	32; Virtual slots	32; Virtual slots	32; Virtual slots
• User data per address area, max.	32 byte	32 byte	32 byte
User data per address area, of which consistent, max.	32 byte	32 byte	32 byte

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
2nd interface			
Type of interface		Integrated	PROFINET
Physics		RS 485 / PROFIBUS	Ethernet RJ45
Isolated		Yes	Yes
Integrated switch			Yes
Number of ports			2
		450 4	2
Power supply to interface (15 to 30 V DC), max.		150 mA	
Automatic detection of transmission speed			Yes; Autosensing
Autonegotiation			Yes
Autocrossing			Yes
Media redundancy			
• supported			Yes
Switchover time on line break, typically			200 ms
• Number of stations in the ring, max.			50
Change of IP address at runtime, supported			Yes; Assignment by higher-level IO controller or by the user program with SFB104 "IP_CONF"
Number of connection resources		16	48
Functionality			
DP master		Yes	No
DP slave		Yes	No
PROFINET IO controller			Yes
PROFINET IO device			Yes
PROFINET CBA			Yes
Open IE communication			Yes
Web server			Yes
 Number of HTTP clients 			5
 Local Operating Network 			No
DP master			
 Number of connections, max. 		16	
• Services			
- PG/OP communication		Yes	
- Routing		Yes	
 Global data communication 		No	
- S7 basic communication		Yes	
- S7 communication		Yes	
- S7 communication, as client		Yes	
- S7 communication, as server		Yes	
- Equidistance mode support		Yes	
- Isochronous mode		Yes	
- SYNC/FREEZE		Yes	
- Activation/deactivation of DP slaves		Yes	
 Direct data exchange (slave-to-slave communication) 		Yes	
- DPV1		Yes	
Transmission rate, max.		12 Mbit/s	
Number of DP slaves, max.		64	
Address area			
- Inputs, max.		4 Kibyte	

recnnical specifications (contin	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
User data per DP slave			
- User data per DP slave, max.		244 byte	
- Inputs, max.		244 byte	
- Outputs, max.		244 byte	
- Slots, max.		244 128 byte	
- per slot, max.		126 byte	
DP slave • Number of connections		16	
Services		16	
- Routing		Yes	
- Programming		Yes	
• GSD file		http://support.automation.siemens.	
		com/WW/view/en/113652	
• Transmission rate, max.		12 Mbit/s	
Transfer memory		044 5. 4.	
- Inputs		244 byte	
OutputsAddress area, max.		244 byte 32	
 User data per address area, max. 		32 byte	
User data per address area, of		32 byte	
which consistent, max.			
PROFINET IO controller			
 Services 			
- PG/OP communication			Yes
- S7 routing			Yes
- S7 communication			Yes
- Isochronous mode			Yes; Only with IRT and the High Performance option
- Open IE communication			Yes
Transmission rate, min.			10 Mbit/s
 Transmission rate, max. 			100 Mbit/s
• Number of connectable IO devices,			256
max.			050
 Max. number of connectable IO devices for RT 			256
- of which in line, max.			256
Number of IO devices with IRT and			256
the option "high flexibility"			
- of which in line, max.			61
Number of IO devices with IRT and the applian "high payformance" may			64
the option "high performance", max of which in line, max.			64
IRT, supported			Yes
 Shared device, supported 			Yes
Prioritized startup supported			Yes
- Number of IO devices, max.			32
 Activation/deactivation of 			Yes
IO devices			
 Number of IO devices that can be simultaneously activated/deacti- 			8
vated, max.			
 IO devices changing during 			Yes
operation (partner ports),			
supported - Max. number of IO devices per			8; 8 parallel calls of the SFC 12
tool			"D_ACT_DP" possible per line.
			Max. 32 IO devices changing
			during operation (partner ports) are supported.
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	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
Device replacement without swap			Yes
medium • Send clock times			250 μs, 500 μs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 μs to 4 ms in 125 μs frame
Updating time			250 µs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO devices and on the amount of configured user data, see PROFINET system description
Address area			
- Inputs, max.			4 Kibyte
Outputs, max.User data per address area, max.			4 Kibyte
- User data consistency, max.			1 024 byte
PROFINET IO device			
• Services			
- PG/OP communication			Yes
- S7 routing - S7 communication			Yes Yes
- Isochronous mode			No
- Open IE communication			Yes
- IRT, supported			Yes
- Prioritized startup supported			Yes
Shared device, supportedNumber of IO controllers with			Yes 2
shared device, max.			2
Transfer memory			
- Inputs, max.			1 440 byte; Per IO controller with
- Outputs, max.			shared device 1 440 byte; Per IO controller with shared device
Submodules			
- Number, max.			64
- User data per submodule, max.			1 024 byte
PROFINET CBA			
acyclic transmission acyclic transmission			Yes Yes
• cyclic transmission			res
Open IE communication Open IE communication, supported			Yes
Number of connections, max.			46
Local port numbers used at the			0, 20, 21, 25, 80, 102, 135, 161,
system end			34962, 34963, 34964, 65532,
Keep-alive function, supported			65533, 65534, 65535 Yes
Isochronous mode			
Isochronous mode	Yes; For PROFIBUS only	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
Number of DP masters with isochronous mode	1	2	1
User data per isochronous slave, max.	244 byte	244 byte	244 byte
Equidistance	Yes	Yes	Yes
Shortest clock pulse	1.5 ms; 0.5 ms without use of SFC 126, 127	1.5 ms; 0.5 ms without use of SFC 126, 127	1.5 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms	32 ms	32 ms

	6ES7 412-1XJ05-0AB0	6ES7 412-2XJ05-0AB0	6ES7 412-2EK06-0AB0
CiR - Configuration in RUN			
CiR synchronization time, basic load	100 ms	100 ms	100 ms
CiR synchronization time, time per I/O slave	30 μs; Time per I/O byte	200 μs; Time per I/O byte	30 μs; Time per I/O byte
Programming			
Configuration software			
• STEP 7	Yes	Yes	Yes
Programming language			
• STEP 7	Yes	Yes	Yes
• LAD	Yes	Yes	Yes
• FBD	Yes	Yes	Yes
• STL	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
• CFC	Yes	Yes	Yes
• GRAPH	Yes	Yes	Yes
• HiGraph®	Yes	Yes	Yes
Nesting levels	7	7	7
Know-how protection			
User program protection/password protection	Yes	Yes	Yes
Block encryption			Yes; With S7 block privacy
EMC			
Emission of radio interference acc. to EN 55 011			
 Limit value class A, for use in industrial areas 	Yes		Yes
 Limit value class B, for use in residential areas 	No		No
Dimensions			
Required slots	1	1	1
Dimensions and weight			
Dimensions			
• Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
• Depth	219 mm	219 mm	219 mm
Weight			
Weight, approx.	0.7 kg	0.7 kg	750 g
		9	9

Ordering data	Order No.		Order No.
CPU 412-1	6ES7 412-1XJ05-0AB0	Manual "Communication for	
Work memory 288 KB, power		SIMATIC S7-300/-400"	CEC7 200 0F400 0440
supply 24 V DC, MPI/PROFIBUS DP master interface, slot for		German	6ES7 398-8EA00-8AA0
memory card, incl. slot number labels		English	6ES7 398-8EA00-8BA0
CPU 412-2	6ES7 412-2XJ05-0AB0	French	6ES7 398-8EA00-8CA0
Work memory 512 KB, power	0L37 412-2X003-0AD0	Spanish	6ES7 398-8EA00-8DA0
supply 24 V DC, MPI/PROFIBUS		Italian SIMATIC manual collection J	6ES7 398-8EA00-8EA0 6ES7 998-8XC01-8YE0
DP master interface, slot for memory card, incl. slot number		Electronic manuals on DVD,	6ES7 998-8XC01-8YE0
labels		multilingual: LOGO!, SIMADYN,	
CPU 412-2 PN	6ES7 412-2EK06-0AB0	SIMATIC bus components, SIMATIC C7,	
Work memory 1 MB, power supply 24 V DC, MPI/PROFIBUS		SIMATIC distributed I/O,	
DP master interface, PROFINET		SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based	
interface, slot for memory card, incl. slot number labels		Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7,	
Memory card RAM		SIMATIC FG/FC, SIMATIC 57, SIMATIC Software, SIMATIC TDC	
64 KB	6ES7 952-0AF00-0AA0	SIMATIC manual collection	6ES7 998-8XC01-8YE2
256 KB	6ES7 952-1AH00-0AA0	update service for 1 year	
1 MB	6ES7 952-1AK00-0AA0	Current "Manual Collection" DVD and the three subsequent	
2 MB	6ES7 952-1AL00-0AA0	updates	
4 MB	6ES7 952-1AM00-0AA0	Brochure "SIMATIC S7-400	
8 MB	6ES7 952-1AP00-0AA0	programmable controller - Design and application"	
16 MB	6ES7 952-1AS00-0AA0	German	6ES7 498-8AA00-8AB0
64 MB	6ES7 952-1AY00-0AA0	English	6ES7 498-8AA00-8BB0
FEPROM memory card	<u> </u>	RS 485 bus connector with	
64 KB	6ES7 952-0KF00-0AA0	90° cable outlet	
256 KB	6ES7 952-0KH00-0AA0	Max. transfer rate 12 Mbit/s	
1 MB	6ES7 952-1KK00-0AA0	Without PG interface	6ES7 972-0BA12-0XA0
2 MB	6ES7 952-1KL00-0AA0	With PG interface	6ES7 972-0BB12-0XA0
4 MB	6ES7 952-1KM00-0AA0	RS 485 bus connector with	
8 MB	6ES7 952-1KP00-0AA0	angled cable outlet Max. transfer rate 12 Mbit/s	
16 MB	6ES7 952-1KS00-0AA0	Without PG interface	6ES7 972-0BA42-0XA0
32 MB	6ES7 952-1KT00-0AA0	With PG interface	6ES7 972-0BB42-0XA0
64 MB	6ES7 952-1KY00-0AA0	RS 485 bus connector with	ULS/ 9/2-UDD42-UAAU
MPI cable	6ES7 901-0BF00-0AA0	90° cable outlet for	
for connection of SIMATIC S7 and		Fast Connect system	
PG via MPI; 5 m in length		Max. transfer rate 12 Mbit/s	
Slot number labels	6ES7 912-0AA00-0AA0	Without PG interface • 1 unit	6ES7 972-0BA52-0XA0
1 set (spare part)		• 100 units	6ES7 972-0BA52-0XB0
Manual "SIMATIC S7-400 programmable controller"		With PG interface	
incl. instruction list		• 1 unit	6ES7 972-0BB52-0XA0
German	6ES7 498-8AA05-8AA0	• 100 units	6ES7 972-0BB52-0XB0
English	6ES7 498-8AA05-8BA0	RS 485 bus connector with axial cable outlet	
S7-400 operation list	OLOT TOU OMMOSTORM	For SIMATIC OP, for connection to	6GK1 500-0EA02
German	6ES7 498-8AA05-8AN0	PPI, MPI, PROFIBUS	
English	6ES7 498-8AA05-8BN0	PROFIBUS FastConnect bus cable	
		Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1 830-0EH10

J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-400

Central processing units Standard CPUs CPU 414

Overview



- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Integrated PROFINET functions in CPU 414-3 PN/DP

Technical specifications

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Product type designation	CPU 414-2	CPU 414-3	CPU414-3 PN/DP
Product version Hardware product version	03	03	01
Firmware version	V5.3	V5.3	V6.0
associated programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher/iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
Supply voltages Rated value • 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
Feeding of external backup voltage to CPU	5 to 15 V DC	5 to 15 V DC	5 to 15 V DC
Current consumption from backplane bus 5 V DC, max.	1.1 A	1.3 A	1.5 A
from interface 5 V DC, max.	90 mA; At each DP interface	90 mA; At each DP interface	90 mA; At each DP interface
Power losses Power loss, typ.	4.5 W	5.5 W	6.5 W
Power loss, max.	5 W	6 W	7.5 W
Backup battery Battery operation • Backup current, typ. • Backup current, max.	not relevant 125 μA; (up to 40 °C) 550 μA	not relevant 125 μΑ 550 μΑ	not relevant 125 μΑ; (up to 40 °C) 450 μΑ
Memory Work memory • integrated (for program) • integrated (for data) • expandable	0.5 Mbyte 0.5 Mbyte No	1.4 Mbyte 1.4 Mbyte No	2 Mbyte 2 Mbyte No
Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte
Backup • present • with battery • without battery	Yes Yes; All data No	Yes Yes; All data No	Yes Yes; All data No

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
CPU-blocks			
DB			
Number, max.	6 000; Number range: 1 to 16,000	6 000; Number range: 1 to 16,000	6 000; Number range: 1 to 16,000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
 Number, max. 	3 000; Number range: 0 to 7999	3 000; Number range: 0 to 7999	3 000; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
 Number, max. 	3 000; Number range: 0 to 7999	3 000; Number range: 0 to 7999	3 000; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
OB			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth			
• per priority class	24	24	24
 additional within an error OB 	1	1	1
CPU processing times			
for bit operations, min.	45 ns	45 ns	45 ns
for word operations, min.	45 ns	45 ns	45 ns
for fixed point arithmetic, min.	45 ns	45 ns	45 ns
for floating point arithmetic, min.	135 ns	135 ns	135 ns
	100 110	100 113	100 113
Counters, timers and their retentivity			
S7 counter			
Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	Z 0 to Z 7	Z 0 to Z 7	Z 0 to Z 7
Counting range	0	0	0
- lower limit	0	0	0 999
- upper limit	999	999	999
IEC counter	V	V	
• Present	Yes	Yes	Yes SFB
TypeNumber	SFB Unlimited (limited only by work	SFB Unlimited (limited only by work	Unlimited (limited only by work
Number	memory)	memory)	memory)
S7 times			
• Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	No times retentive	No times retentive	No times retentive
Time range	-	_	
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer		-	-
• present	Yes	Yes	Yes
• IV/00	SFB	SFB	SFB
TypeNumber	Unlimited (limited only by work	Unlimited (limited only by work	Unlimited (limited only by work

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Data areas and their retentivity			
retentive data area, total	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)
Flag Number, max.	8 Kibyte; Size of bit memory address area	8 Kibyte; Size of bit memory address area	8 Kibyte; Size of bit memory address area
Retentivity available Number of clock memories	Yes 8; (in 1 memory byte)	Yes 8; (in 1 memory byte)	Yes 8; (in 1 memory byte)
	o, (iii i incinory byte)	o, (iii i incinory byto)	o, (iii i memory byte)
Data blocks Number, max.	6 000; Number range: 1 to 16,000	6 000; Number range: 1 to 16,000	6 000; Number range: 1 to 16,000
· Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
ocal data			
adjustable, max.	16 Kibyte	16 Kibyte	16 Kibyte
preset	8 Kibyte	8 Kibyte	8 Kibyte
Address area			`
O address area			
overall	8 Kibyte	8 Kibyte	8 Kibyte
Outputs	8 Kibyte	8 Kibyte	8 Kibyte
of which, distributed	,		,
- MPI/DP interface, inputs	2 Kibyte	2 Kibyte	2 Kibyte
- MPI/DP interface, outputs	2 Kibyte	2 Kibyte	2 Kibyte
- DP interface, inputs	6 Kibyte	6 Kibyte	6 Kibyte
- DP interface, outputs	6 Kibyte	6 Kibyte	6 Kibyte
- PN interface, inputs	o rabyto	o rabyte	8 Kibyte
- PN interface, outputs			8 Kibyte
· · · · · · · · · · · · · · · · · · ·			- · · · · · · · · · · · · · · · · · · ·
Process image	0.1/354-	0.1/31	0.1/3
Inputs, adjustable	8 Kibyte	8 Kibyte	8 Kibyte
Outputs, adjustable	8 Kibyte	8 Kibyte	8 Kibyte
Inputs, preset	256 byte	256 byte	256 byte
Outputs, preset	256 byte	256 byte	256 byte
consistent data, max.	244 byte	244 byte	244 byte
Access to consistent data in process image	Yes	Yes	Yes
Subprocess images Number of subprocess images,	15	15	15
max.			
Digital channels			
• Inputs	65 536	65 536	65 536
Outputs	65 536	65 536	65 536
Inputs, of which central	65 536	65 536	65 536
Outputs, of which central	65 536	65 536	65 536
Analog channels			
• Inputs	4 096	4 096	4 096
Outputs	4 096	4 096	4 096
Inputs, of which central	4 096	4 096	4 096
Outputs, of which central	4 096	4 096	4 096
Hardware configuration			
connectable OPs	31	31	63
Central devices, max.	1	1	1
Expansion devices, max.	21	21	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)
nterface modules	- /	,	,
Number of connectable IMs (total), max.	6	6	6
Number of connectable IM 460s, max.	6	6	6
Number of connectable IM 463s, max.	4; IM 463-2	4; IM 463-2	4; IM 463-2

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Number of DP masters			
• integrated	2	2	1
• via IM 467	4	4	4
• via CP	10; CP 443-5 Extended	10; CP 443-5 Extended	10; CP 443-5 Extended
Mixed mode IM + CP permitted	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)
 via interface module Number of pluggable S5 modules (via adapter capsule in central device), max. 	0 6	6	1; IF 964-DP 6
Number of IO controllers			
integrated	0	0	1
• via CP	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/ GX20, max. 4 in central controller	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/ GX20, max. 4 in central controller	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/ GX20, max. 4 in central controller
Number of operable FMs and CPs			
(recommended) • FM	Limited by number of slots and number of connections	Limited by number of slots and number of connections	Limited by number of slots and number of connections
• CP, point-to-point	CP 440: limited by number of slots; CP 441: limited by number of	CP 440: limited by number of slots; CP 441: limited by number of connections	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections
PROFIBUS and Ethernet CPs	connections 14; Of which 10 CPs max. or IMs	14; Of which 10 CPs max. or IMs	14; In total max. 10 CPs as DP
VITTO I DOS and Effect of S	as DP master, 4 PN controller maximum	as DP master, 4 PN controller maximum	master and PN controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PN controller
Time			
Clock			
Hardware clock (real-time clock)	Yes	Yes	Yes
Battery-backed and synchronizable		Yes	Yes
Resolution	1 ms	1 ms	1 ms
Runtime meter			
Number	16	16	16
Clock synchronization			
• supported	Yes	Yes	Yes
• to MPI, master	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
• to DP, master	Yes	Yes	Yes
• to DP, slave	Yes	Yes	Yes
• in AS, master	Yes Yes	Yes Yes	Yes Yes
in AS, slaveon Ethernet via NTP	No; via CP	No; via CP	Yes; as client
• to IF 964 DP	No.	Yes	Yes
S7 message functions			
Number of login stations for message functions, max.	31; max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC)	31; max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC)	63; max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes	Yes	Yes
SCAN procedure	Yes	Yes	Yes
Number of messages			
• overall, max.	512	512	512
Block related messages	Yes	Yes	Yes
Process diagnostic messages	Yes	Yes	Yes
Alarm 8-blocks	Yes	Yes	Yes
Process control messages	Yes	Yes	Yes
*			

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Test commissioning functions			
Status/control			
Status/control variable	Yes; Up to 16 variable tables	Yes; Up to 16 variable tables	Yes; Up to 16 variable tables
Forcing			
Forcing	Yes	Yes	Yes
Status block	Yes; Up to 2 simultaneously	Yes; Up to 2 simultaneously	Yes; Up to 16 simultaneously
Single step	Yes	Yes	Yes
Number of breakpoints	4	4	16
Diagnostic buffer			
• present	Yes	Yes	Yes
 Number of entries, max. 	400	3 200	3 200
- adjustable	Yes	Yes	Yes
- preset	120	120	120
Service data			
• can be read out			Yes
Communication functions			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
Routing	Yes; S7 routing	Yes; S7 routing	Yes; S7 routing
Global data communication			
 supported 	Yes	Yes	Yes
 Size of GD packets, max. 	54 byte	54 byte	54 byte
S7 basic communication			
supported	Yes	Yes	Yes
 User data per job, max. 	76 byte	76 byte	76 byte
S7 communication			
supported	Yes	Yes	Yes
• as server	Yes	Yes	Yes
• as client	Yes	Yes	Yes
 User data per job, max. 	64 Kibyte	64 Kibyte	64 Kibyte
S5-compatible communication			
 supported 	Yes; Via FC AG_SEND and	Yes; Via FC AG_SEND and	Yes; Via FC AG_SEND and
	AG_RECV, max. via 10 CP 443-1 or		
	443-5	443-5	443-5
User data per job, max.	8 Kibyte	8 Kibyte	8 Kibyte
Standard communication (FMS)	V V 00 11 111 50	V V 00 11 111 50	\(\tag{\tag{\tag{\tag{\tag{\tag{\tag{
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
Web server		N	\ <u>'</u>
• supported	No	No	Yes
Number of HTTP clients			5
User-defined websites			Yes
Open IE communication			
• TCP/IP			Yes; Via integrated PROFINET
			interface and loadable FBs
- Number of connections, max.			62
- Data length, max.			32 Kibyte
- Several passive connections per			Yes
port, supported			

Technical specifications (contin	nuea)		
	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
ISO-on-TCP (RFC1006) Number of connections, max.	Via CP 443-1 and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Data length, max.	1452 bytes via CP 443-1 Adv.	1452 bytes via CP 443-1 Adv.	32 Kibyte; 1452 bytes via CP 443-1 Adv.
• UDP			Yes; Via integrated PROFINET interface and loadable FBs
Number of connections, max.Data length, max.			62 1 472 byte
Number of connections • overall	32	32	64
PROFINET CBA (at set setpoint communication load)			
Number of remote interconnection partners			32
Number of functions, master/slaveTotal of all Master/Slave connec-			150 4 500
tions • Data length of all incoming			45 000 byte
 connections master/slave, max. Data length of all outgoing connections master/slave, max. 			45 000 byte
Number of device-internal and PROFIBUS interconnections			1 000
Data length of device-internal and PROFIBUS interconnections, max.			16 000 byte
 Data length per connection, max. Remote interconnections with 			2 000 byte
acyclic transmission - Sampling frequency: Sampling time, min.			200 ms; Depending on preset communcation load, number of interconnections and data length used
 Number of incoming interconnections 			250
 Number of outgoing interconnections 			250
Data length of all incoming interconnections, max. Data length of all participations.			8 000 byte
Data length of all outgoing interconnections, max.Data length per connection, max.			8 000 byte 2 000 byte
Remote interconnections with cyclic transmission			2 000 Byte
- Transmission frequency: Transmission interval, min.			ms; Depending on preset communication load, number of interconnections and data length used
- Number of incoming interconnections			300
Number of outgoing interconnections Pate length of all incoming.			300 4 900 byto
 Data length of all incoming interconnections, max. Data length of all outgoing 			4 800 byte 4 800 byte
interconnections, max. - Data length per connection, max.			450 byte

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
HMI variables via PROFINET			
(acyclic) - Number of stations that can log on			2v PN OPC/1v iMan
for HMI variables (PN OPC/iMap)			2x PN OPC/1x iMap
- HMI variable updating			500 ms
- Number of HMI variables			1 000
- Data length of all HMI variables,			32 000 byte
max. • PROFIBUS proxy functionality			
- supported			Yes: 32 PROFIBUS slaves max.
			connectable
- Data length per connection, max.			240 byte; Slave-dependent
1st interface	late make d	lata amata d	laka sasaka al
Type of interface	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
Isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA	150 mA
Number of connection resources	MPI: 32, DP: 16	MPI: 32, DP: 16	MPI: 32, DP: 16
Functionality			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
DP slave	Yes	Yes	Yes
MPI			
Number of connections	32; if a diagnostic repeater is used on the line, the number of	32; if a diagnostic repeater is used on the line, the number of	32; if a diagnostic repeater is used on the line, the number of
	connection resources on the line is	connection resources on the line is	connection resources on the line is
	reduced by 1	reduced by 1	reduced by 1
ServicesPG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	Yes	Yes	Yes
- S7 communication, as server	Yes	Yes	Yes
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
DP master			
Number of connections, max.	16; if a diagnostic repeater is used on the line, the number of	16; if a diagnostic repeater is used on the line, the number of	16; if a diagnostic repeater is used on the line, the number of
	connection resources on the line is	connection resources on the line is	connection resources on the line is
	reduced by 1	reduced by 1	reduced by 1
• Services	V	V	V
- PG/OP communication	Yes	Yes	Yes Yes
RoutingGlobal data communication	Yes No	Yes No	No
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	Yes	Yes	Yes
- S7 communication, as server	Yes	Yes	Yes
- Equidistance mode support	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- SYNC/FREEZE	Yes	Yes	Yes
 Activation/deactivation of DP slaves 	Yes	Yes	Yes
- Direct data exchange	Yes	Yes	Yes
(slave-to-slave communication)	-		
- DPV1	Yes	Yes	Yes

Technical specifications (contin	luea)		
	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Transmission rate, max. Number of DP slaves, max.	12 Mbit/s 32	12 Mbit/s 32	12 Mbit/s 32
Address area			
- Inputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
- Outputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
User data per DP slave			
- User data per DP slave, max.	244 byte	244 byte	244 byte
Inputs, max.Outputs, max.	244 byte	244 byte	244 byte
- Outputs, max. - Slots. max.	244 byte 244	244 byte 244	244 byte 244
- per slot, max.	128 byte	128 byte	128 byte
DP slave			
Number of connections	16	16	16
Services		10	10
- PG/OP communication	Yes; with interface active	Yes; with interface active	Yes; with interface active
- S7 routing	Yes; With interface active	Yes; With interface active	Yes; With interface active
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	Yes	Yes	Yes
- S7 communication, as server	Yes	Yes	Yes
 Direct data exchange (slave-to-slave communication) 	No	No	No
- DPV1	No	No	No
• GSD file	http://support.automation.siemens.	http://support.automation.siemens.	http://support.automation.siemens.
0.020	com/WW/view/en/113652	com/WW/view/en/113652	com/WW/view/en/113652
 Transmission rate, max. 	12 Mbit/s	12 Mbit/s	12 Mbit/s
 Automatic baud rate search 	No	No	No
Transfer memory			
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
Address area, max.User data per address area, max.	32; Virtual slots 32 byte	32; Virtual slots 32 byte	32; Virtual slots 32 byte
User data per address area, max.	32 byte	32 byte	32 byte
which consistent, max.	02 byte	02 byte	02 byte
2nd interface			
Type of interface	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
Isolated	Yes	Yes	Yes
Integrated switch			Yes
Number of ports			2
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA	
Automatic detection of transmission speed			Yes; Autosensing
Autonegotiation			Yes
Autocrossing			Yes
Media redundancy			
• supported			Yes
Switchover time on line break,			200 ms
typically			
 Number of stations in the ring, max. 			50
Change of IP address at runtime, supported			Yes; Assignment by higher-level IO controller or by the user program with SFB104 "IP_CONF"

recnnical specifications (continued as a second specification of the second specificat	nueu)		
	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Number of connection resources	16	16	64
Functionality			
DP master	Yes	Yes	No
DP slave	Yes	Yes	No
PROFINET IO controller			Yes
PROFINET IO device			Yes
• PROFINET CBA			Yes
Open IE communication			Yes
Web server			Yes
Number of HTTP clients			5
Local Operating Network			No
· · ·			INO
DP master		40	
Number of connections, max.	16	16	
Services			
- PG/OP communication	Yes	Yes	
- Routing	Yes	Yes	
- Global data communication	No	No	
- S7 basic communication	Yes	Yes	
- S7 communication	Yes	Yes	
- S7 communication, as client	Yes	Yes	
- S7 communication, as server	Yes	Yes	
- Equidistance mode support	Yes	Yes	
- Isochronous mode	Yes	Yes	
- SYNC/FREEZE	Yes	Yes	
- Activation/deactivation of DP slaves	Yes	Yes	
- Direct data exchange (slave-to-slave communication)	Yes	Yes	
- DPV1	Yes	Yes	
 Transmission rate, max. 	12 Mbit/s	12 Mbit/s	
 Number of DP slaves, max. 	96	96	
 Address area 			
- Inputs, max.	6 Kibyte	6 Kibyte	
- Outputs, max.	6 Kibyte	6 Kibyte	
User data per DP slave	·		
- User data per DP slave, max.	244 byte	244 byte	
- Inputs, max.	244 byte	244 byte	
- Outputs, max.	244 byte	244 byte	
- Slots, max.	244	244	
- per slot, max.	128 byte	128 byte	
DP slave			
Number of connections	16	16	
• Services			
- Routing	Yes	Yes	
- Programming	Yes	Yes	
• GSD file	http://support.automation.siemens.		
333 1110	com/WW/view/en/113652	com/WW/view/en/113652	
Transmission rate, max.	12 Mbit/s	12 Mbit/s	
Transfer memory			
- Inputs	244 byte	244 byte	
- Outputs	244 byte	244 byte 244 byte	
•	32	32	
Address area, max. User data per address area, max.			
User data per address area, max.	32 byte	32 byte	
 User data per address area, of which consistent, max. 	32 byte	32 byte	
willon consistent, max.			

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
PROFINET IO controller			
• Services			
- PG/OP communication			Yes
- S7 routing			Yes
- S7 communication			Yes
- Isochronous mode			Yes; only with IRT and the High Performance option
 Open IE communication 			Yes
 Transmission rate, min. 			10 Mbit/s
 Transmission rate, max. 			100 Mbit/s
 Number of connectable IO devices, max. 			256
 Max. number of connectable IO devices for RT 			256
 of which in line, max. 			256
 Number of IO devices with IRT and the option "high flexibility" 			256
 of which in line, max. 			61
 Number of IO devices with IRT and the option "high performance", max. 			64
 of which in line, max. 			64
 IRT, supported 			Yes
 Shared device, supported 			Yes
 Prioritized startup supported 			Yes
 Number of IO devices, max. 			32
 Activation/deactivation of IO devices 			Yes
 Number of IO devices that can be simultaneously activated/ deactivated, max. 			8
 IO devices changing during operation (partner ports), supported 			Yes
Max. number of IO devices per tool			8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO devices changing during operation (partner ports) are supported.
Device replacement without swap medium			Yes
• Send clock times			250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame
Updating time			250 µs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO devices and on the amount of configured user data, see PROFINET system description
Address area			
- Inputs, max.			8 Kibyte
- Outputs, max.			8 Kibyte
• User data per address area, max.			
 User data consistency, max. 			1 024 byte

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
PROFINET IO device			
• Services			
- PG/OP communication			Yes
- S7 routing			Yes
- S7 communication			Yes
- Isochronous mode			No
- Open IE communication			Yes
- IRT, supported			Yes
- Prioritized startup supported			Yes
- Shared device, supported			Yes
- Number of IO controllers with			2
shared device, max.			
Transfer memory			1 440 huta. Day IO controller with
- Inputs, max.			1 440 byte; Per IO controller with shared device
- Outputs, max.			1 440 byte; Per IO controller with
Outputs, max.			shared device
Submodules			
- Number, max.			64
- User data per submodule, max.			1 024 byte
PROFINET CBA			
acyclic transmission			Yes
cyclic transmission			Yes
Open IE communication			
Open IE communication, supported			Yes
Number of connections, max.			62
Local port numbers used at the			0, 20, 21, 25, 80, 102, 135, 161,
system end			34962, 34963, 34964, 65532,
			65533, 65534, 65535
Keep-alive function, supported			Yes
3rd interface			
Type of interface		Pluggable interface module (IF),	Pluggable interface module (IF)
		technical specifications as for 2nd interface	
Diversia interfere as as a state -			IF 004 DD
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964- 2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Dhysics		RS 485 / PROFIBUS	RS 485 / PROFIBUS
Physics			
Isolated		Yes	Yes
Power supply to interface (15 to 30 V DC), max.		150 mA	150 mA
automatic detection of transmission speed		No	No
Number of connection resources		16	16
Functionality			
• MPI		No	No
DP master		Yes	Yes
DP slave		Yes	Yes

Technical specifications (continued)			
	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
DP master			
 Number of connections, max. 		16	16
 Services 			
- PG/OP communication		Yes	Yes
- Routing		Yes; S7 routing	Yes; S7 routing
- Global data communication		No	No
- S7 basic communication		No	Yes
- S7 communication		Yes	Yes
- S7 communication, as client		Yes	Yes
- S7 communication, as server		Yes	Yes
 Equidistance mode support 		Yes	Yes
- Isochronous mode		Yes	Yes
- SYNC/FREEZE		Yes	Yes
 Activation/deactivation of DP slaves 		Yes	Yes
 Direct data exchange (slave-to-slave communication) 		Yes	Yes
- DPV0		Yes	Yes
- DPV1		Yes	Yes
 Transmission rate, max. 		12 Mbit/s	12 Mbit/s
 Transmission rate, min. 		9.6 kbit/s	9.6 kbit/s
 Number of DP slaves, max. 		96	96
 Address area 			
- Inputs, max.		6 Kibyte	6 Kibyte
- Outputs, max.		6 Kibyte	6 Kibyte
 User data per DP slave 			
 User data per DP slave, max. 		244 byte	244 byte
- Inputs, max.		244 byte	244 byte
- Outputs, max.		244 byte	244 byte
- Slots, max.		244	244
- per slot, max.		128 byte	128 byte
DP slave			
 Number of connections 		16	16
• Services			
- PG/OP communication		Yes	Yes
- S7 routing		Yes; With active interface	Yes; With active interface
 Global data communication 		No	No
 S7 basic communication 		No	No
- S7 communication		Yes	Yes
- S7 communication, as client		Yes	Yes
- S7 communication, as server		Yes	Yes
- SYNC/FREEZE		No	No
- Direct data exchange		No	No
(slave-to-slave communication) - DPV1		No	No
- Status/control		Yes; When interface active	Yes; When interface active
GSD file		http://support.automation.siemens	
- GOD IIIC		com/WW/view/en/113652	com/WW/view/en/113652
• Transmission rate, min.		9.6 kbit/s	9.6 kbit/s
Transmission rate, max.		12 Mbit/s	12 Mbit/s
 Automatic baud rate search 		No	No
Transfer memory			
- Inputs		244 byte	244 byte
- Outputs		244 byte	244 byte
 Address areas, max. 		32	32; Virtual slots
• User data per address area, max.		32 byte	32 byte
 User data per address area, of 		32 byte	32 byte
which consistent, max.			

	6ES7 414-2XK05-0AB0	6ES7 414-3XM05-0AB0	6ES7 414-3EM06-0AB0
Isochronous mode			
Isochronous mode	Yes; For PROFIBUS only	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
Number of DP masters with sochronous mode	2	3	2
Jser data per isochronous slave, nax.	244 byte	244 byte	244 byte
Equidistance	Yes	Yes	Yes
Shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127	1 ms; 0.5 ms without use of SFC 126, 127	1 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms	32 ms	32 ms
CiR - Configuration in RUN			
CiR synchronization time, basic load	100 ms	100 ms	100 ms
CiR synchronization time, time per /O slave	15 μs; Time per I/O byte	15 μs	15 μs; Time per I/O byte
programming Configuration software			
• STEP 7	Yes	Yes	Yes
Programming language			
STEP 7	Yes	Yes	Yes
LAD	Yes	Yes	Yes
FBD	Yes	Yes	Yes
STL	Yes	Yes	Yes
SCL	Yes	Yes	Yes
CFC	Yes	Yes	Yes
GRAPH	Yes	Yes	Yes
· HiGraph®	Yes	Yes	Yes
Nesting levels	7	7	7
Know-how protection			
User program protection/password protection	Yes	Yes	Yes
Block encryption			Yes; With S7 block Privacy
EMC Emission of radio interference acc. to EN 55 011			
Limit value class A, for use in industrial areas			Yes
Limit value class B, for use in residential areas			No
Dimensions			
Required slots	1	2	2
Dimensions and weight			
Dimensions			
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
• Depth	219 mm	219 mm	219 mm
Neight • Weight, approx.	0.7 kg	0.9 kg	900 g

Ordering data	Order No.		Order No.
CPU 414-2	6ES7 414-2XK05-0AB0	IF 964-DP interface module	6ES7 964-2AA04-0AB0
Work memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels		To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4	0507.040.04400.0440
CPU 414-3	6ES7 414-3XM05-0AB0	Slot number labels 1 set (spare part)	6ES7 912-0AA00-0AA0
Work memory 2.8 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS		Manual "SIMATIC S7-400 programmable controller"	
DP master interface, slot for		incl. instruction list	
memory card, module slots for 1 IF module, incl. slot number		German	6ES7 498-8AA05-8AA0
labels		English	6ES7 498-8AA05-8BA0
CPU 414-3 PN/DP	6ES7 414-3EM06-0AB0	S7-400 operation list	
Work memory 4 MB, power supply 24 V DC, MPI/PROFIBUS		German	6ES7 498-8AA05-8AN0
DP master interface, PROFINET		English	6ES7 498-8AA05-8BN0
interface, slot for memory card, module slot for 1 IF module, incl. slot number labels		Manual "Communication for SIMATIC S7-300/-400"	
Memory card RAM		German	6ES7 398-8EA00-8AA0
64 KB	6ES7 952-0AF00-0AA0	English	6ES7 398-8EA00-8BA0
256 KB	6ES7 952-1AH00-0AA0	French	6ES7 398-8EA00-8CA0
1 MB	6ES7 952-1AK00-0AA0	Spanish	6ES7 398-8EA00-8DA0
2 MB	6ES7 952-1AL00-0AA0	Italian	6ES7 398-8EA00-8EA0
4 MB	6ES7 952-1AM00-0AA0	SIMATIC manual collection	6ES7 998-8XC01-8YE0
8 MB	6ES7 952-1AP00-0AA0	Electronic manuals on DVD, multilingual: LOGO!. SIMADYN.	
16 MB	6ES7 952-1AS00-0AA0	SIMATIC bus components,	
64 MB	6ES7 952-1AY00-0AA0	SIMATIC C7, SIMATIC distributed I/O,	
FEPROM memory card		SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based	
64 KB	6ES7 952-0KF00-0AA0	Automation, SIMATIC PCS 7,	
256 KB	6ES7 952-0KH00-0AA0	SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
1 MB	6ES7 952-1KK00-0AA0	SIMATIC manual collection D	6ES7 998-8XC01-8YE2
2 MB	6ES7 952-1KL00-0AA0	update service for 1 year	525. 665 6X65. 6122
4 MB	6ES7 952-1KM00-0AA0	Current "Manual Collection" DVD	
8 MB	6ES7 952-1KP00-0AA0	and the three subsequent updates	
16 MB	6ES7 952-1KS00-0AA0	Brochure "SIMATIC S7-400	
32 MB	6ES7 952-1KT00-0AA0	programmable controller - Design and application"	
64 MB	6ES7 952-1KY00-0AA0	German	6ES7 498-8AA00-8AB0
MPI cable	6ES7 901-0BF00-0AA0	English	6ES7 498-8AA00-8BB0
for connection of SIMATIC S7 and PG via MPI; 5 m in length		Progression and a support regulations AL.	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Ordering data	Order No.		Order No.
PROFIBUS bus components		PROFINET bus components	
RS 485 bus connector with 90° cable outlet		IE FC TP standard cable GP 2x2	6XV1 840-2AH10
Max. transfer rate 12 Mbit/s		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug;	
Without PG interface	6ES7 972-0BA12-0XA0	PROFINET-compatible; with UL	
With PG interface	6ES7 972-0BB12-0XA0	approval;	
RS 485 bus connector with angled cable outlet		Sold by the meter FO standard cable GP (50/125)	6XV1 873-2A
Max. transfer rate 12 Mbit/s		Standard cable, splittable, UL	5X1 576 2X
Without PG interface	6ES7 972-0BA42-0XA0	approval, sold by the meter	
With PG interface	6ES7 972-0BB42-0XA0	SCALANCE X204-2 Industrial Ethernet switch	6GK5 204-2BB10-2AA3
RS 485 bus connector with		Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line,	
90° cable outlet for Fast Connect system		star and ring topologies; four 10/100 Mbit/s RJ45 ports and two	
Max. transfer rate 12 Mbit/s		FO ports	
without PG interface • 1 unit	6ES7 972-0BA52-0XA0	IE FC RJ45 plugs	
• 100 units	6ES7 972-0BA52-0XB0	RJ45 plug connector for Industrial Ethernet with a rugged metal	
with PG interface • 1 unit • 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0	enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
RS 485 bus connector with		IE FC RJ45 plug 180	
axial cable outlet	COV4 500 05400	180° cable outlet	
For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1 500-0EA02	1 unit	6GK1 901-1BB10-2AA0
PROFIBUS FastConnect bus		10 units	6GK1 901-1BB10-2AB0
cable		50 units	6GK1 901-1BB10-2AE0
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1 830-0EH10	PROFIBUS/PROFINET bus components For establishing MPI/PROFIBUS/ PROFINET communication	see Catalogs IK PI, CA 01
RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0		
Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure			

I: Subject to export regulations AL: N and ECCN: EAR99H

Overview



- High-performance CPUs in the high-end performance range
- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

Technical specifications

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Product type designation			CPU416-3 PN/DP
Product version Hardware product version			01
Firmware version	V5.0	V5.0	V6.0
Associated programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher/iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
Supply voltages Rated value • 24 V DC			No; Power supply via system power supply
Feeding of external backup voltage to CPU	5 to 15 V DC	5 to 15 V DC	5 to 15 V DC
Current consumption from backplane bus 5 V DC, max.	1.1 A	1.3 A	1.5 A
from interface 5 V DC, max.	90 mA; at each DP interface	90 mA; at each DP interface	90 mA; at each DP interface
Power losses Power loss, typ.	4 W	4.5 W	6.5 W
Power loss, max.			7.5 W
Backup battery Battery operation • Backup current, typ. • Backup current, max.	125 μA; valid up to 40°C 550 μA	125 μA; valid up to 40°C 550 μA	not relevant 125 µA; (up to 40 °C) 450 µA
Memory Work memory • integrated (for program) • integrated (for data) • expandable	2.8 Mbyte 2.8 Mbyte No	5.6 Mbyte 5.6 Mbyte No	8 Mbyte 8 Mbyte No
Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	Yes 64 Mbyte 1 Mbyte Yes 64 Mbyte	Yes 64 Mbyte 1 Mbyte Yes 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 1 Mbyte Yes; with Memory Card (RAM) 64 Mbyte
Backup • present • with battery • without battery	Yes Yes No	Yes Yes No	Yes Yes; all data No

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
CPU-blocks			
DB			
Number, max.	10 000; Number range: 1 to 16000	10 000; Number range: 1 to 16000	10 000; Number range: 1 to 16000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
 Number, max. 	5 000; Number range: 0 to 7999	5 000; Number range: 0 to 7999	5 000; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
Number, max.	5 000; Number range: 0 to 7999	5 000; Number range: 0 to 7999	5 000; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
ОВ			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth			
per priority class	24	24	24
 additional within an error OB 	2	2	2
CPU processing times			
for bit operations, min.	30 ns	30 ns	30 ns
for word operations, min.	30 ns	30 ns	30 ns
for fixed point arithmetic, min.	30 ns	30 ns	30 ns
for floating point arithmetic, min.	90 ns	90 ns	90 ns
	90 HS	90 115	90 115
Counters, timers and their retentivity			
S7 counter			
Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	Z 0 to Z 7	Z 0 to Z 7	Z 0 to Z 7
 Counting range 			
- lower limit	0	0	0
- upper limit	999	999	999
IEC counter			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Number			Unlimited (limited only by work
07.1			memory)
S7 times • Number	2 048	2 048	2 048
Retentivity	2 040	2 040	2 040
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	No times retentive	No times retentive	No times retentive
Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• Present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Number			Unlimited (limited only by work
			memory)

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Data areas and their retentivity			
retentive data area, total	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)	Total working and load memory (with backup battery)
Flag			
Number, max.	16 Kibyte	16 Kibyte	16 Kibyte; Size of bit memory address area
 Retentivity available 	Yes	Yes	Yes
Number of clock memories	8; (in 1 memory byte)	8; (in 1 memory byte)	8; (in 1 memory byte)
Data blocks			
Number, max.	10 000; Number range: 1 to 16000	10 000; Number range: 1 to 16000	10 000; Number range: 1 to 16000
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Local data			
adjustable, max.	32 Kibyte	32 Kibyte	32 Kibyte
• preset	16 Kibyte	16 Kibyte	16 Kibyte
Address area			
I/O address area			
• overall	16 Kibyte	16 Kibyte	16 Kibyte
Outputs	16 Kibyte	16 Kibyte	16 Kibyte
of which, distributed	,	•	•
- MPI/DP interface, inputs	2 Kibyte	2 Kibyte	2 Kibyte
- MPI/DP interface, outputs	2 Kibyte	2 Kibyte	2 Kibyte
- DP interface, inputs	8 Kibyte	8 Kibyte	8 Kibyte
- DP interface, outputs	8 Kibyte	8 Kibyte	8 Kibyte
- PN interface, inputs			8 Kibyte
- PN interface, outputs			8 Kibyte
Process image			
Inputs, adjustable	16 Kibyte	16 Kibyte	16 Kibyte
Outputs, adjustable	16 Kibyte	16 Kibyte	16 Kibyte
• Inputs, preset	512 byte	512 byte	512 byte
Outputs, preset	512 byte	512 byte	512 byte
Consistent data, max.	244 byte	244 byte	244 byte
Access to consistent data in	Yes	Yes	Yes
process image			
Subprocess images			
Number of subprocess images,	15	15	15
max.			
Digital channels			
• Inputs	131 072	131 072	131 072
• Outputs	131 072	131 072	131 072
 Inputs, of which central 	131 072	131 072	131 072
 Outputs, of which central 	131 072	131 072	131 072
Analog channels			
• Inputs	8 192	8 192	8 192
• Outputs	8 192	8 192	8 192
Inputs, of which central	8 192	8 192	8 192
Outputs, of which central	8 192	8 192	8 192
•			

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Hardware configuration			
connectable OPs	63	63	95
Central devices, max.	1	1	1
Expansion devices, max.	21	21	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules			
 Number of connectable IMs (total), max. 	6	6	6
 Number of connectable IMs 460, max. 	6	6	6
 Number of connectable IMs 463, max. 	4; IM 463-2	4; IM 463-2	4; IM 463-2
Number of DP masters			
• integrated	2	2	1
• via IM 467	4	4	4
• via CP	10; CP 443-5 Extended	10; CP 443-5 Extended	10; CP 443-5 Extended
Mixed mode IM + CP permitted	No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode	No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)
via interface module	0	1	1; IF 964-DP
Number of pluggable S5 modules (via adapter capsule in central device), max.	6	6	6
Number of IO controllers			
integrated			1
• via CP	4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller	4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/ GX20, max. 4 in central controller
Number of operable FMs and CPs			
(recommended)			
• FM	Limited by number of slots and	Limited by number of slots and	Limited by number of slots or
• CP, point-to-point	number of connections Limited by number of slots and number of connections	number of connections Limited by number of slots and number of connections	number of connections CP 440: Limited by number of slots; CP 441: Limited by number
PROFIBUS and Ethernet CPs	14; Of which 10 CP or IM max. as DP master and PN controller	14; Of which 10 CP or IM max. as DP master and PN controller	of slots and number of connection 14; In total max. 10 CPs as DP master and PN controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PN controller
Time			
Clock			
	Yes	Yes	Yes
 Hardware clock (real-time clock) battery-backed and synchronizable 		Yes	Yes
Resolution	1 ms	1 ms	1 ms
	11110	11110	11110
Runtime meter Number	8	8	16
Clock synchronization			
• supported	Yes	Yes	Yes
• to MPI, master	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
to DP, master	Yes	Yes	Yes
• to DP, slave	Yes	Yes	Yes
• in AS, master	Yes	Yes	Yes
• in AS, slave	Yes	Yes	Yes
on Ethernet via NTP	Via CP	Via CP	Yes; as client
• to IF 964 DP		Yes	Yes

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
S7 message functions Number of login stations for message functions, max.	63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC)	63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC)	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes	Yes	Yes
SCAN procedure			Yes
Number of messages • overall, max.	1 024	1 024	1 024
Block related messages	Yes	Yes	Yes
Process diagnostic messages			Yes
Alarm 8-blocks	Yes	Yes	Yes
Process control messages	Yes	Yes	Yes
Test commissioning functions Status/control • Status/control variable Forcing	Yes	Yes	Yes; Up to 16 variable tables
• Forcing	Yes	Yes	Yes
Status block	Yes	Yes	Yes; Up to 16 simultaneously
Single step	Yes	Yes	Yes
Number of breakpoints	4	4	16
Diagnostic buffer • present • Number of entries, max. - adjustable - preset	Yes 3 200 Yes 120	Yes 3 200 Yes 120	Yes 3 200 Yes 120
Service data • can be read out			Yes
Communication functions PG/OP communication	Yes	Yes	Yes
Data record routing			Yes
Routing	Yes	Yes	Yes; S7 routing
Global data communication • supported • Size of GD packets, max.	Yes 54 byte	Yes 54 byte	Yes 54 byte
S7 basic communication • supported • User data per job, max.	Yes 76 byte	Yes 76 byte	Yes 76 byte
S7 communication • supported • as server • as client • User data per job, max.	Yes 64 Kibyte	Yes 64 Kibyte	Yes Yes Yes 64 Kibyte
S5-compatible communication • supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
• User data per job, max.	8 Kibyte	8 Kibyte	8 Kibyte
Standard communication (FMS) • supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Web server • supported • Number of HTTP clients • User-defined websites	No; Via CP	No; Via CP	Yes 5 Yes
Open IE communication TCP/IP Number of connections, max. Data length, max. Several passive connections per port, supported ISO-on-TCP (RFC1006) Number of connections, max. Data length, max. UDP Number of connections, max. Data length, max.	Via CP 443-1 Adv. and loadable FB 1452	Via CP 443-1 Adv. and loadable FB 1452	Yes; Via integrated PROFINET interface and loadable FBs 94 32 Kibyte Yes Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs 94 32 Kibyte; 1452 bytes via CP 443-1 Adv. Yes; Via integrated PROFINET interface and loadable FBs 94 1 472 byte
Number of connections • overall	64	64	96
PROFINET CBA (at set setpoint communication load) Number of remote interconnection partners Number of functions, master/slave Total of all Master/Slave connections Data length of all incoming connections master/slave, max. Data length of all outgoing connections master/slave, max. Number of device-internal and PROFIBUS interconnections Data length of device-internal und PROFIBUS interconnections, max. Data length per connection, max. Remote interconnections with acyclic transmission Sampling frequency: Sampling time, min. Number of incoming interconnections Number of outgoing interconnections Data length of all incoming interconnections Data length of all outgoing interconnections, max. Data length of all outgoing interconnections, max.			32 150 6 000 65 000 byte 65 000 byte 1 000 16 000 byte 2 000 byte 2000 ms; depending on preset communcation load, number of interconnections and data length used 500 500 16 000 byte 16 000 byte 2 000 byte

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Remote interconnections with cyclic transmission Transmission frequency: Transmission interval, min. Number of incoming interconnections.			1 ms; Depending on preset communication load, number of interconnections and data length used 300
Number of incoming interconnections			
- Number of outgoing interconnections			300
 Data length of all incoming interconnections, max. Data length of all outgoing 			4 800 byte 4 800 byte
interconnections, max. - Data length per connection, max.			,
HMI variables via PROFINET (acyclic)			450 byte
 Number of stations that can log on for HMI variables (PN OPC/iMap) 			2x PN OPC/1x iMap
- HMI variable updating			500 ms
- Number of HMI variables			1 500
 Data length of all HMI variables, max. 			48 000 byte
 PROFIBUS proxy functionality 			
- supported			Yes; 32 PROFIBUS slaves max. connectable
- Data length per connection, max.			240 byte; Slave-dependent
1st interface			
Type of interface	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	RS 485 / PROFIBUS + MPI
Isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA	150 mA
Number of connection resources	MPI: 44, DP: 32	MPI: 44, DP: 32	MPI: 44, DP: 32
Functionality			
• MPI	Yes	Yes	Yes
DP master DP alove	Yes	Yes	Yes
DP slave	Yes	Yes	Yes
MPI • Number of connections	44	44	44; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
 S7 communication, as client S7 communication, as server 			Yes Yes
 Transmission rate, max. 	12 Mbit/s	12 Mbit/s	12 Mbit/s
aa		.2	

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
DP master			
Number of connections, max.	32	32	32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1
• Services			
 PG/OP communication 	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
 Global data communication 	No	No	No
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client			Yes
- S7 communication, as server			Yes
 Equidistance mode support 	Yes	Yes	Yes
- Isochronous mode			Yes
- SYNC/FREEZE	Yes	Yes	Yes
 Activation/deactivation of DP slaves 	Yes	Yes	Yes
Direct data exchange (slave-to-slave communication)DPV1	Yes	Yes	Yes Yes
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.	32	32	32
Address area	32	32	32
- Inputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
- Outputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
User data per DP slave	2	2	2.00,00
- User data per DP slave, max.	244 byte	244 byte	244 byte
- Inputs, max.	244 byte	244 byte	244 byte
- Outputs, max.	244 byte	244 byte	244 byte
- Slots, max.	244	244	244
- per slot, max.	128 byte	128 byte	128 byte
DP slave			
 Number of connections 	32	32	32
• Services			
- PG/OP communication	Yes	Yes	Yes; with interface active
- Routing	Yes	Yes	
- S7 routing			Yes; With interface active
 Global data communication 			No
- S7 basic communication			No
- S7 communication			Yes
- S7 communication, as client			Yes
- S7 communication, as server			Yes
 Direct data exchange (slave-to-slave communication) 			No
- DPV1			No
GSD file	http://support.automation.siemens.com/WW/view/en/113652	http://support.automation.siemens.com/WW/view/en/113652	http://support.automation.siemens
 Transmission rate, max. 	12 Mbit/s	12 Mbit/s	12 Mbit/s
Automatic baud rate search			No
Transfer memory			
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
 Address area, max. 	32	32	32; Virtual slots
 User data per address area, max. 	32 byte	32 byte	32 byte
 User data per address area, of which consistent, max. 	32 byte	32 byte	32 byte

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
2nd interface			
Type of interface	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
Isolated	Yes	Yes	Yes
Integrated switch			Yes
Number of ports			2
Power supply to interface	150 mA	150 mA	2
(15 to 30 V DC), max.	150 MA	150 mA	
Automatic detection of transmission speed			Yes; Autosensing
Autonegotiation			Yes
Autocrossing			Yes
Media redundancy supported Switchover time on line break, typically Mumber of stations in the ring, max			Yes 200 ms 50
Change of IP address at runtime, supported			Yes; Assignment by higher-level IC controller or by the user program
oupportou .			with SFB104 "IP_CONF"
Number of connection resources	32	32	96
Functionality DP master PP slave PROFINET IO controller PROFINET IO device PROFINET CBA Open IE communication Web server Number of HTTP clients Local Operating Network	Yes Yes	Yes Yes	No No Yes Yes Yes Yes 5
DP master Number of connections, max. Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - Transmission rate, max. Number of DP slaves, max Address area - Inputs, max Outputs, max User data per DP slave - User data per DP slave, max Inputs, max Outputs, max Outputs, max Outputs, max Outputs, max Slots, max per slot, max.	Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes 12 Mbit/s 125 8 Kibyte 8 Kibyte 244 byte 244 byte 244 byte 244 128 byte	Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes 12 Mbit/s 125 8 Kibyte 8 Kibyte 244 byte 244 byte 244 byte 244 128 byte	

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
OP slave			
Number of connections	32	32	
Services			
- Routing	Yes	Yes	
- Programming	Yes	Yes	
GSD file	http://support.automation.siemens.	http://support.automation.siemens.	
	com/WW/view/en/113652	com/WW/view/en/113652	
Transmission rate, max.	12 Mbit/s	12 Mbit/s	
Transfer memory			
- Inputs	244 byte	244 byte	
- Outputs	244 byte	244 byte	
Address area, max.	32	32	
User data per address area, max.	32 byte	32 byte	
User data per address area, of which consistent, max.	32 byte	32 byte	
PROFINET IO controller			
Services			
- PG/OP communication			Yes
- S7 routing			Yes
- S7 communication			Yes
- Isochronous mode			Yes; Only with IRT and the High Performance option
- Open IE communication			Yes
Transmission rate, min.			10 Mbit/s
Transmission rate, max.			100 Mbit/s
Number of connectable IO devices,			256
max.			050
• Max. number of connectable IO devices for RT			256
- of which in line, max.			256
Number of IO devices with IRT and the option "high flexibility"			256
- of which in line, max.			61
Number of IO devices with IRT and the option "high performance", max.			64
- of which in line, max.			64
IRT, supported			Yes
Shared device, supported			Yes
Prioritized startup supported			Yes
- Number of IO devices, max.			32
Activation/deactivation of IO devices			Yes
- Number of IO devices that can be simultaneously activated/deacti-			8
vated, max.			Voe
IO devices changing during operation (partner ports), supported			Yes
Max. number of IO devices per tool			8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO devices changing during operation (partner ports) are supported.
Device replacement without swap medium			Yes
Send clock times			250 μs, 500 μs, 1 ms, 2 ms, 4 m additionally with IRT with high performance: 250 μs to 4 ms in 125 μs frame

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Updating time Address area Inputs, max.			250 µs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO devices and on the amount of configured user data, see PROFINET system description 8 Kibyte
- Outputs, max.			8 Kibyte
User data per address area, max.User data consistency, max.			1 024 byte
PROFINET IO device			
Services - PG/OP communication - S7 routing - S7 communication - Isochronous mode - Open IE communication - IRT, supported - Prioritized startup supported - Shared device, supported - Number of IO controllers with shared device, max. Transfer memory			Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes
- Inputs, max.			1 440 byte; Per IO controller with shared device 1 440 byte; Per IO controller with shared device
Submodules			shared device
- Number, max.			64
- User data per submodule, max.			1 024 byte
PROFINET CBA • acyclic transmission • cyclic transmission			Yes Yes
Open IE communication Open IE communication, supported Number of connections, max. Local port numbers used at the system end			Yes 94 0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported			Yes
3rd interface Type of interface		Pluggable interface module (IF), technical specifications as for 2nd interface	Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics			RS 485 / PROFIBUS
Isolated			Yes
Power supply to interface (15 to 30 V DC), max.			150 mA
Automatic detection of transmission speed			No
Number of connection resources			32
Functionality • MPI • DP master • DP slave			No Yes Yes

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
DP master			
 Number of connections, max. 			32
• Services			
- PG/OP communication			Yes
- Routing			Yes; S7 routing
- Global data communication			No
- S7 basic communication			Yes
- S7 communication			Yes
- S7 communication, as client			Yes
- S7 communication, as server			Yes
 Equidistance mode support 			Yes
- Isochronous mode			Yes
- SYNC/FREEZE			Yes
 Activation/deactivation of DP slaves 			Yes
 Direct data exchange (slave-to-slave communication) 			Yes
- DPV0			Yes
- DPV1			Yes
 Transmission rate, max. 			12 Mbit/s
 Transmission rate, min. 			9.6 kbit/s
 Number of DP slaves, max. 			125
Address area			
- Inputs, max.			8 Kibyte
- Outputs, max.			8 Kibyte
User data per DP slave			
- User data per DP slave, max.			244 byte
- Inputs, max.			244 byte
- Outputs, max.			244 byte
- Slots, max.			244 128 byte
- per slot, max.			120 Dyle
DP slave			
Number of connections			32
• Services			V
- PG/OP communication			Yes
- S7 routing			Yes; With active interface
 Global data communication S7 basic communication 			No No
- S7 communication			Yes
- S7 communication as client			Yes
- S7 communication, as client			Yes
- SYNC/FREEZE			No
- Direct data exchange			No
(slave-to-slave communication) - DPV1			No
- Status/control			Yes; When interface active
• GSD file			http://support.automation.
			siemens.com/WW/view/en/113652
• Transmission rate, min.			9.6 kbit/s
Transmission rate, max.			12 Mbit/s
Automatic baud rate search			No
Transfer memory			
- Inputs			244 byte
- Outputs			244 byte
Address areas, max.			32; Virtual slots
User data per address area, max.			32 byte
 User data per address area, of which consistent, max. 			32 byte
windir consistent, max.			

	6ES7 416-2XN05-0AB0	6ES7 416-3XR05-0AB0	6ES7 416-3ES06-0AB0
Isochronous mode			
sochronous mode	Yes	Yes	Yes; Via PROFIBUS DP or PROFINET interface
Number of DP masters with sochronous mode			2
Jser data per isochronous slave, max.	244 byte	244 byte	244 byte
Equidistance	Yes	Yes	Yes
Shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127	1 ms; 0.5 ms without use of SFC 126, 127	1 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms	32 ms	32 ms
CiR - Configuration in RUN CiR synchronization time, basic load	100 ms	100 ms	100 ms
CiR synchronization time, time per // slave	40 µs	40 μs	10 μs; Time per I/O byte
Programming			
Configuration software STEP 7	Yes	Yes	Yes
Programming language • STEP 7			Yes
• LAD	Yes	Yes	Yes
FBD	Yes	Yes	Yes
STL	Yes	Yes	Yes
SCL	Yes	Yes	Yes
• CFC	Yes	Yes	Yes
GRAPH	Yes	Yes	Yes
• HiGraph®	Yes	Yes	Yes
Nesting levels	7	7	7
Know-how protection			
 User program protection/password protection 	Yes	Yes	Yes
Block encryption			Yes; With S7 block Privacy
EMC Emission of radio interference acc. to EN 55 011			
Limit value class A, for use in industrial areas			Yes
Limit value class B, for use in residential areas			No
Dimensions Required slots	1	2	2
·	ı	2	
Dimensions and weight			
Dimensions	0.5	50	50
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
• Depth	219 mm	219 mm	219 mm
Weight Weight, approx.	720 g	880 g	900 g

Manual **SIMATIC 57-400 Manual **SIMATIC 57-400 Programmable controller* Incl. Instruction list German GES7 498-8AA05-8AA0 GES7 498-8AA05-8BA0 GES7 498-8AA05-8BA0 GES7 498-8AA05-8BA0 GES7 498-8AA05-8BA0 GES7 498-8AA05-8BA0 GES7 498-8AA05-8BA0 GES7 398-BEA00-8AA0 GES7 398-BEA00-8A	Ordering data	Order No.		Order No.
More memory card Gest Map Device	CPU 416-2	6ES7 416-2XN05-0AB0		
Demanter interface, PROFIBUS				
Demaster interface, slot formeromory card, incl. slot number labels				
ST-400 operation list German GES7 498-8AA05-8AN0 Manual "Communication for SIMATIC \$7:300'-400' German GES7 498-8AA05-8AN0 GES7 398-8EA00-8AA0 GES7 398-8AA00-8AA0 GES7 398-8AA00-8AB0 GES7 398-8AA00-8A	DP master interface, slot for			
German G			ŭ	6ES7 498-8AA05-8BA0
English GES7 498-8AA05-8BN0	CPU 416-3	6ES7 416-3XR05-0AB0	·	
DP master interface, PROFIBUS DP master interface, module side for 1 if module, slot for memory card, incl. slot number labels	Work memory 11.2 MB, power			
Card, incl. slot number labels CPU 416-3 PWDP	DP master interface, PROFIBUS DP master interface, module slot		Manual "Communication for	6ES7 498-8AAU5-8BNU
French			German	6ES7 398-8EA00-8AA0
Spanish GES7 398-8EA00-8DA0	CPU 416-3 PN/DP	6ES7 416-3ES06-0AB0	English	6ES7 398-8EA00-8BA0
DP misster interface, PROFINET interface, PROFINET interface, module sol for 1 F submodule, slot for memory card, incl. slot number labels			French	6ES7 398-8EA00-8CA0
SIMATIC manual collection J GES7 998-8XC01-8YE0	DP master interface, PROFINET		Spanish	6ES7 398-8EA00-8DA0
Incl. slot number labels				
Math			SIMATIC manual collection	6ES7 998-8XC01-8YE0
SIMATIC Dus components, SIMATIC Distributed SIMATIC DESTRIBUTED DESTRIBUTED SIMATIC DESTRIBUTED SIMATIC DESTRIBUTED	Memory card RAM			
MB	64 KB	6ES7 952-0AF00-0AA0	SIMATIČ bus components,	
1 MB 6ES7 952-1AK00-0AA0 SIMATIC Sensors, SIMATIC NET, SIMATIC PG/PC,	256 KB	6ES7 952-1AH00-0AA0		
2 MB 6ES7 952-1AL00-0AA0 SIMATIC PCS 7, SIMATIC PCG/PC, SIMATIC Software, SIMATIC STORMARIC STORMAR	1 MB	6ES7 952-1AK00-0AA0	SIMATIC Sensors, SIMATIC NET,	
4 MB 6ES7 952-1AM00-0AA0 SIMATIC ST, SIMATIC Software, SIMATIC TOC 6 MB 6ES7 952-1A900-0AA0 SIMATIC TOC 64 MB 6ES7 952-1AY00-0AA0 Current "Manual collection update service for 1 year 64 MB 6ES7 952-0KF00-0AA0 Current "Manual Collection" DVD and the three subsequent updates 64 KB 6ES7 952-0KH00-0AA0 Brochure "SIMATIC S7-400 programmable controller-Design and application" 2 MB 6ES7 952-1KK00-0AA0 GES7 952-1KM00-0AA0 4 MB 6ES7 952-1KW00-0AA0 English 6ES7 498-8AA00-8BB0 8 MB 6ES7 952-1KY00-0AA0 PROFIBUS bus components 8 MB 6ES7 952-1KY00-0AA0 PROFIBUS bus components 8 MB 6ES7 952-1KY00-0AA0 PROFIBUS bus components 90 cable outlet Max. transfer rate 12 Mbit/s Without PG interface 6ES7 972-0BA12-0XA0 Ferrar 6ES7 972-0BB12-0XA0 Ferrar and dditional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 414-3, CPU 416-3 PN/DP, CPU 414-3, CPU 416-3 PN/DP, CPU 414-4.3, CPU 416-3 PN/DP, CPU 414-4.3, CPU 416-3 PN/DP, CPU 414-4.3 6ES7 912-0AA00-0AA0 Final transfer rate 12 Mbit/s With PG interface 6ES7 972-0B842-0XA0 Final transfer	2 MB	6ES7 952-1AL00-0AA0		
8 MB 6ES7 952-1AP00-0AA0 16 MB 6ES7 952-1AS00-0AA0 64 MB 6ES7 952-1AS00-0AA0 FEPROM memory card 6ES7 952-1AY00-0AA0 64 KB 6ES7 952-0KF00-0AA0 256 KB 6ES7 952-0KH00-0AA0 1 MB 6ES7 952-1KK00-0AA0 2 MB 6ES7 952-1KK00-0AA0 4 MB 6ES7 952-1KN00-0AA0 8 MB 6ES7 952-1KN00-0AA0 8 MB 6ES7 952-1KN00-0AA0 8 MB 6ES7 952-1KN00-0AA0 8 MB 6ES7 952-1KN00-0AA0 64 MB 6ES7 952-1KY00-0AA0 64 MB 6ES7 952-1KY00-0AA0 6FY 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s Without PG interface 6ES7 972-0BA12-0XA0 MPI cable 6ES7 964-2AA04-0AB0 To connect an additional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 414-3, CPU 416-3 PN/DP, CPU 417-4 6ES7 912-0AA00-0AA0 Siot number labels 6ES7 912-0AA00-0AA0	4 MB	6ES7 952-1AM00-0AA0	SIMATIC S7, SIMATIC Software,	
16 MB	8 MB	6ES7 952-1AP00-0AA0		0507 000 0V001 0V50
## FEPROM memory card 64 KB 66 KB 67 952-1 KK00-0AA0 66 KB 66 KB 66 KB 66 KB 66 KB 67 952-1 KK00-0AA0 66 KB 66	16 MB	6ES7 952-1AS00-0AA0		6ES7 998-8XC01-8YE2
Updates	64 MB	6ES7 952-1AY00-0AA0	Current "Manual Collection" DVD	
64 KB 6ES7 952-0KF00-0AA0 6ES7 952-0KH00-0AA0 1 MB 6ES7 952-1KK00-0AA0 2 MB 6ES7 952-1KK00-0AA0 6ES7 952-1KL00-0AA0 4 MB 6ES7 952-1KM00-0AA0 8 MB 6ES7 952-1KM00-0AA0 6ES7 952-1KM00-0AA0 8 MB 6ES7 952-1KP00-0AA0 8 MB 6ES7 952-1KP00-0AA0 8 MB 6ES7 952-1KF00-0AA0 8 MB 6ES7 952-1KY00-0AA0 90° cable outlet Max. transfer rate 12 Mbit/s Without PG interface MPI cable for connection of SIMATIC S7-0BB12-0XA0 FOC PU 414-3, CPU 416-3 PN/DP, CPU 416-3, CPU 417-4 Slot number labels 6ES7 952-0KH00-0AA0 Brochure "SIMATIC S7-400 programmable controller - Design and application" German 6ES7 498-8AA00-8AB0 PROFIBUS bus components RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbit/s With PG interface Max. transfer rate 12 Mbit/s Without PG interface With PG interface	FEPROM memory card			
256 KB 6ES7 952-0KH00-0AA0 programmable controller - Design and application" 1 MB 6ES7 952-1KK00-0AA0 German 6ES7 498-8AA00-8AB0 4 MB 6ES7 952-1KM00-0AA0 English 6ES7 498-8AA00-8BB0 8 MB 6ES7 952-1KK00-0AA0 PROFIBUS bus components 16 MB 6ES7 952-1KY00-0AA0 PROFIBUS bus components 82 MB 6ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s 64 MB 6ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s 6F German 6ES7 972-0BA12-0XA0 6ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s 64 MB 6ES7 952-1KY00-0AA0 MPI cable 6ES7 901-0BF00-0AA0 For connection of SIMATIC S7 and PG via MPI; 5 m in length 6ES7 901-0BF00-0AA0 IF 964-DP interface module 6ES7 964-2AA04-0AB0 To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 414-3, CPU 414-3 PN/DP, CPU 414-3, CPU 416-3, CPU 416-3 PN/DP, CPU 414-3, CPU 416-3 PN/DP, CPU 414-3, CPU 416-3 PN/DP, CPU 414-3 PN/DP,	64 KB	6ES7 952-0KF00-0AA0		
2 MB 4 MB 6ES7 952-1KL00-0AA0 8 MB 6ES7 952-1KP00-0AA0 8 MB 6ES7 952-1KP00-0AA0 8 MB 6ES7 952-1KP00-0AA0 8 MB 6ES7 952-1KV00-0AA0 8 MB 6ES7 952-1KV00-0AA0 8 MB 6ES7 952-1KV00-0AA0 8 MB 6ES7 952-1KV00-0AA0 6ES7 901-0BF00-0AA0 6ES7 972-0BB12-0XA0 6ES7 972-0BB12-0XA0 6ES7 972-0BB42-0XA0	256 KB	6ES7 952-0KH00-0AA0	programmable controller -	
2 MB 4 MB 6 ES7 952-1KL00-0AA0 8 MB 6 ES7 952-1KM00-0AA0 6 ES7 952-1KP00-0AA0 16 MB 6 ES7 952-1KS00-0AA0 6 ES7 952-1KS00-0AA0 6 ES7 952-1KT00-0AA0 6 ES7 952-1KY00-0AA0 6 MPI cable 6 FO connection of SIMATIC S7 and PG via MPI; 5 m in length IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6 ES7 952-1KK00-0AA0 English PROFIBUS bus components RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbit/s Without PG interface 6 ES7 972-0BA12-0XA0 6 ES7 972-0BB12-0XA0 6 ES7 972-0BB42-0XA0 6 ES7 972-0BB42-0XA0 6 ES7 972-0BB42-0XA0 6 ES7 972-0BB42-0XA0	1 MB	6ES7 952-1KK00-0AA0	•	
8 MB 6ES7 952-1KM00-0AA0 16 MB 6ES7 952-1KS00-0AA0 32 MB 6ES7 952-1KT00-0AA0 6ES7 952-1KY00-0AA0 6ES7 952-1KY00-0AA0 6ES7 952-1KY00-0AA0 6ES7 952-1KY00-0AA0 6ES7 952-1KY00-0AA0 MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels FS 952-1KW00-0AA0 PROFIBUS bus components RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbit/s Without PG interface 6ES7 972-0BA12-0XA0 6ES7 972-0BB12-0XA0 6ES7 972-0BA42-0XA0 6ES7 972-0BA42-0XA0 6ES7 972-0BB42-0XA0 6ES7 972-0BB42-0XA0	2 MB	6ES7 952-1KL00-0AA0	German	
16 MB 16 ES7 952-1KS00-0AA0 18 GES7 952-1KS00-0AA0 32 MB 66 ES7 952-1KT00-0AA0 66 ES7 952-1KY00-0AA0 66 ES7 952-1KY00-0AA0 MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length To connect an additional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 66 ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s Max. transfer rate 12 Mbit/s Without PG interface 66 ES7 972-0BA12-0XA0 With PG interface 66 ES7 972-0BB12-0XA0 Max. transfer rate 12 Mbit/s Without PG interface 66 ES7 972-0BA42-0XA0 With PG interface 66 ES7 972-0BA42-0XA0 With PG interface With PG interface 66 ES7 972-0BB42-0XA0 66 ES7 972-0BB42-0XA0	4 MB	6ES7 952-1KM00-0AA0		6ES7 498-8AA00-8BB0
16 MB 32 MB 6ES7 952-1KS00-0AA0 6ES7 952-1KT00-0AA0 MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length To connect an additional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s Mithout PG interface With PG interface Mex. transfer rate 12 Mbit/s Without PG interface Max. transfer rate 12 Mbit/s Without PG interface 6ES7 972-0BA12-0XA0 Mith PG interface 6ES7 972-0BB12-0XA0 Max. transfer rate 12 Mbit/s Without PG interface With PG interface With PG interface 6ES7 972-0BA42-0XA0 6ES7 972-0BB42-0XA0 6ES7 972-0BB42-0XA0	8 MB	6ES7 952-1KP00-0AA0	· · · · · · · · · · · · · · · · · · ·	
32 MB 64 MB 6ES7 952-1KY00-0AA0 6ES7 952-1KY00-0AA0 MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length To connect an additional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6ES7 952-1KY00-0AA0 Max. transfer rate 12 Mbit/s Without PG interface With PG interface 6ES7 972-0BA12-0XA0 With PG interface 6ES7 972-0BB12-0XA0 Max. transfer rate 12 Mbit/s Without PG interface 6ES7 972-0BB42-0XA0 With PG interface With PG interface With PG interface 6ES7 972-0BA42-0XA0 6ES7 972-0BB42-0XA0	16 MB	6ES7 952-1KS00-0AA0		
6ES7 952-1KY00-0AA0 MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels Mithout PG interface With vPG interface With PG interface With vPG interface Max. transfer rate 12 Mbit/s Without PG interface With vPG interface	32 MB	6ES7 952-1KT00-0AA0		
MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6ES7 901-0BF00-0AA0 With PG interface Max. transfer rate 12 Mbit/s Without PG interface With PG interface Max. transfer rate 12 Mbit/s Without PG interface With PG interface	64 MB	6ES7 952-1KY00-0AA0		6ES7 972-0BA12-0XA0
for connection of SIMATIC S7 and PG via MPI; 5 m in length IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 416-3, CPU 416-3, CPU 416-3, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels RS 485 bus connector with angled cable outlet Max. transfer rate 12 Mbit/s Without PG interface With PG interface 6ES7 972-0BA42-0XA0 6ES7 972-0BB42-0XA0	MPI cable	6ES7 901-0BF00-0AA0		
IF 964-DP interface module To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6ES7 964-2AA04-0AB0 Max. transfer rate 12 Mbit/s Without PG interface With PG interface 6ES7 972-0BA42-0XA0 6ES7 972-0BB42-0XA0			RS 485 bus connector with	3.2.0.2.02.12.00.00
To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels Without PG interface With PG interface	IF 964-DP interface module	6ES7 964-2AA04-0AB0	J	
for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 Slot number labels 6ES7 912-0AA00-0AA0 With PG interface 6ES7 972-0BB42-0XA0				6ES7 972-0BA42-0XA0
	CPU 416-3, CPU 416-3 PN/DP,		With PG interface	
1 set (spare part)	Slot number labels	6ES7 912-0AA00-0AA0		
	1 set (spare part)			

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Ordering data	Order No.		Order No.
RS 485 bus connector with		PROFINET bus components	
90° cable outlet for Fast Connect system		IE FC TP standard cable GP 2x2	6XV1 840-2AH10
Max. transfer rate 12 Mbit/s		4-core, shielded TP installation cable for connection to	
without PG interface		IE FC Outlet RJ45/ IE FC RJ45	
• 1 unit	6ES7 972-0BA52-0XA0	Plug; PROFINET-compatible; with UL approval;	
• 100 units	6ES7 972-0BA52-0XB0	Sold by the meter	
with PG interface 1 unit	6ES7 972-0BB52-0XA0	FO standard cable GP (50/125)	6XV1 873-2A
• 100 units	6ES7 972-0BB52-0XB0	Standard cable, splittable,	
RS 485 bus connector with		UL approval, sold by the meter	
axial cable outlet		SCALANCE X204-2 Industrial	6GK5 204-2BB10-2AA3
For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1 500-0EA02	Industrial Ethernet Switches with	
PROFIBUS FastConnect bus		integral SNMP access, web	
cable		diagnostics, copper cable diagnostics and PROFINET	
Standard type with special design for quick mounting, 2-core,	6XV1 830-0EH10	diagnostics for configuring line, star and ring topologies; four	
shielded, sold by the meter, max.		10/100 Mbit/s RJ45 ports and two	
delivery unit 1000 m, minimum ordering quantity 20 m		FO ports	
RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0	IE FC RJ45 plugs	
Transfer rate up to 12 Mbit/s;		RJ45 plug connector for Industrial Ethernet with a rugged metal	
24 V DC; IP20 enclosure		enclosure and integrated insulation displacement contacts	
		for connecting Industrial Ethernet	
		FC installation cables	
		IE FC RJ45 plug 180	
		180° cable outlet	COV4 004 4 P.P.40 0 A A 0
		1 unit	6GK1 901-1BB10-2AA0
		10 units	6GK1 901-1BB10-2AB0
		50 units	6GK1 901-1BB10-2AE0
		PROFIBUS/PROFINET bus components	see Catalogs IK PI, CA 01
		For establishing MPI/PROFIBUS/ PROFINET communication	

I: Subject to export regulations AL: N and ECCN: EAR99H

Overview



- The most powerful SIMATIC S7-400 CPU
- Can be used in the most sophisticated installations in the upper performance range
- With two connection slots for IF modules

Technical specifications

	6ES7 417-4XT05-0AB0
Product version	
Firmware version	V5.0
Associated programming package	STEP7 V 5.3 SP2 or higher with HW update
Supply voltages	5. 45.450
Feeding of external backup voltage to CPU	5 to 15 V DC
Current consumption	
from backplane bus 5 V DC, max.	1.8 A
Power losses	
Power loss, max.	6 W
Backup battery	
Battery operation	005 4 1/ 1/ 1 4000
Backup current, typ.Backup current, max.	225 µA; Valid up to 40°C 750 µA
	700 μ/ (
Memory Work memory	
integrated (for program)	15 Mbyte
• integrated (for data)	15 Mbyte
• expandable	No
Load memory	
expandable FEPROM	Yes
expandable FEPROM, max.	64 Mbyte
• integrated RAM, max.	1 Mbyte
expandable RAMexpandable RAM, max.	Yes 64 Mbyte
	04 MDyte
Backup • present	Yes
with battery	Yes
with battery without battery	No
CPU-blocks	
DB	
Number, max.	16000; Number range: 1 to 16000
• Size, max.	64 Kibyte
FB	
Number, max.	8000; Number range: 0 to 7999
Size, max.	64 Kibyte

	6ES7 417-4XT05-0AB0
FC	
Number, max. Size may.	8 000; Number range: 0 to 7999
• Size, max.	64 Kibyte
OB • Size, max.	64 Kibyte
Nesting depth	04 Nibyte
per priority class	24
additional within an error OB	2
CPU processing times	
for bit operations, min.	18 ns
for word operations, min.	18 ns
for fixed point arithmetic, min.	18 ns
for floating point arithmetic, min.	54 ns
Counters, timers and their retentivity S7 counter	
Number	2048
Retentivityadjustable	Yes
- lower limit	0
- upper limit	2047
- preset	Z 0 to Z 7
Counting range	
lower limitupper limit	0 999
	399
IEC counter • present	Yes
• Type	SFB
S7 times	
Number	2048
Retentivity	
- adjustable	Yes
lower limitupper limit	0 2047
- preset	No times retentive
• Time range	
- lower limit - upper limit	10 ms 9990 s

	6ES7 417-4XT05-0AB0
IEC timer • present • Type	Yes SFB
Data areas and their retentivity retentive data area, total	Total working and load memory (with backup battery)
Flag Number, max. Retentivity available Number of clock memories	16 Kibyte Yes 8; (in 1 memory byte)
Data blocks Number, max. Size, max.	16000; Number range: 1 to 16000 64 Kibyte
Local data • adjustable, max. • preset	64 Kibyte 32 Kibyte
Address area I/O address area overall Outputs of which, distributed MPI/DP interface, inputs MPI/DP interface, outputs DP interface, outputs DP interface, outputs	16 Kibyte 16 Kibyte 2 Kibyte 2 Kibyte 8 Kibyte 8 Kibyte
Process image Inputs, adjustable Outputs, adjustable Inputs, preset Outputs, preset consistent data, max. Access to consistent data in process image	16 Kibyte 16 Kibyte 1 024 byte 1 024 byte 244 byte Yes
Subprocess images Number of subprocess images, max.	15
Digital channels Inputs Outputs Inputs, of which central Outputs, of which central	131 072 131 072 131 072 131 072
Analog channels Inputs Outputs Inputs, of which central Outputs, of which central	8 192 8 192 8 192 8 192
Hardware configuration Connectable OPs	63
Central devices, max.	1
Expansion devices, max.	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)

	0507 447 4VT05 04B0
	6ES7 417-4XT05-0AB0
 Interface modules Number of connectable IMs (total), max. 	6
Number of connectable IMs 460, max.	6
Number of connectable IMs 463, max.	4; IM 463-2
Number of DP masters • integrated • via IM 467 • via CP • Mixed mode IM + CP permitted	2 4 10; CP 443-5 Extended No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode
 via interface module Number of pluggable S5 modules (via adapter capsule in central device), max. 	2 6
Number of IO controllers • via CP	4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller
Number of operable FMs and CPs (recommended) • FM	· · · · · · · · · · · · · · · · · · ·
• CP, point-to-point	Limited by number of slots and number of connections Limited by number of slots and
PROFIBUS and Ethernet CPs	number of connections 14; Of which 10 CP or IM max. as DP master and PN controller
Time Clock • Hardware clock (real-time clock) • battery-backed and synchronizable • Resolution	Yes Yes 1 ms
Runtime meter • Number	8
Clock synchronization • supported • to MPI, master • to MPI, slave • to DP, master • to DP, slave • in AS, master • in AS, slave • on Ethernet via NTP • to IF 964 DP	Yes
S7 message functions Number of login stations for message functions, max.	63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 16 with ALARM_8 and ALARM_P (e.g. WinCC)
Symbol-related messages	Yes
Number of messages • overall, max.	1 024
Block related messages	Yes
Alarm 8-blocks	Yes
Process control messages	Yes
Ŭ	

	6ES7 417-4XT05-0AB0
Test commissioning functions	
Status/control	
Status/control variable	Yes
Forcing	
Forcing	Yes
Status block	Yes
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	3 200
- adjustable	Yes
- preset	120
Communication functions PG/OP communication	Yes
Routing	Yes
Global data communication	
• supported	Yes
Size of GD packets, max.	54 byte
S7 basic communication	
• supported	Yes
 User data per job, max. 	76 byte
S7 communication	
 supported 	Yes
User data per job, max.	64 Kibyte
S5-compatible communication	
supported	Yes; (via CP max. 10 and FC
User data per job, max.	AG_SEND and FC AG_RECV) 8 Kibyte
	o Nibyte
Standard communication (FMS)supported	Yes; Via CP and loadable FB
	res, via Cr and loadable rb
Web server • supported	No; Via CP
Open IE communication	
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable
(111 0 1000)	FB
- Data length, max.	1452
Number of connections	
• overall	64
1st interface	
Type of interface	Integrated
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface	150 mA
(15 to 30 V DC), max.	
Number of connection resources	MPI: 44, DP: 32
Functionality	
• MPI	Yes
DP master	Yes
DP slave	Yes

	6ES7 417-4XT05-0AB0
MPI	
Number of connections	44
• Services	V
- PG/OP communication	Yes
- Routing	Yes
 Global data communication S7 basic communication 	Yes Yes
- S7 basic communication	Yes
Transmission rate, max.	12 Mbit/s
	TE WISIGO
DP master	32
Number of connections, max.Services	32
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	No
- S7 basic communication	Yes
- S7 communication	Yes
- Equidistance mode support	Yes
- SYNC/FREEZE	Yes
 Activation/deactivation of DP 	Yes
slaves	
 Direct data exchange (slave-to-slave communication) 	Yes
• Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	32
Address area	32
- Inputs, max.	2 Kibyte
- Outputs, max.	2 Kibyte
User data per DP slave	.,
- User data per DP slave, max.	244 byte
- Inputs, max.	244 byte
- Outputs, max.	244 byte
- Slots, max.	244
- per slot, max.	128 byte
DP slave	
 Number of connections 	32
• Services	
- PG/OP communication	Yes
- Routing	Yes
GSD file	http://
	support.automation.siemens. com/WW/view/en/113652
• Transmission rate, max.	12 Mbit/s
• Transfer memory	TE WISIGO
- Inputs	244 byte
- Outputs	244 byte
Address area, max.	32
• User data per address area, max.	32 byte
 User data per address area, of 	32 byte
which consistent, max.	
2nd interface	
Type of interface	Integrated
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA
Number of connection resources	32

Technical specifications (continued)			
	6ES7 417-4XT05-0AB0		
Functionality			
DP master	Yes		
DP slave	Yes		
DP master			
 Number of connections, max. 	32		
• Services			
- PG/OP communication	Yes		
- Routing	Yes		
- Global data communication	No		
- S7 basic communication	Yes		
- S7 communication	Yes		
- Equidistance mode support	Yes		
- SYNC/FREEZE	Yes		
 Activation/deactivation of DP slaves 	Yes		
- Direct data exchange (slave-to-slave communication)	Yes		
 Transmission rate, max. 	12 Mbit/s		
Number of DP slaves, max.	125		
 Address area 			
- Inputs, max.	8 Kibyte		
- Outputs, max.	8 Kibyte		
 User data per DP slave 			
- User data per DP slave, max.	244 byte		
- Inputs, max.	244 byte		
- Outputs, max.	244 byte		
- Slots, max.	244		
- per slot, max.	128 byte		
DP slave			
Number of connectionsServices	32		
- Routing	Yes		
- Programming	Yes		
• GSD file	http://		
GOD IIIO	support.automation.siemens.		
	com/WW/view/en/113652		
 Transmission rate, max. 	12 Mbit/s		
 Transfer memory 			
- Inputs	244 byte		
- Outputs	244 byte		
 Address area, max. 	32		
 User data per address area, max. 	32 byte		
 User data per address area, of 	32 byte		
which consistent, max.			
3rd interface			
Type of interface	Pluggable interface module (IF), technical specifications as for 2nd interface		
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964- 2AA04-0AB0)		
4th interface			
Type of interface	Pluggable interface module (IF), technical specifications as for 2nd interface		
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964- 2AA04-0AB0)		

	6ES7 417-4XT05-0AB0
Isochronous mode	
Isochronous mode	Yes
User data per isochronous slave, max.	244 byte
Equidistance	Yes
Shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O slave	40 μs
Programming	
Configuration software	
• STEP 7	Yes
Programming language LAD	Yes
• FBD • STL	Yes Yes
• SCL	Yes
• CFC	Yes
• GRAPH	Yes
• HiGraph®	Yes
Nesting levels	7
Know-how protection	
User program protection/ password protection	Yes
Dimensions Required slots	2
Dimensions and weight	
Dimensions	
• Width	50 mm
HeightDepth	290 mm 219 mm
	219111111
Weight • Weight, approx.	920 g

Ordering data	Order No.		Order No.
CPU 417-4	6ES7 417-4XT05-0AB0	Manual "Communication for	
Work memory 30 MB, power supply 24 V DC, MPI/PROFIBUS	0E37417-4X103-0AB0	SIMATIC S7-300/-400" German	6ES7 398-8EA00-8AA0
DP master interface, PROFIBUS DP master interface, module slots		English	6ES7 398-8EA00-8BA0
for up to 2 additional IF modules,		French	6ES7 398-8EA00-8CA0
slot for memory card, incl. slot number labels		Spanish	6ES7 398-8EA00-8DA0
Memory card RAM		Italian	6ES7 398-8EA00-8EA0
64 KB	6ES7 952-0AF00-0AA0	SIMATIC manual collection J	6ES7 998-8XC01-8YE0
256 KB	6ES7 952-1AH00-0AA0	Electronic manuals on DVD,	
1 MB	6ES7 952-1AK00-0AA0	multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
2 MB	6ES7 952-1AL00-0AA0	SIMATIC C7, SIMATIC distributed	
4 MB	6ES7 952-1AM00-0AA0	I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,	
8 MB	6ES7 952-1AP00-0AA0	SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC,	
16 MB	6ES7 952-1AS00-0AA0	SIMATIC S7, SIMATIC Software,	
64 MB	6ES7 952-1AY00-0AA0	SIMATIC TDC	
FEPROM memory card		SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
64 KB	6ES7 952-0KF00-0AA0	Current "Manual Collection" DVD	
256 KB	6ES7 952-0KH00-0AA0	and the three subsequent updates	
1 MB	6ES7 952-1KK00-0AA0	Brochure "SIMATIC S7-400	
2 MB	6ES7 952-1KL00-0AA0	programmable controller -	
4 MB	6ES7 952-1KM00-0AA0	Design and application"	
8 MB	6ES7 952-1KP00-0AA0	German	6ES7 498-8AA00-8AB0
16 MB	6ES7 952-1KS00-0AA0	English	6ES7 498-8AA00-8BB0
32 MB	6ES7 952-1KT00-0AA0	RS 485 bus connector with 90° cable outlet	
64 MB	6ES7 952-1KY00-0AA0	Max. transfer rate 12 Mbit/s	
MPI cable	6ES7 901-0BF00-0AA0	Without PG interface	6ES7 972-0BA12-0XA0
for connection of SIMATIC S7 and PG via MPI; 5 m in length		With PG interface	6ES7 972-0BB12-0XA0
IF 964-DP interface module	6ES7 964-2AA04-0AB0	RS 485 bus connector with angled cable outlet	
To connect an additional DP line;		Max. transfer rate 12 Mbit/s	
for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP,		Without PG interface	6ES7 972-0BA42-0XA0
CPU 417-4		With PG interface	6ES7 972-0BB42-0XA0
Slot number labels	6ES7 912-0AA00-0AA0	RS 485 bus connector with	0E07 372-0BB42-0AA0
1 set (spare part)		90° cable outlet for	
Manual "SIMATIC S7-400 programmable controller"		Fast Connect system Max. transfer rate 12 Mbit/s	
incl. instruction list		without PG interface	
German	6ES7 498-8AA05-8AA0	• 1 unit	6ES7 972-0BA52-0XA0
English	6ES7 498-8AA05-8BA0	• 100 units	6ES7 972-0BA52-0XB0
S7-400 operation list		with PG interface	0000 000 00000 0V40
German	6ES7 498-8AA05-8AN0	• 1 unit • 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0
English	6ES7 498-8AA05-8BN0	RS 485 bus connector with	0_0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
-		axial cable outlet	
		For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1 500-0EA02
		PROFIBUS FastConnect bus cable	
		Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1 830-0EH10

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Central processing units SIPLUS Standard CPUs

SIPLUS Standard CPUs SIPLUS CPU 416-3/416-3 PN/DP

Overview



High-performance CPUs in the high-end performance range

- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 416-3			
Order number	6AG1 416-3XR05-4AB0	6AG1 416-3ER05-4AB0		
Order No. based on	6ES7 416-3XR05-4AB0	6ES7 416-3ER05-4AB0		
Range of ambient temperature	0 +60 °C			
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product app	The technical data of the standard product applies except for the ambient conditions		
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range			
	795 658 hPa (+2000 +3500 m) derating 10 K			
	658 540 hPa (+3500 +5000 m) derating 20 K			

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; HCI < 4.9 ppm; HCI < 0.66 ppm; HCI < 0.12 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS CPU 416-3	6AG1 416-3XR05-4AB0	SIPLUS CPU 416-3 PN/DP	6AG1 416-3ER05-4AB0
(medial exposure)		(medial exposure)	
Power supply 24 V DC, MPI/ PROFIBUS DP master interface, PROFIBUS DP master interface, module slot for 1 IF module, slot for memory card, including mounting position labels		Power supply 24 V DC, MPI/ PROFIBUS DP master interface, PROFINET interface, module slot for 1 IF module, slot for memory card, including mounting position labels	
11.2 MB work memory		11.2 MB work memory	
		Accessories	See SIMATIC CPU 416-3, CPU 416-3 PN/DP, page 6/45

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²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Central processing units SIPLUS Standard CPUs

SIPLUS CPU 417-4

Overview



The most powerful SIMATIC S7-400 CPU

- · Applicable for plants with maximum requirements in the highend performance range
- With 2 connection slots for IF modules

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 417-4
Order number	6AG1 417-4XT05-4AB0
Order No. based on	6ES7 417-4XT05-0AB0
Ambient temperature range	0 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS CPU 417-4	Н	6AG1 417-4XT05-4AB0
(medial exposure)		
Power supply 24 V DC, MPI/ PROFIBUS DP master interface, PROFIBUS DP master interface, module slots for 2 additional IF modules, slot for memory card, including mounting position labels		
30 MB work memory		
Accessories		see SIMATIC CPU 417-4, page 6/51

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Central processing units Fail-safe CPUs

CPU 414F

Overview



- For constructing a fail-safe automation system for plants with increased safety requirements
- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and Cat. 4 acc. to EN 954-1
- Standard and safety-related tasks can be performed with a single CPU
- Integrated PROFINET functions in CPU 414F-3 PN/DP
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP or PROFINET IO with PROFIsafe profile
- Fail-safe I/O modules can be connected in a distributed manner via the integrated interfaces (DP and PN with CPU 416F-3 PN/DP) and/or through communication modules (CP 443-5 Extended and CP 443-1 Adv.)
- · Central and distributed use of standard modules for nonsafety-oriented applications

Technical specifications

	6ES7 414-3FM06-0AB0
Product type designation	CPU 414F-3 PN/DP
Product version	
Hardware product version	01
Firmware version	V6.0
Associated programming package	STEP7 V5.5 or higher/iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
Supply voltages Rated value	
• 24 V DC	No; Power supply via system power supply
Feeding of external backup voltage to CPU	5 to 15 V DC
Current consumption	
from backplane bus 5 V DC, max.	1.5 A
from interface 5 V DC, max.	90 mA; At each DP interface
Power losses	
Power loss, typ.	6.5 W
Power loss, max.	7.5 W
Backup battery	
Battery operation	not relevant
 Backup current, typ. 	125 μA; (up to 40 °C)
Backup current, max.	450 μΑ
Memory	
Work memory	
• integrated (for program)	2 Mbyte
integrated (for data)	2 Mbyte
expandable	No

	6ES7 414-3FM06-0AB0
Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	Yes; with Memory Card (FLASH) 64 Mbyte 512 Kibyte Yes; with Memory Card (RAM) 64 Mbyte
Backup • present • with battery • without battery	Yes Yes; all data No
CPU-blocks DB • Number, max. • Size, max.	6 000; Number range: 1 to 16000 64 Kibyte
FB • Number, max. • Size, max.	3 000; Number range: 0 to 7999 64 Kibyte
FC • Number, max. • Size, max.	3 000; Number range: 0 to 7999 64 Kibyte
OB • Size, max.	64 Kibyte
Nesting depth • per priority class • additional within an error OB	24

	6ES7 414-3FM06-0AB0
CPU processing times	
for bit operations, min.	45 ns
for word operations, min.	45 ns
for fixed point arithmetic, min.	45 ns
for floating point arithmetic, min.	135 ns
Counters, timers and their	
retentivity	
S7 counter	0.040
NumberRetentivity	2 048
- adjustable	Yes
- lower limit	0
- upper limit	2 047
- preset	Z 0 to Z 7
Counting rangelower limit	0
- lower limit - upper limit	0 999
IEC counter	333
• present	Yes
• Type	SFB
Number	Unlimited (limited only by work
	memory)
S7 times	0.040
NumberRetentivity	2 048
- adjustable	Yes
- lower limit	0
- upper limit	2 047
- preset	No times retentive
Time range	10
lower limitupper limit	10 ms 9 990 s
	3 330 3
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by work
	memory)
Data areas and their retentivity	Ŧ.,
retentive data area, total	Total working and load memory (with backup battery)
Flag	(Will Backap Battory)
Number, max.	8 Kibyte; Size of bit memory
	address area
Retentivity available	Yes
Number of clock memories	8; (in 1 memory byte)
Data blocks	C 000. Number 200
Number, max.Size, max.	6 000; Number range: 1 to 16,000
	64 Kibyte
Local data • adjustable, max.	16 Kibyte
• preset	8 Kibyte
F 300	2

	6ES7 414-3FM06-0AB0
Address area	
I/O address area	
• overall	8 Kibyte
Outputs	8 Kibyte
of which, distributed MPL/DP interface, inputs	2 Kibuto
MPI/DP interface, inputsMPI/DP interface, outputs	2 Kibyte 2 Kibyte
- DP interface, inputs	6 Kibyte
- DP interface, outputs	6 Kibyte
- PN interface, inputs	8 Kibyte
- PN interface, outputs	8 Kibyte
Process image	·
Inputs, adjustable	8 Kibyte
Outputs, adjustable	8 Kibyte
• Inputs, preset	256 byte
Outputs, preset	256 byte
 consistent data, max. 	244 byte
Access to consistent data in	Yes
process image	
Subprocess images	15
 Number of subprocess images, max. 	15
Digital channels	
• Inputs	65 536
• Outputs	65 536
• Inputs, of which central	65 536
 Outputs, of which central 	65 536
Analog channels	
• Inputs	4 096
Outputs	4 096
• Inputs, of which central	4 096
Outputs, of which central	4 096
Hardware configuration	00
connectable OPs	63
Central devices, max.	1
Expansion devices, max.	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	
 Number of connectable IMs (total), max. 	6
Number of connectable IM 460s, max.	6
• Number of connectable IM 463s, max.	4; IM 463-2
Number of DP masters	
• integrated	1
• via IM 467	4
• via CP	10; CP 443-5 Extended
Mixed mode IM + CP permitted	No; IM 467 not suitable for use with CP 443-5 Ext. and CP443-1 EX4x, EX20, GX20 (in PNIO mode)
• via interface module	1; IF 964-DP
Number of pluggable S5 modules	6
(via adapter capsule in central	
device), max.	

Technical specifications (Cont	
Number of IO controllers	6ES7 414-3FM06-0AB0
Number of IO controllers • integrated • via CP	1 4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/ GX20, max. 4 in central controller
Number of operable FMs and CPs (recommended) • FM	Limited by number of slots and number of connections
CP, point-to-point	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections
PROFIBUS and Ethernet CPs	14; In total max. 10 CPs as DP master and PN controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PN controller
Time	
ClockHardware clock (real-time clock)	Yes
battery-backed and synchro-	Yes
nizable • Resolution	1 ms
Runtime meter • Number	16
Clock synchronization	
supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
to DP, masterto DP, slave	Yes Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes; as client
• to IF 964 DP	Yes
S7 message functions	
Number of login stations for message functions, max.	63; max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes
SCAN procedure	Yes
Number of messages • overall, max.	512
Block related messages	Yes
Process diagnostic messages	Yes
Alarm 8-blocks	Yes
Process control messages	Yes
Test commissioning functions Status/control • Status/control variable	Yes; up to 16 variable tables
Forcing	<u>`</u>
• Forcing	Yes
Status block	Yes; up to 16 simultaneously
Single step	Yes

	6ES7 414-3FM06-0AB0
Number of breakpoints	16
Diagnostic buffer	
presentNumber of entries, max.	Yes 3 200
- adjustable	Yes
- preset	120
Service data	
• can be read out	Yes
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Routing	Yes; S7 routing
Global data communication	
• supported	Yes
Size of GD packets, max.	54 byte
S7 basic communication	V
supportedUser data per job, max.	Yes 76 byte
S7 communication	70 byte
• supported	Yes
• as server	Yes
• as client	Yes
User data per job, max.	64 Kibyte
S5-compatible communication	V V 50 40 05ND
• supported	Yes; Via FC AG_SEND and AG RECV, max. via 10 CP 443-1
	or 443-5
User data per job, max.	8 Kibyte
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Web server	V
supportedNumber of HTTP clients	Yes 5
User-defined websites	Yes
Open IE communication	
• TCP/IP	Yes; Via integrated PROFINET
	interface and loadable FBs
Number of connections, max.Data length, max.	62
- Several passive connections per	32 Kibyte Yes
port, supported	100
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET
	interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.	62
- Data length, max.	32 Kibyte; 1452 bytes via
• UDP	CP 443-1 Adv. Yes; Via integrated PROFINET
- 001	interface and loadable FBs
- Number of connections, max.	62
- Data length, max.	1 472 byte
Number of connections	
overall	64

Technical specifications (continued)

Technical specifications (continued)		
	6ES7 414-3FM06-0AB0	
PROFINET CBA (at set setpoint communication load)		
 Number of remote interconnection partners 	32	
 Number of functions, master/slave Total of all Master/Slave connec- 	150 4 500	
tions		
Data length of all incoming connections master/slave, max.	45 000 byte	
 Data length of all outgoing connections master/slave, max. 	45 000 byte	
 Number of device-internal and PROFIBUS interconnections 	1 000	
 Data length of device-internal und PROFIBUS interconnections, max. 	16 000 byte	
 Data length per connection, max. Remote interconnections with acyclic transmission 	2 000 byte	
- Sampling frequency: Sampling time, min.	200 ms; Depending on preset communcation load, number of interconnections and data length used	
 Number of incoming intercon- nections 	250	
 Number of outgoing intercon- nections 	250	
 Data length of all incoming inter- connections, max. 	8 000 byte	
 Data length of all outgoing inter- connections, max. 	8 000 byte	
- Data length per connection, max.	2 000 byte	
Remote interconnections with cyclic transmission		
- Transmission frequency: Transmission interval, min.	1 ms; Depending on preset communication load, number of interconnections and data length used	
 Number of incoming interconnections 	300	
 Number of outgoing intercon- nections 	300	
 Data length of all incoming inter- connections, max. 	4 800 byte	
- Data length of all outgoing inter- connections, max.	4 800 byte	
 Data length per connection, max. 	450 byte	
HMI variables via PROFINET (acyclic)		
Number of stations that can log on for HMI variables (PN OPC/ iMap)	2x PN OPC/1x iMap	
- HMI variable updating	500 ms	
Number of HMI variablesData length of all HMI variables,	1 000 32 000 byte	
max. • PROFIBUS proxy functionality		
- supported - Data length per connection,	Yes; 32 PROFIBUS slaves max. connectable 240 byte; Slave-dependent	
max.	2 to byto, olavo dependent	

	6ES7 414-3FM06-0AB0
1st interface	
Type of interface	Integrated
Physics	RS 485 / PROFIBUS + MPI
Isolated	Yes
Power supply to interface	150 mA
(15 to 30 V DC), max.	100 111/1
Number of connection resources	MPI: 32, DP: 16
Functionality	
• MPI	Yes
DP master	Yes
DP slave	Yes
MPI • Number of connections	32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1
ServicesPG/OP communication	Yes
- Routing	Yes
- Global data communication	Yes
- S7 basic communication	Yes
- S7 communication	Yes
 S7 communication, as client S7 communication, as server 	Yes Yes
Transmission rate, max.	12 Mbit/s
DP master	TE William
Number of connections, max.	16; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1
• Services	
- PG/OP communication	Yes
- Routing	Yes
 Global data communication S7 basic communication 	No Yes
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- Equidistance mode support	Yes
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV1	Yes
 Transmission rate, max. 	12 Mbit/s
Number of DP slaves, max.	32
Address area	O IZilar da
Inputs, max.Outputs, max.	2 Kibyte 2 Kibyte
User data per DP slave	2 Tabyto
- User data per DP slave, max.	244 byte
- Inputs, max.	244 byte
- Outputs, max.	244 byte
- Slots, max.	244

- per slot, max.

128 byte

Technical specifications (continued)		
	6ES7 414-3FM06-0AB0	
DP slave		
 Number of connections 	16	
• Services		
- PG/OP communication	Yes; with interface active	
 S7 routing Global data communication 	Yes; With interface active	
- S7 basic communication	No	
- S7 communication	Yes	
- S7 communication, as client	Yes	
- S7 communication, as server	Yes	
- Direct data exchange	No	
(slave-to-slave communication) - DPV1	No	
• GSD file	http://	
- GOD IIIC	support.automation.siemens.	
	com/WW/view/en/113652	
Transmission rate, max.	12 Mbit/s	
Automatic baud rate search Transfer memory	No	
Transfer memoryInputs	244 byte	
- Outputs	244 byte	
Address area, max.	32; Virtual slots	
User data per address area, max.	32 byte	
• User data per address area, of	32 byte	
which consistent, max.		
2nd interface	PROFINET	
Type of interface	PROFINET	
Physics	Ethernet RJ45	
Isolated	Yes	
Integrated switch	Yes	
Number of ports	2	
Automatic detection of trans- mission speed	Yes; Autosensing	
Autonegotiation	Yes	
Autocrossing	Yes	
Media redundancy		
supported	Yes	
 Switchover time on line break, typically 	200 ms	
 Number of stations in the ring, max. 	50	
Change of IP address at runtime,	Yes; Assignment by higher-level	
supported	IO controller or by the user	
Niverban of a constant	program with SFB104 "IP_CONF"	
Number of connection resources	64	
Functionality	Ne	
DP masterDP slave	No No	
PROFINET IO controller	Yes	
PROFINET IO device	Yes	
• PROFINET CBA	Yes	
Open IE communication	Yes	
Web server	Yes	
- Number of HTTP clients	5	
 Local Operating Network 	No	

	6ES7 414-3FM06-0AB0
PROFINET IO controller	
• Services	
- PG/OP communication	Yes
- S7 routing	Yes
- S7 communication	Yes
- Isochronous mode	Yes; Only with IRT and the High
	Performance option
- Open IE communication	Yes
Transmission rate, min.	10 Mbit/s
Transmission rate, max.	100 Mbit/s
Number of connectable	256
IO devices, max.	256
Max. number of connectable IO devices for RT	256
- of which in line, max.	256
Number of IO devices with IRT and	256
the option "high flexibility"	200
- of which in line, max.	61
Number of IO devices with IRT and	64
the option "high performance",	
max.	
- of which in line, max.	64
IRT, supported	Yes
Shared device, supported	Yes
Prioritized startup supported - Number of IO devices. max.	Yes 32
Activation/deactivation of	yes
IO devices	res
- Number of IO devices that can	8
be simultaneously activated/	
deactivated, max.	
O devices changing during	Yes
operation (partner ports),	
supported May number of IO devices per	9. 9 parallal calls of the CEC 12
 Max. number of IO devices per tool 	8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line.
1001	Max. 32 IO devices changing
	during operation (partner ports)
	are supported.
Device replacement without swap	Yes
medium Send clock times	250 us 500 us 1 ms 2 ms 4 ms
Senu Clock limes	250 μs, 500 μs, 1 ms, 2 ms, 4 ms additionally with IRT with high
	performance: 250 µs to 4 ms in
	125 µs frame
Updating time	250 µs to 512 ms; minimum value
	depends on preset communi-
	cation share for PROFINET IO, on the number of IO devices and on
	the amount of configured user
	data, see PROFINET system
	description
Address area	
- Inputs, max.	8 Kibyte
- Outputs, max.	8 Kibyte
User data per address area, max.	1.0041
- User data consistency, max.	1 024 byte

Technical specifications (continued)		
	6ES7 414-3FM06-0AB0	
PROFINET IO device		
Services - PG/OP communication - S7 routing - S7 communication - Isochronous mode - Open IE communication - IRT, supported - Prioritized startup supported - Shared device, supported - Number of IO controllers with shared device, max.	Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes	
Transfer memoryInputs, max.Outputs, max.	1 440 byte; Per IO controller with shared device 1 440 byte; Per IO controller with	
SubmodulesNumber, max.User data per submodule, max.	shared device 64 1 024 byte	
PROFINET CBA • acyclic transmission • cyclic transmission	Yes Yes	
Open IE communication Open IE communication, supported Number of connections, max. Local port numbers used at the system end Keep-alive function, supported	Yes 62 0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535 Yes	
3rd interface Type of interface	Pluggable interface module (IF)	
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964- 2AA04-0AB0)	
Physics	RS 485 / PROFIBUS	
Isolated	Yes	
Power supply to interface (15 to 30 V DC), max.	150 mA	
Automatic detection of trans- mission speed	No	
Number of connection resources	16	
Functionality • MPI • DP master • DP slave	No Yes Yes	

	6ES7 414-3FM06-0AB0
DP master	
• Number of connections, max.	16
• Services	
- PG/OP communication	Yes
- Routing	Yes; S7 routing
- Global data communication	No You
 S7 basic communication S7 communication 	Yes Yes
- S7 communication as client	Yes
- S7 communication, as cheft	Yes
- Equidistance mode support	Yes
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
- Activation/deactivation of DP	Yes
slaves - Direct data exchange	Yes
(slave-to-slave communication) - DPV0	Yes
- DPV1	Yes
• Transmission rate, max.	12 Mbit/s
• Transmission rate, min.	9.6 kbit/s
Number of DP slaves, max.	96
Address area	
- Inputs, max.	6 Kibyte
- Outputs, max.	6 Kibyte
 User data per DP slave 	
- User data per DP slave, max.	244 byte
- Inputs, max.	244 byte
- Outputs, max.	244 byte
- Slots, max.	244 128 byta
- per slot, max.	128 byte
DP slave	16
Number of connectionsServices	16
- PG/OP communication	Yes
- S7 routing	Yes; With active interface
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- SYNC/FREEZE	No
- Direct data exchange	No
(slave-to-slave communication)	NI-
- DPV1 - Status/control	No Vac. When interface active
GSD file	Yes; When interface active
• GSD file	http:// support.automation.siemens.
	com/WW/view/en/113652
 Transmission rate, min. 	9.6 kbit/s
 Transmission rate, max. 	12 Mbit/s
 Automatic baud rate search 	No
Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Address areas, max.	32; Virtual slots
User data per address area, max.	32 byte
 User data per address area, of which consistent, max. 	32 byte
sir consistent, maxi	

	6ES7 414-3FM06-0AB0
Isochronous mode	
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
Number of DP masters with isochronous mode	2
User data per isochronous slave, max.	244 byte
Equidistance	Yes
Shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms
CIR - Configuration in RUN CIR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O slave	15 μs; Time per I/O byte
Programming	
Configuration software	
• STEP 7	Yes
Programming language • STEP 7 • LAD • FBD • STL • SCL • CFC • GRAPH • HiGraph®	Yes

6ES7 414-3FM06-0AB0
7
Yes
Yes; With S7 block privacy
Yes
No
2
50 mm
290 mm
219 mm
900 g

Ordering data	Order No.
CPU 414F-3 PN/DP	6ES7 414-3FM06-0AB0
for setting up safety-related automation system; work memory 4 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, module slot for 1 IF module, incl. slot number labels	
Option package S7 F Distributed Safety V5.4	
for generating fail-safe programs for the S7-300F/400F	
Floating license	6ES7 833-1FC02-0YA5
Upgrade from V5.x to V5.4	6ES7 833-1FC02-0YE5
Software Update Service	6ES7 833-1FC00-0YX2
Memory Card RAM	
64 KB	6ES7 952-0AF00-0AA0
256 KB	6ES7 952-1AH00-0AA0
1 MB	6ES7 952-1AK00-0AA0
2 MB	6ES7 952-1AL00-0AA0
4 MB	6ES7 952-1AM00-0AA0
8 MB	6ES7 952-1AP00-0AA0
16 MB	6ES7 952-1AS00-0AA0
64 MB	6ES7 952-1AY00-0AA0

	Order No.
FEPROM memory card	
64 KB	6ES7952-0KF00-0AA0
256 KB	6ES7952-0KH00-0AA0
1 MB	6ES7 952-1KK00-0AA0
2 MB	6ES7 952-1KL00-0AA0
4 MB	6ES7 952-1KM00-0AA0
8 MB	6ES7 952-1KP00-0AA0
16 MB	6ES7 952-1KS00-0AA0
32 MB	6ES7 952-1KT00-0AA0
64 MB	6ES7 952-1KY00-0AA0
MPI cable	6ES7 901-0BF00-0AA0
for connection of SIMATIC S7 and PG via MPI; 5 m in length	
IF 964-DP interface module	6ES7 964-2AA04-0AB0
For connecting an additional DP line	
Slot number labels	6ES7 912-0AA00-0AA0
1 set (spare part)	
Manual "SIMATIC S7-400 programmable controller"	
incl. instruction list	
German	6ES7 498-8AA05-8AA0
English	6ES7 498-8AA05-8BA0

Ordering data	Order No.	Order No.	
S7-400 operation list		RS 485 bus connector with axial cable outlet	
German	6ES7 498-8AA05-8AN0	For SIMATIC OP, for connection	6GK1 500-0EA02
English	6ES7 498-8AA05-8BN0	to PPI, MPI, PROFIBUS	0GK1 500-0EA02
Manual "Communication for SIMATIC S7-300/-400"		PROFIBUS FastConnect bus cable	
German	6ES7 398-8EA00-8AA0	Standard type with special	6XV1 830-0EH10
English	6ES7 398-8EA00-8BA0	design for quick mounting, 2-core, shielded, sold by the	
French	6ES7 398-8EA00-8CA0	meter, max. delivery unit 1000 m,	
Spanish	6ES7 398-8EA00-8DA0	minimum ordering quantity 20 m	
Italian	6ES7 398-8EA00-8EA0	RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0
SIMATIC manual collection	6ES7 998-8XC01-8YE0	Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure	
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN,		PROFINET bus components	
SIMATIC bus components, SIMATIC C7, SIMATIC distributed		IE FC TP standard cable GP 2x2	6XV1 840-2AH10
I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval;	
SIMATIC manual collection	6ES7 998-8XC01-8YE2	Sold by the meter	
update service for 1 year		FO standard cable GP (50/125)	6XV1 873-2A
Current "Manual Collection" DVD and the three subsequent		Standard cable, splittable, UL approval, sold by the meter	
updates Brochure "SIMATIC S7-400		SCALANCE X204-2 Industrial	6GK5 204-2BB10-2AA3
programmable controller - Design and application"		Ethernet Switch Industrial Ethernet Switches with	
German	6ES7 498-8AA00-8AB0	integral SNMP access, Web diagnostics, copper cable	
English	6ES7 498-8AA00-8BB0	diagnostics and PROFINET	
PROFIBUS bus components		diagnostics for configuring line, star and ring topologies; four	
RS 485 bus connector with 90° cable outlet		10/100 Mbit/s RJ45 ports and two FO ports	
Max. transfer rate 12 Mbit/s		IE FC RJ45 plugs	
Without PG interface	6ES7 972-0BA12-0XA0	RJ45 plug connector for Indus-	
With PG interface	6ES7 972-0BB12-0XA0	trial Ethernet with a rugged metal enclosure and integrated	
RS 485 bus connector with angled cable outlet		insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
Max. transfer rate 12 Mbit/s		IE FC RJ45 plug 180	
Without PG interface	6ES7 972-0BA42-0XA0		
With PG interface	6ES7 972-0BB42-0XA0	180° cable outlet	6CK1 001 1PP10 0AA0
RS 485 bus connector with		1 unit	6GK1 901-1BB10-2AA0
90° cable outlet for Fast Connect system		10 units 50 units	6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0
Max. transfer rate 12 Mbit/s		PROFIBUS/PROFINET bus	see Catalogs IK PI, CA 01
without PG interface		components	
• 1 unit	6ES7 972-0BA52-0XA0	For establishing MPI/PROFIBUS/ PROFINET communication	
• 100 units	6ES7 972-0BA52-0XB0		
with PG interface 1 unit 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0		

- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Central processing units Fail-safe CPUs

CPU 416F

Overview



- For constructing a fail-safe automation system for plants with increased safety requirements
- High-performance CPU in the top-end performance range
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and Cat. 4 acc. to EN 954-1
- Standard and safety-related tasks can be performed with a single CPU
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP with the PROFIsafe profile
- Fail-safe I/O modules can be connected decentralized over the integrated interfaces (DP and PN with CPU416F-3 PN/DP) and/or through communication modules (CP443-5 Ext. and CP443-1 Adv.)
- Standard modules for non-safety-related applications can be operated centrally and decentralized

Technical specifications

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Product type designation		CPU416F-3 PN/DP
Product version		
Hardware product version		01
Firmware version		V6.0
associated programming package		STEP7 V5.5 or higher/iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
CiR - Configuration in RUN CiR synchronization time, basic load	100 ms	100 ms
CiR synchronization time, time per I/O slave • 24 V DC	40 μs	10 μs; Time per I/O byte No; Power supply via system power supply
from backplane bus 5 V DC, max.	1.1 A	1.5 A
from interface 5 V DC, max.	90 mA; at each DP interface	90 mA; at each DP interface
Power losses		
Power loss, typ.	4 W	6.5 W
Power loss, max.		7.5 W
 Memory Work memory integrated integrated (for program) integrated (for data) expandable 	5.6 Mbyte 2.8 Mbyte 2.8 Mbyte No	16 Mbyte 8 Mbyte 8 Mbyte No
Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	Yes 64 Mbyte 1 Mbyte Yes 64 Mbyte	Yes; with Memory Card (FLASH) 64 Mbyte 1 Mbyte Yes; with Memory Card (RAM) 64 Mbyte
Backup • present • with battery • without battery	Yes Yes No	Yes Yes; all data No
CPU-blocks DB • Number, max. • Size, max.	10000; Number range: 1 to 16,000 64 Kibyte	10000; Number range: 1 to 16000 64 Kibyte
FB • Number, max. • Size, max.	5000; Number range: 0 to 7999 64 Kibyte	5000; Number range: 0 to 7999 64 Kibyte

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
FC		
Number, max.	5 000; Number range: 0 to 7999	5 000; Number range: 0 to 7999
• Size, max.	64 Kibyte	64 Kibyte
OB	2	5 · · · · · · · · · · · · · · · · · · ·
	CA Kilayaka	C4 Kibuta
• Size, max.	64 Kibyte	64 Kibyte
Nesting depth		
 per priority class 	24	24
 additional within an error OB 	2	2
CPU processing times		
for bit operations, min.	30 ns	30 ns
for word operations, min.	30 ns	30 ns
for fixed point arithmetic, min.	30 ns	30 ns
for floating point arithmetic, min.	90 ns	90 ns
Counters, timers and their retentivity		
S7 counter		
Number	2 048	2 048
Retentivity		
- adjustable	Yes	Yes
- lower limit	0	0
- upper limit	2 047	2 047
- preset	Z 0 to Z 7	Z 0 to Z 7
Counting range		
- lower limit	0	0
- upper limit	999	999
IEC counter		
• present	Yes	Yes
• Type	SFB	SFB
• Number	0.2	Unlimited (limited only by work memory)
S7 times		, -, -, -, -, -, -, -, -, -, -, -,
• Number	2 048	2 048
	2 040	2 040
Retentivity	Voe	Voo
- adjustable	Yes	Yes
- lower limit	0	0
- upper limit	2 047	2 047
- preset	No times retentive	No times retentive
• Time range		
- lower limit	10 ms	10 ms
- upper limit	9 990 s	9 990 s
IEC timer		
• present	Yes	Yes
• Туре	SFB	SFB
Number		Unlimited (limited only by work memory)
Data areas and their retentivity		
Retentive data area, total	Total working and load memory (with backup	Total working and load memory (with backup
	battery)	battery)
Flag		
Number, max.	16 Kibyte	16 Kibyte; Size of bit memory address area
Retentivity available	Yes	Yes
Retentivity available Retentivity preset	MB 0 to MB 15	MB 0 to MB 15
Number of clock memories	8; (in 1 memory byte)	8; (in 1 memory byte)
	5, (iii 1 momor y 5,50)	o, (i momory byto)
Local data	20 Kilay ta	20 Kib. do
adjustable, max.preset	32 Kibyte 16 Kibyte	32 Kibyte 16 Kibyte
	IN KINVIO	

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Address area		
I/O address area		
• overall	16 Kibyte	16 Kibyte
• Outputs	16 Kibyte	16 Kibyte
of which, distributed		
- MPI/DP interface, inputs	2 Kibyte	2 Kibyte
- MPI/DP interface, outputs	2 Kibyte	2 Kibyte
- DP interface, inputs	8 Kibyte	8 Kibyte
- DP interface, outputs	8 Kibyte	8 Kibyte
- PN interface, inputs		8 Kibyte
- PN interface, outputs		8 Kibyte
Process image		
• Inputs, adjustable	16 Kibyte	16 Kibyte
Outputs, adjustable	16 Kibyte	16 Kibyte
• Inputs, preset	512 byte	512 byte
Outputs, preset	512 byte	512 byte
Consistent data, max.	244 byte	244 byte
Access to consistent data in process image	Yes	Yes
Subprocess images		
Number of subprocess images, max.	15	15
Digital channels		
• Inputs	131 072	131 072
• Outputs	131 072	131 072
• Inputs, of which central	131 072	131 072
Outputs, of which central	131 072	131 072
Analog channels		
• Inputs	8 192	8 192
• Outputs	8 192	8 192
 Inputs, of which central 	8 192	8 192
Outputs, of which central	8 192	8 192
Hardware configuration		
Expansion devices, max.	21	21
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules		
Number of connectable IMs (total), max.	6	6
• Number of connectable IM 460s, max.	6	6
• Number of connectable IM 463s, max.	4; IM 463-2	4; IM 463-2
Number of DP masters		
• integrated	2	1
• via IM 467	4	4
• via CP	10; CP 443-5 Extended	10; CP 443-5 Extended
• Mixed mode IM + CP permitted	No; IM 467 cannot be used with CP 443-5 Ext.;	No; IM 467 not suitable for use with CP 443-5
	IM 467 cannot be used with CP 443-1 EX40 in	Ext. and CP443-1 EX4x, EX20, GX20
	PN IO mode	(in PNIO mode)
via interface module Negretary of all regards to 05 people less (via a desertary).	0	1; IF 964-DP
 Number of pluggable S5 modules (via adapter capsule in central device), max. 	6	6
Number of IO controllers		
• integrated		1
• via CP	4; Via CP 443-1 EX 41 in PN mode; max. 4 in	4; No mixed operation of CP443-1 EX40 and
	central controller	CP443-1 EX 41/EX20/GX20, max. 4 in central
		controller

Technical specifications (continued)		
	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Number of operable FMs and CPs		
(recommended)		
• FM	Limited by number of slots and number of	Limited by number of slots or number of
00	connections	connections
CP, point-to-point	Limited by number of slots and number of connections	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of
	COTITIECTIONS	connections
PROFIBUS and Ethernet CPs	14; Of which 10 CP or IM max. as DP master	14; In total max. 10 CPs as DP master and
	and PN controller	PN controller, of which up to 10 IMs or CPs as
		DP master and up to 4 CPs as PN controller
Time		
Clock		
Hardware clock (real-time clock)	Yes	Yes
battery-backed and synchronizable	Yes	Yes
• Resolution	1 ms	1 ms
Deviation per day (buffered), max.	1.7 s; Power off	1.7 s; Power off
Deviation per day (unbuffered) max.	8.6 s; For power On	8.6 s; For power On
Runtime meter		
• Number	8	16
Number/Number range Danaga fundana	0 to 7	0 to 15
Range of values	0 to 32767 hours	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours
Granularity	1 hour	1 hour
• retentive	Yes	Yes
	100	100
Clock synchronization	Vaa	Yes
supportedto MPI, master	Yes Yes	Yes
• to MPI, slave	Yes	Yes
• to DP, master	Yes	Yes
• to DP, slave	Yes	Yes
• in AS, master	Yes	Yes
• in AS, slave	Yes	Yes
on Ethernet via NTP	Via CP	Yes; as client
• to IF 964 DP		Yes
Interfaces		
Number of USB interfaces		0
1st interface		
Type of interface	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS + MPI
Isolated	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA
Number of connection resources	MPI: 44, DP: 32	MPI: 44, DP: 32
	WII 1. 44, DI . 02	WII 1. 44, DI . OZ
Functionality • MPI	Yes	Yes
DP master	Yes	Yes
• DP slave	Yes	Yes
MPI	100	100
Number of connections	44	44; if a diagnostic repeater is used on the line,
- Number of connections	44	the number of connection resources on the line
		is reduced by 1
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	Yes	Yes
- S7 basic communication	Yes	Yes
- S7 communication	Yes	Yes
- S7 communication, as client		Yes
 S7 communication, as server Transmission rate, max. 	12 Mbit/s	Yes 12 Mbit/s

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
DP master		
Number of connections, max.	32	32; if a diagnostic repeater is used on the line,
	52	the number of connection resources on the line
		is reduced by 1
• Services		
- PG/OP communication	Yes	Yes
- Global data communication	No	No
- S7 basic communication	Yes	Yes
- S7 communication	Yes	Yes
- S7 communication, as client		Yes
- S7 communication, as server	V	Yes
- Equidistance mode support	Yes	Yes
- Isochronous mode	V	Yes
- SYNC/FREEZE	Yes	Yes
- Activation/deactivation of DP slaves	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
- DPV1		Yes
Transmission rate, max.	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.	32	32
Address area	32	52
- Inputs, max.	2 Kibyte	2 Kibyte
- Outputs, max.	2 Kibyte	2 Kibyte
User data per DP slave	2 Nibyte	2 Nibyte
- User data per DP slave, max.	244 byte	244 byte
- Oser data per Dr. Slave, max. - Inputs, max.	244 byte	244 byte
- Outputs, max.	244 byte	244 byte
- Slots, max.	244	244 244
- per slot, max.	128 byte	128 byte
DP slave	120 0)10	120 5)(0
Number of connections	32	32
Services	32	32
- PG/OP communication	Yes	Yes; with interface active
- S7 routing	162	Yes; with interface active
- Global data communication		No
- S7 basic communication		No
- S7 communication		Yes
- S7 communication, as client		Yes
- S7 communication, as server		Yes
- Direct data exchange		No
(slave-to-slave communication)		NO
- DPV1		No
• GSD file	http://support.automation.siemens.com/WW/	http://support.automation.siemens.com/WW/
	view/en/113652	view/en/113652
 Transmission rate, max. 	12 Mbit/s	12 Mbit/s
Automatic baud rate search		No
Transfer memory		
- Inputs	244 byte	244 byte
- Outputs	244 byte	244 byte
 Address area, max. 	32	32; Virtual slots
 User data per address area, max. 	32 byte	32 byte
• User data per address area, of which consistent,	32 byte	32 byte
max.		
2nd interface		
Type of interface	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	Ethernet RJ45
Isolated	Yes	Yes
Integrated switch		Yes
Number of ports		2
	150 mA	-
Power supply to interface (15 to 30 V DC), max.	150 mA	
Automatic detection of transmission speed		Yes; Autosensing

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Autonegotiation		Yes
Autocrossing		Yes
Media redundancy		100
supported supported supported		Yes
 Switchover time on line break, typically 		200 ms
Number of stations in the ring, max.		50
_		
Change of IP address at runtime, supported		Yes; Assignment by higher-level IO controller o by the user program with SFB104 "IP_CONF"
Number of connection resources	32	96
Functionality		
DP master	Yes	No
DP slave	Yes	No
PROFINET IO controller		Yes
PROFINET IO device		Yes
PROFINET CBA		Yes
 Local Operating Network 		No
DP master		
 Number of connections, max. 	32	
Services		
- PG/OP communication	Yes	
- Global data communication	No	
- S7 basic communication	Yes	
- S7 communication	Yes	
- Equidistance mode support	Yes	
- SYNC/FREEZE	Yes	
- Activation/deactivation of DP slaves	Yes	
- Direct data exchange	Yes	
(slave-to-slave communication)		
 Transmission rate, max. 	12 Mbit/s	
 Number of DP slaves, max. 	125	
Address area		
- Inputs, max.	8 Kibyte	
- Outputs, max.	8 Kibyte	
 User data per DP slave 		
 User data per DP slave, max. 	244 byte	
- Inputs, max.	244 byte	
- Outputs, max.	244 byte	
- Slots, max.	244	
- per slot, max.	128 byte	
DP slave		
Number of connections	32	
Services		
• GSD file	http://support.automation.siemens.com/WW/	
- Transmission rate many	view/en/113652	
• Transmission rate, max.	12 Mbit/s	
Transfer memory	0441	
- Inputs	244 byte	
- Outputs	244 byte	
Address area, max.	32 32 h. da	
User data per address area, max.	32 byte	
 User data per address area, of which consistent, max. 	32 byte	
PROFINET IO controller		
• Services		
- PG/OP communication		Yes
- S7 routing		Yes
- S7 communication		Yes
- Isochronous mode		Yes; Only with IRT and the High Performance
		option
- Open IE communication		Yes

Technical specifications (continued)		
	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Number of connectable IO devices, max.		256
• Max. number of connectable IO devices for RT		256
- of which in line, max.		256
 Number of IO devices with IRT and the option "high flexibility" 		256
- of which in line, max.		61
Number of IO devices with IRT and the option "high performance", max.		64
- of which in line, max.		64
IRT, supported Shared devices supported		Yes Yes
Shared device, supportedPrioritized startup, supported		Yes
- Number of IO devices, max.		32
Activation/deactivation of IO devices		Yes
Number of IO devices that can be simultaneously activated/deactivated, max.		8
• IO devices changing during operation (partner ports), supported		Yes
 Max. number of IO devices per tool Device replacement without swap medium 		8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO devices changing during operation (partner ports) are supported. Yes
Send clock times		250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame
Updating time		250 µs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO devices and on the amount of configured user data, see PROFINET system description
Address area		decomplian
- Inputs, max.		8 Kibyte
- Outputs, max.		8 Kibyte
 User data per address area, max. User data consistency, max. 		1 024 byte
PROFINET IO device		
• Services		
- PG/OP communication		Yes
- S7 routing		Yes
- S7 communication		Yes
Isochronous modeOpen IE communication		No Yes
- IRT, supported		Yes
- Prioritized startup supported		Yes
- Shared device, supported		Yes
 Number of IO controllers with shared device, max. 		2
Transfer memory		
- Inputs, max.		1 440 byte; Per IO controller with shared device
- Outputs, max.		1 440 byte; Per IO controller with shared device
Submodules		04
Number, max.User data per submodule, max.		64 1 024 byte
Open IE communication		
Open IE communication, supported		Yes
Number of connections, max.		94
 Local port numbers used at the system end Keep-alive function, supported 		0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535 Yes

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
3rd interface		
Type of interface		Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS
solated		Yes
Power supply to interface (15 to 30 V DC), max.		150 mA
Automatic detection of transmission speed		No
Number of connection resources		32
		UL.
Functionality • MPI		No
DP master		Yes
DP slave		Yes
DP master		
Number of connections, max.		32
Services		
- PG/OP communication		Yes
- Global data communication		No
- S7 basic communication		Yes
- S7 communication		Yes
- S7 communication, as client		Yes
- S7 communication, as server		Yes
- Equidistance mode support		Yes
- Isochronous mode		Yes
SYNC/FREEZEActivation/deactivation of DP slaves		Yes Yes
•		Yes
- Direct data exchange (slave-to-slave communication)		res
- DPV1		Yes
Transmission rate, max.		12 Mbit/s
Number of DP slaves, max.		125
• Address area		
- Inputs, max.		8 Kibyte
- Outputs, max.		8 Kibyte
User data per DP slave		
- User data per DP slave, max.		244 byte
- Inputs, max.		244 byte
- Outputs, max.		244 byte
- Slots, max.		244
- per slot, max.		128 byte
DP slave		
Number of connections		32
Services		
- PG/OP communication		Yes
- S7 routing		Yes; With active interface
- Global data communication		No
- S7 basic communication		No
- S7 communication		Yes
- S7 communication, as client		Yes
- S7 communication, as server		Yes
- Direct data exchange (slave-to-slave communication)		No
- DPV1		No
• GSD file		http://support.automation.siemens.com/WW/
-		view/en/113652
Transmission rate, max.		12 Mbit/s
 Automatic baud rate search 		No
Transfer memory		
- Inputs		244 byte
- Outputs		244 byte
A 1.1		32; Virtual slots
 Address areas, max. 		
 Address areas, max. User data per address area, max. User data per address area, of which consistent, 		32 byte 32 byte

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Communication functions		
PG/OP communication	Yes	Yes
Number of connectable OPs without message	63	95
processing	66	
Number of connectable OPs with message	63; When using alarm_S and alarm_D	95; When using Alarm_S/SQ and Alarm_D/DQ
processing	co, mon doing diding o did didings	50, 111011 30111g / 11a111_5/5 q and / 11a111_5/5 q
Data record routing		Yes
Global data communication		
• supported	Yes	Yes
Number of GD packets, transmitter, max.	16	16
Number of GD packets, transmitter, max.	32	32
		54 byte
Size of GD packets, max. Size of GD packets (of which page start) may	54 byte	,
• Size of GD packet (of which consistent), max.	1 variable	1 variable
S7 basic communication		
• supported	Yes	Yes
• User data per job, max.	76 byte	76 byte
• User data per job (of which consistent), max.	1 variable	1 variable
S7 communication		
• supported	Yes	Yes
• •	ies	
• as server		Yes
• as client	0.4.17	Yes
User data per job, max.	64 Kibyte	64 Kibyte
 User data per job (of which consistent), max. 	462 byte; 1 variable	462 byte; 1 variable
S5-compatible communication		
• supported	Yes; (via CP max. 10 and FC AG_SEND and	Yes; Via FC AG_SEND and AG_RECV, max. via
	FC AG_RECV)	10 CP 443-1 or 443-5
User data per job, max.	8 Kibyte	8 Kibyte
• User data per job (of which consistent), max.	240 byte	240 byte
 Number of simultaneous AG-SEND/AG-RECV 	64/64	64/64
orders per CPU, max.		
Standard communication (FMS)		
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
Open IE communication		
• TCP/IP		Yes; Via integrated PROFINET interface and
101/11		loadable FBs
- Number of connections, max.		94
- Data length, max.		32 Kibyte
 Several passive connections per port, 		Yes
supported		165
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Yes; Via integrated PROFINET interface or
100 011 101 (111 0 1000)	via or 440 17 lav. and loadable 1 B	CP 443-1 and loadable FBs
- Number of connections, max.		94
- Data length, max.	1452	32 Kibyte; 1452 bytes via CP 443-1 Adv.
• UDP	1402	Yes; Via integrated PROFINET interface and
• ODI		loadable FBs
- Number of connections, max.		94
- Data length, max.		1 472 byte
		1 11 2 5 y to
Webserver	N N 00	V
• supported	No; Via CP	Yes
Number of HTTP clients		5
 User-defined websites 		Yes
PROFINET CBA		
(at set setpoint communication load)		
Setpoint for the CPU communication load		20 %
 Number of remote interconnection partners 		32
Number of functions, master/slave		150
Total of all Master/Slave connections		6 000

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Data length of all incoming connections master/		65 000 byte
slave, max. • Data length of all outgoing connections master/ slave, max.		65 000 byte
Number of device-internal and PROFIBUS inter- connections		1 000
Data length of device-internal und PROFIBUS interconnections, max.		16 000 byte
Data length per connection, max. Remote interconnections with acyclic trans-		2 000 byte
mission - Sampling frequency: Sampling time, min.		200 ms; Depending on preset communcation load, number of interconnections and data length used
 Number of incoming interconnections Number of outgoing interconnections Data length of all incoming interconnections, 		500 500 16 000 byte
max. - Data length of all outgoing interconnections, max.		16 000 byte
Data length per connection, max. Remote interconnections with cyclic transmission		2 000 byte
Transmission frequency: Transmission interval, min. Number of incoming interconnections		1 ms; Depending on preset communication load, number of interconnections and data length used 300
Number of outgoing interconnections Data length of all incoming interconnections, max.		300 4 800 byte
- Data length of all outgoing interconnections, max.		4 800 byte
 Data length per connection, max. HMI variables via PROFINET (acyclic) Number of stations that can log on for HMI variables (PN OPC/iMap) 		450 byte 2x PN OPC/1x iMap
 - HMI variable updating - Number of HMI variables - Data length of all HMI variables, max. • PROFIBUS proxy functionality 		500 ms 1 500 48 000 byte
- supported - Data length per connection, max.		Yes; 32 PROFIBUS slaves max. connectable 240 byte; Slave-dependent
Number of connections • overall	64	96
S7 message functions Number of login stations for message functions, max.	63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC)	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes	Yes
SCAN procedure		Yes
Number of messages overall. max.	1 024	1 024
Block related messages	Yes	Yes
Process diagnostic messages		Yes
Simultaneously active Alarm-S blocks, max.	200	1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks
Alarm 8-blocks	Yes	Yes
 Number of instances for alarm 8 and S7 communication blocks, max. 	1 800	4 000
 Preset, max. 	600	600

	6ES7 416-2FN05-0AB0	6ES7 416-3FS06-0AB0
Test commissioning functions Status/control		V 11 1 40 111 111
Status/control variableVariables	Yes Inputs/outputs, memory bits, DB, distributed I/Os, timers, counters	Yes; Up to 16 variable tables Inputs/outputs, memory bits, DB, distributed I/Os, timers, counters
Number of variables, max.	70	70; Status/control
Forcing • Forcing • Force, variables • Number of variables, max.	Yes Inputs/outputs, bit memories, distributed I/Os 512	Yes Inputs/outputs, bit memories, distributed I/Os 512
Status block	Yes	Yes; Up to 16 simultaneously
Single step	Yes	Yes
Number of breakpoints	4	16
Diagnostic buffer present Number of entries, max. adjustable preset	Yes 3 200 Yes 120	Yes 3 200 Yes 120
Isochronous mode		
Isochronous mode	Yes	Yes; Via PROFIBUS DP or PROFINET interface
Number of DP masters with isochronous mode		2
User data per isochronous slave, max.	244 byte	244 byte
Equidistance	Yes	Yes
Shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127	1 ms; 0.5 ms without use of SFC 126, 127
Max. cycle	32 ms	32 ms
Standards, approvals, certificates Configuration software • STEP 7	Yes	Yes
Programming Programming language LAD FBD STL SCL CFC GRAPH HiGraph® Command set Nesting levels Know-how protection User program protection/password protection Block encryption Dimensions and weight Required slots Dimensions	Yes Yes Yes Yes Yes Yes Yes See instruction list 7 Yes	Yes Yes Yes Yes Yes Yes Yes Yes See instruction list 7 Yes Yes; With S7 block Privacy
Width Height Depth	25 mm 290 mm 219 mm	50 mm 290 mm 219 mm
Weight • Weight, approx.	720 g	900 g

Ordering data	Order No.		Order No.
CPU 416F-2	6ES7 416-2FN05-0AB0	MPI cable	6ES7 901-0BF00-0AA0
For configuring safety-related automation systems;		for connection of SIMATIC S7 and PG via MPI; 5 m in length	
5.6 MB RAM, 24 V DC power supply, MPI/PROFIBUS DP		IF 964-DP interface module	6ES7 964-2AA04-0AB0
master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels		For connecting an additional DP line	
CPU 416F-3 PN/DP		Slot number labels	6ES7 912-0AA00-0AA0
For configuring safety-related		1 set (spare part)	
automation systems; 24 V DC power supply, MPI/		Manual "SIMATIC S7-400 programmable controller"	
PROFIBUS DP master interface, PROFINET interface,		incl. instruction list	
PROFIBUS DP master interface,		German	6ES7 498-8AA05-8AA0
receptacle for 1 IF submodule, slot for memory card, incl. slot		English	6ES7 498-8AA05-8BA0
number labels		S7-400 operation list	
11.2 MB work memory	6ES7 416-3FR05-0AB0	German	6ES7 498-8AA05-8AN0
16 MB work memory	6ES7 416-3FS06-0AB0	English	6ES7 498-8AA05-8BN0
Option package S7 F Distributed Safety V5.4		Manual "Communication for SIMATIC S7-300/-400"	
for generating fail-safe programs for the S7-300F		German	6ES7 398-8EA00-8AA0
Floating license	6ES7 833-1FC02-0YA5	English	6ES7 398-8EA00-8BA0
Upgrade from V5.x to V5.4	6ES7 833-1FC02-0YE5	French	6ES7 398-8EA00-8CA0 6ES7 398-8EA00-8DA0
Software Update Service	6ES7 833-1FC00-0YX2	Spanish Italian	6ES7 398-8EA00-8EA0
Memory card RAM		SIMATIC manual collection J	
64 KB	6ES7 952-0AF00-0AA0	Electronic manuals on DVD,	0L37 990-0XC01-01L0
256 KB	6ES7 952-1AH00-0AA0	multilingual: LOGO!, SIMADYN,	
1 MB	6ES7 952-1AK00-0AA0	SIMATIC bus components, SIMATIC C7, SIMATIC distributed	
2 MB	6ES7 952-1AL00-0AA0	I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,	
4 MB	6ES7 952-1AM00-0AA0	SIMATIC PC Based Automation,	
8 MB	6ES7 952-1AP00-0AA0	SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software,	
16 MB	6ES7 952-1AS00-0AA0	SIMATIC TDC	
64 MB	6ES7 952-1AY00-0AA0	SIMATIC manual collection D	6ES7 998-8XC01-8YE2
FEPROM memory card		update service for 1 year	
64 KB	6ES7952-0KF00-0AA0	Current "Manual Collection" DVD and the three subsequent	
256 KB	6ES7952-0KH00-0AA0	updates	
1 MB	6ES7 952-1KK00-0AA0	Brochure "SIMATIC S7-400 programmable controller -	
2 MB	6ES7 952-1KL00-0AA0	Design and application"	
4 MB	6ES7 952-1KM00-0AA0	German	6ES7 498-8AA00-8AB0
8 MB	6ES7 952-1KP00-0AA0	English	6ES7 498-8AA00-8BB0
16 MB	6ES7 952-1KS00-0AA0		
32 MB	6ES7 952-1KT00-0AA0		
64 MB	6ES7 952-1KY00-0AA0		

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Ordering data	Order No.	Order No.		
PROFIBUS bus components		PROFINET bus components		
RS 485 bus connector with 90° cable outlet		IE FC TP standard cable GP 2x2	6XV1 840-2AH10	
Max. transfer rate 12 Mbit/s		4-core, shielded TP installation		
Without PG interface	6ES7 972-0BA12-0XA0	cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug;		
With PG interface	6ES7 972-0BB12-0XA0	PROFINET-compatible; with UL		
RS 485 bus connector with angled cable outlet		approval; Sold by the meter		
Max. transfer rate 12 Mbit/s		FO standard cable GP (50/125)	6XV1 873-2A	
Without PG interface	6ES7 972-0BA42-0XA0	Standard cable, splittable, UL approval, sold by the meter		
With PG interface	6ES7 972-0BB42-0XA0	SCALANCE X204-2 Industrial	6GK5 204-2BB10-2AA3	
RS 485 bus connector with		Ethernet Switch	0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0	
90° cable outlet for Fast Connect system		Industrial Ethernet Switches with		
Max. transfer rate 12 Mbit/s		integral SNMP access, web diagnostics, copper cable		
without PG interface		diagnostics and PROFINET diagnostics for configuring line,		
• 1 unit	6ES7 972-0BA52-0XA0	star and ring topologies; four		
• 100 units	6ES7 972-0BA52-0XB0	10/100 Mbit/s RJ45 ports and two FO ports		
with PG interface • 1 unit	6ES7 972-0BB52-0XA0	IE FC RJ45 plugs		
• 100 units	6ES7 972-0BB52-0XB0	RJ45 plug connector for Indus-		
RS 485 bus connector with		trial Ethernet with a rugged metal enclosure and integrated		
axial cable outlet		insulation displacement contacts		
For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1 500-0EA02	for connecting Industrial Ethernet FC installation cables		
PROFIBUS FastConnect bus cable		IE FC RJ45 plug 180		
Standard type with special	6XV1 830-0EH10	180° cable outlet		
design for quick mounting,	0XV1 030-0EH10	1 unit	6GK1 901-1BB10-2AA0	
2-core, shielded, sold by the meter, max. delivery unit 1000 m,		10 units	6GK1 901-1BB10-2AB0	
minimum ordering quantity 20 m		50 units	6GK1 901-1BB10-2AE0	
RS 485 repeater for PROFIBUS	6ES7 972-0AA02-0XA0	PROFIBUS/PROFINET bus components	see Catalogs IK PI, CA 01	
Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure		For establishing MPI/PROFIBUS/ PROFINET communication		

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Central processing units Fault-tolerant CPUs

CPU 412H, CPU 414H, CPU 417H

Overview CPU 412H



- CPU for the SIMATIC S7-400H and S7-400F/FH
- Can be used in S7-400H fault-tolerant systems
- Can be used with F runtime license as F-enabled CPU in S7-400F/FH safety-related systems
- With combined MPI/PROFIBUS DP master interface
- With 2 connection slots for synchronization modules

Overview CPU 414H



- CPU for SIMATIC S7-400H and S7-400F/FH.
- Can be used in high availability S7-400H systems
- Can be used with F-runtime license and F-compatible CPU in failsafe S7-400F/FH systems
- With integrated PROFIBUS DP master interface
- With 2 connection slots for sync modules

Overview CPU 417H



- CPU for SIMATIC S7-400H and S7-400F/FH
- Can be used in high availability S7-400H systems
- Can be used with F-runtime license and F-compatible CPU in failsafe S7-400F/FH systems
- With integrated PROFIBUS DP master interface
- With 2 connection slots for sync modules

Technical specifications

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
Product version			
Hardware product version	1	1	1
Firmware version	V4.5	V4.5	V4.5
associated programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update
Supply voltages			
Rated value			
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
Feeding of external backup voltage to CPU	5 to 15 V DC	5 to 15 V DC	5 to 15 V DC
Current consumption			
from backplane bus 5 V DC, max.	1.5 A	1.7 A	1.8 A
from interface 5 V DC, max.	90 mA; At each DP interface	90 mA; At each DP interface	90 mA; At each DP interface
Power losses			
Power loss, typ.	5.5 W	6 W	6.5 W
Backup battery			
Battery operation			
Backup current, typ.	190 μA; Valid up to 40°C	190 μA; Valid up to 40°C	970 μA; Valid up to 40°C
Backup current, max.	660 μA	660 μA	1 980 μΑ
Memory			
Work memory	540 1/1	4.440	45.80
• integrated (for program)	512 Kibyte	1.4 Mbyte	15 Mbyte
• integrated (for data)	256 Kibyte	1.4 Mbyte	15 Mbyte
expandable	No	No	No
Load memory			
expandable FEPROM	Yes	Yes	Yes
expandable FEPROM, max.	64 Mbyte	64 Mbyte	64 Mbyte
 integrated RAM, max. 	256 Kibyte	256 Kibyte	256 Kibyte
 expandable RAM 	Yes	Yes	Yes
 expandable RAM, max. 	64 Mbyte	64 Mbyte	64 Mbyte
Backup			
• present	Yes	Yes	Yes
with battery	Yes; All data	Yes; All data	Yes; All data
without battery	No	No	No
CPU-blocks			
DB			
Number, max.	4 095; Number range: 1 to 4095	4 095; Number range: 1 to 4095	8 191; Number range: 1 - 8191
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
 Number, max. 	2 048; Number range: 0 to 2047	2 048; Number range: 0 to 2047	6 144; Number range: 0 - 6143
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
Number, max.	2 048; Number range: 0 to 2047	2 048; Number range: 0 to 2047	6 144; Number range: 0 - 6143
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
ОВ			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth			
• per priority class	24	24	24
i i i i i i i i i i i i i i i i i i i	1	1	2

SIMATIC S7-400 Central processing units

Central processing units
Fault-tolerant CPUs
CPU 412H, CPU 414H, CPU 417H

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
CPU processing times			
for bit operations, min.	0.075 μs	0.045 μs	0.018 μs
for word operations, min.	0.075 μs	0.045 µs	0.018 µs
for fixed point arithmetic, min.	0.075 μs	0.045 µs	0.018 µs
for floating point arithmetic, min.	0.225 µs	0.135 µs	0.054 µs
Counters, timers and their	6.226 ps	σ. 100 μο	0.00 г. ро
retentivity			
S7 counter			
Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	Z 0 to Z 7	Z 0 to Z 7	Z 0 to Z 7
 Counting range 			
- lower limit	0	0	0
- upper limit	999	999	999
IEC counter			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
S7 times			
Number	2 048	2 048	2 048
Retentivity			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	2 047	2 047	2 047
- preset	No times retentive	No times retentive	No times retentive
Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Data areas and their retentivity			
retentive data area, total	Total working and load memory	Total working and load memory	Total working and load memory
	(with backup battery)	(with backup battery)	(with backup battery)
Flag			
Number, max.	8 Kibyte	8 Kibyte	16 Kibyte
 Retentivity available 	Yes	Yes	Yes
 Number of clock memories 	8; (in 1 memory byte)	8; (in 1 memory byte)	8; (in 1 memory byte)
Data blocks			
Number, max.	4 095; Number range: 1 to 4095	4 095; Number range: 1 to 4095	8 191; Number range: 1 - 8191
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Local data			
adjustable, max.	16 Kibyte	16 Kibyte	64 Kibyte
• preset	8 Kibyte	8 Kibyte	32 Kibyte
Address area	-		
I/O address area			
• overall	8 Kibyte	8 Kibyte	16 Kibyte
• Outputs	8 Kibyte	8 Kibyte	16 Kibyte
of which, distributed	- 1 7		
- MPI/DP interface, inputs	2 Kibyte	2 Kibyte	2 Kibyte
- MPI/DP interface, outputs	2 Kibyte	2 Kibyte	2 Kibyte
- DP interface, inputs	,	6 Kibyte	8 Kibyte
- DP interface, outputs		6 Kibyte	8 Kibyte
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recinical specifications (contin	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
Process image	THE CHEST ON BU		
 Inputs, adjustable Outputs, adjustable Inputs, preset Outputs, preset Consistent data, max. Access to consistent data in process image 	8 Kibyte 8 Kibyte 256 byte 256 byte 244 byte Yes	8 Kibyte 8 Kibyte 256 byte 256 byte 244 byte Yes	16 Kibyte 16 Kibyte 1 024 byte 1 024 byte 244 byte Yes
Subprocess images • Number of subprocess images, max.	15	15	15
Digital channels Inputs Outputs Inputs, of which central Outputs, of which central	65 536 65 536 65 536 65 536	65 536 65 536 65 536 65 536	131 072 131 072 131 072 131 072
Analog channels Inputs Outputs Inputs, of which central Outputs, of which central Hardware configuration	4 096 4 096 4 096 4 096	4 096 4 096 4 096 4 096	8 192 8 192 8 192 8 192
connectable OPs	15 without message processing, 8 with message processing	31 without message processing, 8 with message processing	63 without message processing, 16 with message processing
Central devices, max.	1	1	1
Expansion devices, max.	21	21	21
Multicomputing	No	No	No
Interface modules • Number of connectable IMs (total), max. • Number of connectable IMs 460, max.	6	6	6
Number of connectable IMs 463, max.	4; Single mode only	4; Single mode only	4; Single mode only
Number of DP masters • integrated • via CP • Mixed mode IM + CP permitted • via interface module	1 10 No 0	2 10 No	2 10 No
Number of operable FMs and CPs (recommended)			
FMCP, point-to-point	See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections	See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections	See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections
PROFIBUS and Ethernet CPs	14; Of which max. 10 CP as DP master	14; Of which max. 10 CP as DP master	14; Of which max. 10 CP as DP master
Time Clock			
 Hardware clock (real-time clock) battery-backed and synchronizable Resolution 	Yes Yes 1 ms	Yes Yes 1 ms	Yes Yes 1 ms
Runtime meter • Number	8	8	8

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
Clock synchronization			
supported	Yes	Yes	Yes
• to MPI, master	Yes	Yes	Yes
• to MPI, slave	Yes	Yes	Yes
to DP, master	Yes	Yes	Yes
• to DP, slave	Yes	Yes	Yes
• in AS, master	Yes	Yes	Yes
• in AS, slave	Yes	Yes	Yes
S7 message functions Number of login stations for message functions, max.	8	8	16
Symbol-related messages	No	No	No
Block related messages	Yes	Yes	Yes
Alarm 8-blocks	Yes	Yes	Yes
Process control messages	Yes	Yes	Yes
Test commissioning functions Status/control • Status/control variable	Yes	Yes	Yes
Forcing • Forcing	Yes	Yes	Yes
Status block	Yes	Yes	Yes
Single step	Yes	Yes	Yes
Number of breakpoints	4	4	4
Diagnostic buffer present Number of entries, max. adjustable preset	Yes 3 200 Yes 120	Yes 3 200 Yes 120	Yes 3 200 Yes 120
Communication functions PG/OP communication	Yes	Yes	Yes
Routing	Yes	Yes	Yes
Global data communication • supported	No	No	No
S7 basic communication • supported	No	No	No
S7 communication • supported • as server • as client • User data per job, max.	Yes Yes Yes 64 Kibyte	Yes Yes Yes 64 Kibyte	Yes Yes Yes 64 Kibyte
S5-compatible communication supported User data per job, max.	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) 8 Kibyte	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) 8 Kibyte	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) 8 Kibyte
Standard communication (FMS) • supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
Number of connections • overall	16	32	64

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
1st interface			
Type of interface	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
Isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA	150 mA	150 mA
Number of connection resources	MPI: 16, DP: 16	MPI: 32, DP: 32	MPI: 44, DP: 32
Functionality	· · · · · · · · · · · · · · · · · · ·	·	·
• MPI	Yes	Yes	Yes
DP master	Yes	Yes	Yes
• DP slave	No	No	No
MPI			
Number of connections	16	32	44
Services	· ·		
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	No	No	No
 Global data communication S7 basic communication 	No No	No No	No No
- S7 communication	Yes	Yes	Yes
- S7 communication, as client			Yes
- S7 communication, as server			Yes
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
DP master			
 Number of connections, max. 	16	16	32
Services			
 PG/OP communication 	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes
- S7 communication, as client			Yes
- S7 communication, as server			Yes
- Equidistance mode support	No	No	No
- SYNC/FREEZE	No	No	No
- Activation/deactivation of	No	No	No
DP slaves			
 Direct data exchange (slave-to-slave communication) 	No	No	No
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Number of DP slaves, max.	32	32	32
Address area	02	02	02
- Inputs, max.	2 Kibyte	2 Kibyte	2 Kibyte
- Outputs, max.		*	2 Kibyte
	2 Kibyte	2 Kibyte	2 Mbyte
User data per DP slave Lagr data per DP slave may	244 byto	244 byto	244 byto
- User data per DP slave, max.	244 byte	244 byte	244 byte
- Inputs, max.	244 byte	244 byte	244 byte
- Outputs, max.	244 byte	244 byte	244 byte
- Slots, max.	244	244	244
- per slot, max.	128 byte	128 byte	128 byte
DP slave			
Number of connections	No configuration of CPU as DP		
	slave		

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
2nd interface			
Type of interface		Integrated	Integrated
Physics		RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
solated		Yes	Yes
Power supply to interface		150 mA	150 mA
(15 to 30 V DC), max.		100 110 (100 111/1
Number of connection resources		16	32
unctionality			
DP master		Yes	Yes
DP slave		No	No
OP master			
Number of connections, max.		16	32
Services			
- PG/OP communication		Yes	Yes
- Routing		Yes	Yes
- Global data communication		No	No
- S7 basic communication		No	No
- S7 communication		Yes	Yes
- Equidistance mode support		No	No
- SYNC/FREEZE		No	No
 Activation/deactivation of DP slaves 		No	
- Direct data exchange		No	No
(slave-to-slave communication)		40.540.07	40.44.37
Transmission rate, max.		12 Mbit/s	12 Mbit/s
Number of DP slaves, max.		96	125
Address area			
- Inputs, max.		6 Kibyte	8 Kibyte
- Outputs, max.		6 Kibyte	8 Kibyte
User data per DP slave			
 User data per DP slave, max. 		244 byte	244 byte
- Inputs, max.		244 byte	244 byte
- Outputs, max.		244 byte	244 byte
- Slots, max.		244	244
- per slot, max.		128 byte	128 byte
Brd interface			
Type of interface	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization submodule	Synchronization submodule	Synchronization submodule
	IF 960 6ES7 960-1AA04-0XA0	IF 960 6ES7 960-1AA04-0XA0 or 6ES7 960-1AB04-0XA0	IF 960 6ES7 960-1AA04-0XA0 or 6ES7 960-1AB04-0XA0
th interface			
Type of interface	Pluggable synchronization	Pluggable synchronization	Pluggable synchronization
	submodule (FO)	submodule (FO)	submodule (FO)
Plug-in interface modules	Synchronization submodule	Synchronization submodule	Synchronization submodule
	IF 960 6ES7 960-1AA04-0XA0	IF 960 6ES7 960-1AA04-0XA0 or 6ES7 960-1AB04-0XA0	IF 960 6ES7 960-1AA04-0XA0 or 6ES7 960-1AB04-0XA0
sochronous mode			
sochronous mode	No		
Equidistance	No		
CiR - Configuration in RUN			
CiR synchronization time, basic load	150 ms	100 ms	60 ms
CiR synchronization time, time per I/	40 µs	25 μs	10 μs
O slave		·	

	6ES7 412-3HJ14-0AB0	6ES7 414-4HM14-0AB0	6ES7 417-4HT14-0AB0
Programming			
Configuration software			
• STEP 7	Yes; With hardware update as of STEP7 V5.3 SP2	Yes; With hardware update as of STEP7 V5.3 SP2	Yes; With hardware update as of STEP7 V5.3 SP2
Programming language			
• STEP 7	Yes	Yes	Yes
• LAD	Yes	Yes	Yes
• FBD	Yes	Yes	Yes
• STL	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
• CFC	Yes	Yes	Yes
• GRAPH	Yes	Yes	Yes
HiGraph®	Yes	Yes	Yes
Nesting levels	8	8	8
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
Dimensions			
Required slots	2	2	2
Dimensions and weight			
Dimensions			
Width	50 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
Weight			
Weight, approx.	990 g	995 g	995 g

Ordering data	Order No.		Order No.
CPU 412-3H	6ES7 412-3HJ14-0AB0	CPU 417-4H	6ES7 417-4HT14-0AB0
For S7-400H and S7-400F/FH; 768 KB work memory, combined MPI/PROFIBUS DP master interface, 2 slots for sync modules, slot for memory card, incl. slot number labels		For S7-400H and S7-400F/FH; 30 MB work memory, MPI/ PROFIBUS DP master interface, 2 slots for sync modules, slot for memory card, incl. slot number labels	
CPU 412-3H system bundle		Memory card RAM	
Not assembled, comprising:		1 MB	6ES7 952-1AK00-0AA0
UR2-H rack, 2 x PS 405/407 power supply, 2 x CPU 412-3H,		2 MB	6ES7 952-1AL00-0AA0
2 x memory card RAM (1 MB),		4 MB	6ES7 952-1AM00-0AA0
4 x sync module (for max. 10 m), 2 x fiber-optic connecting cable		8 MB	6ES7 952-1AP00-0AA0
for sync modules (1 m), 4 x backup battery		16 MB	6ES7 952-1AS00-0AA0
412H system bundle, 1 MB,	6ES7 400-0HR00-4AB0	64 MB	6ES7 952-1AY00-0AA0
120/230 V AC, 10 A	0E37 400-0FR00-4AD0	FEPROM memory card	
412H system bundle, 1 MB,	6ES7 400-0HR50-4AB0	1 MB	6ES7 952-1KK00-0AA0
24/48/60 V DC, 10 A		2 MB	6ES7 952-1KL00-0AA0
CPU 414-4H	6ES7 414-4HM14-0AB0	4 MB	6ES7 952-1KM00-0AA0
For S7-400H and S7-400F/FH; 2.8 MB work memory, MPI/		8 MB	6ES7 952-1KP00-0AA0
PROFIBUS DP master interface,		16 MB	6ES7 952-1KS00-0AA0
2 slots for sync modules, slot for memory card, incl. slot number		32 MB	6ES7 952-1KT00-0AA0
labels		64 MB	6ES7 952-1KY00-0AA0
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Ordering data	Order No.		Order No.
MPI cable	6ES7 901-0BF00-0AA0	SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
For connecting SIMATIC S7 and the PG through MPI; 5 m in length		Current "Manual Collection" DVD	
Slot number labels	6ES7 912-0AA00-0AA0	and the three subsequent updates	
1 set (spare part)		Brochure "SIMATIC S7-400	
S7 F systems RT license	6ES7 833-1CC00-6YX0	automation system - design and application"	
For processing safety-related user programs, for one S7 400H-		German	6ES7 498-8AA00-8AB0
based system each with CPU 412-3H, CPU 414-4H or		English	6ES7 498-8AA00-8BB0
CPU 417-4H		RS 485 bus connector with 90° cable outlet	
S7 F systems V6.1	6ES7 833-1CC02-0YA5	Max. transmission rate 12 Mbit/s	
Programming and configuration environment for creating and		Without PG interface	6ES7 972-0BA12-0XA0
using safety-related STEP 7 programs for an S7 400H-based		With PG interface	6ES7 972-0BB12-0XA0
target system, floating license for 1 user, executes with Windows XP		RS 485 bus connector with angled cable outlet	
Prof SP2, Windows XP Prof SP2/ SP3, Windows Server 2003 SP2		Max. transmission rate 12 Mbit/s	
2 languages (German, English) Type of delivery:		Without PG interface	6ES7 972-0BA42-0XA0
Certificate of License as well as		With PG interface	6ES7 972-0BB42-0XA0
software and electronic documentation on CD		Max. transmission rate 1.5 Mbit/s	
S7 F systems upgrade from	6ES7 833-1CC02-0YE5	Without PG interface	6ES7 972-0BA30-0XA0
V5.x/V6.0 to V6.1 2 languages (German, English), Floating License for 1 user Type of delivery:	0207 000 10002 0120	RS 485 bus connector with 90° cable outlet for FastConnect connection system	
Certificate of License as well as		Max. transmission rate 12 Mbit/s	
software and electronic documentation on CD		Without PG interface	
Manual "Communication for		• 1 unit	6ES7 972-0BA52-0XA0
SIMATIC S7-300/-400"		100 units With PG interface	6ES7 972-0BA52-0XB0
German	6ES7 398-8EA00-8AA0	• 1 unit	6ES7 972-0BB52-0XA0
English	6ES7 398-8EA00-8BA0	• 100 units	6ES7 972-0BB52-0XB0
French	6ES7 398-8EA00-8CA0	RS 485 bus connector with	
Spanish	6ES7 398-8EA00-8DA0	axial cable outlet	001/4 500 05 400
Italian	6ES7 398-8EA00-8EA0	For SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	6GK1 500-0EA02
SIMATIC manual collection 5	6ES7 998-8XC01-8YE0	PROFIBUS FastConnect bus	
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		cable Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1 830-0EH10

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SIMATIC S7-400 Central processing units

Sync-module for coupling the CPU 41xH

Overview



- For coupling the two CPU 41xH in the S7-400H subunits.
- Can be plugged directly into the CPU

Technical specifications

	6ES7 960-1AA04-0XA0	6ES7 960-1AB04-0XA0
Current consumption		
from CPU, max.	210 mA	250 mA
Power losses		
Power loss, typ.	1.1 mW	1.3 mW
Dimensions and weight		
Dimensions		
• Width	25 mm	25 mm
Height	53 mm	53 mm
• Depth	140 mm	140 mm
Weight		
 Weight, approx. 	65 g	65 g

Ordering data	Order No.		Order No.
Sync module		Fiber-optic connecting cable	
for coupling the CPU 41xH for S7-400H/F/FH; 2 modules required per CPU;		For Sync module 6ES7 960-1Ax04-0XA0 • 1 m	6ES7 960-1AA04-5AA0
For 6ES7 412-3HJ14-0AB0, 6ES7 414-4HM14-0AB0 and 6ES7 417-4HT14-0AB0; for patch cable, can be used for fiber-optic cables up to 10 m in length	6ES7 960-1AA04-0XA0	• 2 m • 10 m For Sync module 6ES7 960-1AB04-0XA0; fiber-optic monomode	6ES7 960-1AA04-5BA0 6ES7 960-1AA04-5KA0 On request
For 6ES7 414-4HM14-0AB0 and 6ES7 417-4HT14-0AB0; for patch and installation cables, can be used for fiber-optic cables up to 10 km in length	6ES7 960-1AB04-0XA0	LC/LC duplex crossed 9/125 μ (max. 10 km)	

I: Subject to export regulations AL: N and ECCN: EAR99H

Central processing units

Y-Link for S7-400H

Overview



- Bus coupler for the transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- To connect devices with a single PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

Technical specifications

	6ES7 153-2BA02-0XB0
Power supply	
Input current	
Rated value at 24 V DC	650 mA
Output voltage	
Rated value, 5 V DC	Yes
Output current	
• for backplane bus (5 V DC), max.	1.5 A
Supply voltages	
Rated value	
• 24 V DC	Yes
 permissible range (ripple included), lower limit (DC) 	20.4 V
permissible range (ripple	28.8 V
included), upper limit (DC)	20.0 ¥
External protection for supply	2.5 A
cables (recommendation)	
Mains buffering	
 Mains/voltage failure stored 	5 ms
energy time	
Current consumption	
Current consumption, max.	600 mA
Inrush current, typ.	3 A
l ² t	0.1 A ² ·s
Power losses	
Power loss, typ.	5.5 W
Address area	
Addressing volume	
Outputs	244 byte
• Inputs	244 byte
Hardware configuration	
Number of modules per DP slave	12
interface module, max.	

6ES7 153-2BA02-0XB0
PROFIBUS DP to EN 50170
70 mA
Yes
No
9-pin sub D
RS 485
12 Mbit/s
1 to 125 permitted
Yes
Yes
Yes
Yes; Sender
SI04801.GSG Yes
Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file

SIMATIC S7-400 Central processing units

Y-Link for S7-400H

	6ES7 153-2BA02-0XB0
Time stamping	
Accuracy	1 ms; 1ms at up to 8 modules;
recuracy	10ms at up to 12 modules
Number of message buffers	15
Messages per message buffer	20
Number of stampable digital inputs,	128; Max. 128 signals/station;
max.	max. 32 signals/slot
Time format	RFC 1119
Time resolution	0.466 ns
Time interval for transmitting the	1 000 ms
message buffer if a message is present	
	riging / folling odgs on signal
Time stamp on signal change	rising / falling edge as signal entering or exiting
Isolation	
Isolation checked with	Isolation voltage 500 V
	1001ation voltage 000 v
Environmental requirements Operating temperature	
Min	0°C
• Max.	60 °C
Air pressure	2.000 m
 Operating altitude above sea level, max. 	3 000 m
Degree of protection	
IP20	Yes
General information	
Vendor identification (VendorID)	801Eh
Dimensions and weight	
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weight	
 Weight, approx. 	360 g

	6ES7 197-1LB00-0XA0
Product type designation Requirements for DP master system	
 Length of parameter assignment message 	244 byte
Supply voltages Description	via bus module
Rated value	
 permissible range, lower limit (DC) permissible range, upper limit (DC) 	20.4 V 28.8 V
Protocols PROFIBUS DP protocol	Yes
PROFIBUS DP	
Properties of the lower-level DP master systems	
Transmission rate, max.	12 Mbit/s; 45.45 Kbit/s to 12 Mbit/s
 Termination of lower-level DP master system Use of OLM/OBT 	Active terminating resistor (Bus Terminator) Yes
• Use of RS 485 repeaters, max.	9
Number of DP slaves, max.	31; 64 when using RS 485 repeaters or OLM/OBT
Alarms/diagnostics/status information	
Status indicator	No
Alarms • Alarms	No
Diagnostics • Diagnostic functions	Yes
Galvanic isolation	
to lower-level DP master system	Yes
Dimensions and weight	
Dimensions	40 mm
WidthHeight	40 mm 125 mm
• Depth	130 mm
Weight	
Weight, approx.	200 g

SIMATIC S7-400 Central processing units

Y-Link for S7-400H

Ordering data	Order No.		Order No.
For use with STEP 7 from V5.4 or PCS 7 from V7.0:		For use with PCS 7 V6.0 or higher:	
Y-Link	6ES7 197-1LA04-0XA0	Y-Link	6ES7 197-1LA11-0XA0
For connecting single-channel DP slaves to SIMATIC S7-400H; consisting of 2 IM 153 interface modules (6ES7 153-2BA02-0XB0), 1 Y coupler (6ES7 197-1LB00-0XA0), 1 BM IM/IM bus module (6ES7 195-7HD80-0XA0), 1 BM Y coupler bus module (6ES7 654-7HY00-0XA0)	For connecting single-channel DP slaves to SIMATIC S7-400H; consisting of 2 IM 153 interface modules (6ES7 153-2BA82-0XB0), 1 Y coupler (6ES7 197-1LB00-0XA0), 1 BM IM/IM bus module (6ES7 195-7HD80-0XA0), 1 BM Y coupler bus module (6ES7 654-7HY00-0XA0)		
		Accessories Mounting rail	
		For assembling the Y link with active bus modules • Length 483 mm • Length 530 mm	6ES7 195-1GA00-0XA0 6ES7 195-1GF30-0XA0

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-400 Central processing units SIPLUS fault-tolerant CPUs

SIPLUS CPU 412H

Overview



- CPU for SIMATIC S7-400H and S7-400F/FH
- Usable in high-availability systems S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/ FH safety-related systems
- Features a combined MPI/PROFIBUS DP master interface
- Features 2 connection slots for sync modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 412-3HJ14-4AB0
Order No. based on	6ES7 412-3HJ14-0AB0
Ambient temperature range	0 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases! The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS CPU 412-3H	6AG1 412-3HJ14-4AB0
(medial exposure)	
for S7-400H and S7-400F/FH; 768 KB work memory, combined MPI/PROFIBUS DP master interface, 2 slots for sync modules, slot for memory card, including the mounting position labels	
Accessories	See SIMATIC CPU 412-3H, page 6/82

Central processing units SIPLUS fault-tolerant CPUs

SIPLUS CPU 414H

Overview



CPU for SIMATIC S7-400H and S7-400F/FH

- Usable in high-availability systems S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/ FH safety-related systems
- With integral PROFIBUS DP master interface
- Features 2 connection slots for sync modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CPU 414-4H		
Order number	6AG1 414-4HM14-4AB0	
Order No. based on	6ES7 414-4HM14-0AB0	
Ambient temperature range	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ¹⁾²⁾
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data

SIPLUS CPU 414-4H	L	6AG1 414-4HM14-4AB0
(medial exposure)		
For S7-400H and S7-400F/FH; work memory 2.8 MB, MPI/ PROFIBUS DP master interface, 2 slots for synchronization modules, slot for memory card, incl. slot number labels		
Accessories		See SIMATIC CPU 414-4H, page 6/82

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-400 Central processing units SIPLUS fault-tolerant CPUs

SIPLUS CPU 417H

Overview



CPU for SIMATIC S7-400H and S7-400F/FH

- Usable in high-availability systems S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/ FH safety-related systems
- With integral PROFIBUS DP master interface
- Features 2 connection slots for sync modules

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS CPU 417H
Order number	6AG1 417-4HT14-4AB0
Order No. based on	6ES7 417-4HT14-0AB0
Ambient temperature range	0 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- ²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS CPU 417H		
(medial exposure)		
for S7-400H and S7-400F/FH; 30 MB work memory, MPI/ PROFIBUS DP master interface, 2 slots for sync modules, slot for memory card, incl. slot number labels	Н	6AG1 417-4HT14-4AB0
Accessories		See SIMATIC CPU 417-4H, page 6/82

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Central processing units
SIPLUS sync module for connecting
the CPU 41xH

Overview



- For linking the two CPUs 414-4H/417-4H in the subunits of the S7-400H
- Can be plugged direct into the CPU

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 4.0 ppm; $HCI < 4.0 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

SIPLUS sync module (up to 10 m)		
Order number	6AG1 960-1AA04-4XA0	
Order number based on	6ES7 960-1AA04-0XA0	
Ambient temperature range	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic compo- nents	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

Ordering data

SIPLUS Sync module	6AG1 960-1AA04-4XA0
(medial exposure)	
for coupling the CPU 41xH for S7-400H/F/FH; 2 modules required per CPU;	
Accessories	See SIMATIC Sync module, page 6/84

L: Subject to export regulations AL: 91999 and ECCN: N

Central processing units

SIPLUS Y-Link for S7-400H

Overview



- Bus coupler for transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- For connection of devices with only one PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS Y-Link for S7-400H	SIPLUS S7 BUS MODULE BM Y-coupler	
Order No.	6AG1 197-1LA11-4XA0	6AG1 654-7HY00-7XA0	
Order No. based on	6ES7 197-1LA11-0XA0	6ES7 654-7HY00-0XA0	
Ambient temperature range	0 °C to +60 °C	-25 °C to +70 °C	
Conformal coating	Coating of the printed circuit boards ar	nd the electronic components	
Technical data	The technical data of the standard pro-	duct applies except for the ambient conditions.	
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3	B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3	S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range		
	795 658 hPa (+2000 +3500 m) derating 10 K		
	658 540 hPa (+3500 +5000 m) derating 20 K		

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; $H_2S <$ 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2S <$ 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm

Order No.

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
For use with STEP 7 from V5.4 or PCS 7 from V7.0:	
SIPLUS Y-Link for S7-400H H	6AG1 197-1LA11-4XA0
(medial exposure)	
for connecting single-channel DP slaves to SIMATIC S7-400H; consisting of 2 IM 153 interface modules, 1 Y-coupler, 1 BM IM/IM bus module, 1 BM Y-coupler bus module	

Accessories	
SIPLUS S7 BUS MODULE BM Y-coupler	6AG1 654-7HY00-7XA0
(medial exposure)	
Additional accessories	See SIMATIC Y-Link, page 6/87

L: Subject to export regulations AL: 91999 and ECCN: N

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Central processing units
Interface modules
IF-964 DP PROFIBUS module

Overview



- To connect distributed I/Os over PROFIBUS DP
- Max. transmission rate 12 Mbit/s
- Electrically isolated RS 485 interface
- Connection via 9-pin sub-D connector
- The following connection options are available for each S7-400 CPU:
 - A PROFIBUS module in the CPUs 414-3, 414(F)-3 PN/DP, 416-3, 416(F)-3 PN/DP - Two PROFIBUS modules in the CPU 417-4

Note:

Can only be used with CPUs 6ES7 414-3XM05-0AB0, 6ES7 414-3EM05-0AB0, 6ES7 414-3EM06-0AB0, 6ES7 414-3FM06-0AB0, 6ES7 416-3XR05-0AB0, 6ES7 416-3ER05-0AB0, 6ES7 416-3ES06-0AB0, 6ES7 416-3FS06-0AB0 and 6ES7 417-4XT05-0AB0.

Technical specifications

	6ES7 964-2AA04-0AB0
Current consumption	
from CPU, max.	150 mA; Current consumption from S7-400 bus: The module uses no current at 24 V, it provides this voltage only at the DP interface. Total current consumption of the components connected to the DP interface, but maximum 150 mA. Current carrying capacity of the isolated 5 V (P5ext) maximum 90 mA, current carrying capacity of the 24 V maximum 150 mA.
Power losses	
Power loss, typ.	1 W
Communication functions	
Number of connections	
overall	device-dependent
PROFIBUS DP	
Cable length, max.	1 200 m; at 9.6 Kbit/s: 1200 m max.; at 12 Mbit/s: 100 m max.
1st interface	
Physics	RS 485
Isolated	Yes
Functionality	
DP master	Yes; Default setting
DP slave	Yes
DP master Services PG/OP communication Equidistance mode support SYNC/FREEZE Direct data exchange (slave-to-slave communication) Transmission rate, max. Transmission rate, min. Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. Outputs, max.	Yes Yes Yes Yes Yes 12 Mbit/s 9.6 kbit/s 125; depending on the CPU used device-dependent device-dependent 244 byte 244 byte
Dimensions and weight Dimensions • Width • Height • Depth	26 mm 54 mm 130 mm
Weight ● Weight, approx.	65 g

Ordering data	Order No.
IF-964 DP interface module	6ES7 964-2AA04-0AB0
Interface module with integral PROFIBUS DP master interface	

Central processing units SIPLUS interface modules

SIPLUS interface modules

IF-964 DP SIPLUS interface module

Overview



- To connect distributed I/O via PROFIBUS DP
- Max. transmission rate 12 Mbit/s
- Electrically isolated RS-485 interface
- Connection via 9-pin Sub-D socket
- Depending on the S7-400 CPU, one or two PROFIBUS modules are pluggable:
 - CPU 414-3/416-3: 1 module
 - CPU 417-4: 2 modules

Notes

Can only be used with the CPUs 6AG1 416-3XR05-4AB0, 6AG1 416-3ER05-4AB0 and 6AG1 417-4XT05-4AB0.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	IF-964 DP SIPLUS PROFIBUS module
Order No.	6AG1 964-2AA04-2AB0
Order No. based on	6ES7 964-2AA04-0AB0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; H $_2 \rm S < 9.9$ ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2 \rm S <$ 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
IF-964 DP SIPLUS interface L	6AG1 964-2AA04-2AB0
(extended temperature range and medial exposure)	
Interface module with integrated PROFIBUS DP master interface	

L: Subject to export regulations AL: 91999 and ECCN: N

SM 421 digital input module

Overview



- Digital inputs for the SIMATIC S7-400
- For connecting standard switches and two-wire proximity switches (BERO)

Technical specifications

	6ES7 421-7BH01- 0AB0	6ES7 421-1BL01- 0AA0	6ES7 421-1EL00- 0AA0	6ES7 421-1FH20- 0AA0	6ES7 421-7DH00- 0AB0
Supply voltages					
Load voltage L+					
 Rated value (DC) 	24 V				
 Permissible range, lower limit (DC) 	20.4 V				
 Permissible range, upper limit (DC) 	28.8 V				
Current consumption					
from backplane bus 5 V DC, max.	130 mA	20 mA	200 mA	80 mA	150 mA
from supply voltage L+, max.	120 mA				
Power losses					
Power loss, max.	5 W	6 W	16 W	12 W	8 W; 3.5 W (24 V DC); 6.5 W (48 V DC); 8.0 W (60 V DC)
Digital inputs					
Number of digital inputs	16	32	32	16	16
Number of simultaneously controllable inputs all mounting positions					
- Concurrently control- lable inputs, up to 40 °C	16	32	32	16	16
- Concurrently control- lable inputs, up to 60 °C	16	32	32	16	16
Input voltage					
 Rated value, DC 	24 V	24 V			
 Rated value, UC 			120 V	230 V; 120/230 V UC	24 V; 24 to 60 V UC
• for signal "0"	-30 to +5 V DC	-30 to +5 V DC	0 to 20 V UC	0 to 40 V AC/ -40 to +40 V DC	-6 to +6 V DC/ 0 to 5 V AC
• for signal "1"	11 to 30 V DC	13 to 30 V DC	79 to 132 V AC; 80 to 132 V DC	74 to 264 V AC; 80 to 264 V DC, -80 to -264 V	15 to 72 V DC; -15 to -72 V DC; 15 to 60 V AC
• Frequency range			47 to 63 Hz	47 to 63 Hz	47 to 63 Hz AC / DC

SM 421 digital input module

	6ES7 421-7BH01- 0AB0	6ES7 421-1BL01- 0AA0	6ES7 421-1EL00- 0AA0	6ES7 421-1FH20- 0AA0	6ES7 421-7DH00- 0AB0
Input current • for signal "0", max. (permissible quiescent current)		1.3 mA	1 mA	6 mA; AC: 6 mA; DC: 2 mA	
• for signal "1", typ.	6 mA; 6 to 8 mA	7 mA	2 mA; 2 to 5 mA	10 mA; at 120 V: 10 mA AC, 1.8 mA DC; at 230 V: 14 mA AC, 2 mA DC	4 mA; 4 to 10 mA
Input delay (for rated value of input voltage) • for standard inputs - parameterizable - Rated value	Yes				Yes 0.5 ms; 0.5/3/10/2 ms
Cable length					
Cable length, shielded, max.	1 000 m; 1000 m/3 ms; 70 m/0.5 ms; 3 0 m/0.1 ms; 30 m/0.05 ms	1 000 m	1 000 m	1 000 m	1 000 m
Cable length unshielded, max.	600 m; 600 m: 3 ms; 50 m: 0.5 ms; 20 m: 0.1 ms; 20 m: 0.05 ms	600 m	600 m	600 m	600 m; 600 m: 3, 10, 20 ms; 100 m: 0.5 ms
Encoder					
Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 3 mA	Yes 1.5 mA	Yes 1 mA	Yes 5 mA; AC: 5 mA	Yes 0.5 mA; 0.5 to 2 mA
Alarms/diagnostics/ status information Alarms					
Diagnostic alarm Process alarm	Yes; Parameterizable Yes; Parameterizable				Yes; Parameterizable Yes; Parameterizable
Diagnostics • Diagnostics	Yes; internal/ external fault				Yes; internal/ external fault
Isolation Isolation checked with	500 V DC	500 V DC	1500 V AC	1500 V AC	1500 V AC
Galvanic isolation Galvanic isolation digital					
between the channels, in groups of	8	32	8	4	1
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes	Yes
Dimensions and weight					
Dimensions • Width	25 mm	25 mm	25 mm	25 mm	25 mm
WidthHeight	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm
• Depth	210 mm	210 mm	210 mm	210 mm	210 mm
Weight • Weight, approx.	600 g	500 g	600 g	650 g	600 g

SM 421 digital input module

Ordering data	Order No.		Order No.
SM 421 digital input modules		Labeling sheets for machine inscription	
16 inputs, 24 V DC, with process/ diagnostic alarm	6ES7 421-7BH01-0AB0	DIN A4, for printing using laser	
32 inputs, 24 V DC	6ES7 421-1BL01-0AA0	printer; pack of 10	-
32 inputs, 120 V AC/DC	6ES7 421-1EL00-0AA0	petrol	6ES7 492-2AX00-0AA0
16 inputs, 120/230 V AC/DC, inputs according to IEC 1131-2	6ES7 421-1FH20-0AA0	light-beige yellow	6ES7 492-2BX00-0AA0 6ES7 492-2CX00-0AA0
Type 2		red	6ES7 492-2DX00-0AA0
16 inputs, 24 to 60 V AC/DC, with process/diagnostic alarm	6ES7 421-7DH00-0AB0	SIMATIC manual collection J	6ES7 998-8XC01-8YE0
Front connectors		Electronic manuals on DVD,	
48-pin		multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
with screw contacts, 1 unit	6ES7 492-1AL00-0AA0	SIMATIC C7, SIMATIC distributed	
with screw contacts, 84 units	6ES7 492-1AL00-1AB0	I/O, SIMATIC HMI,	
 with spring-loaded terminals, 1 unit 	6ES7 492-1BL00-0AA0	SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC,	
• with crimp contacts, 1 unit	6ES7 492-1CL00-0AA0	SIMATIC S7, SIMATIC Software,	
with crimp contacts, 84 units	6ES7 492-1CL00-1AB0	SIMATIC TDC	
SIMATIC TOP connect	see page 6/164; Information about which compo-	SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
	nents can be used for the respective module, see Industry Mall or Catalog KT 10.2	Current "Manual Collection" DVD and the three subsequent updates	
Cover film for labeling strips	6ES7 492-2XX00-0AA0	Manual "SIMATIC S7-400	
Spare part		programmable controller"	
S7 SmartLabel V3.0		incl. instruction list	
Software for automatic labeling of		German	6ES7 498-8AA05-8AA0
modules direct from the STEP 7 project		English	6ES7 498-8AA05-8BA0
Single license J	2XV9 450-1SL03-0YX0		
Upgrade single license J	2XV9 450-1SL03-0YX4		

- D: Subject to export regulations AL: N and ECCN: 5D992
- F: Subject to export regulations AL: N and ECCN: EAR99
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Digital modules

SM 422 digital output module

Overview



- Digital outputs for the SIMATIC S7-400
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

	6ES7 422-1FH00- 0AA0	6ES7 422-1HH00- 0AA0	6ES7 422-1BH11- 0AA0	6ES7 422-1BL00- 0AA0	6ES7 422-7BL00- 0AB0
Supply voltages Load voltage L+					
Rated value (DC)		60 V	24 V	24 V	24 V
 Permissible range, lower limit (DC) 		1 V	20.4 V	20.4 V	20.4 V
 Permissible range, upper limit (DC) 		60 V	28.8 V	28.8 V	28.8 V
Load voltage L1					
 Rated value (AC) 	230 V; 120 / 230 V AC	230 V			
 Permissible range, lower limit (AC) 	79 V	2 V			20.4 V
 Permissible range, upper limit (AC) 	264 V	264 V			28.8 V
Current consumption					
from load voltage L+ (without load), max.	1.5 mA		30 mA	30 mA	120 mA
from load voltage L1 (without load), max.	6 mA				
from backplane bus 5 V DC, max.	400 mA	1 A	160 mA	200 mA	200 mA
Power losses					
Power loss, max.	16 W	25 W	7 W	4 W	8 W
Digital outputs Number of digital outputs	16	16; Relay	16	32	32
Short-circuit protection	Yes; Fuse 8 A, 250 V; per group		Yes; Clocked electronically	Yes; Clocked electronically	Yes; Clocked electronically
Limitation of inductive shutdown voltage to			-30 V	-27 V	L+ (-45 V)
Lamp load, max.	50 W	60 W	10 W	5 W	5 W
Output voltage					
• for signal "1", min.	L1 (-18.1 V)		L+ (-0.5 V)	L+ (-0.3 V)	L+ (-0.8 V)
Output current					
• for signal "1" rated value	2 A	5 A	2 A	0.5 A	0.5 A
 for signal "1" permissible range for 0 to 60 °C, min. 	10 mA		5 mA	5 mA	5 mA

SM 422 digital output module

	6ES7 422-1FH00- 0AA0	6ES7 422-1HH00- 0AA0	6ES7 422-1BH11- 0AA0	6ES7 422-1BL00- 0AA0	6ES7 422-7BL00- 0AB0
• for signal "1" permissible range for 0 to 60 °C, max.			2.4 A	0.6 A	0.6 A
for signal "0" residual current, max.	2.6 mA		0.5 mA	0.3 mA	0.5 mA
Switching frequencywith resistive load, max.	10 Hz	10 Hz	100 Hz	100 Hz	100 Hz
with inductive load, max.	0.5 Hz		0.1 Hz	0.5 Hz	2 Hz
Aggregate current of					
outputs (per group) • up to 60 °C, max.	2 A; 5 A with fan subassembly; per 4 adjacent outputs	5 mA; 10 A with fan subassembly	2 A; 2 adjacent outputs each	2 A; 8 adjacent outputs each	2 A
Cable length Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m
Relay outputs					
Number of operating cycles		100 000; 100,000 (15 AC / 13 DC); 3000000 mechanical			
Switching capacity of contacts					
 with inductive load, 		5 A; 5 A (30 V DC);			
max. • with resistive load, max.		5 A (230 V AC) 5 A; 5 A (30 V DC); 5 A (230 V AC); 1.2 A (60 V DC); 0.2 A (125 V DC)			
Alarms/diagnostics/ status information					
Diagnostic alarm					Yes; Parameterizable
Diagnostics • Diagnostics					Yes; internal/ external fault
Isolation Isolation checked with	1500 V AC	1500 V AC	500 V DC	500 V DC	500 V DC
Galvanic isolation					
Galvanic isolation digital outputs					
 between the channels, in groups of 	4	2	8	32	8
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes	Yes
Dimensions and weight					
Dimensions	05	05	05	05	05
WidthHeight	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm
Depth	210 mm	210 mm	210 mm	290 mm	210 mm
Weight • Weight, approx.	800 g	700 g	600 g	600 g	600 g

Digital modules

SM 422 digital output module

Ordering data	Order No.		Order No.	
SM 422 digital output modules	CEC7 400 4 PU144 0 A A O	Labeling sheets for machine inscription		
16 outputs, 24 V DC; 2 A 32 outputs, 24 V DC; 0.5 A	6ES7 422-1BH11-0AA0 6ES7 422-1BL00-0AA0	DIN A4, for printing using laser printer; pack of 10		
32 outputs, 24 V DC, 0.5 A; with diagnostics	6ES7 422-7BL00-0AB0	petrol	6ES7 492-2AX00-0AA0	
16 outputs, 120/230 V AC; 2 A	6ES7 422-1FH00-0AA0	light-beige	6ES7 492-2BX00-0AA0 6ES7 492-2CX00-0AA0	
16 outputs, relay contacts	6ES7 422-1HH00-0AA0	122-1HH00-0AA0 yellow		
Front connectors		red	6ES7 492-2DX00-0AA0	
48-pin		SIMATIC manual collection	6ES7 998-8XC01-8YE0	
with screw contacts, 1 unit with screw contacts, 84 units with spring-loaded terminals, 1 unit with crimp contacts, 1 unit with crimp contacts, 84 units SIMATIC TOP connect	6ES7 492-1AL00-0AA0 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0 6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0 see page 6/164 Information about which components can be used for the respective module, see Industry Mall or Catalog KT 10.2	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2	
Cover film for labeling strips	6ES7 492-2XX00-0AA0	Current "Manual Collection" DVD		
Spare part		and the three subsequent updates		
S7 SmartLabel V3.0		Manual "SIMATIC S7-400		
Software for automatic labeling of modules direct from the STEP 7 project		programmable controller" incl. instruction list		
Single license J	2XV9 450-1SL03-0YX0	German	6ES7 498-8AA05-8AA0	
Upgrade single license J 2XV9 450-1SL03-0YX4		English	6ES7 498-8AA05-8BA0	

- D: Subject to export regulations AL: N and ECCN: 5D992
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- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-400 SIPLUS digital modules

SIPLUS SM 421 digital input module

Overview



- Digital inputs for SIMATIC S7-400
- For connection of switches and 2-wire proximity switches (BEROs)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 421 digital input module			
Order number	6AG1 421-1BL01-2AA0		
Order No. based on	6ES7 421-1BL01-0AA0		
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions		

Ambient conditions	Ambient conditions			
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range			
	795 658 hPa (+2000 +3500 m) derating 10 K			
	658 540 hPa (+3500 +5000 m) derating 20 K			

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 421 digital input modules	
(extended temperature range and medial exposure)	
32 inputs, 24 V DC L	6AG1 421-1BL01-2AA0
Accessories	See SIMATIC S7-400 digital input modules, page 6/97

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-400 SIPLUS digital modules

SIPLUS SM 422 digital output module

Overview



- Digital outputs for SIMATIC S7-400
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order number	6AG1 422-1BL00-2AA0		
Order No. based on	6ES7 422-1BL00-0AA0		
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic compo- nents		
Technical data	The technical data of the standard product applies except for the ambient conditions		

Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range		
	795 658 hPa (+2000 +3500 m) derating 10 K		
	658 540 hPa (+3500 +5000 m) derating 20 K		

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 422 digital output modules	
(extended temperature range and medial exposure)	
32 outputs, 24 V DC L	6AG1 422-1BL00-2AA0
Accessories	See SIMATIC S7-400 digital output modules, page 6/100

L: Subject to export regulations AL: 91999 and ECCN: N

SM 431 analog input module

Overview



- Analog inputs for the SIMATIC S7-400
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers
- Resolution from 13 to 16 bit

	6ES7 431-0HH00-0AB0	6ES7 431-1KF20-0AB0	6ES7 431-1KF00-0AB0	6ES7 431-1KF10-0AB0
Supply voltages Load voltage L+ • Rated value (DC)	24 V; Only required for supplying 2-wire transmitters	24 V; Only required for supplying 2-wire transmitters	not necessary	24 V; Only required for supplying 2-wire trans- mitters
Reverse polarity protection	Yes	Yes		Yes
Current consumption from load voltage L+ (without load), max.	400 mA; for 16 connected, fully controlled 2-wire transmitters	200 mA; for 8 connected, fully controlled 2-wire transmitters		200 mA
from backplane bus 5 V DC, max.	100 mA	1 000 mA	350 mA	600 mA
Power losses Power loss, typ.	2 W	4.9 W	1.8 W	3.5 W
Analog inputs Number of analog inputs	16	8	8	8
Number of analog inputs for voltage/current measurement	16	8	8	8
Number of analog inputs for resistance measurement		4	4	4
Cable length, shielded, max.	200 m	200 m	200 m	200 m; 50 m with thermo- couples and input ranges <= 80 mV
Input ranges (rated values), voltages • 1 to 5 V • -1 V to +1 V • -10 V to +10 V • -2.5 V to +2.5 V • -250 mV to +250 mV • -5 V to +5 V • -500 mV to +500 mV • -80 mV to +80 mV	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes

Analog modules

SM 431 analog input module

	6ES7 431-0HH00-0AB0	6ES7 431-1KF20-0AB0	6ES7 431-1KF00-0AB0	6ES7 431-1KF10-0AB0
Input ranges (rated values),				
• 0 to 20 mA				Yes
• -20 to +20 mA	Yes	Yes	Yes	165
• 4 to 20 mA	Yes	Yes	Yes	Yes
Input ranges (rated values), thermoelements Type B				Yes
• Type E • Type J				Yes Yes
• Type K • Type L				Yes Yes
• Type N				Yes
Type RType S				Yes Yes
• Type T				Yes
• Type U				Yes
Input ranges (rated values), resistance thermometers				
• Ni 100				Yes
• Ni 1000 • Pt 100				Yes Yes
• Pt 1000				Yes
• Pt 10000				Yes
• Pt 200				Yes
• Pt 500				Yes
Input ranges (rated values), resistors				
• 0 to 150 Ohm				Yes
• 0 to 300 Ohm				Yes
• 0 to 48 Ohm				Yes
• 0 to 600 Ohm		Yes	Yes	Yes
• 0 to 6000 Ohm				Yes; usable up to 5000 Ohm
Voltage input				
 permissible input voltage for voltage input (destruction limit), max. 	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	18 V; 18 V permanent, 75 V for 1 ms (mark to space ratio 1:20)	50 V	18 V; 18 V permanent, 75 V for 1 ms (mark to space ratio 1:20)
Current input • permissible input current for current input (destruction limit), max.	40 mA	40 mA; permanent	50 mA; 40 mA permanent	40 mA; permanent
Characteristic linearization				V
parameterizablefor thermocouples				Yes Type R F I K I N R S
- for thermocouples				Type B, E, J, K, L, N, R, S, T, U
for resistance thermometer				Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000
Temperature compensation internal temperature				No
compensation				
 external temperature compensation with compensations socket 				Yes
external temperature compensation with Pt100				Yes
dynamic reference temper- ature value				Yes

SM 431 analog input module

	6ES7 431-0HH00-0AB0	6ES7 431-1KF20-0AB0	6ES7 431-1KF00-0AB0	6ES7 431-1KF10-0AB0
Analog value creation				
Integrations and conversion time/ resolution per channel				
 Resolution with overrange (bit including sign), max. 	13 bit	14 bit; 14 / 14 / 14	13 bit	14 bit; with activated filtering: 16 bits
 Integration time, parameter- izable 	Yes	Yes	Yes	Yes
Basic conversion time, ms	55 / 65 ms	52 µs	23 / 25 ms	20.1 / 23.5 ms
 Integration time, ms additional conversion time for wire break monitoring 	50 / 60 ms		16.7 / 20 ms	16.7 / 20 ms 4.3 ms
additional conversion time for resistance measurement				40.2 / 47 ms
additional conversion time for wire break monitoring and resistance measurement				5.5 ms
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz	none / 400 / 60 / 50 Hz	60 / 50 Hz	60 / 50 Hz
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer		Yes	Yes; with external trans- mitter supply	Yes
for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
 for resistance measurement with 2-conductor connection 		Yes; Line resistances are also measured	Yes; Line resistances are also measured	Yes; Line resistances are also measured
 for resistance measurement with 3-conductor connection 		Yes; Line resistances are also measured	Yes; Line resistances are also measured	Yes
 for resistance measurement with 4-conductor connection 		Yes	Yes	Yes
Errors/accuracies				
Operational limit in overall temperature range				
Voltage, relative to input area	+/- 0,65 %; 1.0% at 1 to 5 V; 0.65% at +/-1 V, +/-10 V	+/- 0,7 %; +/-0.7% at +/-1 V; +/-0.9% at +/-10 V, 1 to 5 V	+/- 1 %; +/-1.0% at +/-1 V; +/-0.6% at +/-10 V; +/-0.7% at 1 to 5 V	+/- 0,38 %; +/-0.38% at +/-80 mV; +/-0.35% at +/-250 mV, +/-500mV, +/-1 V, +/-2,5 V, +/-5 V, 1 to 5 V, +/-10 V
Current, relative to input area Resistance, relative to input	+/- 0,65 %	+/- 0,8 %; at +/-20 mA, 4 to 20 mA +/- 1 %	+/- 1 %; at +/-20 mA, 4 to 20 mA +/- 1,25 %; 0 to 500 Ohm (4-conductor	+/- 0,35 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA +/- 0,5 %
area			measurement, in range of 600 Ohm)	
Resistance-type thermometer, relative to input area			,	+/- 0,5 %
Basic error limit (operational limit at 25 °C)				
Voltage, relative to input area	+/- 0,25 %; 0.5% at 1 to 5 V; 0.25% at +/-1 V, +/-10 V	+/- 0,6 %; 0.6% at +/-1 V; 0.75% at +/-10 V, 1 to 5 V	+/- 0,7 %; 0.7% at +/-1 V; 0.4% at +/-10 V; 0.5% at 1 to 5 V	+/- 0,15 %; +/-0.15% (+/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/-10 V); +/-0.17% (+/- 80 mV);
Current, relative to input area	+/- 0,25 %; at +/-20 mA, 4 to 20 mA	+/- 0,7 %; at +/-20 mA, 4 to 20 mA	+/- 0,7 %; at +/-20 mA, 4 to 20 mA	+/- 0,15 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA

Analog modules

SM 431 analog input module

	6ES7 431-0HH00-0AB0	6ES7 431-1KF20-0AB0	6ES7 431-1KF00-0AB0	6ES7 431-1KF10-0AB0
Resistance-type thermometer, relative to input area Resistance-type thermometer, relative to input area		+/- 0,7 %; 0 to 600 Ohm	+/- 0,8 %; 0 to 500 Ohm (4-conductor measurement, in range of 600 Ohm)	+/- 0,15 %; +/-0.15% at 0 to 48 Ohm (4-conductor measurement), 0 to 150 Ohm (4-conductor measurement), 0 to 300 Ohm (4-conductor measurement), 0 to 600 Ohm (4-conductor measurement), 0 to 5000 Ohm (4-conductor measurement, in range of 6000 Ohm); +/-0.3% at 0 to 300 Ohm (3-conductor measurement), 0 to 600 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement, in range of 6000 Ohm) +/- 0,3 %
Isolation Isolation checked with	500 V DC between bus and local ground	2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground	2120 V DC between bus and analog part; 500 V DC between bus and local ground; 2120 V DC between analog part and local ground	2120 V DC between bus and L+/M; 2120 V D between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground
Galvanic isolation				
Galvanic isolation analog				
nputs • Galvanic isolation analog inputs	No	Yes; internal/external	Yes; internal/external	Yes; internal/external
• between the channels	No	No	No	No
Permissible potential				
difference between the inputs (UCM)	2 V DC/2 Vpp AC	8 V AC	30 V AC	120 V AC
Dimensions				
Required slots	1	1	1	1
Dimensions and weight				
Dimensions • Width	25 mm	25 mm	25 mm	25 mm
• wiath • Height	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm	25 mm 290 mm
Depth	210 mm	210 mm	210 mm	210 mm
Weight	= . 2	= : 2	= . 2	
Weight, approx.	500 g	500 g	500 g	500 g

SM 431 analog input module

	6ES7 431-7QH00-0AB0	6ES7 431-7KF00-0AB0	6ES7 431-7KF10-0AB0
Supply voltages			
Load voltage L+			
Rated value (DC)	24 V; Only required for supplying 2-wire transmitters		
Reverse polarity protection	Yes		
Current consumption			
from load voltage L+ (without load), max.	400 mA	400 mA	400 mA
from backplane bus 5 V DC, max.	700 mA	1 200 mA	650 mA
Power losses			
Power loss, typ.	4.5 W	4.6 W	3.3 W
Analog inputs			
Number of analog inputs	16	8	8
Number of analog inputs for voltage/current measurement	16	8	
Number of analog inputs for resistance measurement	8		8
Cable length, shielded, max.	200 m; 50 m with thermocouples and input ranges <= 80 mV	200 m	200 m; 50 m with thermocouples and input ranges +/-80 mV
Input ranges (rated values), voltages			
• 1 to 5 V	Yes	Yes	
• -1 V to +1 V	Yes	Yes	
• -10 V to +10 V	Yes	Yes	
• -100 mV to +100 mV		Yes	
• -2.5 V to +2.5 V	Yes	Yes	
• -20 mV to +20 mV		Yes	
• -25 mV to +25 mV	Yes		
• -250 mV to +250 mV	Yes	Yes	
• -5 V to +5 V	Yes	Yes	
• -50 mV to +50 mV	Yes	Yes	
• -500 mV to +500 mV	Yes	Yes	
• -80 mV to +80 mV	Yes	Yes	
Input ranges (rated values), currents			
• 0 to 20 mA	Yes	Yes	
• -10 to +10 mA	Yes	Yes	
• -20 to +20 mA	Yes	Yes	
• -3.2 to +3.2 mA		Yes	
• 4 to 20 mA	Yes	Yes	
• -5 to +5 mA	Yes	Yes	
Input ranges (rated values), thermoelements			
• Type B	Yes	Yes	
• Type E	Yes	Yes	
• Type J	Yes	Yes	
• Type K	Yes	Yes	
• Type L	Yes	Yes	
• Type N	Yes	Yes	
• Type R	Yes	Yes	
• Type S	Yes	Yes	
• Type T	Yes	Yes	
• Type U	Yes	Yes	

Analog modules

SM 431 analog input module

	6ES7 431-7QH00-0AB0	6ES7 431-7KF00-0AB0	6ES7 431-7KF10-0AB0
Input ranges (rated values),			
resistance thermometers • Ni 100	Yes		Yes
• Ni 1000	Yes		Yes; Different characteristics
• NI 1000	165		selectable: Europe/U.S.
• Pt 100	Yes		Yes
• Pt 1000	Yes		Yes
• Pt 200	Yes		Yes
• Pt 500	Yes		Yes
Input ranges (rated values), resistors			
• 0 to 150 Ohm	Yes		
• 0 to 300 Ohm	Yes		
• 0 to 48 Ohm	Yes		
• 0 to 600 Ohm	Yes		
• 0 to 6000 Ohm	Yes; usable up to 5000 Ohm		
Voltage input			
permissible input voltage for veltage input (destruction limit)	18 V; 18 V permanent, 75 V for	35 V; 35 V permanent, 75 V for	35 V; 35 V permanent, 75 V for
voltage input (destruction limit), max.	1 ms (mark to space ratio 1:20)	max. 1 s (mark to space ratio 1:20)	max. 1 s (mark to space ratio 1:20)
Current input • permissible input current for current	40 mA	32 mA	
input (destruction limit), max.	40 111/4	32 IIIA	
Characteristic linearization			
parameterizable	Yes	Yes	Yes
• for thermocouples	Type B, E, J, K, L, N, R, S, T, U	Type B, E, J, K, L, N, R, S, T, U	100
for resistance thermometer	Pt100, Pt200, Pt500, Pt1000,	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Pt100, Pt200, Pt500, Pt1000,
	Ni100, Ni1000		Ni100, Ni1000; different character-
			istics selectable (Europe/U.S.)
Temperature compensation			
• internal temperature compensation		Yes	
external temperature compensation	Yes	Yes	
with compensations socket • external temperature compensation	Yes		
with Pt100	165		
dynamic reference temperature	Yes	Yes	
value			
Analog value creation			
Integration and conversion time/			
resolution per channel	10111110110110	40.1%	40.17
 Resolution with overrange (bit including sign), max. 	16 bit; 16 / 16 / 16	16 bit	16 bit
Integration time, parameterizable	Yes	Yes	Yes
Basic conversion time, ms	6 / 20.1 / 23.5 ms	10 / 16.7 / 20 / 100	8 / 23 / 25 ms
Integration time, ms	2.5 / 16.7 / 20 ms	2.5 / 16.7 / 20 / 100 ms	20 ms at 50 Hz (entire module incl.
			wire break)
- additional conversion time for wire	4.3 / 4.3 / 4.3 ms		110 ms / 4 ms
break monitoring	40 / 40 0 / 47		
 additional conversion time for resistance measurement 	12 / 40.2 / 47 ms		
- additional conversion time for wire	5.5 ms	1 ms (module)	none
break monitoring and resistance		(
measurement			
 Interference voltage suppression for interference frequency f1 in Hz 	400 / 60 / 50 Hz	400 / 60 / 50 / 10 Hz	none/ 60 / 50 Hz
ioi interierence frequency IT III HZ			

SM 431 analog input module

·	6ES7 431-7QH00-0AB0	6ES7 431-7KF00-0AB0	6ES7 431-7KF10-0AB0
Encoder			320: 101:112:10:0120
Connection of signal encoders for current measurement as 2-wire transducer	Yes		
• for current measurement as 4-wire transducer	Yes	Yes	
• for resistance measurement with 2-conductor connection	Yes; Line resistances are also measured		v.
 for resistance measurement with 3-conductor connection for resistance measurement with 	Yes Yes	Yes	Yes
4-conductor connection	165	165	ies
Errors/accuracies Operational limit in overall temperature range			
Voltage, relative to input area	+/- 0,3 %; +/-0.3% at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/- 10 V; +/-0.31% at +/-80 mV; +/-0.32% at +/-50 mV; +/-0.35% at +/-25 mV;	+/- 0,3 %	
Current, relative to input area	+/- 0,3 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	+/- 0,5 %	
Resistance, relative to input area	+/- 0,3 %; +/-0.3% at 0 to 48 Ohm (4-conductor measurement), 0 to 150 Ohm (4-conductor measurement), 0 to 300 Ohm (4-conductor measurement), 0 to 600 Ohm (4-conductor measurement), 0 to 5000 Ohm (4-conductor measurement, in range of 6000 Ohm); +/-0.4% at 0 to 300 Ohm (3-conductor measurement), 0 to 600 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement, in range of		
Resistance-type thermometer, relative to input area	6000 Ohm); +/- 0,4 %		+/-1 °C
Basic error limit (operational limit at 25 °C)			
Voltage, relative to input area	+/- 0,15 %; +/-0.15% at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/-10 V; +/-0.17% at +/-80 mV; +/-0.19% at +/-50 mV; +/-0.23% at +/-25 mV;	+/- 0,1 %	
Current, relative to input area	+/- 0,15 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	+/- 0,17 %	
Impedance, relative to input area	+/- 0,15 %; +/-0.15% at 0 to 48 Ohm (4-conductor measurement), 0 to 150 Ohm (4-conductor measurement), 0 to 300 Ohm (4-conductor measurement), 0 to 5000 Ohm (4-conductor measurement, in range of 6000 Ohm); +/-0.3% at 0 to 300 Ohm (3-conductor measurement), 0 to 600 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement, in range of 6000 Ohm)		
Resistance-type thermometer, relative to input area	+/- 0,3 %		+/-0.2 °C
Alarms/diagnostics/status information Alarms			
Diagnostic alarmLimit value alarm	Yes; Parameterizable Yes; Parameterizable	Yes; Parameterizable Yes	Yes; Parameterizable Yes
Diagnostics • Diagnostics	Yes; Parameterizable	Yes	Yes

Analog modules

SM 431 analog input module

	6ES7 431-7QH00-0AB0	6ES7 431-7KF00-0AB0	6ES7 431-7KF10-0AB0
Isolation			
Isolation checked with	2120 V DC between bus and L+/M; 2120 V D between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground	1500 V DC	1500 V DC
Galvanic isolation			
Galvanic isolation analog inputs			
 Galvanic isolation analog inputs 	Yes; internal/external	Yes; internal/external	Yes; internal/external
 between the channels 	No	Yes	No
Permissible potential difference			
between the inputs (UCM)	120 V AC	120 V AC	none
Dimensions			
Required slots	1	1	1
Dimensions and weight			
Dimensions			
Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm
Weight			
 Weight, approx. 	500 g	650 g	650 g

SM 431 analog input module

Ordering data	Order No.		Order No.
SM 431 analog input module		S7 SmartLabel V3.0	
16 inputs, non-floating, 13 bit	6ES7 431-0HH00-0AB0	Software for automatic labeling of	
8 inputs, floating, 13 bit	6ES7 431-1KF00-0AB0	modules direct from the STEP 7 project	
8 inputs, floating, 14 bit, with linearization	6ES7 431-1KF10-0AB0	Single license J	
8 inputs, floating, 14 bit	6ES7 431-1KF20-0AB0	Upgrade single license J	2XV9 450-1SL03-0YX4
16 inputs, floating, 16 bit, process interrupt capability	6ES7 431-7QH00-0AB0	Labeling sheets for machine inscription	
8 inputs, floating, 16 bit, process interrupt capability, for thermo-	6ES7 431-7KF00-0AB0	DIN A4, for printing using laser printer; 10 units	
couples (I, U)		petrol	6ES7 492-2AX00-0AA0
8 inputs, floating, 16 bit, process	6ES7 431-7KF10-0AB0	light-beige	6ES7 492-2BX00-0AA0
interrupt capability, for temperature sensors		yellow	6ES7 492-2CX00-0AA0
Front connectors		red	6ES7 492-2DX00-0AA0
48-pin		SIMATIC manual collection	6ES7 998-8XC01-8YE0
with screw contacts, 1 unit with screw contacts, 84 units with spring-loaded terminals, 1 unit with crimp contacts, 1 unit with crimp contacts, 84 units unit: for 6ES7 431-7KF00-0AB0:	6ES7 492-1AL00-0AA0 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0 6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0 6ES7431-7KF00-6AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC,	
spare part, included in scope of delivery	0E37431-7KF00-0AA0	SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC TOP connect	see page 6/164; Information about which compo-	SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
	nents can be used for the respective module, see Industry Mall or Catalog KT 10.2	Current "Manual Collection" DVD and the three subsequent updates	
Measuring range module for analog inputs	6ES7 974-0AA00-0AA0	Manual "SIMATIC S7-400 programmable controller"	
1 module for 2 inputs (spare part)		incl. instruction list	
Cover film for labeling strips	6ES7 492-2XX00-0AA0	German	6ES7 498-8AA05-8AA0
Spare part		English	6ES7 498-8AA05-8BA0

- D: Subject to export regulations AL: N and ECCN: 5D992
- F: Subject to export regulations AL: N and ECCN: EAR99
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SM 432 analog output module

Overview



- Analog outputs for the SIMATIC S7-400
- For the connection of analog actuators

	6ES7 432-1HF00-0AB0
Supply voltages	
Load voltage L+ • Rated value (DC)	24 V
Current consumption	450 4
from backplane bus 5 V DC, max.	150 mA
from supply voltage L+, max.	400 mA
Power losses Power loss, max.	9 W
Analog outputs Number of analog outputs	8
Cable length, shielded, max.	200 m
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	19 V
Output ranges, voltage • 0 to 10 V • 1 to 5 V • -10 to +10 V	Yes Yes Yes
Output ranges, current • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA	Yes Yes Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max.	1 k Ω 1 μF 500 Ω ; 600 Ohm if commonmode-voltage reduced to <1 V
Analog value creation Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel)	13 bit 420 μs; 420 μs in the ranges 1 to 5 V and 4 to 20 mA; 300 μs in all ranges

	6ES7 432-1HF00-0AB0
Settling time	
 for resistive load 	0.1 ms
 for capacitive load 	3.5 ms
 for inductive load 	0.5 ms
Errors/accuracies	
Operational limit in overall temperature range	
Voltage, relative to output area	+/- 0,5 %; +/-10 V, 0 to 10 V, 1 to 5 V
 Current, relative to output area 	+/- 1 %; +/-20 mA, 4 to 20 mV
Basic error limit (operational limit at 25 °C)	
Voltage, relative to output area	+/- 0,5 %; +/-10 V, 0 to 10 V, 1 to 5 V
 Current, relative to output area 	+/- 0,5 %; +/-20 mA, 0 to 20 mA
Alarms/diagnostics/status information	
Substitute values connectable	No
Isolation	
Isolation checked with	2120 V DC between bus and L+/M; 2120 V D between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground
Galvanic isolation	
Galvanic isolation analog outputs • between the channels and the backplane bus	Yes
Dimensions Required slots	1
Dimensions and weight Dimensions • Width • Height	25 mm 290 mm
• Depth	210 mm
Weight • Weight, approx.	650 g

SM 432 analog output module

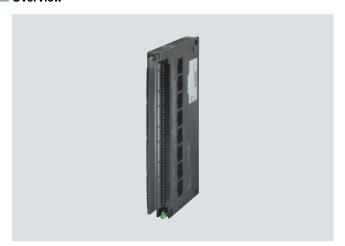
Ordering data	Order No.		Order No.
SM 432 analog output module	6ES7 432-1HF00-0AB0	SIMATIC manual collection J	6ES7 998-8XC01-8YE0
8 outputs, floating, 13 bit		Electronic manuals on DVD,	
Front connectors		multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
48-pin • with screw contacts, 1 unit • with screw contacts, 84 units • with spring-loaded terminals, 1 unit • with crimp contacts, 1 unit	6ES7 492-1AL00-0AA0 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0 6ES7 492-1CL00-0AA0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC S0ftware, SIMATIC TDC	
with crimp contacts, 84 units	6ES7 492-1CL00-1AB0	SIMATIC manual collection D	6ES7 998-8XC01-8YE2
SIMATIC TOP connect	see page 6/164; Information about which compo- nents can be used for the respective module, see Industry Mall or Catalog KT 10.2	update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	
Cover film for labeling strips	6ES7 492-2XX00-0AA0	Manual "SIMATIC S7-400 programmable controller"	
Spare part		incl. instruction list	
S7 SmartLabel V3.0		German	6ES7 498-8AA05-8AA0
Software for automatic labeling of modules direct from the STEP 7 project		English	6ES7 498-8AA05-8BA0
Single license J	2XV9 450-1SL03-0YX0		
Upgrade single license J	2XV9 450-1SL03-0YX4		
Labeling sheets for machine inscription			
DIN A4, for printing using laser printer; pack of 10			
petrol	6ES7 492-2AX00-0AA0		
light-beige	6ES7 492-2BX00-0AA0		
yellow	6ES7 492-2CX00-0AA0		
red	6ES7 492-2DX00-0AA0		

- D: Subject to export regulations AL: N and ECCN: 5D992 $\,$
- F: Subject to export regulations AL: N and ECCN: EAR99
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-400 SIPLUS analog modules

SIPLUS SM 431 analog input module

Overview



- Analog inputs for SIMATIC S7-400
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers
- Resolution 13 to 16 bit

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 431 analog input module		
Order number	6AG1 431-0HH00-4AB0	
Order No. based on	6ES7 431-0HH00-0AB0	
Ambient temperature range	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions	

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.	
SIPLUS SM 431 analog input module	6AG1 431-0HH00-4AB0	
(medial exposure)		
16 inputs, non-floating, 13 bit		
Accessories	See SIMATIC S7-400 analog input modules, page 6/111	

SIMATIC S7-400 SIPLUS analog modules

SIPLUS SM 432 analog output module

Overview



- Analog outputs for SIMATIC S7-400
- · For connection of analog actuators

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS SM 432 analog output module	
Order number	6AG1 432-1HF00-4AB0
Order No. based on	6ES7 432-1HF00-0AB0
Range of ambient temperature	0 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS SM 432 analog output module	6AG1 432-1HF00-4AB0
(medial exposure)	
8 outputs, floating, 13 bit	
Accessories	See SIMATIC S7-400 analog output modules, page 6/113

L: Subject to export regulations AL: 91999 and ECCN: N

Function modules

FM 450-1 counter module

Overview



- Two-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs for outputting the response when the comparison values are reached

Note:

SIMODRIVE Sensor/Motion Connect 500 feature incremental encoders and preassembled connecting cables for counting and positioning functions.

www.siemens.com/simatic-technology

rechinical specifications	
	6ES7 450-1AP00-0AE0
Supply voltages Aux. voltage 1L+, load voltage 2 L+	
Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V; dynamic 18.5 V
 permissible range, upper limit (DC) 	28.8 V; dynamic 30.2 V
• non-periodic skip	
- Duration	500 ms
- Recovery time	50 s
- Value	35 V
Load voltage 1L+	
Reverse polarity protection	Yes
Load voltage 2L+	
 Reverse polarity protection 	Yes
Current consumption	
from load voltage 1L+ (without	40 mA
load), max.	
from backplane bus 5 V DC, max.	450 mA
Power losses	
Power loss, typ.	9 W
Connection method	
required front connector	1x 48-pin
Digital inputs	
Number of digital inputs	6
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
Input voltage	
• for signal "0"	-28.8 to +5 V
• for signal "1"	+11 to +28.8 V
Input current	
• for signal "1", typ.	9 mA
Input delay (for rated value of input	
voltage)	
• Input frequency (with a time delay	200 kHz
of 0.1 ms), max. • for standard inputs	
- parameterizable	Yes
- at "0" to "1", max.	2.5 μs; >= 2.5 μs (200 kHz);
,	<= 25 μs (20 kHz)
Digital outputs	
Number of digital outputs	6
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown	2L+ (-39 V)
voltage to	
Output voltage	0.1/
• for signal "0" (DC), max.	3 V
• for signal "1", min.	2L+ (-1.5 V)
Output current	0.5.4
• for signal "1" rated value	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for	0.6 A
0 to 60 °C, max.	
Output delay with resistive load	
• 0 to "1", max.	300 μs

SIMATIC \$7-400 Function modules

FM 450-1 counter module

Technical specifications (cont	inued)
	6ES7 450-1AP00-0AE0
Encoder supply 5 V encoder supply • 5 V • Short-circuit protection • Output current, max.	Yes; 5.2 V +/-2% Yes 300 mA
24 V encoder supply • 24 V • Short-circuit protection • Output current, max.	Yes; 1L+ (-3 V) Yes 300 mA
Encoder Connectable encoders Incremental encoder (symmetrical) Incremental encoder (asymmetrical) 24 V initiator 24 V directional element	Yes; with 2 pulse strings offset by 90° Yes Yes Yes; 1 pulse train, 1 direction level
Counter Number of counter inputs	2; 32 bit or +/-31 bit
Counter input 5 V Type Terminating resistor Differential input voltage Counter frequency, max.	RS 422 220 Ω min. 0.5 V 500 kHz
Counter input 24 V Input voltage, for signal "0" Input voltage, for signal "1" Input current, for signal "1", typ. Counter frequency, max. Minimum pulse width	-30 to +5 V +11 to +30 V 9 mA 200 kHz >= 2.5 µs (200 kHz); <= 25 µs (20 kHz) (parameterizable)
Parameter Remark	Assigned binary addresses: 64 bytes/64 bytes
Isolation Isolation checked with	500 V
Galvanic isolation Galvanic isolation digital inputs • between the channels and the backplane bus	Yes; Optocoupler
Galvanic isolation digital outputs • between the channels and the backplane bus	Yes; Optocoupler
Galvanic isolation counter • between the channels and the backplane bus	Yes; Optocoupler
Permissible potential difference between different circuits	75 V DC / 60 V AC
Dimensions and weight Dimensions • Width • Height • Depth	25 mm 290 mm 210 mm
Weight • Weight, approx.	650 g

Ordering data	Order No.
FM 450-1 counter module	6ES7 450-1AP00-0AE0
with 2 channels, max. 500 kHz; for incremental encoder	
Front connectors	
 48-pin with screw contacts, 1 unit with screw contacts, 84 units with spring-loaded terminals, 1 unit with crimp contacts, 1 unit with crimp contacts, 84 units 	6ES7 492-1AL00-0AA0 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0 6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0
Front covers for CPU and function modules	6ES7 492-1XL00-0AA0
Spare part	

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

FM 451 positioning module

Overview



- Three-channel positioning module for rapid/slow-action drives
- 4 digital outputs per channel for motor control
- Displacement measurement incremental or synchronousserial

Note:

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 451-3AL00-0AE0
Supply voltages Rated value	
• 24 V DC	Yes
Current consumption Current consumption, max.	550 mA
Connection method required front connector	1x 48-pin
Digital inputs Number of digital inputs	12; 4 per axis
Functions	Reference cams, reversing cams, flying actual value setting, start/ stop positioning
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -3 to +5 V 11 to 30 V
Input current • for signal "1", typ. • for 2-wire BERO - for signal "1", typ.	6 mA 30 mA
Digital outputs Number of digital outputs	12; 4 per axis
Functions	Rapid traverse, creep, run right, run left

	6ES7 451-3AL00-0AE0
Short-circuit protection	Yes
Output voltage	
• for signal "1", min.	UP - 3 V
Output current	
• for signal "1" permissible range for	600 mA; with UPmax
0 to 55 °C, max. • for signal "0" residual current, max.	0.5 mA
Encoder supply	0.0 11# (
5 V encoder supply	
• 5 V	Yes
Output current, max.	210 mA
Cable length, max.	35 m; at max. 210 mA
24 V encoder supply • 24 V	Yes
Output current, max.	300 mA
Cable length, max.	100 m; at max. 300 mA
Absolute encoder (SSI) encoder	
supply	
Absolute encoder (SSI) Output voltage	Yes 24 V DC
Output voltageOutput current, max.	300 mA
Cable length, max.	300 m; At max. 156 Kbit/s
Encoder	
Connectable encoders	
 Incremental encoder (symmetrical) 	Yes
Incremental encoder	Yes
(asymmetrical)	
Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical)	
Trace mark signals	A, notA, B, notB
 Zero mark signal 	N, notN
Input signal	5 V difference signal (phys. RS 422)
Input frequency, max.	(priys. no 422) 1 MHz
Encoder signals, incremental	
encoder (asymmetrical)	
Trace mark signals	A, B
Zero mark signalInput voltage	N 24 V
Input frequency, max.	50 kHz; for 25 m cable length,
	25 kHz for 100 m cable length
Cable length, shielded, max.	100 m
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal
D	(phys. RS 422)
Data signal Clack signal	DATA, notDATA CL, notCL
Clock signalTelegram length	13 or 25 bit serial
Clock frequency, max.	1.25 MHz
Gray code	1
Cable length, shielded, max.	300 m; at max. 156 kBit/s
Galvanic isolation	
Galvanic isolation digital inputs • Galvanic isolation digital inputs	Yes
Galvanic isolation digital outputs	100
Galvanic isolation digital outputs	Yes
• '	

SIMATIC \$7-400 Function modules

FM 451 positioning module

Technical specifications (continued)

	6ES7 451-3AL00-0AE0
Environmental requirements	
Operating temperature	
• Min.	0 °C
• Max.	55 °C
Storage/transport temperature	
• Min.	-40 °C
• Max.	70 °C
Relative humidity	
 Humidity class F 	Yes

	6ES7 451-3AL00-0AE0
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
• Width	50 mm
Height	290 mm
• Depth	210 mm
Weight	
Weight, approx.	1 300 g

Ordering data	Order No.		Order No.
FM 451 positioning module	6ES7 451-3AL00-0AE0	Signal cable (continued)	
for rapid traverse and creep speed drives		Pre-assembled for HTL encoder, UL/DESINA	6FX5 0 2-2AL00-
Front connector		Pre-assembled for SSI absolute	6FX5 0 ■ 2-2CC11- ■ ■ ■
48-pin		encoder, UL/DESINA	
• with screw contacts, 1 unit		Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	6FX5 0 = 2-2CD01-
 with screw contacts, 84 units with spring-loaded terminals, 	6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0	Pre-assembled for TTL encoder	6FX5 0 = 2-2CD24-
1 unit	0E37 492-1BL00-0AA0	24 V, UL/DESINA	01 A3 0 = 2-20D2+- = = = =
	6ES7 492-1CL00-0AA0	0 m	A
with crimp contacts, 84 units	6ES7 492-1CL00-1AB0	1 m	В
Front covers for CPU and function modules	6ES7 492-1XL00-0AA0	2 m	С
Spare part		3 m	D
Signal cable		4 m	E
Pre-assembled for HTL encoder,	6FX5 0 2-2AL00-	5 m	F
UL/DESINA	0FA5 U = 2-2ALUU-	6 m	G
Pre-assembled for SSI absolute	6FX5 0 2-2CC11-	7 m	н
encoder, UL/DESINA		8 m	J
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	6FX5 0 2-2CD01-	0 m	K
Pre-assembled for TTL encoder	6FX5 0 ■ 2-2CD24- ■ ■ ■	0.0 m	0
24 V, UL/DESINA		0.1 m	1
		0.2 m	2
Not crimped	0	0.3 m	3
Module end crimped, connector case supplied	1	0.4 m	4
1.1	4	0.5 m	5
Motor end crimped, connector case supplied	4	0.6 m	6
0 m	1	0.7 m	7
100 m	2	0.8 m	8
200 m	3		
0 m	A		
10 m	В		
20 m	С		
30 m	D		
40 m	E		
50 m	F		
60 m	G		
70 m	H		
80 m	J		
90 m	K		
30 111	N.		

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

FM 452 cam controller

Overview



- Very high speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 16 onboard digital outputs for direct output of actions
- Incremental or synchronous-serial position feedback

Note:

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

www.siemens.com/simatic-technology

	6ES7 452-1AH00-0AE0
Supply voltages	
Rated value	Voe
• 24 V DC	Yes
Current consumption Current consumption, max.	500 mA
Connection method	
Required front connector	1x 48-pin
Digital inputs Number of digital inputs	11
Functions	Reference point switch, flying
Tunctions	actual value setting/length measurement, brake release, enable track output no. 3 to 10
Input voltage	
Rated value, DC fare size at #0#	24 V
for signal "0"for signal "1"	-28.8 to +5 V 11 to 28.8 V
Input current	11 to 20.0 v
for signal "0", max. (permissible quiescent current) for 2-wire BERO	2 mA
- for signal "1", typ.	9 mA
Digital outputs Number of digital outputs	16
Functions	Cam track
Short-circuit protection	Yes
Output voltage Rated value (DC) for signal "1", min.	24 V UP - 0.8 V
Output current • for signal "1" permissible range for 0 to 55 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
Encoder supply 5 V encoder supply • 5 V • Output current, max. • Cable length, max.	Yes 300 mA 32 m
24 V encoder supply	
• 24 V	Yes
Output current, max.Cable length, max.	300 mA 100 m
Encoder	100 111
Connectable encoders	
Incremental encoder	Yes
(symmetrical)Incremental encoder	Von
Incremental encoder (asymmetrical)	Yes
Absolute encoder (SSI)2-wire BEROS	Yes Yes

SIMATIC S7-400 Function modules

FM 452 cam controller

Technical specifications (conti	nued)
	6ES7 452-1AH00-0AE0
Encoder signals, incremental encoder (symmetrical) Trace mark signals Zero mark signal Input signal Input frequency, max.	A, notA, B, notB N, notN 5 V difference signal (phys. RS 422) 1 MHz
Encoder signals, incremental encoder (asymmetrical) Trace mark signals Zero mark signal Input voltage Input frequency, max.	A, B N 24 V 50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
Encoder signals, absolute encoder (SSI) Input signal Data signal Clock signal Telegram length Clock frequency, max. Gray code Cable length, shielded, max.	5 V difference signal (phys. RS 422) DATA, notDATA CL, notCL 13 or 25 bit serial 1 MHz 1 300 m; at max. 125 kHz
Galvanic isolation Galvanic isolation digital inputs • Galvanic isolation digital inputs	No
Galvanic isolation digital outputs • Galvanic isolation digital outputs	No
Environmental requirements Operating temperature • Min. • Max. Storage/transport temperature	0 °C 55 °C
Min. Max.	-40 °C 70 °C
Relative humidity • Humidity class F	Yes
Degree of protection	Yes
Dimensions and weight Dimensions • Width • Height • Depth Weight	25 mm 290 mm 210 mm
Weight, approx.	650 g

Ordering data	Order No.
FM 452 electronic cam controller	6ES7 452-1AH00-0AE0
Front covers for CPU and function modules	6ES7 492-1XL00-0AA0
Spare part	
Front connector	
48-pin • with screw contacts, 1 unit • with screw contacts, 84 units • with spring-loaded terminals, 1 unit • with crimp contacts, 1 unit • with crimp contacts, 84 units	6ES7 492-1AL00-0AA0 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0 6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0
Signal cable	
Pre-assembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA	6FX5 002-2CA12-
Pre-assembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA	6FX5 002-2CC12-
Length code	see FM 451, page 6/119

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

FM 453 positioning module

Overview



- Positioning module for servo and/or stepper motors in machines with high clock-pulse rates
- Can be used for simple point-to-point positioning and for complex traversing profiles
- Up to 3 independent motors can be controlled

Note:

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

Further information can be found on the Internet at:

www.siemens.com/simatic-technology

/ 5 to 30.2 V 4 to 28.8 V ; with 24 V position encoder; for 5 V position encoder per channel A; rated current
to 30.2 V to 28.8 V with 24 V position encoder; for 5 V position encoder per channel
to 30.2 V to 28.8 V with 24 V position encoder; for 5 V position encoder per channel
4 to 28.8 V with 24 V position encoder; for 5 V position encoder per channel
with 24 V position encoder; for 5 V position encoder per channel
for 5 V position encoder per channel
for 5 V position encoder per channel
· ·
A: rated current
71, rated carrent
18-pin
or each channel/axis
figurable
/
E \ / / O A \
o +5 V (max. 3 mA)
١

	6ES7 453-3AH00-0AE0
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", max.	15 µs; via input voltage range, 8 µs at 24 V DC
- at "1" to "0", max.	45 μs; via input voltage range
Digital outputs	
Number of digital outputs	4; for each channel/axis
Functions	configurable
Short-circuit protection	Yes
Output voltage	
Rated value (DC)	24 V
• for signal "1", min.	UP - 0,3 V
Output current	
 for signal "1" rated value 	0.5 A; at 40 °C; 0.1 A at 60 °C
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.12 A
• for signal "0" residual current, max.	2 mA
Switching frequency	
 with resistive load, max. 	100 Hz
 with inductive load, max. 	0.25 Hz
Encoder supply	
5 V encoder supply	
• 5 V	Yes
Output current, max.	300 mA
Cable length, max.	35 m; at max. 210 mA; 25 m at max. 300 mA
24 V encoder supply	max. ded m/t
• 24 V	Yes
Cable length, max.	100 m; at max. 300 mA
Encoder	·
Connectable encoders	
• Incremental encoder (symmet-	Yes
rical)	V
Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical)	
• Input signal	5 V difference signal
1	(phys. RS 422)
Input frequency, max.	1 MHz; for 10 m cable length; 0.5 MHz for 35 m cable length
Encoder signals, absolute encoder	
(SSI) Input signal	5 V difference signal
- input signal	(phys. RS 422)
 Clock frequency, max. 	1.25 Mbit/s at 10 cable length
Cable length, shielded, max.	(2.5 Mbit/s available soon) 250 m; at max. 156 kBit/s
Drive interface	
Signal input I	
• Type	Drive interface step, signal input
. Franchica	"READY 1"
Function	"Power section ready" where Ui < 1 V, Ii = 2mA
	,,

SIMATIC \$7-400 Function modules

FM 453 positioning module

Technical specifications (continued)

• `	,
	6ES7 453-3AH00-0AE0
Signal output I	
• Type	5 V (phys. RS 422)
• Function	Clock pulse, direction, enable, current control
 Differential output voltage, min. 	2 V; RL = 100 Ohm
 Differential output voltage for signal "0", max. 	1.1 V; Io = 30 mA
 Differential output voltage, for signal "1", min. 	3.7 V; Io = -30 mA
 Load impedance 	55 Ω
 Pulse frequency 	200 kHz; 500 kHz available soon
Cable length, max.	35 m; 35 m with symm. transmission; 10 m with asymm. transmission
Signal output II	
• Type	Contact relay
Function	Drive disconnection for operation
• Load	1 A/50 V/30 VA DC
Signal output III	
• Type	Analog output
• Function	Drive interface Servo: Setpoint output for drive
 Output voltage 	-10 to +10 V
Output current	-3 to +3 mA
Cable length, max.	30 m

	6ES7 453-3AH00-0AE0
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	Yes; Optocoupler
Galvanic isolation digital outputs	
 Galvanic isolation digital outputs 	Yes; Optocoupler
Environmental requirements	
Operating temperature	
• Min.	0 °C
• Max.	55 °C
Storage/transport temperature	
• Min.	-40 °C
• Max.	70 °C
Relative humidity	
 Humidity class F 	No
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
Width	50 mm
Height	290 mm
Depth	210 mm
Weight	
 Weight, approx. 	1 620 g

Ordering data	Order No.
FM 453 positioning module	6ES7 453-3AH00-0AE0
with 3 channels/axes	
Setpoint connecting cable	
for 3 servo motors	6FX2 002-3AD01-
for 3 stepper motors	6FX2002-3AB04-
for 2 servo motors / 1 stepper 6FX2002-3AB02-	
for 1 servo motor / 2 stepper motors	6FX2002-3AB03-
Length code	see FM 451, page 6/119
Front connector	
 48-pin with screw contacts, 1 unit with screw contacts, 84 units with spring-loaded terminals, 1 unit 	6ES7 492-1AL00-0AA0 F 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0
 with crimp contacts, 1 unit with crimp contacts, 84 units 	6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0

Front covers for CPU and function modules	6ES7 492-1XL00-0AA0
Spare part	
Signal cable	
Pre-assembled for SSI absolute encoder, UL/DESINA	6FX5 0 2-2CC11-
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	6FX5 0 2-2CD01-
Pre-assembled for TTL encoder 24 V, UL/DESINA	6FX5 0 2-2CD24-
Length code	see FM 451, page 6/119

Order No.

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

FM 455 controller module

Overview



- 16-channel closed-loop control module for universal control tasks
- Can be used for temperature, pressure and flow controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
 - FM 455 C as continuous controller
- FM 455 S as step or pulse controller
- With 16 analog outputs (FM 455 C) or 32 digital outputs (FM 455 S) for actuators

	6ES7 455-0VS00-0AE0	6ES7 455-1VS00-0AE0
Supply voltages Load voltage L+		
Rated value (DC)	24 V	24 V
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from load voltage L+ (without load), max.	440 mA; typ. 370 mA	400 mA; typ. 330 mA
Power losses		
Power loss, typ.	12 W	10.7 W
Power loss, max.	17.3 W	16.2 W
Connection method		
required front connector	2x 48-pin	2x 48-pin
Digital inputs		
Number of digital inputs	16	16
Input characteristic curve acc. to IEC 1131, Type 2	Yes	Yes
Input voltage	041/	041/
Rated value, DCfor signal "0"	24 V -3 to +5 V	24 V -3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current	10 10 00 0	10 10 00 7
• for signal "1", typ.	7 mA	7 mA
Cable length		
Cable length, shielded, max.	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs		32
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output voltage		
• for signal "1", min.		L+ (-2.5 V)

SIMATIC S7-400 Function modules

FM 455 controller module

	6ES7 455-0VS00-0AE0	6ES7 455-1VS00-0AE0
Output current		
• for signal "1" rated value		0.1 A
• for signal "1" permissible range for 0 to 60 °C,		5 mA
min.		
 for signal "1" permissible range for 0 to 60 °C, 		150 mA
max.		0 F ma A
• for signal "0" residual current, max.		0.5 mA
Parallel switching of 2 outputs		V
• for logic links		Yes
Switching frequency		
 with resistive load, max. 		100 Hz
 with inductive load, max. 		0.5 Hz
 on lamp load, max. 		100 Hz
Load resistance range		
• lower limit		240 Ω
• upper limit		4 kΩ
Cable length		
Cable length, shielded, max.		1 000 m
9		
Cable length unshielded, max.		600 m
Analog inputs		
Number of analog inputs	16; with thermocouples or 2-wire connection;	16; with thermocouples or 2-wire connection;
	8 with Pt 100 or 4-wire connection	8 with Pt 100 or 4-wire connection
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 to +23.5 mA	Yes	Yes
• 4 to 20 mA	Yes	Yes
Input ranges (rated values), thermoelements		
	Yes	Yes
• Type B		
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
Input ranges (rated values), resistance		
thermometers	V	V
• Pt 100	Yes	Yes
Voltage input		
 permissible input voltage for voltage input 	20 V	20 V
(destruction limit), max.		
Current input		
 permissible input current for current input 	40 mA	40 mA
(destruction limit), max.		
Characteristic linearization		
parameterizable	Yes	Yes
• for thermocouples	Type B, J, K, R, S	Type B, J, K, R, S
		Pt100 (standard)
for resistance thermometer	Pt100 (standard)	
• for resistance thermometer	Pt100 (standard)	r troo (standard)
Temperature compensation	,	
	Yes; parameterizable Yes; parametrizable	Yes; parameterizable Yes; parametrizable

SIMATIC S7-400 Function modules

FM 455 controller module

	6ES7 455-0VS00-0AE0	6ES7 455-1VS00-0AE0
Analog outputs		
Number of analog outputs	16	
Cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
Output ranges, voltage		
• 0 to 10 V	Yes	
• -10 to +10 V	Yes	
Output ranges, current	Vaa	
• 0 to 20 mA • -20 to +20 mA	Yes Yes	
• 4 to 20 mA	Yes	
Connection of actuators		
• for voltage output 2-conductor connection	Yes	
• for current output 2-conductor connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ	
 with voltage outputs, capacitive load, max. 	1 μF	
 with current outputs, max. 	500 Ω	
with current outputs, inductive load, max.	1 mH	
Analog value creation		
Measurement principle	integrating	integrating
Integrations and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign),	14 bit; 12 or 14 bit, parameterizable	14 bit; 12 or 14 bit, parameterizable
max. • Conversion time (per channel)	16.67 ms; with 12 bits: 16 2/3 ms at 60 Hz,	16.67 ms; with 12 bits: 16 2/3 ms at 60 Hz,
Conversion time (per charmer)	20 ms at 50 Hz; with 14 bits: 100 ms at 50 and	20 ms at 50 Hz; with 14 bits: 100 ms at 50 and
	60 Hz	60 Hz
Settling time		
for resistive load	0.2 ms	0.1 ms
for capacitive load	3.3 ms	3.3 ms
for inductive load	0.5 ms	0.5 ms
Encoder Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Connectable encoders		
• 2-wire BEROS	Yes	Yes
- permissible quiescent current (2-wire BEROS),	1.5 mA	1.5 mA
max.		
Errors/accuracies	. / 0.05.9/	. / 0.05.9/
Linearity error (relative to input area)	+/- 0.05 %	+/- 0.05 %
Temperature error (relative to input area)	+/- 0.005 %/K	+/- 0.005 %/K
Linearity error (relative to output area)	+/- 0.05 %	
Temperature error (relative to output area)	+/- 0.02 %/K	

SIMATIC \$7-400 Function modules

FM 455 controller module

Technical specifications (continued)

	6ES7 455-0VS00-0AE0	6ES7 455-1VS00-0AE0
Operational limit in overall temperature range • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area	+/-0.6 to +/-1% +/-0.6 to +/-1% +/-0.6 to +/-1%	+/-0.6 to +/-1% +/-0.6 to +/-1% +/-0.6 to +/-1%
Voltage, relative to output areaCurrent, relative to output area	+/- 0,5 % +/- 0,6 %	
Basic error limit (operational limit at 25 °C) • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area • Voltage, relative to output area • Current, relative to output area	+/-0.4 to +/-0.6% +/-0.4 to +/-0.6% +/-0.4 to +/-0.6% +/- 0,4 % +/- 0,5 %	+/-0.4 to +/-0.6% +/-0.4 to +/-0.6% +/-0.4 to +/-0.6%
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • Series mode interference (peak value of interference < rated value of input range), min. • common mode voltage (USS < 2.5 V), min.	40 dB 70 dB	40 dB 70 dB
Control technology Number of closed-loop controllers	16; with thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection	16; with thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection
Alarms/diagnostics/status information Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Isolation Isolation checked with	500 V DC	500 V DC
Galvanic isolation Galvanic isolation controller • between the channels • between the channels and the backplane bus	No Yes; Optocoupler	No Yes; Optocoupler
Permissible potential difference between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight Dimensions • Width • Height • Depth	50 mm 290 mm 210 mm	50 mm 290 mm 210 mm
Weight • Weight, approx.	1 400 g	1 400 g

Ordering data	Order No.		Order No.
FM 455 C controller module	6ES7 455-0VS00-0AE0	Front connectors	
with 16 analog outputs for 16 continuous controllers		48-pin ■ with screw contacts, 1 unit	6ES7 492-1AL00-0AA0
FM 455 S controller module	6ES7 455-1VS00-0AE0	with screw contacts, 84 units with spring-loaded terminals,	F 6ES7 492-1AL00-1AB0 6ES7 492-1BL00-0AA0
with 32 digital outputs for 16 step or pulse controllers		unit with crimp contacts, 1 unit with crimp contacts, 84 units	6ES7 492-1CL00-0AA0 6ES7 492-1CL00-1AB0

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

Function modules

FM 458-1 DP application module

Overview



SIMATIC FM 458-1 DP integrated in SIMATIC S7-400

- Designed for high-performance and user-configurable closed-loop control tasks in the SIMATIC S7-400.
- Can be adapted to individual requirements as required, such as: Controlling, computing, closed-loop control as well as motion control. Can therefore be used flexibly for a wide variety of applications.
- Extensive library with approx. 300 function blocks: E.g. simple functions such as AND, ADD and OR through to complex GMC (general motion control) blocks as virtual master or gear functions.
- User-friendly graphical configuration with the SIMATIC engineering tool CFC (Continuous Function Chart) and the D7-SYS add-on software package: Optimum code generation by the compiler, therefore SCL is not required.
- PROFIBUS DP interface onboard.

SIMATIC FM 458-1 DP is based on more than 15 years experience with high-performance control systems and combines this know-how with the advantages of SIMATIC – the leading automation system for decades. In contrast to other function modules with static structures/functions, the FM 458-1 DP application module can be configured flexibly and adapted to individual requirements.

Function modules

FM 458-1 DP application module FM 458-1 DP basic module

Overview



- Basic module for handling arithmetic, closed-loop control and open-loop control tasks
- PROFIBUS DP interface for connection of distributed I/O and drives
- Modular design with expansion modules for I/O and communication

Technical specifications	
	6DD1 607-0AA2
Supply voltages	
Rated value	
• 5 V DC	Yes
• 24 V DC	Yes
 permissible range (ripple included), lower limit (DC) 	4.8 V
 permissible range (ripple included), upper limit (DC) 	5.25 V
Current consumption	
Current consumption, typ.	1.5 A
Current consumption, max.	3 A
Backup battery	
Battery operation	yes
 Backup current, max. 	15 μΑ
Memory	
Backup	
• present	Yes; SRAM
Time Clock	
Hardware clock (real-time clock)	Yes
Resolution	500 ms
PROFIBUS DP	
Equidistance	Yes; with connection to interrupt tasks
Direct data exchange (slave-to-slave communication)	Yes
Digital inputs	
Number of digital inputs	8; Connectors x2
Input voltage	
 Rated value, DC 	24 V
• for signal "0"	-1 to +6 V
• for signal "1"	13.5 to 33 V
Input current	
• for signal "0", max. (permissible	0 mA
quiescent current)for signal "1", typ.	3 mA; At 24 V
	3111A, At 24 V
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", max.	5 μs
Alarms/diagnostics/status infor-	
mation	
Alarms	
Alarms	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
Galvanic isolation digital inputs	No; only via optional interface modules
Dimensions	
Required slots	1
Dimensions and weight	
Weight	
Weight, approx.	1 000 g

SIMATIC S7-400
Function modules
FM 458-1 DP application module
FM 458-1 DP basic module

Ordering data	Order No.		Order No.
FM 458-1 DP application module	6DD1 607-0AA2	RS 485 bus connector with angled cable outlet	
Basic module for computing,		Max. transmission rate 12 Mbit/s	
closed-loop control and open- loop control tasks; with		Without PG interface	6ES7 972-0BA42-0XA0
PROFIBUS DP interface		With PG interface	6ES7 972-0BB42-0XA0
Micro Memory Card		RS 485 bus connector with	
for FM 458-1 DP basic module		90° cable outlet for FastConnect connection system	
2 MB	6ES7 953-8LL20-0AA0	Max. transmission rate 12 Mbit/s	
4 MB	6ES7 953-8LM20-0AA0	Without PG interface	
8 MB	6ES7 953-8LP20-0AA0	• 1 unit	6ES7 972-0BA52-0XA0
FM 458-1 DP Know-How-Protect	6DD1 607-0GA0	• 100 units	6ES7 972-0BA52-0XB0
for protection of technological application modules against		With PG interface • 1 unit	6ES7 972-0BB52-0XA0
unauthorized copying		• 100 units	6ES7 972-0BB52-0XB0
SC 64 interface cable	6DD1 684-0GE0	PROFIBUS FastConnect bus	
To connect FM 458-1 to the serial port of a programming device/ PC		cable Standard type with special design	6XV1 830-0EH10
SB10 interface module	6DD1 681-0AE2	for quick mounting, 2-core,	0XV1 030-0E1110
To connect 8 binary I/Os to		shielded, sold by the meter, max. delivery unit 1000 m, minimum	
FM 458-1 DP		ordering quantity 20 m	
SB61 interface module	6DD1 681-0EB3	Preferred lengths:	
To connect 8 binary I/Os to FM 458-1 DP, input voltage:		20 m	6XV1 830-0EN20
24/48 V DC		50 m	6XV1 830-0EN50
SU12 interface module	6DD1 681-0AJ1	100 m	6XV1 830-0ET10
To connect 10 signals to FM 458-1 DP			
RS 485 bus connector with 90° cable outlet			
Max. transmission rate 12 Mbit/s			
Without PG interface	6ES7 972-0BA12-0XA0		
With PG interface	6ES7 972-0BB12-0XA0		

Function modules

FM 458-1 DP application module EXM 438-1 input/output expansion

Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- For input and output of time-critical signals
- With digital and analog inputs/outputs
- Incremental and absolute value encoders can be connected
- 4 high-resolution analog outputs
- Fan-free operation up to 40°C

	6DD1 607-0CA1
Supply voltages	
Rated value	
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
Current consumption	
Current consumption, typ.	1.5 A
Digital inputs	
Number of digital inputs	16
Input voltage	
 Rated value, DC 	24 V
• for signal "0"	-1 to +6 V or input open
• for signal "1"	+13 to +33 V
Input current	
 for signal "0", max. (permissible quiescent current) 	0 mA
• for signal "1", typ.	3 mA
	JIIA
Input delay (for rated value of input voltage)	
• for standard inputs	
- at "0" to "1", max.	200 μs
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V

	6DD1 607-0CA1
Output voltage	
• for signal "0" (DC), max.	3 V
• for signal "1" (DC), max.	Supply voltage -2.5 V
Output current	
• for signal "1" rated value	50 mA
• for signal "1" permissible range for 0 to 40 °C, min.	100 mA
• for signal "0" residual current, max.	20 μΑ
Total switching current	80% at 50 °C all outputs 50 mA
Output delay with resistive load	
• 0 to "1", max.	15 μs
Analog inputs	5 D.W
Number of analog inputs	5; Differential inputs
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes; -10 V: +/-4 LSB; to +10 V:
	+/-4 LSB (1 LSB = 4.88 mV)
• Input resistance (-10 V to +10 V)	470 kΩ
Analog outputs	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs 12 bit
Voltage output, short-circuit	Yes; relative to frame
protection	ree, relative to maine
Voltage output, short-circuit current,	16 bits: 27 mA; 12 bits: 100 mA
max.	
Output ranges, voltage	
• -10 to +10 V	Yes
Analog value creation	
Integrations and conversion time/ resolution per channel	
Resolution with overrange	4 AO: 16 bits, 4 AO: 12 bits,
(bit including sign), max.	5 Al: 12 bits
Conversion time (per channel)	4 AO (16 bits): 2 μs; 4 AO (12 bits): 4 μs; 5 AI: 45 μs
Encoder supply	(12 5π3). 4 μ3, 6 / π. 40 μ3
Output voltage	about 14 V (non-isolated)
Output current, rated value	100 mA
Short-circuit protection	Yes; electronic
Encoder	roo, croonerno
Number of connectable encoders,	12; 8 incremental encoders
max.	(synchronizable), 4 absolute
	encoders
Connectable encoders	V
 Incremental encoder (symmetrical) 	Yes
Incremental encoder	Yes
(asymmetrical)	
Absolute encoder (SSI)	Yes; Single- or multiturn-encoder with SSI (synchronous serial) or
	EnDat interface

SIMATIC S7-400
Function modules
FM 458-1 DP application module
EXM 438-1 input/output expansion

Technical specifications (continued)	
	6DD1 607-0CA1
Encoder signals, incremental encoder (symmetrical) • Trace mark signals	1) for tracks A and B (90° out of
	phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input signal	with 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
Input frequency, max.	2.5 MHz
Encoder signals, incremental encoder (asymmetrical)	
Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
Input frequency, max.	1 MHz; Track frequency
Encoder signals, absolute encoder (SSI)	
Input signal	5 V to RS 422
Data signalClock frequency, max.	Dual-, Gray-, Gray-Excess-Code 2 MHz; 100 kHz to 2 MHz (depending on cable length)
Errors/accuracies	
Linearity error (relative to output area)	(+/- 1 LSB)
Galvanic isolation Galvanic isolation digital inputs	
Galvanic isolation digital inputs	No
Galvanic isolation digital outputs Galvanic isolation digital outputs	No
Galvanic isolation analog inputs • Galvanic isolation analog inputs	No
Galvanic isolation analog outputs • Galvanic isolation analog outputs	No
Dimensions Required slots	1
Dimensions and weight	•
Weight	
Weight, approx.	1 kg

Ordering data	Order No.
EXM 438-1 input/output expansion	6DD1 607-0CA1
for direct exchange of digital and analog signals between FM 458-1 DP and the plant	
SB10 interface module	6DD1 681-0AE2
To connect 8 binary inputs or outputs to FM 458-1 DP	
SB61 interface module	6DD1 681-0EB3
To connect 8 binary inputs to FM 458-1 DP, input voltage: 24/48 V DC	
SB71 interface module	6DD1 681-0DH1
To connect 8 binary outputs to FM 458-1 DP, output voltage: 24/48 V DC	
SU12 interface module	6DD1 681-0AJ1
To connect 10 signals to FM 458-1 DP	
SU13 interface module	6DD1 681-0GK0
To connect 50 signals to FM 458-1 DP	
SC 62 interface cable	6DD1 684-0GC0
To connect EXM 438-1 with up to 5 SBxx or SU12	
SC 63 interface cable	6DD1 684-0GD0
To connect EXM 438-1 with an SU13	

Function modules

FM 458-1 DP application module EXM 448 universal communication expansion

Overview



- Optional expansion module for the FM 458-1 DP basic module
- For fast communication over PROFIBUS DP or SIMOLINK
- EXM 448: With vacant slot for a MASTERDRIVES option module.

6DD1 607-0EA0
Yes
0.8 A
1
0.8 kg

Ordering data	Order No.
EXM 448 universal communication expansion	6DD1 607-0EA0
For fast communication, for example, with drives; with free slot for MASTERDRIVES option module	

Function modules

FM 458-1 DP application module EXM 448-2 universal communication expansion

Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- For high-speed communication over up to 2 SIMOLINK interfaces
- For coupling several FM 458-1 DP application modules in synchronism with the sampling time

Technical specifications

	6DD1 607-0EA2
Supply voltages	
Rated value	
• 5 V DC	Yes
Current consumption	
Current consumption, typ.	0.6 A
Dimensions	
Required slots	1
Dimensions and weight	
Weight	
Weight, approx.	0.9 kg

Ordering data

Order No.

EXM 448-2 universal communication expansion

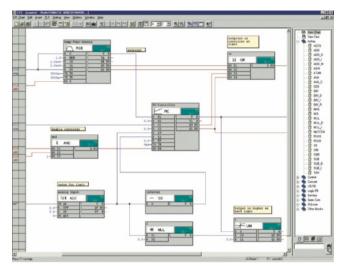
For high-speed communication with drives; for establishing two SIMOLINK fiber optic connections

6DD1 607-0EA2

Function modules

FM 458-1 DP application module D7-SYS

Overview



- Add-on for STEP 7/CFC/SFC for configuration of control and automation tasks with T400, FM 458, SIMADYN D or SIMATIC TDC
- Contains function blocks for every application
- Scope of delivery: Software packages D7-SYS, CFC, SFC, TH-PO
- Optional: D7-FB-Gen, function block generator for the creation of customized function blocks

Ordering data Order No.

SIMATIC D7-SYS V7.1

Function block library for configuring closed-loop control and automation tasks

SIMATIC S7-400/FM 458/ SIMATIC TDC/T400/SIMADYN

Windows 2000/XP

on CD, German, English, with electronic documentation

Floating license

Upgrade License V5.x and higher

Software Update Service

SIMATIC D7 FB Gen V2.1

Function block generator

SIMATIC manual collection

Electronic manuals on DVD. multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC CALL.

I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7 852-0CC02-0YA5

6ES7 852-0CC02-0YE5

6ES7 852-0CC01-0YL5

6DD1 805-5DA0

6ES7 998-8XC01-8YE0

6ES7 998-8XC01-8YE2

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Function modules

FM 458-1 DP application module Accessories

Overview SC64 interface cable



(Similar to figure) Interface cable for FM 458-1 DP basic module and SB10, SB60, SB61 and SU12 interface modules.

Overview SC63 interface cable



This cable is used to connect the SIMATIC TDC SM500 peripheral (I/O) module or the SIMATIC S7-400 EXM 438-1 expansion module to a SU13 interface module.

Overview SC62 interface cable



This cable is used to connect the SIMATIC TDC SM500 peripheral module (I/O) or the SIMATIC S7-400 EXM 438-1 expansion module to up to 5 interface modules SB10, SB60, SB70, SB61 SB71 and/ or SU12.

Overview SB10 interface module



Similar to figure.

The interface module is used to connect 8 digital inputs or outputs.

Function modules
FM 458-1 DP application module Accessories

Overview SB10 interface module



It is used to connect 8 digital inputs with conversion from 24/48 V DC to 24 V DC.

Overview SU12 interface module



The interface module is used to connect 10 signals; there is no electronic conversion.

Overview SB71 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 24/48 V DC on the plant side using transistors.

Overview SU13 interface module



This interface module can be used to connect 50 signals; there is no electronic conversion.

SIMATIC S7-400
Function modules
FM 458-1 DP application module
Accessories

Technical specifications SB10 in	terface module	
Number of digital inputs or outputs		
Electrical isolation	No	
Max. cable cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	
Weight	0.3 kg	
Technical specifications SB61 in	terface module	
Number of digital inputs for • Input voltage	8 24/48 V DC	
Electrical isolation	Yes, via optocoupler	
Max. cable cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	
Weight	0.32 kg	
Technical specifications SB71 in	terface module	
Number of digital outputs Output voltage, max	8 24/48 V DC	
Output current, max.	40 mA, short-circuit proof	
Electrical isolation	Yes, via optocoupler	
Max. cable cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	
Weight	0.32 kg	
Technical specifications SU12 in	terface module	
Number of signal cables which can be connected	10	
Signal amplitude per signal, max.	60 V, 0.5 A	
Electrical isolation	No	
Max. cable cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	
Weight	0.28 kg	
Technical specifications SU13 in	terface module	
Number of signal cables which can be connected	50	
Signal amplitude per signal, max.	60 V, 0.5 A	
Electrical isolation	No	
Max. cable cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	

0.3 kg

Ordering data	Order No.
SC64 interface cable	6DD1 684-0GE0
between the FM 458-1 DP (X2) module and an SBxx or SU12 interface module, 2 m long	
SC62 interface cable	6DD1 684-0GC0
between the SM500 or EXM 438-1 module and a max. of 5 interface moduls SB10, SB60, SB70, SB61 SB71 and/or SU12, 2 m long	
SC63 interface cable	6DD1 684-0GD0
between an SM500 or EXM 438-1 module and SU13 interface module, 2 m long	
SB10 interface module	6DD1 681-0AE2
8 digital inputs/outputs, 24 V DC	
SB61 interface module	6DD1 681-0EB3
8 digital inputs, 24/48 V DC	
SB71 interface module	6DD1 681-0DH1
8 digital outputs with transistors, 24/48 V DC	
SU12 interface module	6DD1 681-0AJ1
with plug-in terminal, 10-pin	
SU13 interface module	6DD1 681-0GK0
with screw-plug-in terminal	

Weight

SIMATIC S7-400 SIPLUS function modules

SIPLUS FM 450-1 counter module

Overview



- Two-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison functions with two definable comparison values
- Integrated digital outputs for the output of the reaction on reaching the comparison values

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order Number	6AG1 450-1AP00-4AE0	
SIPLUS counter module FM 450-1		
Order No. based on	6ES7 450-1AP00-0AE0	
Ambient temperature range	0 +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	
	795 658 hPa (+2000 +3500 m) derating 10 K	
	658 540 hPa (+3500 +5000 m) derating 20 K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Note:

We offer incremental sensors and preassembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.	
SIPLUS FM 450-1 counter module	6AG1 450-1AP00-4AE0	
(medial exposure)		
with 2 channels, max. 500 kHz; for incremental encoder		
Accessories	See SIMATIC FM 450-1, page 6/117	

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS function modules

SIPLUS DCF 77 radio clock module

Overview



This module can be used to synchronize the real-time clock of the SIMATIC S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the programmable controllers SIMATIC and SIPLUS together with a software driver included in the scope of delivery (function block FB). The function blocks are available on the Internet for downloading.

www.siemens.com/siplus - Support - Tools and Downloads!

Technical specifications

Radio clock module SIPLUS DCF 77		
Radio frequency	77.5 Hz	
Power supply	24 V DC (20.4 to 28.8 DC)	
Power consumption, typ.	50 mA	
Dimensions (W x H x D)	75 mm x 125 mm ¹⁾ x 75 mm	

1) Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

Ordering data

Order No.

SIPLUS DCF 77 radio clock

Bundesanstalt Braunschweig

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische

6AG1 057-1AA03-0AA0

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

CP 440

Overview



- For high-performance transmission of messages via point-topoint connections (high message rate)
- Physical interface: RS 422/RS 485 (X.27)
- Up to 32 nodes
- Protocol implemented: ASCII, 3964 (R)
- Simple parameterization via a parameterization tool integrated into STEP 7

Technical specifications

	6ES7 440-1CS00-0YE0
Supply voltages Rated value	
• 5 V DC • 24 V DC	Yes Yes
Current consumption from backplane bus 5 V DC, max.	360 mA
Power losses Power loss, typ.	1.7 W
Memory Memory requirements per interface in memory card of S7-CPU	1 to 5 Kbytes for parameters
Interfaces Number of interfaces	1
Interface physics, RS 422/ RS 485 (X.27)	Yes
RS 422/485, cable length, shielded, max.	1 200 m
Point-to-point Integrated protocol driver • 3964 (R) • ASCII	Yes Yes
Transmission speed, RS 422/485 with 3964 (R) protocol, max. with ASCII protocol, max.	115.2 kbit/s 115.2 kbit/s
Programming Configuration software • STEP 7	Yes; own parameter assignment forms
Dimensions and weight Dimensions • Width • Height • Depth	25 mm 290 mm 210 mm
Weight • Weight, approx.	600 g

Ordering data	Order No.
CP 440 communication processor	6ES7 440-1CS00-0YE0
with one RS 422/485 (X.27) interface	
RS 422/485 connecting cable	
for linking to SIMATIC S7	
5 m	6ES7 902-3AB00-0AA0
10 m	6ES7 902-3AC00-0AA0
50 m	6ES7 902-3AG00-0AA0

Communication

CP 441-1, CP 441-2

Overview



- For powerful, high-speed serial communication via point-topoint connections
- 2 versions:
 - CP 441-1 with 1 variable interface for simple point-to-point connection
 - CP 441-2 with 2 variable interfaces for powerful point-topoint connection
- Plug-in interface modules for different transmission interfaces: RS 232C (V.24) , 20 mA (TTY) or RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), printer drivers; CP 441-2 additionally has RK 512 and customized protocols (retrofittable)
- Simple parameterization via a parameterization tool integrated into STEP 7

Technical specifications

	6ES7 441-1AA04-0AE0	6ES7 441-2AA04-0AE0
Supply voltages Rated value • 5 V DC	Yes	Yes
• 24 V DC	Yes	Yes
Current consumption from backplane bus 5 V DC, max.	600 mA; without interface module	600 mA; without interface module
Power losses Power loss, typ.	0.3 W	0.3 W
Memory Memory requirements per interface in memory card of S7-CPU	1 to 5 KB for parameters; 0 to 55 KB for message texts	1 to 5 KB for parameters; 0 to 55 KB for message texts; 0 to 64 KB for loadable drivers
Interfaces Number of interfaces	1; variable	2; variable
Interface physics, 20 mA (TTY)	Yes	Yes
Interface physics, RS 232C (V.24)	Yes	Yes
Interface physics, RS 422/RS 485 (X.27)	Yes	Yes
20mA (TTY), cable length, shielded, max.	1 000 m	1 000 m
RS 232, cable length, shielded, max.	10 m	10 m
RS 422/485, cable length, shielded, max.	1 200 m	1 200 m
Interface modules • 20 mA (TTY), power consumption from 5 V/24 V, max. • RS 422/485 (X.27), power consumption from 5 V,	100 mA; 100 mA from 5 V; 45 mA from 24 V 250 mA; From 5 V	300 mA at 5 V, 45 mA at 24 V 300 mA
max.RS 232C (V.24), power consumption from 5 V, max.	100 mA; from 5V	300 mA
Point-to-point supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user- defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user- defined
Transmission rate, max.	38.4 kbit/s	115.2 kbit/s; distributed on both interfaces
Integrated protocol driver • 3964 (R) • ASCII • Printer • customer-specific drivers reloadable • RK512	Yes Yes Yes No No	Yes Yes Yes Yes
Transmission speed, 20 mA (TTY) • with 3964 (R) protocol, max. • with ASCII protocol, max. • with printer driver, max., • with RK 512 protocol, max.	19.2 kbit/s 19.2 kbit/s 19.2 kbit/s	19.2 kbit/s 19.2 kbit/s 19.2 kbit/s 19.2 kbit/s

CP 441-1, CP 441-2

Technical specifications (continued)

	6ES7 441-1AA04-0AE0	6ES7 441-2AA04-0AE0
Transmission speed, RS 422/485		
• with 3964 (R) protocol, max.	38.4 kbit/s	115.2 kbit/s
 with ASCII protocol, max. 	38.4 kbit/s	115.2 kbit/s
 with printer driver, max., 	38.4 kbit/s	115.2 kbit/s
 with RK 512 protocol, max. 		115.2 kbit/s
Transmission speed, RS232		
 with 3964 (R) protocol, max. 	38.4 kbit/s	115.2 kbit/s
 with ASCII protocol, max. 	38.4 kbit/s	115.2 kbit/s
 with printer driver, max., 	38.4 kbit/s	115.2 kbit/s
 with RK 512 protocol, max. 		115.2 kbit/s
Programming		
Configuration software		
• STEP 7	Yes; own parameter assignment forms	Yes; own parameter assignment forms
Dimensions and weight		
Dimensions		
• Width	25 mm	25 mm
Height	290 mm	290 mm
• Depth	210 mm	210 mm
Weight		
 Weight, approx. 	800 g; Interface module: 100 g	720 g; Interface module: 100 g

Ordering data	Order No.		Order No.
CP 441-1 communication	6ES7 441-1AA04-0AE0	TTY connecting cable	
module		5 m	6ES7 902-2AB00-0AA0
With 1 variable interface for interface modules; including		10 m	6ES7 902-2AC00-0AA0
configuration package on CD		50 m	6ES7 902-2AG00-0AA0
CP 441-2 communication module	6ES7 441-2AA04-0AE0	RS 422/485 connecting cable	
		5 m	6ES7 902-3AB00-0AA0
With 2 variable interfaces for interface modules; including		10 m	6ES7 902-3AC00-0AA0
configuration package on CD		50 m	6ES7 902-3AG00-0AA0
Interface submodules		Loadable drivers for CP 441-2	
RS 232C (V.24)	6ES7 963-1AA00-0AA0	Modbus master (RTU format)	
20 mA (TTY)	6ES7 963-2AA00-0AA0	Single license	6ES7 870-1AA01-0YA0
RS 422/485 (X.27)	6ES7 963-3AA00-0AA0	 Single license, without software or documentation 	6ES7 870-1AA01-0YA1
RS 232 connecting cable		Modbus slave (RTU format)	
5 m	6ES7 902-1AB00-0AA0	Single license	6ES7 870-1AB01-0YA0
10 m	6ES7 902-1AC00-0AA0	Single license, without software or documentation	6ES7 870-1AB01-0YA1

Communication

Loadable drivers for CP 441-2 and CP 341

Overview

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7 441-2AA04-0AE0)

Technical specifications

Parameterization software	Loadable drivers for CP 441-2 and CP 341	
Type of license	Simple license, copy license	
Target system	SIMATIC CP 341, SIMATIC CP 441-2	
Technical specifications	Modbus Master	
	 Modbus protocol with RTU format 	
	Master/slave coupling: SIMATIC S7 is master	
	• Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11,12,15,16	
	 No V.24 control and signal lines 	
	• CRC polynomial: $x^{16} + x^{15} + x^2 + 1$	
	 Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire 	
	 Receive mailbox specified on BRCV 	
	Character delay time 3.5 characters or multiple thereof	
	Broadcast message possible	
Adjustable parameters	 Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s) 	
	Character frame	
	With/without RS 485 operation for 2-wire connections	
	With/without modem operation (ignore smudge characters)	
	• Response monitoring time 100 ms to 25.5 s in steps of 100 ms	
	• Factor for the character delay time 1-10	
	 Default setting of receive line when using the X.27 interface module 	

Adjustable parameters

Modbus slave

- Modbus protocol with RTU format
- Master/slave coupling: SIMATIC S7 is slave
- Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16
- No V.24 control and signal line
- CRC polynomial: $x^{16} + x^{15} + x^2 + 1$
- Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire
- Communications FB 180, instance DB 180 (use of a multi-instance)
- Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters
- Character delay time 3.5 characters or multiple thereof
- Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
- Character frame
- Slave address of CP (1 to 255)
- With/without RS 485 operation for 2-wire connection
- With/without modem operation (ignore smudge characters)
- Factor for the character delay time 1-10
- Number of work DB (for FB processing)
- Enabling of memory areas for writing by the master
- Default setting of receive line when using the X.27 interface module
- Conversion of Modbus addresses to S7 data areas

Loadable drivers for CP 441-2 and CP 341

Ordering data	Order No.		Order No.		
Modbus Master V3.1		SIMATIC manual collection J	6ES7 998-8XC01-8YE0		
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as master Requirements: CP 341 or CP 441-2; STEP 7 V4.02 and higher Type of delivery: Driver program/documentation, English, German, French		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC			
Single license	6ES7 870-1AA01-0YA0	SIMATIC manual collection D	6ES7 998-8XC01-8YE2		
Single license, without software and documentation	6ES7 870-1AA01-0YA1	update service for 1 year Current "Manual Collection" DVD			
Modbus Slave V3.1		and the three subsequent updates			
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as slave Requirement: CP 341 or CP 441-2; STEP 7 V4.02 and higher Type of delivery: Driver program/documentation, English, German, French					
Single license	6ES7 870-1AB01-0YA0				
Single license, without software and documentation	6ES7 870-1AB01-0YA1				

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Communication

CP 443-5 Basic

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
		•	•	•	6_K10,XX_10158

- Connection of the S7-400 to PROFIBUS
- Communication services:
- PG/OP communication S7 communication
- Open communication (SEND/RECEIVE)
- PROFIBUS FMS
- Time synchronization
- Easy programming and configuration over PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Modules can be replaced without the need for a PG
- SIMATIC H system operation for redundant S7 communication

Technical specifications

Order No.	6GK7 443-5FX02-0XE0		
Product type designation	CP 443-5 Basic		
Transmission rate			
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s		
Interfaces			
Number of electrical connections at interface 1 in accordance with PROFIBUS	1		
Design of electrical connection at interface 1 in accordance with PROFIBUS	9-pin D-sub socket (RS485)		
Supply voltage, current consumption, power loss			
Type of power supply	DC		
Power supply 1 from backplane bus	5 V		
Relative symmetrical tolerance at 5 V DC	5 %		
Current input from backplane bus with 5 V DC, typical	1.2 A		
Effective power loss	6.5 W		
Permitted ambient conditions			
Ambient temperature • During operating phase • During storage • During transport	0 +60 °C -40 +70 °C -40 +70 °C		
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %		
IP degree of protection	IP 20		
Design, dimensions and weights			
Module format	S7-400 compact module, single-width		
Width	25 mm		
Height Depth	290 mm 210 mm		
Net weight	0.7 kg		
Product properties, functions,	0.7 Ng		
components in general			
Maximum number of modules per CPU	14		
Number of modules - Note	-		

CP 443-5 Basic

Technical specifications (conti	nued)	Ordering data	Order No.
Order No.	6GK7 443-5FX02-0XE0	CP 443-5 communication	6GK7 443-5FX02-0XE0
Product type designation	CP 443-5 Basic	processor	
Performance data		Communication processor for connection of S7-400 to	
Performance data Open communication		PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	32	CD-RÓM STEP 7 Version 5.4	
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	240 byte	Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows 2000 Prof./XP Prof.	
Performance data FMS functions		Type of delivery:	
Number of possible connections with FMS connection, maximum	48	German, English, French, Spanish, Italian; incl. 3.5" authori- zation disk, without documen-	
Data volume of variables Maximum with READ request Maximum with WRITE request	237 byte 233 byte	tation • Floating license on CD • Rental license for 50 hours	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6
Number of variables Configurable from server to FMS partner	512	 Software Update Service on CD (requires current software version) 	6ES7 810-4BC01-0YX2
Loadable from server onto FMS partner	2 640	 Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD Trial License STEP 7 V5.4; on 	6ES7 810-4CC08-0YE5 6ES7 810-4CC08-0YA7
Performance data S7 communication		CD, runs for 14 days	0207 010 40000 01A7
Maximum number of possible connections for S7 communication	48	bus connector With 90° cable outlet: insulation	
Number of possible connections for S7 communication - Note	-	displacement technology, max. transmission rate 12 Mbit/s	
Performance data Multiprotocol operation		Without PG interfaceWith PG interface	6ES7 972-0BA50-0XA0 6ES7 972-0BB50-0XA0
Number of possible connections, of	59	PROFIBUS bus connector IP20	
which 2 reserved for PG/OP communication in multiprotocol mode, maximum		With connection to PPI, MPI, PROFIBUS • Without PG interface	6ES7 972-0BA12-0XA0
Product functions Management, configuration, programming		With PG interface	6ES7 972-0BB12-0XA0
Configuration software required	STEP 7 V5.2 SP1 and higher and	12M PROFIBUS bus terminal	6GK1 500-0AA10
Samgaration solution required	NCM S7 for PROFIBUS	Bus terminal for connection of PROFIBUS nodes up to 12 Mbit/s with plug-in cable	

Communication

CP 443-5 Extended

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•			•	•	G,K1Q,XX, 10154

- PROFIBUS DP master with electrical interface for connection of SIMATIC S7-400 to PROFIBUS up to 12 Mbit/s (incl. 45.45 kbit/s)
- For setting up additional PROFIBUS DP lines
- Communication services:
 - PROFIBUS DP
 - PG/OP communication
 - S7 communication
 - Open communication (SEND/RECEIVE)
- Time synchronization
- Easy programming and configuration via PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Module replacement without PG
- SIMATIC H system operation for redundant S7 communication or DP master communication
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Technical specifications

Order No.	6GK7 443-5DX04-0XE0
Product type designation	CP 443-5 Extended
Transmission rate	
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s
Interfaces	
Number of electrical connections at interface 1 in accordance with PROFIBUS	1
Design of electrical connection at interface 1 in accordance with PROFIBUS	9-pin D-sub socket (RS485)
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply 1 from backplane bus	5 V
Relative symmetrical tolerance at 5 V DC	5 %
Current input from backplane bus with 5 V DC, typical	1.3 A
Effective power loss	6.5 W
Permitted ambient conditions	
Ambient temperature During operating phase During storage During transport	0 +60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-400 compact module, single-width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.7 kg
Product properties, functions, components General	
Maximum number of modules per CPU	14
Number of modules - Note	The number of CPs which can be used as DP masters depends of the number of CP 443-1 Advanced used in the S7-400 station as PROFINET IO-Controllers. A total of 10 CPs can be used, as PROFINET IO-Controller (CP 443-1 Advanced) -> maximum 4, as DP master (CP 443-5 Extended) -> maximum 10

CP 443-5 Extended

Technical specifications (conti	nued)	Ordering data	Order No.
Order No.	6GK7 443-5DX04-0XE0	CP 443-5 Extended communi-	
Product type designation	CP 443-5 Extended	cation processor	
Performance data		for connection of the SIMATIC S7-400 to PROFIBUS	
Performance data Open communication		Extended version for PROFIBUS DP; with electronic manual on	6GK7 443-5DX04-0XE0
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	32	CD-ROM STEP 7 Version 5.4	
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks, maximum	240 byte	Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows 2000 Prof./XP Prof.	
Performance data PROFIBUS DP		Type of delivery:	
Service as DP master DPV1	Yes	German, English, French, Spanish, Italian; incl. 3.5" authori-	
Number of DP slaves operable on DP master	125	zation disk, without documentation	0F07 040 40000 0V4F
Data volume		 Floating license on CD Rental license for 50 hours 	6ES7 810-4CC08-0YA5 6ES7 810-4CC08-0YA6
 of address area of inputs as DP master, total 	4 096 byte	Software Update Service on CD (requires current software)	6ES7 810-4BC01-0YX2
of address area of outputs as DP master, total	4 096 byte	version) • Upgrade Floating License	6ES7 810-4CC08-0YE5
of address area of inputs per DP slave	244 byte	3.x/4.x/5.x to V5.4; on CD • Trial License STEP 7 V5.4; on	6ES7 810-4CC08-0YA7
of address area of outputs per DP slave	244 byte	CD, runs for 14 days	0E57 010-4CC00-01A7
Performance data S7 communication		RS485 PROFIBUS FastConnect bus connector	
Maximum number of possible connections for S7 communication	48	With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
Number of possible connections for S7 communication - Note	-	Without PG interfaceWith PG interface	6ES7 972-0BA50-0XA0 6ES7 972-0BB50-0XA0
Performance data Multiprotocol		PROFIBUS bus connector IP20	
operation		With connection to PPI, MPI,	
Number of active connections in multiprotocol mode		PROFIBUS • Without PG interface	6ES7 972-0BA12-0XA0
Maximum without DP	59	With PG interface	6ES7 972-0BB12-0XA0
Maximum with DP	55	12M PROFIBUS bus terminal	6GK1 500-0AA10
Product functions Management, configuration, programming		Bus terminal for connection of	300 0,2110
Configuration software required	STEP 7 V5.4 SP4 and higher and NCM S7 for PROFIBUS	PROFIBUS nodes at up to 12 Mbit/s with connecting cable	

Communication

CP 443-1

Overview



150	UDP	PIN	MKP	"	IP-R	PG/UP	3//33
•	•	•	•	•		•	G_K10_XX_101

Communication processor for connecting the SIMATIC S7-400 to Industrial Ethernet networks and PROFINET IO controllers or in SIMATIC H systems.

Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE), PROFINET communication, and IT communication. Furthermore, the communication processor can also be used for redundant S7 communication in SIMATIC H systems and also for fail-safe applications (PROFIsafe) in combination with an S7-400 F-CPU.

Technical specifications

Order No.	6GK7 443-1EX20-0XE0
	CP 443-1
Transmission rate	
Transmission rate at interface 1	10 100 Mbit/s
Interfaces	
Number of electrical connections at interface 1 in accordance with Industrial Ethernet	2
Design of electrical connection at interface 1 in accordance with Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of power supply	DC
Power supply 1 from backplane bus	5 V
Relative symmetrical tolerance at 5 V DC	5 %
Current input from backplane bus with 5 V DC, typical	1.4 A
Effective power loss	8.6 W
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	0 60 °C -40 +70 °C -40 +70 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP 20
Design, dimensions and weights	
Module format	S7-400 compact module, single-width
Width	25 mm
Height Depth	290 mm 210 mm
Net weight	0.7 kg
Product properties, functions,	
Components in general	14
Maximum number of modules per CPU	14
Number of modules - Note	Max. 4 as PN IO Ctrl.

CP 443-1

Technical specifications (continued)

lechnical specifications (conti	nueu)
Order No.	6GK7 443-1EX20-0XE0
	CP 443-1
Performance data	
Performance data Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, maximum	64
Data volume • as user data per ISO connection for open communication by means of SEND/RECEIVE blocks, maximum	8 KB
as user data per ISO on TCP connection for open communi- cation by means of SEND/ RECEIVE blocks, maximum	8 KB
as user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum	8 KB
as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum	2 KB
Number of possible connections for open communication by means of T blocks, maximum	64
Data volume as user data per ISO on TCP connection for open communication by means of T blocks, maximum	1 452 byte
Number of multicast nodes	-
Performance data S7 communication	
Number of possible connections for S7 communication	
MaximumMaximum with PG connections	128 2
Number of possible connections for S7 communication - Note	When using several CPUs
Performance data Multiprotocol operation	
Number of active connections in multiprotocol mode	128
Performance data PROFINET communication as PN IO controller	
Product function: PROFINET IO controller	-
Total number of PN IO devices which can be operated on the PROFINET IO controller	128
Number of PN IO IRT Devices which can be operated on the PROFINET IO controller	32
Number of external PN IO lines with PROFINET, per rack	4

Order No.	6GK7 443-1EX20-0XE0 CP 443-1
Data volume	41/0
 As user data for input variables as PROFINET IO controller, maximum 	4 KB
 As user data for output variables as PROFINET IO controller, maximum 	4 KB
 As user data for input variables per PN IO device as PROFINET 	240 byte
O controller, maximum As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte
As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte
Product functions Management,	
configuration, programming	
Product function: MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software required	STEP 7 V5.4 SP4 and higher
Product functions Diagnostics	
Product function: Web-based diagnostics	Yes
Product functions Switch	
Product feature: Switch	Yes
Product function	
Switch-managed	No
with IRT PROFINET IO Switch	Yes
 Configuration with STEP 7 	Yes
Product functions Redundancy	
Product function	
Ring redundancy	Yes
Redundancy manager	Yes
Redundancy procedure MRP	Yes
Product functions Security	
Product function	
ACL - IP based	Yes
Switching-off non-required services	Yes
Blocking of communication via physical ports	Yes
Log file for unauthorized access	No
Product functions Time	
Product function	
SICLOCK support	Yes
Passing-on of time synchroni- zation	Yes

Protocol is supported NTP

Yes

CP 443-1

Ordering data	Order No.		Order No.
CP 443-1	6GK7 443-1EX20-0XE0	IE FC TP standard cable GP 2x2	6XV1 840-2AH10
communication processor For connecting SIMATIC S7-400 to Industrial Ethernet through TCP/IP, ISO and UDP; PROFINET IO controller, MRP; integrated		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	
real-time switch ERTEC with two ports; 2 x RJ-45 interface; S7 communication, open commu-		SCALANCE X204-2 Industrial Ethernet switch	6GK5 204-2BB10-2AA3
nication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, DHCP, SNMP V2, diagnostics, multicast, access protection over IP access list, initialization over LAN 10/100 Mbit/s with electronic manual on DVD		Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ-45 ports and two fiber-optic cable ports	
SOFTNET S7 for Industrial Ethernet		IE FC RJ45 Plug 180 2x2	
Software for S7 and open communication, including OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on a USB stick, Class A		RJ-45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation-displacement/terminal contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/	
SOFTNET V8.0 for Industrial Ethernet		CPUs with Industrial Ethernet interface	
for 32-bit Windows 7 Professional/ Ultimate; German/English		 1 pack = 1 unit 1 pack = 10 units 1 pack = 50 units 	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0
up to 64 connectionsSingle license for 1 installation	6GK1 704-1CW80-3AA0	IE FC stripping tool	6GK1 901-1GA00
SOFTNET Edition 2008 for Industrial Ethernet		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
for 32-bit Windows XP Profes- sional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English		STEP 7 Version 5.4 Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC	
up to 64 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0	Requirements: Windows XP Professional, Vista Ultimate, Vista Business Type of delivery: German, English, French, Spanish, Italian, including license key on USB flash drive, with	
• Upgrade from Edition 2006 to	6GK1 704-1CW00-3AE0	electronic documentation • Floating license on DVD	6ES7 810-4CC08-0YA5
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE1	Rental license for 50 hoursSoftware Update Service on	6ES7 810-4CC08-0YA6 6ES7 810-4BC01-0YX2
SOFTNET S7 Lean Edition V8 for Industrial Ethernet		DVD (requires current software version) • Floating license upgrade	6ES7 810-4CC08-0YE5
up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0	3.x/4.x/5.x to V5.4; on DVD • Trial license STEP 7 V5.4; on	6ES7 810-4CC08-0YA7
SOFTNET S7 Lean Edition 2008	7.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	DVD, operational for 14 days	0L3/ 010-40000-01A/
for Industrial Ethernet			
up to 8 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0		
 Upgrade from Edition 2006 to V8.0 	6GK1 704-1LW00-3AE0		
• Upgrade from V6.0, V6.1, V6.2	6GK1 704-1LW00-3AE1		
or V6.3 to V8.0		I: Subject to export regulations AL: N	l and FCCN: FAR99H

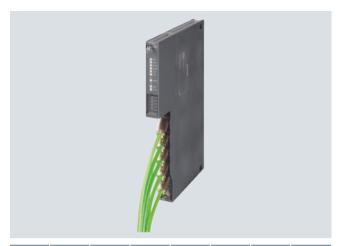
I: Subject to export regulations AL: N and ECCN: EAR99H

maximum

SIMATIC S7-400 Communication

CP 443-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5	
•	•	•	•	•	•	•	G_K10,XX_10150	

Communication processor for connecting the SIMATIC S7-400 to Industrial Ethernet networks and PROFINET IO controllers or in SIMATIC H systems.

Support of PG/OP communication, S7 communication, open communication (SEND/RECEIVE), PROFINET communication, and IT communication. Furthermore, the communication processor can also be used for redundant S7 communication in SIMATIC H systems and also for fail-safe applications (PROFIsafe) in combination with an S7-400 F-CPU. Furthermore, the CP 443-1 Advanced, with its e-mail option and web pages that can be created by the user, offers ideal support for maintenance and quality assurance. The Internet functions such as FTP even permit the coupling to many different PC-based systems. Therefore, for the S7-400, this CP is the bridge between the field level and control level. The CP 443-1 Advanced is seamlessly connected to the security structures of the office and IT world.

Technical specifications

Order No.	6GK7 443-1GX20-0XE0
	CP 443-1 Advanced
Transmission rate	
Transmission rate	
at interface 1	10 1 000 Mbit/s
• at interface 2	10 100 Mbit/s
Interfaces	
Number of electrical connections	
• at interface 1 in accordance with Industrial Ethernet	1
• at interface 2 in accordance with Industrial Ethernet	4
Design of electrical connection	
• at interface 1 in accordance with Industrial Ethernet	RJ45 port
at interface 2 in accordance with Industrial Ethernet	RJ45 port

Order No.	6GK7 443-1GX20-0XE0		
0.40.110.	CP 443-1 Advanced		
Design of swap medium C-Plug	Yes		
Supply voltage, current	103		
consumption, power loss			
Type of power supply	DC		
Power supply 1 from backplane bus	5 V		
Relative symmetrical tolerance at 5 V DC	5 %		
Current input from backplane bus with 5 V DC, typical	1.8 A		
Effective power loss	7.25 W		
Permitted ambient conditions			
Ambient temperature			
During operating phase	0 60 °C		
During storage	-40 +70 °C		
During transport	-40 +70 °C		
Relative humidity at 25 °C without	95 %		
condensation during operating phase, maximum	93 /6		
IP degree of protection	IP 20		
Design, dimensions and weights			
Module format	S7-400 compact module, single-width		
Width	25 mm		
Height	290 mm		
Depth	210 mm		
Net weight	0.7 kg		
Product properties, functions,			
components in general			
Maximum number of modules per CPU	14		
Number of modules - Note	Max. 4 as PN IO Ctrl.		
Performance data			
Performance data Open communication			
Number of possible connections for			
open communicationby means of SEND/RECEIVE	64		
blocks, maximum			
by means of T blocks, maximum	64		
Data volume			
 as user data per ISO connection for open communication by means of SEND/RECEIVE blocks, maximum 	8 Kibyte		
as user data, per ISO on TCP connection for open communi- cation			
 by means of SEND/RECEIVE blocks, maximum 	8 Kibyte		
 by means of T blocks, maximum as user data per TCP connection for open communication by means of SEND/RECEIVE blocks, maximum 	1 452 byte 8 Kibyte		
as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks, maximum	2 Kibyte		

maximum

SIMATIC S7-400 Communication

CP 443-1 Advanced

Technical specifications (continued)

Number of multicast stations Performance data S7 communi-	CP 443-1 Advanced
Performance data S7 communi-	-
cation	
Number of possible connections for communication	100
Maximum Maximum with PG connections	128 2
Number of possible connections for 37 communication - Note	When using several CPUs
Performance data Multiprotocol pperation	
Number of active connections in nultiprotocol mode	128
Performance data IT functions	
Number of possible connections as client with FTP, maximum as server	20
- with FTP, maximum - with HTTP, maximum	10 4
as e-mail client, maximum	1
Data volume as user data for e-mail, naximum	8 Kibyte
Storage capacity of user memory as flash memory file system as RAM as RAM additionally buffered by central backup battery	30 Mibyte 16 Mibyte 512 Kibyte
Number of possible write cycles of lash memory cells	100 000
Performance data PROFINET communication as PN IO controller	
Product function: PROFINET O controller	Yes
otal number of PN IO devices which can be operated on the PROFINET IO controller	128
Number of PN IO IRT Devices which can be operated on the PROFINET O controller	32
Number of external PN IO lines with PROFINET, per rack	4

	2017 112 10 10 10 10 10 10 10 10 10 10 10 10 10
Order No.	6GK7 443-1GX20-0XE0
-	CP 443-1 Advanced
Data volume • As user data for input variables as	4 Kibyte
PROFINET IO controller, maximum	•
 As user data for output variables as PROFINET IO controller, maximum 	4 Kibyte
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte
As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte
As user data for input variables per PN IO device as PROFINET IO controller, maximum	240 byte
As user data for output variables per PN IO device as PROFINET IO controller, maximum	240 byte
Performance data PROFINET CBA	
Number of remote connection partners with PROFINET CBA	64
Total number of connections with PROFINET CBA	600
Data volume • As user data for digital inputs with	8 Kibyte
PROFINET CBA, maximum • As user data for digital outputs with PROFINET CBA, maximum	8 Kibyte
 As user data for arrays and data types 	
- with acyclic transmission with PROFINET CBA, maximum	8 KB
 with cyclic transmission with PROFINET CBA, maximum 	250 byte
- with local connection with PROFINET CBA, maximum	2 400 byte
Performance data PROFINET CBA remote connection with acyclic transmission	
Updating time of remote connections with acyclic transmission with PROFINET CBA	100 ms
Number of remote connections with input variables with acyclic transmission with PROFINET CBA, maximum	150
Number of remote connections with output variables with acyclic transmission with PROFINET CBA, maximum	150

CP 443-1 Advanced

Technical specifications (continued)

i lechnical specifications (conti	nued)		
Order No.	6GK7 443-1GX20-0XE0		
	CP 443-1 Advanced		
Data volume as user data for remote connections with input variables with acyclic transmission with PROFINET CBA	8 KB		
as user data for remote connections with output variables with acyclic transmission with PROFINET CBA	8 KB		
Performance data PROFINET CBA remote connection with cyclic transmission			
Updating time of remote connections with cyclic transmission with PROFINET CBA	10 ms		
Number of remote connections with input variables with cyclic transmission with PROFINET CBA, maximum	250		
Number of remote connections with output variables with cyclic transmission with PROFINET CBA, maximum	250		
Data volume • as user data for remote connec-	2 000 byte		
tions with input variables with cyclic transmission with PROFINET CBA, maximum	2 300 8,10		
 as user data for remote connections with output variables with cyclic transmission with PROFINET CBA, maximum 	2 000 byte		
Performance data PROFINET CBA HMI variables via PROFINET, acyclic			
Number of HMI stations for logging- on for HMI variables with acyclic transmission with PROFINET CBA	3		
Updating time of HMI variables with acyclic transmission with PROFINET CBA	500 ms		
Number of HMI variables with acyclic transmission with PROFINET CBA, maximum	200		
Data volume as user data for HMI variables with acyclic transmission with PROFINET CBA, maximum	8 KB		
Performance data PROFINET CBA device-internal connections			
Maximum number of internal connections with PROFINET CBA	300		
Data volume of internal connections with PROFINET CBA, maximum	2 400 byte		
Performance data PROFINET CBA connections with constants			
Maximum number of connections with constants with PROFINET CBA	500		

Data volume as user data for connections with constants with PROFINET CBA, maximum	CP 443-1 Advanced
connections with constants with	4.000 byto
	4 000 byte
Performance data PROFINET CBA PROFIBUS proxy functionality	
Performance data with PROFINET CBA PROFIBUS proxy functionality	No
Product functions Management,	
configuration, programming	V
Product function: MIB support	Yes
Protocol is supported	
• SNMP v1 • DCP	Yes Yes
• LLDP	Yes
Configuration software	
Required	STEP 7 V5.4 SP4 and higher
• Required for PROFINET CBA	SIMATIC IMAP V3.0 SP1 and higher
Product functions Diagnostics	
Product function: Web-based diagnostics	Yes
Product functions Switch	
Product feature: Switch	Yes
Product function	
 Switch-managed 	No
 with IRT PROFINET IO Switch 	Yes
 Configuration with STEP 7 	Yes
Product functions Redundancy	
Product function	
Ring redundancy	Yes
Redundancy manager	Yes
Redundancy procedure MRP	Yes
Product functions Security	
Product function Password protection for Web	Yes
applications ACL - IP based	Yes
• ACL - IP based for PLC/routing	Yes
• Switching-off non-required	Yes
services	V
 Blocking of communication via physical ports 	Yes
• Log file for unauthorized access	No
Product functions Time	
Product function	
 SICLOCK support 	Yes
 Passing-on of time synchroni- zation 	Yes
	Yes

CP 443-1 Advanced

Ordering data	Order No.		Order No.		
CP 443-1 Advanced communication processor		SOFTNET S7 Lean Edition V8 for Industrial Ethernet			
For the connection of SIMATIC S7-400 to Industrial		up to 8 connections • Single license for 1 installation	6GK1 704-1LW80-3AA0		
Ethernet; PROFINET IO controller with RT and IRT, MRP, PROFINET CBA, TCP/IP, ISO and UDP;		SOFTNET S7 Lean Edition 2008 for Industrial Ethernet			
S7 communication, open communication (SEND/ RECEIVE) with FETCH/WRITE, with and without RFC 1006, diagnostic expansions, multicast, clock synchronization via SIMATIC procedure or NTP,		up to 8 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1LW71-3AA0 6GK1 704-1LW00-3AL0		
access protection via IP access list, FTP client/server, HTTP		 Upgrade from Edition 2006 to V8.0 	6GK1 704-1LW00-3AE0		
server, HTML diagnostics, SNMP, DHCP, e-mail, data storage on C-PLUG:		 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1LW00-3AE1		
PROFINET interface: 4 x RJ-45 (10/100 Mbit/s) over		IE FC TP standard cable GP 2x2 (type A)	6XV1 840-2AH10		
switch; Gigabit interface: 1 x RJ-45 (10/100/1000 Mbit/s); with electronic manual on DVD • For use with	6GK7 443-1GX20-0XE0	4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold in meters, max.			
SIMATIC S7-400 CPU, V5.2 and higher;		quantity 1000 m, minimum order 20 m			
SOFTNET S7 for Industrial Ethernet		IE FC TP standard cable GP 4x2			
Software for S7 and open commu- nication, including OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD- ROM, license key on a USB stick, Class A		8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal application; with UL approval; sold by the meter, max quantity 1000 m, minimum order 20 m • AWG 22, for connection to IE FC RJ-45	6XV1 870-2E		
SOFTNET V8.0 for Industrial Ethernet		Modular Outlet • AWG 24,	6XV1 878-2A		
for 32-bit Windows 7 Professional/ Ultimate; German/English		for connection to IE FC RJ-45 Plug 4 x 2			
up to 64 connections		IE FC RJ45 Plug 180 2x2			
Single license for 1 installation	6GK1 704-1CW80-3AA0	RJ-45 plug connector for Industrial Ethernet with a rugged metal			
SOFTNET Edition 2008 for Industrial Ethernet		housing and integrated insulation-displacement/terminal			
for 32-bit Windows XP Profes- sional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; German/English		contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface			
up to 64 connections • Single license for 1 installation • 1-year Software Update Service, with automatic extension; requirement: Current software version	6GK1 704-1CW71-3AA0 6GK1 704-1CW00-3AL0	• 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0 6GK1 901-1BB10-2AE0		
 Upgrade from Edition 2006 to V8.0 	6GK1 704-1CW00-3AE0				
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to V8.0 	6GK1 704-1CW00-3AE1				

CP 443-1 Advanced

Ordering data	Order No.		Order No.
IE FC RJ-45 Plug 4 x 2		SIMATIC iMap V3.0	
RJ-45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface 1 pack = 1 unit 1 pack = 50 units	6GK1 901-1BB11-2AA0 6GK1 901-1BB11-2AB0 6GK1 901-1BB11-2AE0	for configuring PROFINET CBA, Requirements: Windows 2000 Prof. with Service Pack 4 or later or Windows XP Prof. with Service Pack 1 or later or Windows 2003 Server with Service Pack 1 or later; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or later with Service Pack 3, PN OPC Server V6.3 and higher	
IE FC stripping tool	6GK1 901-1GA00	Type of delivery:	
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables		German, English, with electronic documentation • Single license • Software Update Service D	6ES7 820-0CC04-0YA5 6ES7 820-0CC01-0YX2
Industrial Ethernet Switch SCALANCE X204-2	6GK5 204-2BB10-2AA3	Upgrade to V3.0, Single license D	6ES7 820-0CC01-07X2
with four 10/100 Mbit/s RJ-45 ports and two fiber-optic cable ports			
Industrial Ethernet Switch SCALANCE X308-2			
2 x 1000 Mbit/s multimode fiberoptic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ-45 port, 7 x 10/100 Mbit/s RJ-45 ports; for glass fiber-optic cable (multimode) up to 750 m max.			
STEP 7 Version 5.4			
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Professional, Vista Ultimate, Vista Business Type of delivery: German, English, French, Spanish, Italian, including license key on USB flash drive, with electronic documentation • Floating license on DVD	6ES7 810-4CC08-0YA5		
Rental license for 50 hours	6ES7 810-4CC08-0YA6		
 Software Update Service on DVD (requires current software version) 	6ES7 810-4BC01-0YX2		
• Floating license upgrade 3.x/4.x/5.x to V5.4; on DVD	6ES7 810-4CC08-0YE5		
 Trial license STEP 7 V5.4; on DVD, operational for 14 days 	6ES7 810-4CC08-0YA7		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H

SIPLUS communication

SIPLUS CP 443-5 Extended

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•			•	•	6.KIQ.X.DIS

- DP-V1 master connection of the S7-400 to PROFIBUS
- For setting up additional PROFIBUS DP lines
- Communication services:
 - PROFIBUS DP
- PG/OP communication
- S7 communication
- S5-compatible communication (SEND/RECEIVE)
- Clock synchronization
- · Easy programming and configuration over PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Module replacement without PG
- SIMATIC H system operation for redundant S7 communication or DP master communication
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 443-5-Extended				
Order number	6AG1 443-5DX04-4XE0			
Order No. based on	6GK7 443-5DX04-0XE0			
Ambient temperature range	0 +60 °C			
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions			
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K			
	658 540 hPa (+3500 +5000 m) derating 20 K			

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2 S <$ 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2 S <$ 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.	
SIPLUS CP 443-5 Extended communication processor		
(medial exposure)		
for connection of the SIMATIC S7-400 to PROFIBUS		
Extended version for PROFIBUS LDP; with electronic manual on CD-ROM	6AG1 443-5DX04-4XE0	
Accessories	See SIMATIC CP 443-5 Extended, page 6/149	

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-400 SIPLUS communication

SIPLUS CP 443-1

Overview



ISO	TCP/ UDP	/ PN	MRP	IT 	IP-R	PG/OP	S7/S5
	•	•	•	•		•	G_K10_XX_101

- The connection for the SIMATIC S7-400 to Industrial Ethernet
 2 x RJ-45 interface for 10/100 Mbit/s full/half-duplex connection with auto-sensing/auto-negotiation and autocrossover function
 - Integrated real-time switch ERTEC with two ports
 - Multi-protocol operation for ISO, TCP/IP, UDP and PROFINET IO protocols
 - Adjustable keep alive function
- Communication services:
- Open communication (ISO, TCP/IP, and UDP)
- PROFINET IO controller with real-time properties RT and IRT
- PG/OP communication: Cross-network by means of S7 routing
- S7 communication
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP.
- Multicast by UDP
- · Access protection via configurable access list
- Support for fail-safe programmable controllers together with SIMATIC S7-400 CPU 416F-3PN/DP
- · Module replacement without PG
- SIMATIC H system operation for redundant S7 communication
- Configuration with STEP 7
- Diagnostic possibilities in STEP 7 and via Web browser
- Automatic CPU-clock setting via Industrial Ethernet with NTP or SIMATIC procedure
- Integration of network management systems via SNMP (MIB II diagnostic information)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 443-1				
Order No.	6AG1 443-1EX20-4XE0			
Order No. based on	6GK7 443-1EX20-0XE0			
Ambient temperature range	0 +60 °C			
Conformal coating	Coating of the printed circuit boards and the electronic components			
Technical data	The technical data of the standard product applies except for the ambient conditions			
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range			
	795 658 hPa (+2000 +3500 m) derating 10 K			
	658 540 hPa (+3500 +5000 m) derating 20 K			

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
Orgering gara	Orger No.

SIPLUS CP 443-1 communication processor

(medial exposure)

For connecting SIMATIC S7-400 to Industrial Ethernet through TCP/IP, ISO and UDP; PROFINET IO controller, MRP; integrated real-time switch ERTEC with two ports; 2 x RJ-45 interface; S7 communication, open communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, DHCP, SNMP V2, diagnostics, multicast, access protection over IP access list, initialization over LAN 10/100 Mbit/s with electronic manual on DVD

Accessories

6AG1 443-1EX20-4XE0

See SIMATIC CP 443-1, page 6/152

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS communication

SIPLUS CP 443-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
•	•	•	•	•	•	•	G_K10,XX_10150

- The connection for the SIMATIC S7-400 to Industrial Ethernet
 Multi-protocol operation for ISO, TCP/IP, UDP and PROFINET
 IO protocols
 - Adjustable keep alive function
- Two separate interfaces (integrated network separation):
 - Gigabit interface with one RJ45 port with 10/100/ 1000 Mbit/s full/half-duplex with auto-sensing capability
 - PROFINET interface with four RJ45 ports with 10/100 Mbit/s full/half duplex with autosensing and auto-crossover functionality via 4-port switch
- · Communication services via both interfaces
 - Open communication (ISO, TCP/IP and UDP), multicast with UDP, including routing between both interfaces
 - PG/OP communication: Cross-network by means of S7 routing
 - S7 communication (client, server, multiplexing) including routing between both interfaces
 - IT communication: HTTP communication supports access to process data via own web pages; e-mail client function, sending of e-mails with authentication directly from user program; FTP communication supports program-controlled FTP client communication; access to data blocks through FTP server
- Communication services via PROFINET interface
- PROFINET IO controller with real-time properties (RT and IRT)
- PROFINET ĆBA
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Support of the prioritized startup of PROFINET IO devices
- Configuration with STEP 7
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP.
- · Access protection by means of configurable IP access list
- Module replacement without programming device; all information is stored on the C-PLUG (also file system for IT functions)

- Extensive diagnostics functions for all modules in the rack
- Integration into network management systems through the support of SNMP V1 MIB-II
- SIMATIC H system operation for redundant S7 communication
- Operation in fail-safe applications (PROFIsafe) in combination with SIMATIC S7-400 CPU 416F

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 443-1 Advanced			
Order No.	6AG1 443-1GX20-4XE0		
Order No. based on	6GK7 443-1GX20-0XE0		
Ambient temperature range	0 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions		
Ambient conditions			
Relative humidity	5 100 % Condensation permissible		
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K		

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-400 SIPLUS communication

SIPLUS CP 443-1 Advanced

Ordering data	Order No.		Order No.
SIPLUS CP 443-1 Advanced communication processor		Accessories	See SIMATIC CP 443-1 Advanced, page 6/156
(medial exposure)			
For the connection of SIMATIC S7-400 to Industrial Ethernet; PROFINET IO controller with RT and IRT, MRP, PROFINET CBA, TCP/IP, ISO and UDP; S7 communication, open communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, diagnostic expansions, multicast, clock synchronization via SIMATIC procedure or NTP, access protection via IP access list, FTP client/server, HTTP server, HTML diagnostics, SNMP, DHCP, e-mail, data storage on C-PLUG; PROFINET interface: 4 x RJ-45 (10/100 Mbit/s) over switch; Gigabit interface: 1 x RJ-45 (10/100/1000 Mbit/s); with electronic manual on DVD • For use with SIMATIC S7-400 CPU, V5.2 and higher	6AG1 443-1GX20-4XE0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

SIMATIC S7-400 Connection methods

Front connectors



- For simple and user-friendly connection of sensors and actuators
- For retaining the wiring when replacing modules
- With coding to avoid mistakes when replacing modules

Ordering data	Order No.
Front connectors	
48-pin for signal modules, function modules; 1 unit With screw contacts With spring-loaded terminals With crimp contacts	6ES7 492-1BL00-0AA0
48-pin for signal modules, function modules; 84 units per pack • With screw contacts • With crimp contacts	6ES7 492-1AL00-1AB0 6ES7 492-1CL00-1AB0
for 6ES7 431-7KF00-0AB0; spare part, included in scope of delivery; 1 unit	6ES7 431-7KF00-6AA0
Crimp contacts	6XX3 070
250 units	
Pliers	6XX3 071
for crimping the contacts	
Front cover for front connector	6ES7 492-2XL00-0AA0
6 units	
Connection terminal for modules	6ES7 490-1BA00-0AA0
6 units	
Manual "SIMATIC S7-400 automation system"	
incl. instruction list	
German	6ES7 498-8AA05-8AA0
English	6ES7 498-8AA05-8BA0
SIMATIC manual collection	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates	

- D: Subject to export regulations AL: N and ECCN: 5D992
- F: Subject to export regulations AL: N and ECCN: EAR99
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC S7-400 Connection methods

SIMATIC TOP connect for SIMATIC S7

Overview

Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet manufacture, procurement and ease of service.

With SITOP TOP connect system cabling, this connection is established for your SIMATIC S7-300/400 simply, quickly and reliably.

With the SIMATIC TOP connect **configuration tool**, you can configure the connection between the SIMATIC S7 interface and the I/O per mouse click. The program automatically checks for plausibility and generates a parts list for the selected connection components.

www.siemens.com/simatic-tc-configurator

Design

Two cabling versions are available for the most diverse control cabinet concepts:

Fully modular connection

Each component is individually inserted.

The system consists of:

- Front connector module
- · Connecting cable
- Connection modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is minimized. Connect systematically the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced as cables sold by the meter that are either pre-assembled or that can be assembled easily can be used.

Flexible connection

Consisting of:

- Front connector with screw-type or crimp connection
- Front connector with fixed single cores
- Single cores also available with UL/CSA-certified cores

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 46 single cores per module is necessary.

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Overview



The fully modular connection is the standard connection for the SIMATIC S7-300/400. The fully modular connection allows the peripherals to be conveniently and quickly connected to the SIMATIC S7-300/400 without errors.

Benefits

- Easy plug-in of front connector module, connecting cable and connection module
- Fast and low-cost wiring
- Supply voltage connectable to front connector module or connection module for digital and analog signals
- · Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or by double-byte
- · Each component can be replaced individually
- Every cable length can be configured without cutting, or pre-assembled cables can be used

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector. The front connector modules are available in many different versions. For the SIMATIC S7-300 and SIMATIC S7-400, digital or analog. The connecting cables are plugged into these front connector modules.

Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pole round cable (shielded or unshielded) up to a length of 5 m, or the 16-pole round-sheath ribbon cable (with or without shield), which can be easily assembled by the user, or as 2 x 16-pole round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (to be ordered separately). The cable transmits $8 \text{ or } 2 \times 8$ channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the connection module.

Connection module

The system has digital and analog connection modules for connecting the I/O signals. These are snapped onto the standard mounting rail.

The connection modules are available for two connection methods: with spring-loaded or screw-type terminals

Basic module:

Connection modules with basic functionality for getting the signal from the field to the module or from the module to the field quickly and easily. For digital or analog signals.

Signal module:

Expands the digital basic module with LEDs for signaling the active high signal. This makes commissioning easier for you, and you always have an overview of the signal states of your I/O. One LED signals the availability of the supply voltage.

Function module:

Digital connection modules that are fitted with relays or opto-couplers.

If other voltage or power levels are required in the field, the connection module for output signals TPRo or TPOo is used. For the TPRo connection module, relays are used for the implementation. For the TPOo connection module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay connection module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency here.

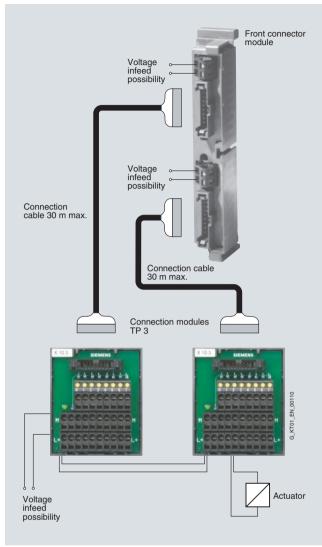
Shield plate

The shield plate is latched onto the connection module for 3-core initiators or optionally onto the connection module for analog signals and then snapped onto the mounting rail with the connection module. With the terminal elements, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded mounting rail.

Connection methods

SIMATIC TOP connect for SIMATIC ST Fully modular connection

Design (continued)



Design of the fully modular connection (16-channel in example)

Technical specifications Front Connector Module

Technical data of front connector module				
Rated operating voltage	24 V DC			
Max. permissible operating voltage	60 V DC			
Max. permissible continuous current per connector pin	1 A			
Max. permissible summation current	4 A/byte (power supply)			
Permissible ambient temperature	0 to + 60 °C			
Test voltage	0.5 kV, 50 Hz, 60 s			
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89),			

overvoltage class II,

pollution degree 2

Wiring rules for the front connector modules

Front connector module SIMATIC TOP connect, connection for potential supply

Screw connection

Modules up to 4 connections

Connectable cable cross-sections

solid cables

flexible cables with/ without wire end

ferrule

Number of cables per

connection

Max. diameter of the cable insulation

0.25 to 1.5 mm²

1 or a combination of 2 conductors up to 1.5 mm² (total) in a common wire end ferrule

3.1 mm

Stripping length of the cables

without insulating collar

• with insulating collar

Wire-end ferrules according to DIN 46228

without insulating collar

 with insulating collar 0.25 to 1.0 mm with insulating collar

1.5 mm² Blade width of the

screwdriver

Tightening torque for connecting the cables Form A; 5 to 7 mm long

3.5 mm (cylindrical shape)

0.4 to 0.7 Nm

Front connector module SIMATIC TOP connect, connection for potential supply

Screw connection

Modules up to 6 connections

Connectable cable cross-sections

solid cables

 flexible cables with/ without wire end ferrule

0.25 to 0.75 mm²

Number of cables per connection

1 or a combination of 2 conductors up to 0.75 mm² (total) in a common wire end ferrule

Max. diameter of the cable insulation

2.0 mm

Nο

Stripping length of the wires

without insulating collar

with insulating collar

6 mm

Wire-end ferrules to DIN 46228

without insulating collar

 with insulating gollar 0.25 to 1.0 mm

 with insulating collar 1.5 mm

Blade width of the screwdriver

Tightening torque for connecting the cables Form A; 5 to 7 mm long

3.5 mm (cylindrical shape)

0.4 to 0.7 Nm

6/165

SIMATIC S7-400 Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Technical specifications Connecting Cable

•	•
Technical data of connecting cat module	ole from SIMATIC S7 to connection
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. summation current	4 A/byte
Operating temperature	0 to +60°C
Outer diameter of pre-assembled round cable in mm, unshielded/shielded	Approx. 6.5/7.0
Outer diameter of round-sheath ribbon cable in mm , 16-pole/2 x 16-pole	Approx. 9.5/11.5

Technical specifications Basic Module

TP1, TP3 and TPK connection mo	TP1, TP3 and TPK connection module				
Max. operating voltage	60 V DC				
Continuous current per signal	1 A				
Max. summation current (voltage infeed)	4 A/byte				
Operating temperature	0 to + 60°C				
Mounting position	Any				
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3				
Dimensions (W x H x D) in mm 1-wire connection 6ES7924-0AA10-0A_0 for 3-wire initiators 6ES7924-0CA10-0A_0 for 2 x 8 signals 6ES7924-1AA10-0A_0	Approx. 55 x 43.2 x 63 Approx. 68 x 43.2 x 80 Approx. 100 x 43.2 x 80				
TP2 connection module					
Max. operating voltage	60 V DC				
Continuous current signal conductor	2 A				
Operating temperature	0 to + 60°C				
Mounting position	Any				
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3				
Dimensions (W x H x D) in mm • for 2 ampere modules 6ES7924-0BB10-0A_0	Approx. 68 x 43.2 x 80				

TPA connection module				
Max. operating voltage	60 V DC			
Continuous current signal conductor	1 A			
Operating temperature	0 to + 60°C			
Mounting position	Any			
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3			
Dimensions (W x H x D) in mm • for 2 analog modules 6ES7924-0CC10-0A_0	Approx. 68 x 43.2 x 80			

Wiring rules for the front connector modules

_			
TPA, TP1, TP2, TP3, TPK cor	nnection module		
	Spring connection	Screw connection	
Connectable cable cross-sec	ctions		
• solid cables	No		
 flexible cables without wire end ferrule 	0.5 to 2.5 mm ²		
flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)	
flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm ²		
Number of cables per connection	1 or a combination of 2 cables up to the cross-sections specified above (total) in a shared wire end ferrule		
Blade width of the screw- driver	3.5 mm (cylindrical shape)		
Tightening torque for connecting the cables		0.4 to 0.7 Nm	

Connection methods

SIMATIC TOP connect for SIMATIC S7 Fully modular connection

Technical specifications Signal Module

TP1, TP3 and TPK connection module with LED		
Max. operating voltage	24 V DC	
Continuous current per signal	1 A	
Max. summation current (voltage infeed)	4 A/byte	
Operating temperature	0 to + 60 °C	
Mounting position	Any	
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3	
Dimensions (W x H x D) in mm • 1-wire connection with LED 6ES7924-0AA10-0B_0 • for 3-wire initiators with LED 6ES7924-0CA10-0B_0 • for 2 x 8 signals with LED 6ES7924-1AA10-0B_0	Approx. 55 x 43.2 x 63 Approx. 68 x 43.2 x 80 Approx. 100 x 43.2 x 80	

TP2 connection module with LED		
Max. operating voltage	24 V DC	
Continuous current per signal conductor	2 A	
Operating temperature	0 to + 60 °C	
Mounting position	Any	
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3	
Dimensions (W x H x D) in mm • for 2-ampere modules with LED 6ES7924-0BB10-0B_0	Approx. 68 x 43.2 x 80	

Wiring rules for the front connector modules

TP1 LED, TPK LED, TP2 LED, TP3 LED connection module		
	Spring connection	Screw connection
Connectable cable cross-sect	ions	
solid cables	No	
flexible cables without wire end ferrule	0.5 to 2.5 mm ²	
flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)
flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm ²	
Number of wires per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared wire end ferrule	
Blade width of the screw- driver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Technical specifications Function Module

Connection module with relay for outputs (TPRo)		
Energizing side		
Operating voltage for coil	24 V DC	
Input circuit	Reverse polarity protection and freewheeling diodes	
Contact side		
Number of relay outputs	8 (NO contacts)	
Contact design	Single contact, 1 NO contact	
Switching capacity (resistive load)	max. 4 A/250 V AC max. 3 A/30 V DC max. 0.6 A/48 V DC max. 0.4 A/60 V DC recommended minimum load ≥ 10 mA	
Switching frequency	20 cycles/minute	
Service life • Mechanical • Electrical	5×10^6 switching cycles 3×10^4 operating cycles at 230 V AC/2 A/ cos $\Upsilon = 1$	
Operating temperature	0 +60 °C	
Mounting position	Any	
Clearance and creepage distances	Basic standard IEC 60664-1; UL 508; Cul (Reference CSA C22.2 No. 142) Overvoltage category III Pollution degree 2	
Dimensions (W x H x D) in mm		
6ES7924-0BD10-0B_0	Approx. 100 x 45 x 80	
Connection module with optocoupler for outputs (TPOo)		
Input data		
Power supply		
Potential connection (L1/M1)	24 V DC (20.4 28.8 V DC)	
Status indicator "L1"	Green LED	
Switching inputs		
Number	8 channels (channel 0 7) with	

Input data	
Power supply	
Potential connection (L1/M1)	24 V DC (20.4 28.8 V DC)
Status indicator "L1"	Green LED
Switching inputs	
Number	8 channels (channel 0 7) with reverse polarity protection
Input voltage "off"	0 V DC (0 5 V DC)
Input voltage "on"	24 V DC (15 28.8 V DC)
Input current	min. 5 mA with 20 V DC, per channel
Status indicator "on"	Green LED per channel
Output data	
Power supply	
Operating voltage $U_{\rm B}$ (L2/M2, L3/M3)	24 V DC (20 30 V DC) per group of 4 one $V_{\rm B}$
U _B conditionally protected against polarity reversal ¹⁾	Up to 30 V DC
Current consumption	approx. 10 mA for 24 V DC + output currents per group of 4
Aggregate current	max. 8 A per group of 4
Switching outputs	
Number	8 channels (channel 0 7)
Short-circuit protection ²⁾	for <i>U</i> _B < 24 V DC or 24 30 V DC/max. 20 A
1) 5	1.16.1

¹⁾ Protected against polarity reversal, if the ground potential of the output load is directly connected to the 0 V supply of the power supply unit

 $^{^{2)}}$ Not sustained short-circuit-proof, max. duration approx. 60 min.

SIMATIC S7-400
Connection methods
SIMATIC TOP connect for SIMATIC S7
Fully modular connection

Technical specifications Function Module (continued)

Connection module with optocoupler for outputs (TPOo)		
Output voltage	typ. U _B – 1 V (for input "on")	
Output current • Lamp load	Max. 4 A per channel max. 20 W at 24 V per channel	
Demand factor per group of 4	50 %, max. 2 outputs active under full load (4 A)	
Short-circuit response	Clocked output signal (approx. 2 20 ms)	
On/off-delay	typ. 100 μs/250 μs with resistive load	
Switching frequency	max. 500 Hz with 4 A resistive load (square wave voltage, pulse/pause 1:1)	
"Overload" fault indication	Red LED per channel, in the event of wire breakage or short-circuit	
Wire break indication	Active $I_{\text{out}} < 0.1 \text{ A} / \text{inactive}$ $I_{\text{out}} \ge 0.9 \text{ A}$	
Group fault messages SF1, SF2		
Monitored channels	SF1: Channels 0 3, SF2: for channels 4 7	
Voltage <i>U</i> _{SF1} , <i>U</i> _{SF2} • No error at the switching output • Wire break at the switching output • Short-circuit at the switching output	typ. $U_{\rm B}$ – 2 V Approx. 0 V 0 V to $U_{\rm B}$, clocked	
Current I _{SF1} , I _{SF2}	min. 4 mA/max. 200 mA	
General data		
Degree of protection	IP20	
Operating temperature	0 60 °C	
Mounting position	Any, except overhead	
Connecting terminals	Screw-type or spring-loaded terminals	
Stripped length	9 mm	
Conductor cross-section • Finely stranded without end sleeve	0.5 2.5 mm ²	
 with end sleeve for screw-type terminals 	0.5 2.5 mm ² according to DIN 46228-1	
• with end sleeve for spring-loaded terminals	0.5 1.5 mm ² according to DIN 46228-1 and DIN 46228-4	
Screwdriver	according to DIN 5264 B 0.6 x 3.5 mm	
Tightening torque of screw-type terminals	0.4 Nm	
Weight	Approx. 400 g	
Dimensions (W x H x D) in mm	134 x 84 x 77	

Connection module with relay for inputs (TPRi)		
Energizing side		
Operating voltage for coil	230 V AC	
	from 207 – 280 V AC	
Input circuit	Varistors	
Contact side		
Number of relay outputs	8 (NO contacts)	
Contact design	Single contact, 1 NO contact	
Switching capacity (resistive load)	max. 50 A/24 V AC, max. 50 mA/48 V DC max. 50 mA/60 V DC recommended minimum load ≥ 5 mA	
Switching frequency	200 cycles/minute	
Service life • Mechanical • Electrical	10 x 10 ⁶ switching cycles 3×10^6 operating cycles at 230 V AC/50 mA/cos $\Upsilon = 1$	
Operating temperature	0 +60 °C	
Mounting position	Any	
Clearance and creepage distances	Basic standard IEC 60664-1; UL 508; Cul (Reference CSA C22.2 No. 142) Overvoltage category III Pollution degree 2	
Dimensions (W x H x D) in mm		
6ES7924-0BE10-0B_0	Approx. 130 x 45 x 80	

Wiring rules for the connection modules

TPRo and TPRi connection modules		
	Spring-loaded connection	Screw-type connection
Connectable cable cross-see	ctions	
Solid conductorsFlexible cables without end sleeve	No 0.5 2.5 mm ²	
Flexible cables with end sleeve according to DIN 46228/1	0.5 1.5 mm ²	0.5 to 2.5 mm ² (2.5 mm ² with a crimp in accordance with EN 60947-1)
 Flexible cables with end sleeve and plastic collar according to DIN 46228/4 	0.5 1.5 mm ²	
Number of conductors per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared end sleeve	
Blade width of the screw- driver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 0.7 Nm

Connection methods
SIMATIC TOP connect for SIMATIC S7
Fully modular connection

Ordering data Front Connect. M	lodule Order No.	Ordering Data Basic Module	Order No.
Front connector module		TP1 connection module	
(digital 4 x 8 I/O)		for 1-wire initiators	
Voltage infeed via Screw terminals	6ES7921-4AB00-0AA0	Packaging unit (1 unit)	
Front connector module		Spring terminals Screw terminals	6ES7 924-0AA10-0AB0 6ES7 924-0AA10-0AA0
(2 x 8 outputs) for 2 ampere		TP3 connection module	OLOT SET UNA IU-UMAU
digital outputs		for 3-wire initiators	
Voltage infeed via • Screw terminals	6ES7921-4AD00-0AA0	Packaging unit (1 unit)	
Front connector module (analog)	0_0.0	Spring terminals	6ES7 924-0CA10-0AB0
Voltage infeed via		Screw terminals	6ES7 924-0CA10-0AA0
Screw terminals	6ES7921-4AG00-0AA0	TPK connection module	
		for 2 x 8 signals	
Ordering data Connect. Cable	Order No.	Packaging unit (1 unit)	
Pre-assembled round cable		Spring terminals Screw terminals	6ES7 924-1AA10-0AB0 6ES7 924-1AA10-0AA0
16-pole, 0.14 mm ²		TP2 connection module	OLOT SETTIMATOTUMAU
Unshielded		for 2 A modules	
0.5 m	6ES7 923-0BA50-0CB0	for 2-wire initiators	
1.0 m	6ES7 923-0BB00-0CB0	Packaging unit (1 unit)	
1.5 m	6ES7 923-0BB50-0CB0	Spring terminals	6ES7 924-0BB10-0AB0
2.0 m	6ES7 923-0BC00-0CB0	Screw terminals	6ES7 924-0BB10-0AA0
2.5 m	6ES7 923-0BC50-0CB0	TPA connection module	
3.0 m	6ES7 923-0BD00-0CB0	for analog signals	
4.0 m	6ES7 923-0BE00-0CB0	Packaging unit (1 unit)	
5.0 m	6ES7 923-0BF00-0CB0	Spring terminals Screw terminals	6ES7 924-0CC10-0AB0 6ES7 924-0CC10-0AA0
Shielded	0201 020-0D1 00-00D0	• Screw terminals Accessories	0E37 324-0CC10-0AA0
1.0 m	6ES7 923-0BB00-0DB0		
2.0 m	6ES7 923-0BC00-0DB0	Labeling plates for connection modules	
2.5 m	6ES7 923-0BC50-0DB0	Insertable labeling plate	6ES7 928-2AB00-0AA0
3.0 m	6ES7 923-0BD00-0DB0	PU = 200 units	
4.0 m	6ES7 923-0BE00-0DB0	Self-adhesive labeling plate PU = 200 units	6ES7 928-2BB00-0AA0
5.0 m	6ES7 923-0BF00-0DB0	Shield plate	6ES7 928-1BA00-0AA0
Round-sheath ribbon cable	0201 020-0D1 00-0DD0	for analog connection module	OLOT OLOTIDADO OMAD
16-pole, 0.14 mm ²		(4 units)	
Unshielded		Shield connection terminal	
30 m	6ES7 923-0CD00-0AA0	for shield plate, 2 units, with cable	
60 m	6ES7 923-0CG00-0AA0	diameter • 2 to 6 mm (2 cables)	6ES7 390-5AB00-0AA0
Shielded	VOGOV UNIO	• 3 to 8 mm	6ES7 390-5BA00-0AA0
30 m	6ES7 923-0CD00-0BA0	• 4 to 13 mm	6ES7 390-5CA00-0AA0
60 m	6ES7 923-0CG00-0BA0		
Round-sheath ribbon cable			
2 x 16-pole, 0.14 mm ²			
Unshielded			
30 m	6ES7 923-2CD00-0AA0		
60 m	6ES7 923-2CG00-0AA0		
Connector (female ribbon connector)	6ES7 921-3BE10-0AA0		
16-pole, insulation displacement system, with strain relief devices; packing unit: 8 connectors and 8 cable grips			
Accessories			
Pliers	6ES7 928-0AA00-0AA0		
For preparing the connectors			
(female ribbon connector)			

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC S7-400
Connection methods
SIMATIC TOP connect for SIMATIC S7
Fully modular connection

Ordering data Signal Module	Order No.
TP1 connection module with	
LED	
for 1-wire initiators	
Packaging unit (1 unit)	
Spring terminals	6ES7 924-0AA10-0BB0
Screw terminals	6ES7 924-0AA10-0BA0
TP3 connection module with LED	
for 3-wire initiators	
Packaging unit (1 unit)	
 Spring terminals 	6ES7 924-0CA10-0BB0
Screw terminals	6ES7 924-0CA10-0BA0
TPK connection module with LED	
for 2 x 8 signals	
Packaging unit (1 unit)	
 Spring terminals 	6ES7 924-1AA10-0BB0
Screw terminals	6ES7 924-1AA10-0BA0
TP2 connection module with LED	
for 2 A modules	
for 2-wire initiators	
Packaging unit (1 unit)	
 Spring terminals 	6ES7 924-0BB10-0BB0
Screw terminals	6ES7 924-0BB10-0BA0
Accessories	
Labeling plates for connection modules	
Insertable labeling plate PU = 200 units	6ES7 928-2AB00-0AA0
Self-adhesive labeling plate PU = 200 units	6ES7 928-2BB00-0AA0

Ordering data Function Module Order No.		
TPRo connection module for output signals		
for 2-wire connection		
Packaging unit 1 unit • Spring-loaded terminals • Screw-type terminals	6ES7 924-0BD10-0BB0 6ES7 924-0BD10-0BA0	
Connection module optocoupler		
Packaging unit 1 unit • Spring-loaded terminals • Screw-type terminals	6ES7 924-0BF10-0BB0 6ES7 924-0BF10-0BA0	
TPRi connection module for input signals		
for 2-wire connection		
Packaging unit 1 unit • Spring-loaded terminals • Screw-type terminals	6ES7 924-0BE10-0BB0 6ES7 924-0BE10-0BA0	
Accessories		
Labels for connection modules		
Insertable labels PU = 200 units	6ES7 928-2AB00-0AA0	
Self-adhesive labels PU = 200 units	6ES7 928-2BB00-0AA0	
Replacement relay for relay connection module PU = 4 units		
Replacement relay for TPRi	6ES7 928-3BA00-4AA0	
Replacement relay for TPRo	6ES7 928-3AA00-4AA0	
Optocoupler DC alternative for relay in the case of TPRo PU = 4 units	6ES7 928-3DA00-4AA0	
Optocoupler AC alternative for relay in the case of TPRo PU = 4 units	6ES7 928-3CA00-4AA0	

Connection methods

SIMATIC TOP connect for SIMATIC S7 Flexible connection

Overview



The flexible connection guarantees a fast and direct connection from the input/output modules of the SIMATIC S7-300/400 to the individual elements in the cabinet.

Already attached single cores reduce the wiring effort.

The core cross-sections of 0.5 mm² also allow higher currents.

Technical specifications

Front connector with single cores		
Rated operating voltage	24 V DC	
Max. permissible continuous current with simultaneous load of all cores	1.0 A	
Permissible ambient temperature	0 to +60 °C	
Core type	H05V-K or with UL style 1007/1569 CSA TR64	
Number of cores	46	
Core cross-section	0.5 mm ² , Cu	
Bundle diameter in mm	approx. 17	
Core color	Blue, RAL 5010	
Designation of cores	Numbered 3 to 48 (adapter contact = core number)	
Assembly	Screw-type or crimp contacts	

Ordering data Order No.

Front connector with single cores 32-channel module SIMATIC S7-400, 46 x 0.5 mm²

Core type H05V-K

Screw connection

Packaging unit: 1 unit

- Length: • 2.5 m
- 3.2 m
- 5 m • Custom lengths
- Packaging unit: 5 units Length:
- 2.5 m • 3.2 m
- 5 m

Crimp connection

Packaging unit: 1 unit Length:

- 2.5 m
- 3.2 m • 5 m
- Custom lenaths

Packaging unit: 5 units Length:

- 2.5 m • 3.2 m
- 5 m

Core type UL/CSA-certified

Screw-type version

Packaging unit: 1 unit • 3.2 m

- 5 m
- Custom lengths

6ES7 922-4BC50-0AD0

6ES7 922-4BD20-0AD0

6ES7 922-4BF00-0AD0

On request

6ES7 922-4BC50-5AD0 6ES7 922-4BD20-5AD0

6ES7 922-4BF00-5AD0

6ES7 922-4BC50-0AE0 6ES7 922-4BD20-0AE0 6ES7 922-4BF00-0AE0

On request

6ES7 922-4BC50-5AE0 6ES7 922-4BD20-5AE0 6ES7 922-4BF00-5AE0

> 6ES7 922-4BD20-0UD0 6ES7 922-4BF00-0UD0

On request

Racks

Racks

Overview



- The basic mechanical framework of the SIMATIC S7-400/S7-400H
- For accommodating the modules, supplying them with operating voltage and connecting them via the backplane bus
- Several versions for configuring central controllers and expansion racks

UR1 (Universal Rack)

- For setting up central controllers and expansion units
- For holding up to 18 modules
- Also suitable for S7-400H
- · Also available as aluminum rack

UR2 (Universal Rack)

- For setting up central controllers and expansion units
- For holding up to 9 modules
- Also suitable for S7-400H
- · Also available as aluminum rack

CR2 (Central Rack)

- For setting up central controllers
- For holding up to 18 modules
- Segmented rack: For operating two mutually independent S7-400 CPUs without S7-400 Multicomputing, but with communication between the CPUs via the backplane bus (C bus). Both CPUs can address their own local I/O modules (segmented P bus).

CR3 (Central Rack)

- For configuring central racks
- Optimized for distributed automation solutions due to holding up to 4 modules

UR2-H

- For configuring a complete S7-400H system in one subrack
- Also suitable for S7-400: Operation of 2 separate CPUs with their own I/O (separate P and C buses)
- Can also be used as an expansion unit
- For holding up to 18 modules
- Also available as aluminum rack

ER1 (Extension Rack)

- For setting up expansion units economically
- For holding up to 18 modules with restricted functionality
- Also suitable for S7-400H
- · Also available as aluminum rack

ER2 (Extension Rack)

- For setting up expansion units economically
- For holding up to 9 modules with restricted functionality
- Also suitable for S7-400H
- · Also available as aluminum rack

Technical specifications

	6ES7 400-1TA01-	6ES7 400-1TA11-	6ES7 400-1JA01-	6ES7 400-1JA11-	6ES7 401-2TA01-	6ES7 401-1DA01-
	0AA0	0AA0	0AA0	0AA0	0AA0	0AA0
Hardware configuration Number of single-width slots, max.	18	18	9	9	18; 2 segments with 8 or 10 slots	4
Rack • C bus • P bus	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions and weight Dimensions • Width • Height • Depth	482.5 mm	482.5 mm	257.5 mm	257.5 mm	482.5 mm	130 mm
	290 mm	290 mm				
	27.5 mm	27.5 mm				
Weight • Weight, aprox.	4 200 g	3 000 g	2 200 g	1 500 g	4 200 g	750 g

Racks

Racks

	6ES7 400-2JA00- 0AA0	6ES7 400-2JA10- 0AA0	6ES7 403-1TA01- 0AA0	6ES7 403-1TA11- 0AA0	6ES7 403-1JA01- 0AA0	6ES7 403-1JA11- 0AA0
Hardware configuration						
Number of single- width slots, max.	18	18	18	18	9	9
Rack						
• C bus	Yes	Yes				
• P bus	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions and weight						
Dimensions						
 Width 	482.5 mm	482.5 mm	482.5 mm	482.5 mm	257.5 mm	257.5 mm
 Height 	290 mm					
Depth	27.5 mm					
Weight						
 Weight, aprox. 	4 200 g	3 000 g	4 200 g	2 500 g	2 200 g	1 250 g

for central and expansion units, 18 slots UR1 rack, aluminum version for central and expansion units, 18 slots	ES7 400-1TA01-0AA0 ES7 400-1TA11-0AA0 ES7 400-1JA01-0AA0	UR2-H rack for separated central units, 18 slots UR2-H rack, aluminum version for separated central units, 18 slots ER1 rack	6ES7 400-2JA00-0AA0 6ES7 400-2JA10-0AA0
18 slots UR1 rack, aluminum version for central and expansion units, 18 slots UR2 rack for central and expansion units,		18 slots UR2-H rack, aluminum version for separated central units, 18 slots	
for central and expansion units, 18 slots UR2 rack 66 for central and expansion units,		for separated central units, 18 slots	
18 slots UR2 rack for central and expansion units,	ES7 400-1JA01-0AA0	18 slots	0507 400 4TA04 0A 10
for central and expansion units,	ES7 400-1JA01-0AA0	ER1 rack	CEO7 400 4T404 04 40
			6ES7 403-1TA01-0AA0
		for expansion units, P bus only,18 slots	
UR2 rack, aluminum version 6E	ES7 400-1JA11-0AA0	ER1 rack, aluminum version	6ES7 403-1TA11-0AA0
for central and expansion units, 9 slots		for expansion units, P bus only,18 slots	
CR2 rack 6E	ES7 401-2TA01-0AA0	ER2 rack	6ES7 403-1JA01-0AA0
for segmented central units, 18 slots, 2 local segments		for expansion units, P bus only, 9 slots	
CR3 rack 6E	ES7 401-1DA01-0AA0	ER2 rack, aluminum version	6ES7 403-1JA11-0AA0
for central and expansion units, 4 slots; optimized for distributed		for expansion units, P bus only, 9 slots	
automation solutions		Slot cover	6ES7 490-1AA00-0AA0
		10 units (spare part)	

Racks

Fan subassembly

Overview



- Fans for the SIMATIC S7-400
- Necessary when using modules that generate an extremely large amount of heat

Technical specifications

	6ES7 408-1TA01-0XA0	6ES7 408-1TB00-0XA0
Supply voltages		
Rated value		
• 24 V DC	Yes	
 permissible range, lower limit (DC) 	19.2 V	
 permissible range, upper limit (DC) 	30 V	
• 120 V AC		Yes
• 230 V AC		Yes
 permissible range, lower limit (AC) 		85/170 V AC
 permissible range, upper limit (AC) 		132 V AC or 264 V AC
 permissible frequency range, lower limit 		47 Hz
 permissible frequency range, upper limit 		63 Hz
Current consumption		
Inrush current, typ.	0.9 A; at 24 V	0.6 A at rated voltage 230 V AC: 1.15 A: at rated voltage 120 V AC
Power losses		
Power loss, max.	11 W	20 W
Relay outputs		
Rated input voltage of relay L+ (DC)	24 V	24 V
Switching capacity of contacts		
 with resistive load, max. 	200 mA	200 mA
Dimensions and weight		
Dimensions		
• Width	482.5 mm	482.5 mm
Height	109.5 mm	109.5 mm
Depth	235 mm	235 mm
Weight		
Weight, approx.	1.6 kg	2 kg

Ordering data	Order No.	Order No.		
Fan subassembly		Replacement fan	6ES7 408-1TA00-6AA0	
for all racks; Supply voltage		Spare part		
24 V DC	6ES7 408-1TA01-0XA0	Cable duct	6ES7 408-0TA00-0AA0	
120 / 230 V AC	6ES7 408-1TB00-0XA0	Same design as fan subas-		
Dust filter	6ES7 408-1TA00-7AA0	sembly, but without fans or electronic units		
10 units				

Racks

Expansion devices

Overview

- SIMATIC S5 expansion racks for distributed expansion of the SIMATIC S7-400
- For connection to existing SIMATIC S5 systems

The following components can be connected to the SIMATIC S7-400:

- Expansion racks ER 701-2 and ER 701-3 from the SIMATIC S5-115U series
- Expansion racks EG 183U and EG 185U from the SIMATIC S5-135U/-155U series

The following requirements must be met for expansion:

- IM 463-2 interface module plugged into the SIMATIC S7-400 central controller
- IM 314 interface module plugged into SIMATIC S5 expansion racks
- Maximum configuration: Up to 32 SIMATIC S5 expansion racks can be connected to one S7-400 central controller
- Transmission distance: The maximum permissible distance between the central controller and the last expansion rack on a line is 600 m

Suitable SIMATIC S5 modules

Expansion rack	ER 701-2, ER 701-3	EG 183U, EG 185 U
Digital input modules	6ES5 420-7LA11	6ES5 420-4UA14
	6ES5 430-7LA12	6ES5 430-4UA14
	6ES5 431-7LA11	6ES5 431-4UA12
	6ES5 432-7LA11	6ES5 432-4UA12
	6ES5 434-4UA12	6ES5 434-4UA12
	6ES5 434-7LA12	6ES5 436-4UA12
	6ES5 435-7LA11	
	6ES5 435-7LB11	
	6ES5 435-7LC11	
	6ES5 436-7LA11	
	6ES5 436-7LB11	
	6ES5 436-7LC11	
Digital output modules	6ES5 441-7LA13	6ES5 441-4UA14
	6ES5 451-7LA21	6ES5 451-4UA14
	6ES5 453-7LA11	6ES5 453-4UA12
	6ES5 454-7LA12	6ES5 454-4UA14
	6ES5 454-7LB11	6ES5 455-4UA12
	6ES5 455-7LA11	6ES5 456-4UA12
	6ES5 456-7LA11	6ES5 457-4UA12
	6ES5 456-7LB11	6ES5 458-4UA13
	6ES5 457-7LA11	6ES5 458-4UC11
	6ES5 458-7LA11	
	6ES5 458-7LB11	
	6ES5 458-7LC11	
Digital input/output modules	6ES5 482-7LA11	6ES5 482-4UA20
	6ES5 482-7LF11	
	6ES5 482-7LF21	
	6ES5 482-7LF31	
Analog input modules	6ES5 460-7LA13	6ES5 460-4UA13
7 maiog inpat modules	6ES5 463-4UA12	6ES5 463-4UA13
	6ES5 463-4UB12	6ES5 465-4UA13
	6ES5 465-7LA13	6ES5 466-4UA11
	6ES5 466-4UA11	0200 100 107111
Analog output modules	6ES5 470-7LA13	6ES5 470-4UA13
alog oatput modules	6ES5 470-7LB13	6ES5 470-4UB13
	6ES5 470-7LC13	6ES5 470-4UC13
Interface modules	6ES5 306-7LA11	6ES5 300-3AB11
,,	6ES5 314-3UA11	6ES5 300-5CA11
	1230 0 00	1_20 000 00.111

SIPLUS module racks

SIPLUS racks

Overview



- The mechanical basic structure of SIPLUS S7-400/S7-400H
- For accommodating the modules, operating voltage supply, and connection of the modules via a backplane bus
- Several versions for setting up central controllers and expansion units.
- SIPLUS rack material: Aluminum

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-400 rack				
Order No.	6AG1 400-1JA11-4AA0	6AG1 400-1TA11-4AA0	6AG1 400-2JA10-4AA0	
Order No. based on	6ES7 400-1JA11-0AA0	6ES7 400-1TA11-0AA0	6ES7 400-2JA10-0AA0	
Ambient temperature range	0 +60 °C			
Conformal coating	Coating of the printed circuit by	poards and the electronic component	s	
Technical data	The technical data of the standard product applies except for the ambient conditions			
Ambient conditions				
Relative humidity	5 100 % Condensation permissible			
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)			
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)			
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾			
Air pressure (depending on the highest positive temperature range	1080 795 hPa (-1000 +20 see ambient temperature rang			
specified)	795 658 hPa (+2000 +35 derating 10 K	00 m)		
	658 540 hPa (+3500 +5000 m) derating 20 K			

 $[\]begin{array}{l} \text{1)} \quad \text{ISA-S71.04 severity level GX: Long-term load: SO}_2 < 4.8 \text{ ppm; H}_2\text{S} < 9.9 \text{ ppm; CI} < 0.2 \text{ ppm; HCI} < 0.66 \text{ ppm; HF} < 0.12 \text{ ppm; NH} < 49 \text{ ppm; O}_3 < 0.1 \text{ ppm; NOX} < 5.2 \text{ ppm} \\ \text{Limit value (max. 30 min/d): SO}_2 < 17.8 \text{ ppm; H}_2\text{S} < 49.7 \text{ ppm; CI} < 1.0 \text{ ppm; HCI} < 3.3 \text{ ppm; HF} < 2.4 \text{ ppm; NH} < 247 \text{ ppm; O}_3 < 1.0 \text{ ppm; NOX} < 10.4 \text{ ppm} \\ \end{array}$

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
SIPLUS S7-400 rack		UR2 aluminum rack	
UR1 aluminum rack		for central controllers and	6AG1 400-1JA11-4AA0
for central controllers and expansion units, 18 slots	6AG1 400-1TA11-4AA0	expansion units, 9 slots Accessories	See SIMATIC rack S7-400,
UR2 rack			page 6/173
for central controllers and expansion units, 9 slots	H 6AG1 400-2JA10-4AA0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

SIMATIC S7-400 Interface modules

IM 460-0

Overview



- Send interface module for central expansion to 5 m
- Transmission of P and C bus
- Can be plugged into the central controller
- Up to 8 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 461-0

Technical specifications

	6ES7 460-0AA01-0AB0
Current consumption	
from backplane bus 5 V DC, max.	140 mA
Power losses	
Power loss, max.	700 mW
Hardware configuration	
Cable length between first and last interface module, max.	5 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	600 g

Ordering data Order No.

IM 460-0 interface module	6ES7 460-0AA01-0AB0
Send interface module for central connection up to 5 m; with C bus transmission	
468-1 connecting cable	
between IM 460-0 and IM 461-0; IM 460-3 and IM 461-3	
0.75 m	6ES7 468-1AH50-0AA0
1.5 m	6ES7 468-1BB50-0AA0
5 m	6ES7 468-1BF00-0AA0

SIMATIC S7-400 Interface modules

IM 461-0

Overview



- Receive interface module for centralized expansion up to 5 m
- Transmission of P and C bus
- Can be plugged into expansion rack
- To be used exclusively with IM 460-0

Technical specifications

for IM 461-0

	6ES7 461-0AA01-0AA0
Current consumption	
from backplane bus 5 V DC, max.	290 mA
Power losses	
Power loss, max.	1 450 mW
Hardware configuration	
Cable length between first and last interface module, max.	5 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	610 g

Ordering data	Order No.
IM 461-0 interface module	6ES7 461-0AA01-0AA0
Receive interface module for central connection up to 5 m; with C bus transmission	
468-1 connecting cable	
between IM 460-0 and IM 461-0; IM 460-3 and IM 461-3	
0.75 m	6ES7 468-1AH50-0AA0
1.5 m	6ES7 468-1BB50-0AA0
5 m	6ES7 468-1BF00-0AA0
Terminating connector	6ES7 461-0AA00-7AA0

Interface modules

IM 460-1

Overview



- Send interface module for central expansion to 1.5 m
- Transmission of P bus
- With voltage supply for expansion units
- Can be plugged into the central controller
- Up to 2 expansion racks can be connected (up to 1 per interface)
- Can be used exclusively with IM 461-1

Technical specifications

	6ES7 460-1BA01-0AB0
Current consumption	
from backplane bus 5 V DC, max.	85 mA
Power losses	
Power loss, max.	425 mW
Hardware configuration	
Cable length between first and last interface module, max.	1.5 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	600 g

Ordering data Order No.

6ES7 460-1BA01-0AB0
6ES7 468-3AH50-0AA0
6ES7 468-3BB50-0AA0

Interface modules

IM 461-1

Overview



- Receive interface module for central expansion up to 1.5 m
- Transmission of P bus
- With voltage supply for expansion racks
- Can be plugged into expansion rack
- Can be used exclusively with IM 460-1

Technical specifications

	6ES7 461-1BA01-0AA0
Current consumption	
from backplane bus 5 V DC, max.	120 mA
Power losses	
Power loss, max.	600 mW
Hardware configuration	
Cable length between first and last interface module, max.	1.5 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	610 g

Ordering data Order No.

IM 461-1 interface module	6ES7 461-1BA01-0AA0
Receive IM for central coupling up to max. 1.5 m; without C bus transfer	
468-3 connecting cable	
For connecting IM 460-1 and IM 461-1	
0.75 m	6ES7 468-3AH50-0AA0
1.5 m	6ES7 468-3BB50-0AA0

SIMATIC S7-400 Interface modules

IM 460-3

Overview



- Send interface module for distributed expansion to 102 m
- Transmission of K and P bus
- Can be plugged into the central controller
- Up to 8 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 461-3

Technical specifications

	6ES7 460-3AA01-0AB0
Current consumption	
from backplane bus 5 V DC, max.	1 550 mA
Power losses	
Power loss, max.	7 750 mW
Hardware configuration	
Cable length between first and last interface module, max.	102.25 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	630 g

Ordering data Order No.

IM 460-3 interface module	6ES7 460-3AA01-0AB0
Send interface module for distributed connection up to 102 m; with C bus transmission	
468-1 connecting cable	
between IM 460-3 and IM 461-3	
0.75 m	6ES7 468-1AH50-0AA0
1.5 m	6ES7 468-1BB50-0AA0
5 m	6ES7 468-1BF00-0AA0
10 m	6ES7 468-1CB00-0AA0
25 m	6ES7 468-1CC50-0AA0
50 m	6ES7 468-1CF00-0AA0
100 m	6ES7 468-1DB00-0AA0

SIMATIC S7-400 Interface modules

IM 461-3

Overview



- Receive interface module for distributed expansion up to 102 m
- Transmission of data from the P-bus and C-bus
- Can be plugged into expansion rack
- To be used exclusively with IM 460-3

Technical specifications

	6ES7 461-3AA01-0AA0
Current consumption	
from backplane bus 5 V DC, max.	620 mA
Power losses	
Power loss, max.	3 100 mW
Hardware configuration	
Cable length between first and last interface module, max.	102.25 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	620 g

Ordering data Order No. IM 461 2 into

IM 461-3 interface module	6ES7 461-3AA01-0AA0
Receive interface module for distributed connection up to 102 m; with C bus transmission	
468-1 connecting cable	
between IM 460-3 and IM 461-3	
0.75 m	6ES7 468-1AH50-0AA0
1.5 m	6ES7 468-1BB50-0AA0
5 m	6ES7 468-1BF00-0AA0
10 m	6ES7 468-1CB00-0AA0
25 m	6ES7 468-1CC50-0AA0
50 m	6ES7 468-1CF00-0AA0
100 m	6ES7 468-1DB00-0AA0
Terminating connector	6ES7 461-3AA00-7AA0
for IM 461-3	

Interface modules

IM 463-2

Overview



- Send interface module for distributed expansion with SIMATIC S5 expansion racks up to 600 m
- Can be plugged into the central controller
- Up to 8 SIMATIC S5 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 314

Technical specifications

	6ES7 463-2AA00-0AA0
Current consumption	
from backplane bus 5 V DC, max.	1 320 mA
Power losses	
Power loss, max.	6 600 mW
Hardware configuration	
Cable length between first and last interface module, max.	600 m
Dimensions and weight	
Dimensions	
• Width	25 mm
Height	290 mm
• Depth	217 mm
Weight	
 Weight, approx. 	360 g

Ordering data Order No.

Receiving IM for distributed
coupling of SIMATIC S5-EUs up
to max. 600 m

IM 463-2 interface module

6ES7 463-2AA00-0AA0

SIPLUS interface modules

SIPLUS IM 460-0

Overview



- Send interface module for centralized expansion up to 5 m
- Transfer from P and C Bus
- Plug into central controller
- You may connect up to 8 expansion units (max. 4 per port)
- Usable exclusively with IM 461-0

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS IM 460-0	
Order number	6AG1 460-0AA01-2AB0
Order No. based on	6ES7 460-0AA01-0AB0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 460-0 interface L	6AG1 460-0AA01-2AB0
(extended temperature range and medial exposure)	
Send IM for central coupling up to 5 m; with C bus transfer	
Accessories	See SIMATIC IM 460-0, page 6/177

L: Subject to export regulations AL: 91999 and ECCN: N

SIMATIC S7-400 SIPLUS interface modules

SIPLUS IM 461-0

Overview

- Receive interface module for central extension up to 5 m
- Transfer from P and C Bus
- Pluggable in extension device
- Usable exclusively with IM 460-0

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS IM 461	
Order No.	6AG1 461-0AA01-2AA0
Order No. based on	6AG1 461-0AA01-2AA0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; HCI < 3.3 ppm; $HCI < 3.3 \text{$

²⁾ The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 461-0 interface L	6AG1 461-0AA01-2AA0
(extended temperature range and medial exposure)	
Receiver IM for central coupling up to 5 m; with C bus transfer	
Accessories	See SIMATIC IM 461-0, page 6/178

L: Subject to export regulations AL: 91999 and ECCN: N

PS 405/407 power supply

Overview



- Power supplies for SIMATIC S7-400
- For conversion of AC or DC line voltages to the 5 V DC and 24 V DC operating voltages required
- 4 A, 10 A and 20 A output currents
- In addition:
 - SIPLUS power supply 6AG1 405-0KA02-2AA0 for temperature range of -25 to +60 °C and use under medium load
 - ature range of -25 to +60 °C and use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 405-0KA02-0AA0
 SIPLUS power supply 6AG1 407-0KA02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 407-0KA02-0AA0
 SIPLUS power supply 6AG1 407-0KR02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 407-0KR02-0AA0

Technical specifications

	6ES7 405-0DA02-0AA0	6ES7 405-0KA02-0AA0	6ES7 405-0KR02-0AA0	6ES7 405-0RA02-0AA0
Product type designation	PS405, 24 V DC, 5 V DC/ 4 A	PS405, 24/48/60 V DC, 5 V DC/10 A	PS405,24/48/60 V DC, 5 V DC/10 A,RED	PS405, 24/48/60 V DC, 5 V DC/20 A
Power supply				
Input voltage				
 Rated value, 24 V DC 	Yes	Yes	Yes	Yes
 Rated value, 48 V DC 	Yes	Yes	Yes	Yes
 Rated value, 60 V DC 	Yes	Yes	Yes	Yes
 permissible range, lower limit (DC) 	19.2 V; dynamic 18.5 V	19.2 V; dynamic 18.5 V	19.2 V; dynamic 18.5 V	19.2 V; dynamic 18.5 V
 permissible range, upper limit (DC) 	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V
Input current				
 Rated value at 24 V DC 	2 A	4 A	4 A	7 A
 Rated value at 48 V DC 	1 000 mA	2 A	2 A	3.2 A
 Rated value at 60 V DC 	800 mA	1.6 A	1.6 A	2.5 A
• Inrush current, max.	18 A; Full width at half maximum 20 ms	18 A; Full width at half maximum 20 ms	18 A; Full width at half maximum 20 ms	56 A; Full width at half maximum 1.5 ms
Output voltage				
 Rated value, 5 V DC 	Yes	Yes	Yes	Yes
 Rated value, 24 V DC 	Yes	Yes	Yes	Yes
Output current				
• for backplane bus (5 V DC), max.	4 A; no base load required	10 A; no base load required	10 A; no base load required	20 A; no base load required
 for backplane bus (24 V DC), max. 	0.5 A; idling-proof	1 A; idling-proof	1 A; idling-proof	1 A; idling-proof
Short-circuit protection	Yes	Yes	Yes	Yes
Supply voltages Mains buffering				
Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms
 Mains buffering according to NAMUR recommendation 	Yes	Yes	Yes	Yes
Current consumption				
Power consumption, typ.	48 W	95 W	95 W	168 W

PS 405/407 power supply

	6ES7 405-0DA02-0AA0	6ES7 405-0KA02-0AA0	6ES7 405-0KR02-0AA0	6ES7 405-0RA02-0AA0
Power losses				
Power loss, typ.	16 W	20 W	20 W	44 W
Backup battery Backup battery				
Backup battery (optional)	Yes; 1 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah
Connection method				
Connecting cables/cross sections	3 x 1.5 mm2, solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm2, solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm2, solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm2, solid or stranded wire with end sleeve, external diameter 3 to 9 mm
Galvanic isolation				
primary/secondary	Yes	Yes	Yes	Yes
Degree of protection				
Protection class	1; with protective conductor			
Standards, approvals, certificates				
FM approval	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4
Dimensions				
Required slots	1	2	2	2
Dimensions and weight				
Dimensions				
Width	25 mm	50 mm	50 mm	50 mm
 Height 	290 mm	290 mm	290 mm	290 mm
• Depth	217 mm	217 mm	217 mm	217 mm
Weight				
 Weight, approx. 	760 g	1 200 g	1 200 g	1 300 g

	6ES7 407-0DA02-0AA0	6ES7 407-0KA02-0AA0	6ES7 407-0KR02-0AA0	6ES7 407-0RA02-0AA0
Product type designation			PS407, UC 120/230 V, 5 V DC/10 A,RED.	PS407, UC 120/230 V, 5 V DC/20 A
Power supply				
Input voltage				
 Rated value, 110 V DC 	Yes; Rated value 120 V DC	Yes; Rated value 120 V DC	Yes; Rated value 120 V DC	Yes; Rated value 120 V DC
 Rated value, 230 V DC 	Yes	Yes	Yes	Yes
 permissible range, lower limit (DC) 	88 V	88 V	88 V	88 V
 permissible range, upper limit (DC) 	300 V	300 V	300 V	300 V
 Rated value, 120 V AC 	Yes	Yes	Yes	Yes
 Rated value, 230 V AC 	Yes	Yes	Yes	Yes
 permissible range, lower limit (AC) 	85 V	85 V	85 V	85 V
 permissible range, upper limit (AC) 	264 V	264 V	264 V	264 V
 Line frequency 				
- Rated value 50 Hz	Yes	Yes	Yes	Yes
- Rated value 60 Hz	Yes	Yes	Yes	Yes
 permissible range, lower limit 	47 Hz	47 Hz	47 Hz	47 Hz
 permissible range, upper limit 	63 Hz	63 Hz	63 Hz	63 Hz
Input current				
Rated value at 110 V DC	350 mA; at 120 V DC	1 A; at 120 V DC	1 A; at 120 V DC	1.4 A; at 120 V DC
 Rated value at 230 V DC 	190 mA	0.5 A	0.5 A	0.7 A
 Rated value at 120 V AC 	0.42 A	0.9 A	0.9 A	1.4 A
 Rated value at 230 V AC 	0.22 A	0.5 A	0.5 A	0.7 A
• Inrush current, max.	8.25 A; Full width at half maximum 5 ms	63 A; Full width at half maximum 1 ms	63 A; Full width at half maximum 1 ms	88 A; Full width at half maximum 1.1 ms

PS 405/407 power supply

recnnical specifications	· ,			
	6ES7 407-0DA02-0AA0	6ES7 407-0KA02-0AA0	6ES7 407-0KR02-0AA0	6ES7 407-0RA02-0AA0
Output voltage • Rated value, 5 V DC • Rated value, 24 V DC	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Output current • for backplane bus (5 V DC), max.	4 A; no base load required	10 A; no base load required	10 A; no base load required	20 A; no base load required
• for backplane bus (24 V DC), max.	0.5 A; idling-proof	1 A; idling-proof	1 A; idling-proof	1 A; idling-proof
Short-circuit protection	Yes	Yes	Yes	Yes
Supply voltages Mains buffering • Mains/voltage failure stored energy time • Mains buffering according	20 ms Yes	20 ms Yes	20 ms Yes	20 ms Yes
 Mains buffering according to NAMUR recommendation 	165	165	165	165
Current consumption Power consumption, typ.	52 W	95 W	95 W	158 W
Power losses Power loss, typ.	20 W	20 W	20 W	35 W
Backup battery Backup battery				
Backup battery (optional)	Yes; 1 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah
Connection method Connecting cables/cross sections	3 x 1.5 mm ² , solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm ² , solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm ² , solid or stranded wire with end sleeve, external diameter 3 to 9 mm	3 x 1.5 mm ² , solid or stranded wire with end sleeve, external diameter 3 to 9 mm
Galvanic isolation primary/secondary	Yes	Yes	Yes	Yes
EMC				
Compliance with line harmonic distortion limits • Observance of line harmonic distortion acc. to IEC 61000-3-2, IEC 61000-3-3	Yes	Yes	Yes	Yes
Degree of protection Protection class	1; with protective conductor			
Standards, approvals, certificates				
FM approval	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4
Dimensions Required slots	1	2	2	2
Dimensions and weight Dimensions • Width • Height • Depth	25 mm 290 mm 217 mm	50 mm 290 mm 217 mm	50 mm 290 mm 217 mm	50 mm 290 mm 217 mm
Weight • Weight, approx.	760 g	1 200 g	1 200 g	1 300 g

PS 405/407 power supply

Ordering data	Order No.		
PS 405 power supply modules 24 V DC: 5 V DC. 24 V DC		SIPLUS PS 407 power supply modules	
4 A	6ES7 405-0DA02-0AA0	(extended temperature range and medium load)	
10 A, wide range	6ES7 405-0KA02-0AA0	120/230 V AC; 5 V DC, 24 V DC	
10 A, redundant, wide range 20 A, wide range	6ES7 405-0KR02-0AA0 6ES7 405-0RA02-0AA0	10 A L	6AG1 407-0KA02-4AA0 6AG1 407-0KR02-4AA0
SIPLUS PS 405 power supply modules		Power plug for PS 407	6ES7 490-0AB00-0AA0
(extended temperature range and medium load)		Spare part Backup battery	6ES7 971-0BA00
24 V DC; 5 V DC, 24 V DC		Type AA; 3.6 V/2.3 Ah	
10 A, wide range L	6AG1 405-0KA02-2AA0	SITOP power supplies	See Catalog KT 01
Power plug for PS 405 Spare part	6ES7 490-0AA00-0AA0	For the 24 V supply of actuators or sensors	
Backup battery	6ES7 971-0BA00	Add-on modules and DC-UPS	See Catalog KT 01
Type AA; 3.6 V/2.3 Ah	0_0 , 0, 1, 0_ 1, 0 0	To increase system availability	
PS 407 power supply modules			
120/230 V AC; 5 V DC, 24 V DC			
4 A	6ES7 407-0DA02-0AA0		
10 A	6ES7 407-0KA02-0AA0		
10 A, redundant	6ES7 407-0KR02-0AA0		
20 A	6ES7 407-0RA02-0AA0		

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

Accessories

Labeling sheets

Overview

Labeling sheets

- Film sheets for application-specific labeling of SIMATIC S7-400 I/O modules with commercial laser printers
- Single-color films, tear-resistant, dirt-resistant
- Easy handling:
 - Pre-perforated labeling sheets in DIN A4 format to allow easy separation of the labeling strips

 - The separated strips can be inserted directly into the
 - I/O modules

• Different colors for distinction between module types or preferred areas of application: The labeling sheets are available in the colors petrol, light beige, red and yellow. Yellow is reserved for failsafe systems.

Label cover

- Film to cover and hold user-made labeling strips on normal paper
- Accessories, 10 units

Technical specifications

	6ES7 492-2AX00-0AA0	6ES7 492-2BX00-0AA0	6ES7 492-2CX00-0AA0	6ES7 492-2DX00-0AA0
Dimensions and weight Weight				
Weight, approx.	2 g	2 g	2 g	2 g

	6ES7 492-2XX00-0AA0
Dimensions and weight	
Weight	
 Weight, approx. 	72 g

Ordering data	Order No.	Order No.	
Labeling sheets		Cover film for labeling strips	6ES7 492-2XX00-0AA0
DIN A4, for printing using laser printer; 10 units		10 units (spare part)	
Petrol	6ES7 492-2AX00-0AA0		
Light beige	6ES7 492-2BX00-0AA0		
Yellow	6ES7 492-2CX00-0AA0		
Red	6ES7 492-2DX00-0AA0		

SIMATIC S7-400 Accessories

Spare parts

Overview

Cover film for labeling strips

- Petrol-colored film for covering and fixing user-created labeling strips
- On standard paper
- Spare part

Measuring range module for analog input modules

- Plug-in module for selecting the input ranges for analog modules
- 1 module for 2 inputs
- Spare part

Module slot cover

- Cover plates for unassigned slots in module mounting racks
- Spare part, 10 units

Power plug

- Plug for connecting of the PS 405 and PS 407 power supply modules to the line supply
- Spare part

Exchangeable fan

- · Fan unit for installation in the fan subassembly
- Spare part

Exchangeable monitoring unit

- Electronic monitoring unit for the fan subassembly
- Spare part

Exchangeable power supply unit

- Power supply unit for installation in the fan subassembly
- Spare part

Ordering data	Order No.
Cover foil for labeling strip	6ES7 492-2XX00-0AA0
10 units (spare part)	
Range card for analog input modules	6ES7 974-0AA00-0AA0
1 card for 2 inputs; 2 units (spare part)	
Slot covers	6ES7 490-1AA00-0AA0
for racks; 10 units (spare part)	
Power plug for PS 405	6ES7 490-0AA00-0AA0
Spare part	
Power plug for PS 407	6ES7 490-0AB00-0AA0
Spare part	
Replacement fan	6ES7 408-1TA00-6AA0
Spare part	

IM 153-1/153<u>-2</u>

Overview



The ET 200M system with various interface modules is available for the decentralized use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

IM 153-1 Standard

The IM 153-1 is one reasonably priced version that is best suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

IM 153-2 High Feature

For higher requirements in manufacturing technology, such as the use of F-technology or the highest performance in conjunction with clock synchronization, the IM 153-2 High Feature is available. This IM is also designed for use with the PCS 7 in the field of manufacturing applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1 ms

Technical specifications

	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA82-0XB0
Power supply Input voltage • Rated value, 24 V DC • permissible range, lower limit (DC) • permissible range, upper limit (DC)	Yes 20.4 V 28.8 V		
Input current • Rated value at 24 V DC	625 mA	650 mA	650 mA
Output voltage • Rated value, 5 V DC	Yes	Yes	Yes
Output current • for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
Supply voltages Rated value • 24 V DC • permissible range (ripple included), lower limit (DC) • permissible range (ripple included), upper limit (DC)		Yes 20.4 V 28.8 V	Yes 20.4 V 28.8 V
external protection for supply cables (recommendation)	not necessary	2.5 A	2.5 A
Mains buffering • Mains/voltage failure stored energy time	5 ms	5 ms	5 ms
Current consumption Current consumption, max.	350 mA; At 24 V DC	600 mA	600 mA
Inrush current, typ.	2.5 A	3 A	3 A
l ² t	0.1 A ^{2.} s	0.1 A ^{2.} s	0.1 A ² ·s

IM 153-1/153-2

	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA82-0XB0
Power losses			
Power loss, typ.	3 W	5.5 W	5.5 W
Address area			
Addressing volume	100	0441	0441
• Outputs	128 byte 128 byte	244 byte	244 byte
• Inputs	126 byte	244 byte	244 byte
Hardware configuration Number of modules per DP slave	8	12	12
interface module, max.	0	12	12
Communication functions			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
Interfaces			
PROFIBUS DP, output current, max.	90 mA	70 mA	70 mA
Interface physics, RS 485	Yes	Yes	Yes
Interface physics, FOC	No	No	No
Connection method			
PROFIBUS DP	9-pin sub D socket	9-pin sub D	9-pin sub D
PROFIBUS DP			
Transmission procedure	RS 485	RS 485	RS 485
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
Automatic detection of transmission speed	Yes	Yes	Yes
SYNC capability	Yes	Yes	Yes
FREECE capability	Yes	Yes	Yes
Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; Sender	Yes; Sender
1st interface			
DP slave			
GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI04801.GSG	SI0480E.GSG
Automatic baud rate search	Yes	Yes	Yes
Programming		.00	1.00
Configuration software			
• STEP 7	STEP 7 / COM PROFIBUS /	Yes; STEP 7 / COM PROFIBUS /	Yes; STEP 7 / COM PROFIBUS /
	non-Siemens tools via GSD file	non-Siemens tools via GSD file	non-Siemens tools via GSD file
Time stamping			
Accuracy		1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers		15	15
Messages per message buffer		20	20
<u> </u>			
Number of stampable digital inputs, max.		128; Max. 128 signals/station; max. 32 signals/slot	128; Max. 128 signals/station; max. 32 signals/slot
Time format		RFC 1119	RFC 1119
Time resolution		0.466 ns	0.466 ns
Time interval for transmitting the message buffer if a message is present		1 000 ms	1 000 ms
Time stamp on signal change		rising / falling edge as signal entering or exiting	rising / falling edge as signal entering or exiting

IM 153-1/153-2

Isolation Isolation checked with Isolation voltage 500 V Isolation voltage 500 V	6ES7 153-2BA82-0XB0
Environmental requirements Operating temperature • Min.	
Operating temperature • Min.	Isolation voltage 500 V
 Min. 0 °C 0 °C Max. 60 °C 60 °C Air pressure Operating altitude above sea level, a 000 m 3 000 m and max. Degree of protection IP20 Yes Yes General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions Width 40 mm Width 40 mm 	
 Max. 60 °C 60 °C Air pressure Operating altitude above sea level, a 000 m 3 000 m Degree of protection IP20 Yes Yes General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions Width 40 mm 40 mm 	
Air pressure Operating altitude above sea level, 3 000 m 3 000 m Degree of protection IP20 Yes Yes General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions Width 40 mm 40 mm	-25 °C
 Operating altitude above sea level, max. Degree of protection IP20 General information Vendor identification (VendorID) Dimensions and weight Dimensions Width Width Wood m 3 000 m Yes Yes Yes Wes Description Wood m 40 mm 	60 °C
max. Degree of protection IP20 Yes Yes General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions • Width 40 mm 40 mm	
IP20 Yes Yes General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions Width 40 mm 40 mm	3 000 m
General information Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions • Width 40 mm 40 mm	
Vendor identification (VendorID) 801Dh 801Eh Dimensions and weight Dimensions • Width 40 mm 40 mm	Yes
Dimensions and weight Dimensions ◆ Width 40 mm 40 mm	
Dimensions • Width 40 mm 40 mm	801Eh
• Width 40 mm 40 mm	
• Height 125 mm 125 mm	40 mm
	125 mm
• Depth 117 mm 117 mm	117 mm
Weight	
• Weight, approx. 360 g 360 g	360 g

	6ES7 195-7HD10-0XA0
Accessories	
belongs to product	ET 200M
Dimensions and weight	
Dimensions	
Width	97 mm
 Height 	92 mm
• Depth	30 mm
Weight	
 Weight, approx. 	133 g

	6ES7 195-7HA00-0XA0	6ES7 195-7HB00-0XA0	6ES7 195-7HC00-0XA0
Dimensions and weight			
Dimensions			
• Width	97 mm	97 mm	97 mm
Height	92 mm	92 mm	92 mm
• Depth	30 mm	30 mm	30 mm
Weight			
Weight, approx.	111 g	140 g	127 g

IM 153-1/153-2

Ordering data	Order No.		Order No.
IM 153-1 interface module Slave interface module for		SIMATIC DP DIN rail for ET 200M	
connecting an ET 200M to PROFIBUS DP • Standard temperature range	6ES7 153-1AA03-0XB0	Accommodates up to 5 bus modules; for hot-swapping function	
IM 153-2 interface module		• Length: 483 mm (19")	6ES7 195-1GA00-0XA0
Slave interface module for connecting an ET 200M to PROFIBUS DP; also for use in		Length: 530 mmLength: 620 mmLength: 2000 mm	6ES7 195-1GF30-0XA0 6ES7 195-1GG30-0XA0 6ES7 195-1GC00-0XA0
High Feature High Feature with extended temperature range	6ES7 153-2BA02-0XB0 6ES7 153-2BA82-0XB0	SIMATIC S7-300 DIN rail • Length: 160 mm • Length: 480 mm (19") • Length: 530 mm	6ES7 390-1AB60-0AA0 6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0
Active IM 153 /IM 153 bus module	6ES7 195-7HD10-0XA0	Length: 830 mmLength: 2000 mm	6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0
For two IM 153-2 High Feature modules for designing redundant		S7 manual collection J	6ES7 998-8XC01-8YE0
systems		Electronic manuals on DVD, multi-language:	
To accommodate a power supply and an IM 153 module for the hot-swapping function during RUN time, incl. bus module cover Bus module for ET 200M To accommodate a power supply and an IM 153 module for the hot-swapping function during RUN time, incl. bus module cover	6ES7 195-7HA00-0XA0	S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Commu-	
 To accommodate two 40-mm wide I/O modules for the hot- swapping function 	6ES7 195-7HB00-0XA0	nication) S7 manual collection, update D	6ES7 998-8XC01-8YE2
To accommodate one 80-mm wide I/O module for the hot- swapping function	6ES7 195-7HC00-0XA0	service for 1 year Scope of delivery: Current DVD "S7 Manual	0007 330-0001-0102
ET 200M redundancy bundle	6ES7153-2AR03-0XA0	Collection" and the three subse-	
Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module		quent updates	
Accessories			
PROFIBUS bus connector			
90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbit/s, FastConnect			
Without PG interface			
1 unit100 units	6ES7 972-0BA52-0XA0 6ES7 972-0BA52-0XB0		
With PG interface 1 unit 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS IM 153-1/153-2

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 153-1	SIPLUS IM 153-2	SIPLUS IM 153-2
Order number	6AG1 153-1AA03-2XB0	6AG1 153-2BA02-7XY0	6AG1 153-2BA02-7XB0
Order No. based on	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA02-0XB0
Ambient temperature range	-40 +70 °C Startup temperature -25 °C	-25 +60 °C	-40 +70 °C Startup temperature -25 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	No
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS bus module	for accommodating a PS and an IM 153	for accommodating two 40 mm wide I/O modules
Order number	6AG1 195-7HA00-2XA0	6AG1 195-7HB00-7XA0
Order No. based on	6ES7 195-7HA00-0XA0	6ES7 195-7HB00-0XA0
Ambient temperature range	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS bus module	for accommodating an 80 mm module	for accommodating 2 IM 153-2
Order number	6AG1 195-7HC00-2XA0	6AG1 195-7HD10-2XA0
Order No. based on	6ES7 195-7HC00-0XA0	6ES7 195-7HD10-0XA0
Ambient temperature range	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS IM 153-1/153-2

Overview (continued)		Ordering data	
Ambient conditions		IM 153-1 interface module	
Relative humidity	5 100 % Condensation permissible	Slave interface module for connecting an ET 200M to PROFIBUS DP	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal	Standard temperature range L	6AG1 153-1AA03-2XB0
	spores (except fauna)	IM 153-2 interface module	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}	Slave interface module for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems	
Mechanically active substances	Conformity with EN 60721-3-3,	High Feature H	0.101.100.121.102.11120
	Class 3S4 including conductive sand, dust ²⁾	Active IM 153/IM 153 bus module	6AG1 195-7HD10-2XA0
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	For two IM 153-2 High Feature modules for designing redundant systems	
	795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	Bus module for ET 200M To accommodate a power supply and an IM 153 for the hotswapping function during RUN, incl. bus module cover To accommodate two 40 mm	6AG1 195-7HA00-2XA0 6AG1 195-7HB00-7XA0
 1) ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases! 		wide I/O modules for the hot- swapping function To accommodate one 80 mm wide I/O module for the hot swapping function	6AG1 195-7HC00-2XA0
		Accessories	See SIMATIC ET 200M IM 153-1/153-2, page 6/195
interrace when operated in almos	prieres containing corrosive gases!	H: Subject to export regulations Al.	91999 and FCCN: FAR99H

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

H: Subject to export regulations AL: 91999 and ECCN: EAR99H L: Subject to export regulations AL: 91999 and ECCN: N

Siemens ST 70 · 2011

Isolation module

Overview



- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M when Cat. 4 or SIL 3 has to be achieved.
- The isolation module is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respec-

When Cat. 4/SIL 3 is required, the isolation module must be implemented in the following situations:

Application	Isolation module must be used
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP	
Only fail-safe modules in the tier	Yes, behind the CPU
Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack	
Only fail-safe modules in the tier Standard and fail-safe modules in the tier	Yes, after the IM 36x Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with copper connection	
Only fail-safe modules in the station	Yes, after the IM 153-2
Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with fiber-optic connection	
Only fail-safe modules in the station	No
Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module

Technical specifications

	6ES7 195-7KF00-0XA0	
Dimensions and weight		
Weight		
 Weight, approx. 	10 g	

Ordering data	Order No.
Isolation module	6ES7 195-7KF00-0XA0
for simultaneous operation of fail- safe and standard modules in an ET 200M	
Isolation bus module	6ES7 195-7HG00-0XA0
for accommodating the isolating module in an ET 200M	

SIPLUS isolation module

Overview



- Permits combined operation of fail-safe signal modules in safety mode and standard S7-300 modules in the same ET 200M system.
- The isolation module is not required if the safety class SIL 3 or safety category < Cat. 4 is to be achieved.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-300 isolation module		
Order No.	6AG1 195-7KF00-2XA0	
Order No. based on	6ES7 195-7KF00-0XA0	
Ambient temperature range	- 25 + 60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic compo- nents	
Technical specifications	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100%, condensation allowed	

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Technical specifications

	6ES7 195-7KF00-0XA0				
Dimensions and weight					
Weight					
 Weight, approx. 	10 g				

Ordering data	Order No.
SIPLUS isolation module H	6AG1 195-7KF00-2XA0
for simultaneous operation of fail- safe and standard modules in the same ET 200M	
Accessories	See SIMATIC S7-300 isolation module, page 6/198

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

Modules for SIMATIC S7-400F/FH

Fail-safe input/output modules

Overview



- Failsafe input/output modules for use with the SIMATIC S7-400F/FH
- With integrated safety functions
- Can only be plugged into the ET 200M
- Achievable safety classes in safety operation: SIL 2, SIL 3 according to IEC 61508, AK 4, AK 6 according to DIN V 19250, category 3, 4 according to EN 954-1
- Use in standard mode with high diagnostics requirements
- Also suitable for redundant operation

For further information see chapter 5, page 5/150.

Embedded controller

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//2	SIMATIC S7-modular embedded controller
7/2	EC31
7/12	Expansion modules
7/13	SIPLUS S7-modular embedded controller
7/14	Embedded Box PC bundles
7/14	SIMATIC IPC427C bundles
7/17	Embedded Panel PC bundles
7/17	SIMATIC HMI IPC477C bundles
7/21	Communication
7/21	CP 5603

CP 1604

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

Embedded controller

SIMATIC S7-modular embedded controller

EC31

Overview



For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

- Get off to a fast start in automation solutions with embedded PC platforms.
 - Ready-to-use SIMATIC WinAC RTX or WinAC RTX F preinstalled on EC31
 - Prepared for use in a SIMATIC environment with PROFINET and Industrial Ethernet
 - Commissioning by specialist automation personnel as with the S7-300
 - Configuring and programming with SIMATIC STEP 7 over Industrial Ethernet
 - Optional visualization
- Modular expansion capability:

Central expansion with

- S7-300 I/O (SM modules of S7-300)
- Expansion modules for additional PC interfaces, e.g. DVI-I, USB, Gigabit Ethernet networks and memory card slots, as well as PCI-104
- Rugged operation
 - Hard-disk-free operation based on flash disk and Windows Embedded Standard
 - Fan-free operation
- Flexibility of a PC-based automation environment
 - Free memory space on flash disk can be used for other PC applications
 - Use of WinAC ODK with SIMATIC WinAC RTX and WinAC RTX F (read-only in safety-related program part)
 - Connection option for USB devices
 - Memory capacity expandable using multimedia card
- Data retentivity for WinAC RTX and RTX F without uninterruptible power supply (UPS)

Technical specifications

	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0
Product type designation	SIMATIC S7-mEC, EC31	S7-mEC, EC31- RTX	S7-mEC, EC31- RTX F	S7-mEC, EC31- HMI/RTX 128PT	S7-mEC, EC31- HMI/RTX 512PT	S7-mEC, EC31- HMI/RTX 2048PT
Product version Hardware product version	01	01	04	01	01	01
Firmware version	V2.0	V2.0	V1.3	V2.0	V2.0	V2.0
PC configuration Computer platform	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller
Processor selection	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz
Work memory	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM
Flash Disk	4 GB	4 GB	2 GB	4 GB	4 GB	4 GB
Operating systems	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows XP embedded SP2 FP2007	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows Embedded Standard 2009
Power supply Input voltage						
 Rated value, 24 V DC 	Yes	Yes	Yes	Yes	Yes	Yes
 Permissible range, lower limit (DC) 	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
Permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
Input current • Rated value at 24 V DC	without backplane bus and USB power supply	without backplane bus and USB power supply	800 mA; without backplane bus and USB power supply	without backplane bus and USB power supply	without backplane bus and USB power supply	without backplane bus and USB power supply

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Supply voltages						
Mains buffering						
 Mains/voltage failure stored energy time 	5 ms					
Power losses						
Power loss, typ.			34 W			
Memory						
Memory type	256 KB non- volatile memory for retentive data	512 KB non- volatile memory for retentive data				
CPU-blocks						
DB		May and aims	May and size	May and aim	May and size	May pada sina
Number, max. Size max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max. FB		64 Kibyte				
Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max.		64 Kibyte				
FC		,	,	,	,	,
Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max.		64 Kibyte				
ОВ						
Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
 Size, max. 		64 Kibyte				
 Number of free cycle OBs 		1; OB 1				
 Number of time alarm OBs 		1; OB 10				
 Number of delay alarm OBs 		1; OB 20				
 Number of time alarm OBs 		9; OB 30-38				
 Number of process alarm OBs 		1; OB 40				
 Number of startup OBs 		2; OB 100, 102				
 Number of asynchronous error OBs 		7; OB 80, 82-85, 86, 88				
 Number of synchronous error OBs 		2; OB 121, 122				
Nesting depth		0.4	0.4	0.4	0.4	0.4
per priority classadditional within an error OB		24 24	24 24	24 24	24 24	24 24

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	0.004 μs; typ.	0.004 μs; typ.	0.004 μs; typ.	0.004 μs; typ.	0.004 μs; typ.
	0.003 μs; typ.	0.003 μs; typ.	0.003 μs; typ.	0.003 μs; typ.	0.003 μs; typ.
	0.004 μs; typ.	0.004 μs; typ.	0.004 µs; typ.	0.004 µs; typ.	0.004 μs; typ.
	2 048	2 048	2 048	2 048	2 048
	Yes 0 2.047	Yes 0 2.047	Yes 0 2.047	Yes 0 2.047	Yes 0 2 047
	8	8	8	8	8
	res 0 999	res 0 999	res 0 999	Yes 0 999	Yes 0 999
	Yes SFB	Yes SFB	Yes SFB	Yes SFB	Yes SFB
	2 048	2 048	2 048	2 048	2 048
	Yes 0 2 047	Yes 0 2 047	Yes 0 2 047	Yes 0 2 047	Yes 0 2 047
	10 ms 9 990 s	10 ms 9 990 s	10 ms 9 990 s	10 ms 9 990 s	10 ms 9 990 s
	Yes SFB	Yes SFB	Yes SFB	Yes SFB	Yes SFB
	512 KB	512 KB	512 KB	512 KB	512 KB
	0.2.1.5	0.2.1.5	0.2.1.5	0.2.1.5	
	16 Kibyte MB 0 to MB 16383	16 Kibyte MB 0 to MB 16383	16 Kibyte MB 0 to MB 16383	16 Kibyte MB 0 to MB 16383	16 Kibyte MB 0 to MB 16383
	MB 0 to MB 15 8	MB 0 to MB 15 8	MB 0 to MB 15 8	MB 0 to MB 15 8	MB 0 to MB 15 8
	Max. code size and max. data size: 4 MB each 64 Kibyte	Max. code size and max. data size: 4 MB each 64 Kibyte	Max. code size and max. data size: 4 MB each 64 Kibyte	Max. code size and max. data size: 4 MB each 64 Kibyte	Max. code size and max. data size: 4 MB each 64 Kibyte
		0BA0 0.004 μs; typ. 0.003 μs; typ. 0.004 μs; typ. 2 048 Yes 0 2 047 8 Yes 0 9999 Yes SFB 2 048 Yes 0 2 047 10 ms 9 990 s Yes SFB 512 KB 16 Kibyte MB 0 to MB 16383 MB 0 to MB 15 8 Max. code size and max. data size: 4 MB each	OBAO OBBO OFBO 0.004 μs; typ. 0.004 μs; typ. 0.003 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 2 048 2 048 Yes Yes 0 0 2 047 2 047 8 8 Yes Yes 0 999 999 999 Yes Yes 0 0 2 048 2 048 Yes Yes 0 0 2 047 2 047 10 ms 10 ms 9 990 s 9 990 s Yes SFB 512 KB 512 KB 512 KB 16 Kibyte MB 0 to MB 16383 MB 0 to MB 15 8 MB 0 to MB 15 MB 0 to MB 15 8 Max. code size and max. data size: 4 MB each size: 4 MB each	OBA0 OBB0 OFB0 OBF0 0.004 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 0.003 μs; typ. 0.003 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 0.004 μs; typ. 2 048 2 048 2 048 Yes Yes Yes 0 0 0 2 047 2 047 2 047 8 8 8 Yes Yes Yes 0 0 0 999 999 999 Yes Yes Yes SFB SFB SFB Yes Yes Yes 0 0 0 2 047 2 047 2 047 10 ms 10 ms 10 ms 9 990 s 9 990 s 9 990 s Yes Yes Yes SFB SFB SFB 512 KB 512 KB 512 KB 16 Kibyte	OBBO OFBO OBFO OBFO OBGO

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	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0
Address area I/O address area Overall Outputs of which,		16 Kibyte 16 Kibyte				
distributed - Inputs - Outputs			8 Kibyte 8 Kibyte			
Process image Inputs, adjustable Outputs, adjustable		16 Kibyte 16 Kibyte	16 Kibyte 16 Kibyte	8 Kibyte 8 Kibyte	8 Kibyte 8 Kibyte	8 Kibyte 8 Kibyte
Inputs, defaultOutputs, default		512 byte 512 byte				
Subprocess images Number of subprocess images, max.		15	15	15	15	15
Digital channels Inputs Outputs		128 000 128 000				
Analog channels Inputs Outputs		8 000 8 000				
Time Clock • Hardware clock (real-time clock)		Yes; Resolution:				
Clock synchronization supported on Ethernet via NTP		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
S7 message functions Number of login stations for message functions, max.		62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules
Process diagnostic messages		Yes; Alarm_S				
Test commissioning functions Status/control		V	V	V	V	V
Status/control variable Forcing		Yes	Yes	Yes	Yes	Yes
• Forcing Diagnostic buffer		No	No	No	No	No
• present Monitoring		Yes	Yes	Yes	Yes	Yes
functions Status LEDs		Yes	Yes	Yes	Yes	Yes

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Communication functions PG/OP communication		Yes	Yes	Yes	Yes	Yes
Global data communication • supported		No	No	No	No	No
S7 basic communication						
 supported 		No	No	No	No	No
S7 communication • supported • as server • as client		Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Open IE communication • TCP/IP		Yes; Via integ-	Yes; Via integ-	Yes; Via integ-	Yes; Via integ-	Yes; Via integ-
- Number of connections,		rated PROFINET interface (X1) and loadable FBs	rated PROFINET interface and loadable FBs 32	rated PROFINET interface (X1) and loadable FBs	rated PROFINET interface (X1) and loadable FBs	rated PROFINET interface (X1) and loadable FBs 32
max Data length, max. • ISO-on-TCP (RFC1006)		Yes; Via integ- rated PROFINET interface (X1) and loadable FBs	8 192 byte No	Yes; Via integ- rated PROFINET interface (X1) and loadable FBs	Yes; Via integ- rated PROFINET interface (X1) and loadable FBs	Yes; Via integ- rated PROFINET interface (X1) and loadable FBs
 Number of connections, max. 		32		32	32	32
UDPNumber of		Yes; Via integ- rated PROFINET interface (X1) and loadable FBs 32	Yes; Via integ- rated PROFINET interface and loadable FBs 32	Yes; Via integ- rated PROFINET interface (X1) and loadable FBs 32	Yes; Via integ- rated PROFINET interface (X1) and loadable FBs 32	Yes; Via integrated PROFINET interface (X1) and loadable FBs
connections, max. - Data length, max.			1 472 byte	02	<u>C</u>	02
Number of connections • overall		64	64	64	64	64
usable for PG communication						
 reserved for PG communication usable for OP communication 		1	1	1	1	1
- reserved for OP communication		1	1	1	1	1
1st interface Type of interface		PROFINET	PROFINET	PROFINET	PROFINET	PROFINET
Physics		2x RJ45	2x RJ45	2x RJ45	2x RJ45	2x RJ45
automatic detection of transmission speed		Yes	Yes	Yes	Yes	Yes
Autonegotiation		Yes	Yes	Yes	Yes	Yes
Autocrossing		Yes	Yes	Yes	Yes	Yes
Number of connection resources		32	32	32	32	32

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	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0
Functionality						
• MPI			No			
DP master			No			
DP slave DDOFINET		No	No	No	No	Nie
PROFINET IO device		No	No	No	No	No
PROFINET IO controller		Yes	Yes	Yes	Yes	Yes
 PROFINET CBA 		Yes	Yes	Yes	Yes	Yes
Open IE communi- cation		Yes	Yes	Yes	Yes	Yes
Point-to-point connection			No			
PROFINET IO controller						
ServicesPG/OP communi-		Yes	Yes	Yes	Yes	Yes
cation		165	165	165	165	163
- S7 routing		Yes	Yes	Yes	Yes	Yes
 S7 communi- cation 		Yes	Yes	Yes	Yes	Yes
 Isochronous mode 		Yes	No	Yes	Yes	Yes
 Number of connectable IO devices, max. 		256	256	256	256	256
 Max. number of connectable IO devices for RT 		256		256	256	256
- of which in line, max.		256		256	256	256
Number of IO devices with IRT and the option			64			
"high flexibility"						V
IRT, supportedPrioritized startup supported		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
- Number of IO devices, max.			32			
 Activation/deactivation of IO devices 		Yes	Yes	Yes	Yes	Yes
- Number of IO devices that			8			
can be simultane- ously activated/ deactivated, max.						
 IO devices changing during operation (partner ports), supported 		Yes	Yes	Yes	Yes	Yes
 Max. number of IO devices per 		8	8	8	8	8
tool Device replacement without		Yes		Yes	Yes	Yes
swap mediumSend cycles		Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms
Updating times		250 μs - 128 ms (at signal cycle 250 μs); 500 μs - 256 ms (at signal cycle 500 μs);	250 μs - 128 ms (at signal cycle 250 μs); 500 μs - 256 ms (at signal cycle 500 μs); 1 ms - 512 ms (at	250 μs - 128 ms (at signal cycle 250 μs); 500 μs - 256 ms (at signal cycle 500 μs);	250 μs - 128 ms (at signal cycle 250 μs); 500 μs - 256 ms (at signal cycle 500 μs); 1 ms - 512 ms (at	250 µs - 128 ms (at signal cycle 250 µs); 500 µs - 256 ms (at signal cycle 500 µs); 1 ms - 512 ms (at
		1 ms - 512 ms (at signal cycle 1 ms)	signal cycle 1 ms)	1 ms - 512 ms (at signal cycle 1 ms)	signal cycle 1 ms)	signal cycle 1 ms)

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	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0
PROFINET IO controller • Address area						
Inputs, max.Outputs, max.User data per			16 Kibyte 16 Kibyte			
address area, max.			2 Kibyte			
 User data consistency, max. 			256 byte			
PROFINET CBA						
 acyclic trans- mission 		Yes	Yes	Yes	Yes	Yes
 cyclic transmission 		Yes	Yes	Yes	Yes	Yes
Open IE communication						
 Open IE communication, supported 		Yes	Yes	Yes	Yes	Yes
 Number of connections, max. 			32			
Local port numbers used at the system end		0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
PROFINET functions						
 Detection of accessible nodes, supported 		Yes; DCP				
 Assignment of the IP address, supported 		Yes; DCP				
 Assignment of the device name, supported 		Yes; DCP				
 Topology recog- nition, supported 		Yes; LLDP, LLDP MIB, SNMP				
 Extended network diagnostics with Standard MIB II, supported 		Yes; Standard MIB II, SNMP				
2nd interface Type of interface		Integrated Ethernet interface				
Physics		Ethernet RJ45				
Automatic detection of transmission speed		Yes	Yes	Yes	Yes	Yes
Autonegotiation		Yes	Yes	Yes	Yes	Yes
Autocrossing		No	No	No	No	No
Number of connection resources		32	32	32	32	32

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	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0
Functionality • PROFINET IO controller • PROFINET		No No	No No	No No	No No	No No
IO device PROFINET CBA PROFINET CBA- SRT		No No	No No	No No	No No	No No
PROFINET functions • Detection of accessible nodes, supported		Yes; DCP		Yes; DCP	Yes; DCP	Yes; DCP
 Assignment of the IP address, supported 		Yes; DCP		Yes; DCP	Yes; DCP	Yes; DCP
Assignment of the device name, supported		Yes; DCP		Yes; DCP	Yes; DCP	Yes; DCP
Topology recognition, supported Extended network diagnostics with Standard MIB II, supported		Yes; LLDP, LLDP MIB, SNMP Yes; Standard MIB II, SNMP		Yes; LLDP, LLDP MIB, SNMP Yes; Standard MIB II, SNMP	Yes; LLDP, LLDP MIB, SNMP Yes; Standard MIB II, SNMP	Yes; LLDP, LLDP MIB, SNMP Yes; Standard MIB II, SNMP
Programming Configuration software • STEP 7		Yes; As of V5.5 + HW update/iMap V3.0 SP1	Yes; STEP7 V5.4 SP5 or higher + HSP135 as basic requirement for the HSP178 for WinAC RTX F 2009 on Embedded Controller / iMap V3.0 SP1	Yes; As of V5.5 + HW update/iMap V3.0 SP1	Yes; As of V5.5 + HW update/iMap V3.0 SP1	Yes; As of V5.5 + HW update/iMap V3.0 SP1
Programming language • STEP 7 • LAD • FBD • STL • SCL • CFC • GRAPH • HiGraph®		Yes	Yes; V5.4 SP5 Yes	Yes	Yes	Yes
Installed software Visualization				WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options	WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options	WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options
Control		SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX F 2009	SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX 2010
Communication		Yes	Yes	Yes	Yes	Yes

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	6ES7 677-1DD10- 0BA0	6ES7 677-1DD10- 0BB0	6ES7 677-1FD00- 0FB0	6ES7 677-1DD10- 0BF0	6ES7 677-1DD10- 0BG0	6ES7 677-1DD10- 0BH0	
EMC							
Emission of radio interference acc. to EN 55 011							
 Limit value class A, for use in industrial areas 	Yes	Yes	Yes	Yes	Yes	Yes	
Environmental requirements							
Operating temperature							
• Min.	0 °C						
Max.	50 °C						
Storage/transport temperature							
Min.Max.	-40 °C 70 °C						
Vibrations	70 0	70 0	70 0	70 C	70 0	70 C	
 Operation, checked according to IEC 60068-2-6 	Yes	Yes	Yes	Yes	Yes	Yes	
• Transport checked according to IEC 60068-2-6	Yes	Yes	Yes	Yes	Yes	Yes	
Shock test							
• checked according to IEC 60068-2-27	Yes	Yes	Yes	Yes	Yes	Yes	
checked according to IEC 60068-2-29	Yes	Yes	Yes	Yes Yes		Yes	
Shock testing	.,	.,	.,		.,	v.	
 Checked according to IEC 60068-2-29 	Yes	Yes	Yes	Yes Yes		Yes	
Operation, checked according to IEC 60068-2-29	Operation, checked according to IEC 60068-2-27						
• Storage/transport, checked according to IEC 60068-2-29	Yes	Yes	Yes	Yes	Yes	Yes	
Degree of							
protection IP20	Yes	Yes	Yes	Yes	Yes	Yes	
Standards, approvals, certificates							
CE mark	Yes	Yes	Yes	Yes	Yes	Yes	
CSA approval	Yes; included in cULus						
C-TICK	Yes	Yes	Yes	Yes	Yes	Yes	
cULus	Yes	Yes	Yes	Yes	Yes	Yes	
FM approval	Yes	Yes	Yes	Yes	Yes	Yes	
Dimensions and weight Dimensions							
Width	160 mm						
Height	125 mm						
Depth	115 mm						
Weight • Weight	1.5 kg; Approx.						

EC31

Ordering data	Order No.		Order No.
SIMATIC S7-modular embedded controller		EC31-HMI/RTX	
EC31 C Intel CoreDuo 1.2 GHz processor Memory configuration:	6ES7 677-1DD10-0BA0	Intel CoreDuo 1.2 GHz processor Memory configuration: 1 GB RAM, 4 GB Flash Disk; interfaces:	
1 GB RAM, 4 GB Flash Disk; interfaces: 1 Industrial Ethernet port,		Industrial Ethernet port, PROFINET ports, 2 USB ports, 1 slot for multimedia card; Software:	
2 PROFINET ports, 2 USB ports, 1 slot for multimedia card; Software: Windows Embedded Standard		Windows Embedded Standard, WinAC RTX 2010, SIMATIC SOFTNET-S7/V7.0 Lean preins- talled	
preinstalled, Software Development Kit (SDK) for creating C/C++ applications with		With WinCC flexible 2008 RT C 128 PT	6ES7 677-1DD10-0BF0
accesses to central I/O modules		 With WinCC flexible 2008 RT C 512 PT 	6ES7 677-1DD10-0BG0
EC31-RTX C Intel CoreDuo 1.2 GHz processor	6ES7 677-1DD10-0BB0	 With WinCC flexible 2008 RT C 2048 PT 	6ES7 677-1DD10-0BH0
Memory configuration: 1 GB RAM, 4 GB Flash Disk;		Accessories	
interfaces:		EM PCI-104 expansion module	6ES7 677-1DD40-1AA0
1 Industrial Ethernet port, 2 PROFINET ports, 2 USB ports, 1 slot for multimedia card;		For fitting up to 3 additional PCI-104 cards	
Software: Windows Embedded Standard		EM PC expansion module	6ES7 677-1DD50-2AA0
and WinAC RTX 2010 preinstalled		Additional connection options:	
EC31-RTX F	6ES7 677-1FD10-0FB0	2 USB interfaces, 1 Gigabit Ethernet interface, 1 serial interface, 1 slot for CF card, 1 slot	
Intel CoreDuo 1.2 GHz processor Memory configuration: 1 GB RAM, 4 GB Flash Disk; interfaces: 1 Industrial Ethernet port, 2 PROFINET ports, 2 USB ports,		for SD card/Micro Memory Card	
1 slot for multimedia card; Software: Windows Embedded Standard and WinAC RTX F 2010 preins- alled			

C: Subject to export regulations AL: N and ECCN: 5D002ENCU I: Subject to export regulations AL: N and ECCN: EAR99H

Expansion modules

Overview



- Expansion modules for SIMATIC S7-modular Embedded Controller EC31
 - EM PCI-104 for additionally accommodating up to 3 PCI-104 cards
 - EM PC with additional PC interfaces and slots for memory

Technical specifications

	6ES7 677-1DD40- 1AA0	6ES7 677-1DD50- 2AA0
Product type designation	EM PCI-104	EM PC
Product version		
Hardware product version	01	01
Power supply		
Input voltage		
Rated value, 24 V DC	Yes; Optional: external infeed	
 Permissible range, lower limit (DC) 	20.4 V	
 Permissible range, upper limit (DC) 	28.8 V	
Current consumption		
from expansion bus	100 mA	580 mA
Power losses		
Power loss, typ.	2.4 W; without inserted PCI-104 cards	9 W
Power loss, max.		14 W
Alarms/diagnostics/status information Diagnostics		
Diagnostic functions	Yes; POWER LED, status LED	Yes; POWER LED, CARD LED for indicating access to SD/MMC
EMC		
Emission of radio interference		
acc. to EN 55 011Limit value class A. for use	Yes	Yes
in industrial areas	100	100

	6ES7 677-1DD40- 1AA0	6ES7 677-1DD50- 2AA0
Environmental		
requirements Operating temperature		
Min.	0 °C	0°C
• Max.	50 °C	50 °C
Storage/transport tempe- rature		
• Min.	-40 °C	-40 °C
• Max.	70 °C	70 °C
Vibrations		
Operation, checked according to IEC 60068-2-6	Yes	Yes
• Transport, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
 Checked according to IEC 60068-2-27 	Yes	Yes
Checked according to IEC 60068-2-29	Yes	Yes
Shock test		
 Checked according to IEC 60068-2-29 	Yes	Yes
 Operation, checked according to IEC 60068-2-29 	Yes	Yes
• Storage/transport, checked according to IEC 60068-2-29	Yes	Yes
Degree of protection IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
C-TICK	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
Dimensions and weight		
Dimensions and weight		
• Width	120 mm; Without bus connector	80 mm; Without bus connector
• Height	extension bus 125 mm; Without external voltage connecting terminal	extension bus 125 mm
• Depth	115 mm	115 mm
Weight • Weight	0.5 kg	0.4 kg

Ordering data	Order No.
EM PCI-104 expansion module	6ES7 677-1DD40-1AA0
For fitting up to 3 additional PCI-104 cards	
EM PC expansion module	6ES7 677-1DD50-2AA0
Additional connection options: 2 USB interfaces, 1 Gigabit Ethernet interface, 1 serial interface, 1 slot for CF card, 1 slot for SD card/Micro Memory Card	

I: Subject to export regulations AL: N and ECCN: EAR99H

Embedded controller

SIMATIC S7-modular embedded controller

SIPLUS S7-modular embedded controller

658 ... 540 hPa (+3500 ... +5000m) derating 20 K

Overview



- Get off to a fast start in automation solutions with embedded PC platforms.
 - Ready-to-use SIMATIC WinAC RTX or WinAC RTX F preinstalled on EC31
 - Prepared for use in a SIMATIC environment with PROFINET and Industrial Ethernet
 - Commissioning by specialist automation personnel as with the S7-300
 - Configuring and programming with SIMATIC STEP 7 over Industrial Ethernet
 - Optional visualization
- Modular expansion capability:
 Control expansion with
 - Central expansion with
 - S7-300 I/O (SM modules of S7-300)
 - Expansion modules for additional PC interfaces, e.g. DVI-I, USB, Gigabit Ethernet networking and memory card slots, as well as PCI-104
- Rugged operation
 - Disk-free operation based on flash disk and Windows XP embedded
 - Fan-free operation
- Flexibility of a PC-based automation environment
 - Free memory space on flash disk can be used for other PC applications
 - Use of WinAC ODK with SIMATIC WinAC RTX and WinAC RTX F (read-only in safety-related program part)
 - Connection option for USB devices
 - Memory capacity expandable using multimedia card
- Data retentivity for WinAC RTX and RTX F without uninterruptible power supply (UPS)

	SIPLUS S7-modular embedded controller EC31
Order No.	6AG1 677-1DD00-4BA0
Order No. based on	6ES7 677-1DD00-0BA0
Ambient temperature range	0 +50 °C
Conformal coating	Coating of the printed circuit boards and the electronic compo- nents
Technical specifications	The technical data of the standard product applies except for the ambient conditions.

	SIPLUS S7-modular embedded controller EC31-RTX				
Order No.	6AG1 677-1DD00-4BB0				
Order No. based on	6ES7 677-1DD00-0BB0				
Ambient temperature range	0 +50 °C				
Conformal coating	Coating of the printed circuit boards and the electronic components				
Technical specifications	The technical data of the standard product applies except for the ambient conditions.				
Ambient conditions					
Relative humidity	5 100 % Condensation permissible				
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000m) see ambient temperature range 795 658 hPa (+2000 +3500m) derating 10 K				

Ordering data		Order No.
SIPLUS S7-modular embedded controller		
EC31	С	6AG1 677-1DD10-4BA0
(medial exposure)		
Intel CoreDuo 1.2 GHz processor Memory: 1 GB RAM, 4 GB flash disk; interfaces: 1 Industrial Ethernet port, 2 PROFINET ports, 2 USB ports, 1 multimedia card slot; software: Windows Embedded Standard pre-installed, Software Development Kit (SDK) for creating C/C++ applications with access to central I/O modules		
EC31-RTX	С	6AG1 677-1DD00-4BB0
(medial exposure)		
Intel CoreDuo 1.2 GHz processor Memory: 1 GB RAM, 4 GB flash disk; interfaces: 1 Industrial Ethernet port, 2 PROFINET ports, 2 USB ports, 1 multimedia card slot; software: Windows Embedded Standard and WinAC RTX 2010 preinstalled		
Accessories		See SIMATIC S7-modular Embedded Controller, page 7/11

C: Subject to export regulations AL: N and ECCN: 5D002ENCU

Embedded controller

Embedded Box PC bundles

SIMATIC IPC427C bundles

Overview



- Get off to a fast start in automation solutions with embedded PC platforms.
- SIMATIC WinAC RTX or SIMATIC WinAC RTX F preinstalled on SIMATIC IPC427C and ready for use
- PROFINET, PROFIBUS and Industrial Ethernet prepared for use in a SIMATIC environment
- Optional WinCC flexible for visualization tasks in parallel with SIMATIC WinAC RTX.
- Configuration and programming with SIMATIC STEP 7 via Industrial Ethernet, PROFINET, or PROFIBUS
- Safety requirements up to SIL 3 in accordance with IEC 61508/ 62061 or EN ISO 13849-1 up to PL e can be implemented with WinAC RTX F.
- Rugged operation
 - Operation without a hard disk, based on Compact Flash Card (CF Card) or Solid State Drive and Windows Embedded Standard
 - Fan-free operation
 - 128 KB of retentive data for WinAC RTX, also without uninterruptible power supply (UPS)
- · Flexibility of a PC-based automation environment
 - Free memory space on CF Card can be used for other PC applications
 - Use of WinAC ODK with SIMATIC WinAC RTX or SIMATIC WinAC RTX F (read-only for fail-safe program
 - Connection option for USB devices, flat panel monitor or screen
 - PCI 104 cards can be plugged in
- High-performance service concept
 - Replacement parts for preferred types available from stock
- New hardware basis SIMATIC IPC427C
- · Cost-effective versions with PROFINET, based on the standard Ethernet interface
- Current product versions of the pre-installed software:
 - SIMATIC WinAC RTX 2010 or SIMATIC WinAC RTX F 2010 SIMATIC WinCC flexible 2008 SP2

 - SIMATIC NET Edition 2008

Ordering data	Order No.

SIMATIC IPC427C bundles

All versions with SIMATIC WinAC RTX 2010 (F) and

WinCC flexible 2008									
SIMATIC IPC427C bundles	С	6ES7 675-1D			0-			0	
Processor									
 Celeron M, 1.2 GHz, 2x PROFINET (IE) 1) 			A						
• Celeron M, 1.2 GHz,			В						
2x PROFINET (IE), 1x PROFIBUS ¹⁾									
• Core2 Solo. 1.2 GHz.			Ε						
2x PROFINET (IE) 1)									
 Core2 Solo, 1.2 GHz, 2x PROFINET (IF) 			F						
2x PROFINET (IE), 1x PROFIBUS ¹⁾									
 Core2 Solo, 1.2 GHz, 1x PROFINET (IE), 			G						
PROFINET (RT/IRT) 3 ports									
 Core2 Duo, 1.2 GHz, 2x PROFINET (IE) 1) 			J						
• Core2 Duo, 1.2 GHz,			K						
2x PROFINET (IE), 1x PROFIBUS ¹⁾									
• Core2 Duo, 1.2 GHz,			L						
1x PROFINET (IE),									
PROFINET (RT/IRT) 3 ports									
Work memory • 1 GB RAM				2					
• 2 GB RAM ¹⁾				3					
• 4 GB RAM				4					
Mass storage, internal									
 Without (can only be ordered with externally accessible mass 						0			
storage) 1)	<u> </u>								
 250 GB HDD SATA, additionally with externally accessible CF 	′					1			
• 32 GB Solid State Disk SATA,						2			
Windows Embedded 2009 and									
software pre-installed4 GB internal CompactFlash,						6			
Windows Embedded 2009 and software pre-installed 1)									
8 GB internal CompactFlash,						7			
Windows Embedded 2009 and software pre-installed 1)									
Externally accessible mass storage									
 Without (can only be ordered 							Α		
with internal mass storage) 1) • 4 GB CompactFlash, Windows							D		
Embedded 2009 and software pre-installed 1)							-		
• 8 GB CompactFlash, Windows							E		
Embedded 2009 and software pre-installed 1)									

¹⁾ Replacement hardware units available in exchange

C: Subject to export regulations AL: N and ECCN: 5D002ENCU

SIMATIC IPC427C bundles

Ordering data	Order No.	Order No.

SIMATIC IPC427C bundles

All versions with SIMATIC WinAC RTX 2010 (F) and WinCC flexible 2008

SIMATIC IPC427C bundles C	6ES7 675-1D 0- 0- 0)
Software configurations 1)		
WinAC RTX	В	
 WinCC flexible RT 128 PT 	С	
 WinCC flexible RT 512 PT 	D	
 WinCC flexible RT 2048 PT 	E	
 WinCC flexible RT 4096 PT 	F	
 WinAC RTX, WinCC flexible RT 128 PT 	к	
 WinAC RTX, WinCC flexible RT 512 PT 	L	
 WinAC RTX, WinCC flexible RT 2048 PT 	М	
 WinAC RTX, WinCC flexible RT 4096 PT 	N	
WinAC RTX F	P	
 WinAC RTX F, WinCC flexible RT 128 PT 	R	
 WinAC RTX F, WinCC flexible RT 512 PT 	S	
 WinAC RTX F, WinCC flexible RT 2048 PT 	т	
 WinAC RTX F, WinCC flexible RT 4096 PT 	U	

¹⁾ Replacement hardware units available in exchange

Delivery versions (from stock)	
Replacement hardware units available in exchange	
SIMATIC IPC427C bundle with WinAC RTX 2010	
Core2 Solo processor, 1.2 GHz, C 2x PROFINET (IE), 1x PROFIBUS, 2 GB RAM, 4 GB CompactFlash	6ES7 675-1DF30-0DB0
Core2 Duo processor, 1.2 GHz, C 2x PROFINET (IE), 1x PROFIBUS, 2 GB RAM, 4 GB CompactFlash	6ES7 675-1DK30-0DB0
Core2 Duo processor, 1.2 GHz, C 2x PROFINET (IE), 1x PROFIBUS, 2 GB RAM, 8 GB CompactFlash	6ES7 675-1DK30-0EP0
SIMATIC IPC427C bundle with WinAC RTX 2010 and WinCC flexible 2008 512 PT	
Core2 Duo processor, 1.2 GHz, C 2x PROFINET (IE), 1x PROFIBUS, 2 GB RAM, 4 GB CompactFlash	6ES7 675-1DK30-0DL0

SIMATIC IPC427C Bundles with SIMATIC WinCC RT, V7.0 SP2 incl. Update 1

С	6ES7 675-1DA20-6AX0
С	6ES7 675-1DE30-7AX0
С	6ES7 675-1DF30-7AX0
С	6ES7 675-1DK40- ■ A ■ 0
	7 2 X W
	С

C: Subject to export regulations AL: N and ECCN: 5D002ENCU

SIMATIC IPC427C bundles

Ordering data	Order No.		Order No.
Accessories		SIMATIC PC keyboard	
CP 5603 Microbox Package	6GK1 560-3AU00	German/international, USB connection	6ES7 648-0CB00-0YA0
Package for using the PROFIBUS CP 5603 in Microbox PCs; comprising a CP 5603 module		German/international, USB connection, with 4-way USB HUB	6ES7 648-0CD00-0YA0
and a Microbox expansion frame		SIMATIC PC USB mouse	6ES7 790-0AA01-0XA0
CP 1604 Microbox Package	6GK1 160-4AU00	Optical, 3 buttons, with	
Package for using the PROFINET		PS/2 adapter	
CP 1604 in Microbox PCs; comprising CP 1604, connection		SIMATIC IPC USB FlashDrive	6ES7 648-0DC50-0AA0
board, power supply and expansion frame for Microbox PC; implemented with Development		8 GB (SLC), USB 2.0, incl. SIMATIC IPC BIOS manager, bootable, metal housing	
Kit DK-16xx PN IO; NCM P		SIMATIC IPC Service USB	6AV7 672-8JD01-0AA0
Expansion kit PC/104	6AG4 070-0BA00-0XA0	FlashDrive	
Expansion frame incl. mounting hardware; 6 units		8 GB (SLC), USB 2.0, incl. SIMATIC IPC Image & Partition	
CompactFlash Cards		 Creator and SIMATIC IPC BIOS manager (pre-installed), 	
4 GB	6ES7 648-2BF02-0XG0	bootable, metal enclosure	
8 GB	6ES7 648-2BF02-0XH0	Portrait assembly kit	6ES7 648-1AA20-0YB0
	32 33 33	Interfaces to the front	

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SIMATIC HMI IPC477C bundles

Overview



Embedded PC platform with extremely high industrial compatibility for demanding tasks in the field of PC-based automation

- Maintenance-free (no rotating components such as fan and
- Rugged construction: The PC is resistant to even the harshest mechanical stress and is extremely reliable in operation
- Battery-backed retentive memory onboard
- Compact design (only 61-69 mm installation depth for 12"-19")
- High investment protection
- Fast integration capability

The following versions are available:

- Built-in versions
- 12" and 15" TFT Touch 12" and 15" TFT Key
- 19" Touch
- Support arm versions

- PRO 15" and 19" Touch
Fully-enclosed device to IP65 degree of protection for mounting on a support arm/stand.

Technical specifications

	6AV7 884	6AV7 883PRO
General features		
Processors	Intel Celeron M 1.2 GHz, Intel Core2 Solo 1.2 GHz or Core2 Duo 1.2 GHz	Intel Celeron M 1.2 GHz, Intel Core2 Solo 1.2 GHz or Core2 Duo 1.2 GHz
Memory type	DDR3-RAM	DDR3-RAM
Work memory	1 GB, 2 GB or 4 GB	1 GB, 2 GB or 4 GB
Free slots	1 x CF card slot (externally accessible)	1 x CF card slot (externally accessible)
Operating system	Windows Embedded Standard 2009 (EN/DE) or Windows XP Professional Multi-Language	Windows Embedded Standard 2009 (EN/DE) or Windows XP Professional Multi-Language
Additional OS information	Language: EN/DE	Language: EN/DE
SIMATIC Software	Optionally with pre-installed bundle software SIMATIC WinCC flexible 2008 SP2 and/or WinAC RTX 2010 SIMATIC WinAC RTX F 2010 SIMATIC WinCC as Web Client or single-user station	Optionally with pre-installed bundle software SIMATIC WinCC flexible 2008 SP2 and/or WinAC RTX 2010 SIMATIC WinAC RTX F 2010 SIMATIC WinCC as Web Client or single-user station
Drives		
Disk drive	Optionally via external USB floppy disk drive	Optionally via external USB floppy disk drive
Optical drives	Possible as external drive via USB	Possible as external drive via USB
Hard drive/mass storage	CompactFlash drive with 2, 4 or 8 GB and/or SSD (Solid State Drive) with 32 GB	CompactFlash drive with 2, 4 or 8 GB and/or SSD (Solid State Drive) with 32 GB
Interfaces		
Graphics interface	DVI-I for additional display unit: Color depth 32 bits	DVI-I for additional display unit: Color depth 32 bits
Connection for keyboard/mouse	USB / USB	USB / USB
Serial interface	COM1: 1 x V.24 (RS232)	COM1: 1 x V.24 (RS232)
PROFIBUS/MPI	Optionally onboard, isolated, max. 12 Mbit/s, no plug-in card required, CP5611-compatible, not upgradeable	Optionally onboard, isolated, max. 12 Mbit/s, no plug-in card required, CP5611-compatible, not upgradeable
PROFINET (RT/IRT)	Optional: 3 x RJ45, CP1616-compatible; not upgradeable	Optional: 3 x RJ45, CP1616-compatible; not upgradeable
USB	1 x on front, 4 x on rear, USB 2.0 (500 mA)	1 x on front, 4 x on rear, USB 2.0 (500 mA)
PROFINET (IE), Ethernet	onboard, 2 x 10/100/1000 Mbit (RJ45 with/without PROFIBUS), 1 x 10/100/1000 Mbit (RJ45 with PROFINET), no plug-in card required	onboard, 2 x 10/100/1000 Mbit (RJ45 with/without PROFIBUS), 1 x 10/100/1000 Mbit (RJ45 with PROFINET), no plug-in card required
Multimedia	No	No
Supply voltage		
Supply voltage	24 V DC	24 V DC
Monitoring functions		
Temperature	Yes	Yes

SIMATIC HMI IPC477C bundles

	6AV7 884	6AV7 883PRO
Watchdog	Yes	Yes
DiagBit (similar to S.M.A.R.T.)	Yes (for CF cards and SSD)	Yes (for CF cards and SSD)
Status LEDs	Yes (on rear)	Yes
Front side according to EN 60529	IP65 (on the front) acc. to EN 60529 and NEMA4	IP65 all around according to EN 60529 and NEMA4
Ambient conditions		
Vibration load during operation	Checked in accordance with IEC 60068-2-6: 10 - 58 Hz: 0.075 mm, 58 to 200 Hz: 9.8 m/s² (1 g)	Checked in accordance with IEC 60068-2-6: 10 - 58 Hz: 0.075 mm, 58 to 200 Hz: 9.8 m/s² (1 g)
Shock load during operation	Checked in accordance with IEC 60068-2-7: 50 m/s² (5 g), 30 ms, 100 shocks	Checked in accordance with IEC 60068-2-7: 50 m/s² (5 g), 30 ms, 100 shocks
Relative humidity	Checked in accordance with IEC 60068-78, IEC 60068-2-30: 5% to 80% at 25 °C (no condensation)	Checked in accordance with IEC 60068-78, IEC 60068-2-30: 5% to 80% at 25 °C (no condensation)
Maximum permissible installation angle +/-	30° over vertical	45° over vertical
Ambient temperature during	0 °C +50 °C in maximum configuration; no fan	15": 0 °C +45 °C in maximum configuration; no fan
operation		19": 0 °C +40 °C in maximum configuration; no fan
Certifications & standards		
Approvals	CE, cULus(508), Marine	CE, cULus(508)
EMC	CE, 55022A, EN 61000-6-4, EN 61000-6-2	CE, 55022A, EN 61000-6-4, EN 61000-6-2

	6AV7 884-0	6AV7 884-1	6AV7 884-2	6AV7 884-3	6AV7 884-5	6AV7 883-6 (PRO)	6AV7 883-7 (PRO)
Front plate	12" TFT Touch	12" TFT Key	15" TFT Touch	15" TFT Key	19" TFT Touch	15" TFT Touch	19" TFT Touch
Display							
Resolution (W x H in pixels)	800 x 600	800 x 600	1024 x 768	1024 x 768	1280 x 1024	1024 x 768	1280 x 1024
MTBF of backlighting (at 25 °C)	50000 h at 24 h continuous operation, temperature- dependent						
Type of operation							
Function keys	No	36	No	36	No	No	No
Alphanumeric keyboard	No	Yes	No	Yes	No	No	No
Touch screen (analog/resistive)	Yes	No	Yes	No	Yes	Yes	Yes
Mouse on front	No	Yes	No	Yes	No	No	No
Design							
Centralized configuration	Yes						
Distributed configuration	No						
Dimensions							
Mounting dimensions in centralized configuration (W x H x D, without optical drive) in mm	368 x 290 x 61	450 x 290 x 61	450 x 290 x 64	450 x 321 x 59	450 x 380 x 71	400 x 310 x 98	483 x 400 x 115
Operator control unit (W x H) in mm	400 x 310 (7 HU)	483 x 310 (19", 7 HU)	483 x 310 (19", 7 HU)	483 x 355 (19", 8 HU)	483 x 400 (19", 9 HU)	483 x 400 (19", 9 HU)	483 x 400 (19", 9 HU)
Weight	6.1 kg	6.6 kg	7.0 kg	6.6 kg	7.2 kg	7.4 kg	10.9 kg
General features							
Accessories	Touch protective membranes	Insertable strips for keyboard	Touch protective membranes	Insertable strips for keyboard	Touch protective membranes	Touch protective membranes	Touch protective membranes
Power loss in maximum configuration	24 V DC: max. 45 W	24 V DC: max. 45 W	24 V DC: max. 55 W	24 V DC: max. 55 W	24 V DC: max. 60 W	24 V DC: max. 55 W	24 V DC: max. 55 W

SIMATIC HMI IPC477C bundles

Ordering data Order No. Order No.

Bundles with WinAC RTX 2010 and WinCC flexible 2008 SP2

(Built-to-order version, delivery time max. 15 business days and with identified repair, if not preferred type)

with identified repair, if not pre	ete	rred type)							
SIMATIC HMI IPC477C PRO	С	6AV7 883-	•	۱.			-		0
Embedded and fan-free with fully enclosed IP65 enclosure 4 x USB (500 mA), 24 V DC power supply with On/ Off switch									
SIMATIC HMI IPC477C	С	6AV7 884-		۱.				П	0
Without fan 5 x USB 2.0 (500 mA), one of which on the front 1 x COM (RS232) 24 V DC power supply with On/ Off switch									
Front Plate									
• 12" TFT Touch 1) • 12" TFT Key			0 1						
• 15" TFT Touch 1)			2						
• 15" TFT Key		;	3						
• 19" TFT Touch ¹⁾			5						
• 15" TFT Touch (IP65 enclosure; PRO)		,	6						
• 19" TFT Touch (IP65 enclosure; PRO)		7	7						
Processors and fieldbus			_						
 Celeron M 1.2 GHz, 2 x PROFINET (IE) 1) 				Α	,				
• Celeron M1 1.2 GHz,				В					
2 x PROFINET (IE),									
1 x PROFIBUS DP 12 1) • Core2 Solo 1.2 GHz,				D					
2 x PROFINET (IE) 1)				ľ					
 Core2 Solo 1.2 GHz, 2 x PROFINET (IE), 				E					
1 x PROFIBUS DP 12 1)									
• Core2 Solo 1.2 GHz,				F					
1 x PROFINET (IE), 1 x PROFINET (3 ports) ¹⁾									
Core2 Duo 1.2 GHz,				G					
2 x PROFINET (IE) 1)				Н					
 Core2 Duo 1.2 GHz, 2 x PROFINET (IE), 				"					
1 x PROFIBUS DP 12 1)				١.					
 Core2 Duo 1.2 GHz, 1 x PROFINET (IE), 				J					
1 x PROFINET (3 ports) 1)									
Work memory (DDR3 RAM), 1 bank									
• 1 GB					1				
• 2 GB ¹⁾					2				
• 4 GB					3				
Second mass storage									
(installed and formatted) • Without 1)						0			
CompactFlash 2 GB (only with Windows Embedded Standard						2			
2009) ¹⁾ • CompactFlash 4 GB ¹⁾						3			
• CompactFlash 8 GB ¹⁾						4			
• SSD (Solid State Drive)						6			
min. 32 GB									

С	0.41/7.000 = 4 = = =	_		
	6AV7 883- A			0
С	6AV7 884- A A			0
	2 3 4 6			
		В	Α	
		D	A	
		В	В	
		B B	D E	
		B B	L M	
		В	P	
		B B	S T	
		3 4 6	3 4 6 8 B B B B B B B B B B B B B B B B B B	BA DA BB

¹⁾ Preferred versions with repaired replacement device from stock C: Subject to export regulations AL: N and ECCN: 5D002ENCU

SIMATIC HMI IPC477C bundles

Ordering data Order No. Order No.

Bundles with WinCC V7.0 SP2, incl. Update 1

("Built to order" with delivery time of max. 14 business days, for hardware only repairs are possible)

SIMATIC HMI IPC477C	С	6AV7	884-		A	п	0	-		В		0
Without fan 4 x USB 2.0 on rear, 1 x USB 2.0 on front, 1 x COM (RS232), 2 x 10 100/1000 Mbit/s Ethernet (RJ45); software pre-installed on CF/SSD Windows Embedded Standard, SIMATIC WinCC V7.0 SP1												
SIMATIC HMI IPC477C PRO	С	6AV7	883-	0	A		0	-		В		0
Fan-free, 4 x USB 2.0 (500 mA), 1 x USB 2.0 on front (not on PRO), 1 x COM (RS 232), 24 V DC power supply with On/Off switch, 2 x PROFINET (IE), Windows Embedded 2009 pre-installed SIMATIC WinCC V7.0 SP2 incl. Update 1 Runtime pre-installed												
Front plate				П								
• 15" TFT Touch	С	6AV7										
• 19" TFT Touch	С	6AV7										
• 15" TFT Touch PRO	С	6AV7										
• 19" TFT Touch PRO	С	6AV7	883-	_								
Client configurations Processor Celeron M 1.2 GHz, 1 GB DDR3 RAM, 4 GB CF Card, runtime license 128 PT					,	۱ 1			3		X	
Client and single-user station												
configurations Processor Core2 Solo 1.2 GHz, 2 GB SDRAM-DDR3, 8 GB CF					ſ	2			4		X	
Card, runtime license 128 PT												
Processor Core2 Solo 1.2 GHz, PROFIBUS DP, 2 GB SDRAM- DDR3, 8 GB CF Card, runtime license 128 PT					E	Ε 2			4		X	
Single-user station												
configurations		0.41/=								_		
SIMATIC HMI IPC477C	С	6AV7										
SIMATIC HMI IPC477C PRO Core2 Duo processor 1.2 GHz, PROFIBUS DP, 4 GB SDRAM-DDR3	С	6AV7	883-		Αŀ	13	0	-		В		0
 8 GB CF Card 32 GB SSD Runtime license 128 PT Runtime license 2048 PT 									4 6		X W	

Note:

Other ready-to-use SIMATIC HMI IPC477Cs can be found in the catalog ST 80/ST, Panel PC chapter under HMI IPC477C.

- C: Subject to export regulations AL: N and ECCN: 5D002ENCU
- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Protective film for Panel PCs 477/577/677

For protecting the touch screen against dirt/scratches

• for 12" Touch

Accessories

- for 15" Touch (not for PRO)
- for 19" Touch

6AV7 671-2BA00-0AA0 6AV7 671-4BA00-0AA0 6AV7 672-1CE00-0AA0

6AV7 672-0DA00-0AA0

Labeling membranes for Panel PCs 477/577/677

For labeling soft keys and function keys, blank, supplied in 10 units

Touch pen 6AV7 672-1JB00-0AA0

Captive pen for operation of the touch devices, mounting of the support on the control cabinet or direct on the PRO unit

Expansion components

SIMATIC IPC DiagMonitor V4.2 J 6ES7 648-6CA04-2YX0

Software tool for monitoring SIMATIC PCs, incl. manual, on CD-ROM (German/English)

SIMATIC IPC Image & Partition D 6ES7 648-6AA03-1YA0 Creator V3.1

Software tool for preventive data backup and hard disk partitioning for SIMATIC PCs, incl. manual on CD-ROM (German, English)

SIMATIC IPC USB FlashDrive 6ES7 648-0DC50-0AA0 8 GB, USB 2.0, metal enclosure,

hootable SIMATIC IPC Service USB

FlashDrive 8 GB, USB 2.0, metal enclosure,

bootable With: BIOS Manager, Image &

Partition Creator pre-installed, incl. CD USB disk drive 3.5"

with 1 m connecting cable **Industrial USB Hub 4**

4 x USB 2.0, IP65 for control cabinet door or DIN rail

CompactFlash Card

- 2 GB
- 4 GB
- 8 GB

6ES7 648-2BF02-0XG0 6ES7 648-2BF02-0XH0

6AV7 672-8JD01-0AA0

6FC5 235-0AA05-1AA2

6AV6 671-3AH00-0AX0

6ES7 648-2BF02-0XF0

Please be sure to note:

The HMI IPC477C is delivered as standard with an inserted CF card. The licenses are located on the supplied USB flash drive.

Note:

Further complete turnkey solutions (software pre-installed and configured) based on the Microbox PC can be found under SIMATIC PC based Control.

CP 5603

Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
•	•	•	•	•	S K10 XX 10166

- PCI-104 interface card with own microprocessor for connecting embedded systems with PCI-104 interface to PROFIBUS at up to 12 Mbit/s
- Function compatible with CP 5613 A2
- · Communication services:
 - PROFIBUS DP master Class 1 and 2 or DP slave according to IEC 61158/61784
 - PG/OP communication with STEP 5 and STEP 7
 - S7 communication with S7-5613 software package HARDNET S7
 - Open communication (SEND/RECEIVE) based on the FDL interface
 - PROFIBUS FMS according to IEC 61158/61784 with FMS-613 software package
- Extensive diagnostics options for installation, commissioning and operation of the module
- Event and filter mechanism for reducing the load on the host
 CPLI
- Multiprotocol operation and parallel operation of up to three CPs
- The appropriate OPC server and configuration tools are included in the scope of delivery of the respective communication software
- Linux-based development kit with driver sources for integration into "non-Windows" environments

Note:

FMS-5613 supports up to two CP 5603/CP 5613 A2/5614 A2/CP 5623/CP 5624 processors

Technical specifications

Order No.	6GK1 560-3AA00				
Product type designation	CP 5603				
Data transmission rate					
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 Kbit/s 12 Mbit/s				
Interfaces					
Number of electrical connections at interface 1 in accordance with PROFIBUS	1				

Order No.	6GK1 560-3AA00
Product type designation	CP 5603
Design of electrical connection	
 at interface 1 in accordance with PROFIBUS 	9-pin D-sub socket (RS 485)
• of the backplane bus	PCI-104 (32 bit)
Supply voltage, current consumption, power loss	
Type of power supply	DC
Supply voltage 1 from	5 V
backplane bus	O V
Relative symmetric tolerance at 5 V DC	5 %
Current consumption 1 from backplane bus with DC, maximum	0.66 A
Effective power loss	3.3 W
Permitted ambient conditions	
Ambient temperature	
During operating phase	0 70 °C
During storageDuring transport	-40 +70 °C -40 +70 °C
Relative humidity at 25 °C without	85 %
condensation during operating phase, maximum	00 /0
IP degree of protection	IP00
Design, dimensions and weights	
Module format	PCI -104
Width	90 mm
Height	21 mm
Depth	96 mm
Net weight	80 g
Type of mounting	Screw mounting
Product properties, functions, components in general	<u> </u>
Number of plug-in cards of same	3
design which can be inserted per PC station	3
Number of modules - Note	FMS-5613 supports a maximum of two CP 5603 / CP 5613 A2 / CP 5614 A2 / CP 5623 / CP 5624 processors
Performance data	
Performance data Open communication	
Software required for open communication by means of SEND/ RECEIVE	FDL driver included in scope of delivery of CP
Number of possible connections for open communication by means of SEND/RECEIVE, maximum	80

CP 5603

reciffical specifications (continued)			
Order No.	6GK1 560-3AA00		
Product type designation	CP 5603		
Performance data for PROFIBUS DP master			
Software required for DP master function	No		
Service as DP master			
• DPV0	Yes		
• DPV1 • DPV2	Yes Yes		
Number of DP slaves operable on DP master	124		
Data volume			
 of address area of inputs as DP master, total 	30 256 byte		
 of address area of outputs as DP master, total 	30 256 byte		
of address area of inputs per DP slave	244 byte		
of address area of outputs per DP slave	244 byte		
of address area of diagnostics data per DP slave	244 byte		
Performance data for PROFIBUS DP slave			
Software required for DP slave function	No		
Service as DP slave			
• DPV0	Yes		
• DPV1	Yes		
Data volume			
 of address area of inputs as DP slave, total 	244 byte		
of address area of outputs as DP slave, total	244 byte		
Performance data FMS functions			
Software required for FMS communication	Yes, HARDNET-FMS (FMS-5613)		
Number of possible connections with FMS connection, maximum	40		

Order No.	6GK1 560-3AA00
Product type designation	CP 5603
Performance data S7 communication	
Software required for S7 communication	Yes, HARDNET-S7 (S7-5613)
Number of possible connections for S7/PG communication, maximum	50
Performance data Multiprotocol operation	
Number of active connections for multiprotocol operation	50
Number of configurable connections per PC station	207
Product functions Management, configuration, programming	
Configuration software required	NCM PC included in scope of delivery
Product functions Diagnostics	
Product function: Port diagnostics	Yes
Standards, specifications, approvals	
Standard • For EMC • For CSA and UL safety	2004/108/EC CAN/CSA C22.2 & UL 60950-1, UL 508
For emitted interferenceFor noise immunity	EN 61000-6-3, EN 61000-6-4 EN 61000-6-1, EN 61000-6-2
Certificate of suitability • CE mark • C-Tick	Yes Yes
Accessories	
Accessories	Optional: Expansion frame for SIMATIC Microbox and withdra- wable drawer for SIMATIC S7 modular embedded controller

CP 5603

Ordering data	Order No.		Order No.
CP 5603 communication	6GK1 560-3AA00	DP-5613 Edition 2008	
PCI-104 card for connection to PROFIBUS incl. DP-Base coftware with NCM PC; DP-RAM interface for DP master or DP clave, incl. PG and FDL protocols; ingle license for 1 installation, untime software, software and electronic manual on CD-ROM, class A, for operating system support see SIMATIC NET coftware; German/English		for 32 bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German • Single license for 1 installation • Software Update Service for 1 year, with automatic extension; requirement: Current software version	6GK1 713-5DB71-3AA0 6GK1 713-5DB00-3AL0
Software upgrade	6GK1 561-3AA01-3AE0	 Upgrade from DP-5613 Edition 2006 or 2007 to DP-5613 Edition 	6GK1 713-5DB00-3AE0
or CP 5603, CP 5613 A2 and CP 5623 on edition 2008 or V8.1	OGKT 301-3AA01-3AE0	2008 or HARDNET DP V8.1 • Upgrade from DP-5613, V6.0,	6GK1 713-5DB00-3AE1
CP 5603 Microbox Package	6GK1 560-3AU00	V6.1, V6.2 or V6.3 to DP-5613 Edition 2008 or HARDNET DP	
For use of CP 5603 in Microbox 420/427B/427C; consisting of CP 5603 module and Microbox expansion frame		V8.1 HARDNET S7 Software for S7 communication,	
CP 5603 expansion frame	6GK1 560-3AA00-0AU0	incl. PG and FDL protocol, OPC server and NCM PC; runtime	
for use in Microbox 420/427B/ 427C with mounting material		software, software and electronic manual on USB flash drive, Class A; for CP 5603,	
CP 5603 mEC Package	6GK1 560-3AE00	CP 5613 A2, CP 5623, CP 5614 A2, CP 5624;	
For use of CP 5603 in SIMATIC S7-MEC; SIMATIC S7-MEC; SIMATIC S7-MEC; SIMATIC S7-MEC; SIMATIC S7-MEC SIMATIC S7-MEC		HARDNET-PB S7 V8.1 for 32/64 bit; Windows 7 Professional/Ultimate; or 64 bit; Windows 2008 Server R2; English/German	
CP 5603 insert plate	6GK1 560-3AA00-0AE0	• Single license for 1 installation D	6GK1 713-5CB08-1AA0
Metal plate with RS485 cutout for nserting for the S7 modular embedded controller		S7-5613 Edition 2008 for 32 bit Windows XP Professional SP2/3; Windows 2003	
HARDNET-PB DP development kit Software HARDNET-PB DP Development kit for CP 5603, CP 5613, CP 5613 A2, CP 5623, CP 5613 FO, CP 5614, CP 5614 A2, CP 5624; for integration into	See www.siemens.com/simatic- net/dk5613	Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German • Single license for 1 installation • Software Update Service for 1 year,	6GK1 713-5CB71-3AA0 6GK1 713-5CB00-3AL0
other operating system environments on systems with a PCI slot		with automatic extension; requirement: Current software version	
HARDNET-PB DP		 Upgrade from S7-5613 Edition 	6GK1 713-5CB00-3AE0
Software for DP, incl. PG and FDL protocol, OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on USB lash drive, Class A; for CP 5603, CP 5613 A2, CP 5624;		2006 or 2007 to S7-5613 Edition 2008 or HARDNET S7 V8.1 • Upgrade from S7-5613 V6.0, V6.1, V6.2 or V6.3 to S7-5613 Edition 2008 or HARDNET S7 V8.1	6GK1 713-5CB00-3AE1
HARDNET-PB DP V8.1			
or 32/64 bit; Nindows 7 Professional/Ultimate; or 64 bit; Nindows 2008 Server R2; English/German			

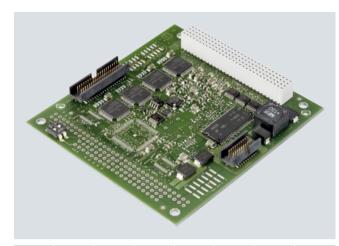
D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H

CP 5603

Ordering data	Order No.		Order No.
FMS-5613 Edition 2008		PROFIBUS FC standard cable	6XV1 830-0EH10
Software for FMS protocol incl. PG/OP communication; FDL, FMS-OPC server and NCM PC; runtime software, software and electronic manual on USB stick, Class A, for 32-bit Windows XP Professional SP2/3;		Standard type with special design for quick assembly, 2-core, shielded, sold in meters; delivery unit max. 1000 m, minimum order 20 m	
Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; for CP 5603, CP 5613, CP 5613 A2,		PROFIBUS FastConnect bus connector RS485 Plug 180	6GK1 500-0FC10
CP 5623, CP 5613 FO, CP 5614, CP 5614 A2, CP 5624; German/English		With 180° cable outlet, insulation displacement	
Single license for 1 installation	6GK1 713-5FB71-3AA0	12M PROFIBUS bus terminal	6GK1 500-0AA10
Software Update Service for 1 year, with automatic extension; requirement: Current software	6GK1 713-5FB00-3AL0	Bus terminal for connection of PROFIBUS stations up to 12 Mbit/s with plug-in cable 1.5 m long	
version • Upgrade FMS-5613 Edition 2006 or 2007 to FMS-5613	6GK1 713-5FB00-3AE0	PROFIBUS FastConnect stripping tool	6GK1 905-6AA00
Edition 2008 • Upgrade FMS-5613 V6.0, V6.1, V6.2 or V6.3 to FMS-5613 Edition 2008	6GK1 713-5FB00-3AE1	Preset stripping tool for fast stripping of PROFIBUS FastConnect bus cables	

CP 1604

Overview



ISO	TCP/ UDP	PN	MRP	OPC	PG/OP	S7/S5	IT	
	•	•	•				G_K10,XX_10159	

- PCI-104 module for connecting PCI-104 systems to PROFINET IO
- Full/half duplex with autonegotiation
- With Ethernet real-time ASIC ERTEC 400
- Integral 4-port real-time switch
- Communication services:
 - PROFINET IO controller and/or PROFINET IO device
 - Support of IRT in motion control applications
- High performance through direct memory access
- Integration in network management systems through the support of SNMP
- Comprehensive diagnostics possibilities for installation, start-up and operation of the module
- Powerful configuration tools are included in the scope of delivery of module

Technical specifications

Order No.	6GK1 160-4AA00
Product type designation	CP 1604
Transmission rate	
Transmission rate at interface 1	10 100 Mbit/s
Interfaces	
Number of electrical connections	
at interface 1 in accordance with Industrial Ethernet	4
for power supply	1
Design of electrical connection	
 at interface 1 in accordance with Industrial Ethernet 	RJ45 port via connection board
• of backplane bus	PCI-104 (32 bit)
• for power supply	4-pin terminal block via power supply board

Order No.	6GK1 160-4AA00
Product type designation	CP 1604
Supply voltage, current consumption, power loss	
Type of power supply	DC
Type of power supply: optional external supply	Yes
Power supply • 1 from backplane bus • External	5 V
Power supply - Note	Optional external supply and external supply voltage alternatively via power supply board (optional accessory)
Relative symmetrical tolerance	
At 5 V with DCAt 24 V with DC	5 % 20 %
 Current consumed Max. 1 from backplane bus with DC 	0.8 A
 Maximum from external power supply with 24 V DC 	0.3 A
Effective power loss Maximum with switch mode	4 W 4.1 W
Permitted ambient conditions	
Ambient temperature • During operating phase • During storage • During transport	5 55 °C -20 +60 °C -20 +60 °C
Relative humidity at 25 °C without condensation during operating phase, maximum	95 %
IP degree of protection	IP00
Design, dimensions and weights	
Module format	PCI-104
Width	90 mm
Height	24 mm
Net weight	110 g
Product properties, functions, components General	
Number of plug-in cards of same design which can be inserted per PC station	1
Number of modules - Note	-

CP 1604

(continued)		
6GK1 160-4AA00		
CP 1604		
No		
128		
64		
8 192 byte		
8 192 byte		
1 433 byte		
1 433 byte		
1 433 byte		
1 433 byte		
254 byte		
254 byte		
254 byte		
64		

Order No.	6GK1 160-4AA00
Product type designation	CP 1604
Product functions Management, configu- ration, programming	
Product function: MIB support	Yes
Protocol is supported SNMP v1 DCP LLDP Configuration software required	Yes Yes Yes NCM PC included in scope of delivery
Product functions Diagnostics	
Product function • Web-based diagnostics • Port diagnostics	Yes Yes
Product functions Switch	
Product feature: Switch Product function: Switch- managed	Yes No
Product function with IRT PROFINET IO Switch	Yes
Product functions Redundancy	
Product function • Ring redundancy • Redundancy manager • Redundancy procedure MRP	Yes Yes Yes
Standards, specifications, approvals	
Standard • For EMC • For CSA and UL safety • For emitted interference • For noise immunity Certificate of suitability • CE mark • C-Tick	89/336/EEC CAN/CSA C22.2 & UL 60950-1 EN 61000-6-3, EN 61000-6-4 EN 61000-6-1, EN 61000-6-2 Yes Yes
Accessories Accessories	Optional: Connection Board for CP 1604, Power Supply Board for CP 1604, Development Kit

CP 1604

Ordering data	Order No.		Order No.
CP 1604 communication processor	6GK1 160-4AA00	HARDNET-PN IO development kit	see www.siemens.com/simationet/dk16xx
PCI-104 card (32-bit) with ASIC ERTEC 400 for connecting PCI-104 systems to PROFINET IO with 4-port real-time switch (RJ45); incl. IO-Base software for PROFINET IO-Controller and NCM PC; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32-bit Windows XP Professional; other operating systems by means of DK-16xx PN IO Development Kit German/English		Software development kit for CP 1616/CP 1604; driver and IO-Base software for CP 1616/CP 1604 as PN IO controller and IO device in source code for transfer to other PC-based operating systems; including executable example code for SUSE Linux 10, Windows XP Professional and Windows 7 IE TP Cord RJ45/RJ45 TP cable 4 x 2 with 2 RJ45	
CP 1604 Microbox Package	6GK1 160-4AU00	connectors	
Package for implementing the CP 1604 in the SIMATIC Microbox PC; comprising the CP 1604, connection board, power supply and expansion frames for Microbox PC; for use with Development Kit DK-16xx PN IO; NCM PC		• 0.5 m • 1 m • 2 m • 6 m • 10 m SCALANCE X204IRT Managed Industrial Ethernet	6XV1 870-3QE50 6XV1 870-3QH10 6XV1 870-3QH20 6XV1 870-3QH60 6XV1 870-3QN10 6GK5 204-0BA00-2BA3
Accessories		switches; isochronous real time.	
Connection board for CP 1604	6GK1 160-4AC00	LED diagnostics,	
Connection board for CP 1604 with four RJ45 sockets incl. connecting cable		error signaling contact with SET button, redundant power supply 4 x 10/100 Mbit/s RJ45 ports	
Power supply for CP 1604	6GK1 160-4AP00	.,	
Redundant power supply for CP 1604 for operating the integral 4-port switch of the CP 1604 with the PC-104 system switched off; incl. connecting cable			

I: Subject to export regulations AL: N and ECCN: EAR99H

8

SIMATIC PC-based controller



8/2 8/2 8/9 8/16

SIMATIC PC-based controller SIMATIC WinAC RTX SIMATIC WinAC RTX F SIMATIC WinAC ODK

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

SIMATIC PC-based controller

SIMATIC PC-based controller

SIMATIC WinAC RTX

Overview



- SIMATIC WinAC RTX: Optimized for applications that require a high degree of flexibility and integration capability.
- The software solution for tasks that require hard deterministic behavior and high performance.
- With real-time expansion for assuring deterministic behavior for the control section.

New with WinAC RTX 2010:

- Operation under Windows 7
- Web server
- New PROFINET functions:
 - Isochronous mode
 - Shared Device
 - Media redundancy
 - IP configuration

Technical specifications

	6ES7 671-0RC08-0YA0
Product type designation	SIMATIC WinAC RTX 2010
Product version	
Hardware product version	-
Firmware version	V4.6
associated programming package	STEP7 as of V5.5 + HW update / iMap V3.0 SP1
Memory	
Work memory	
• integrated (for program)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
• integrated (for data)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
Load memory	
• integrated RAM, max.	8 Mbyte; Adjustable; depends on Non Paged Memory Pool
CPU-blocks	
DB	
Number, max.	65 535; Limited only by RAM set for data
• Size, max.	64 Kibyte
FB	
• Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 Kibyte
FC	
• Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 Kibyte
ОВ	
Number, max.	Limited only by RAM set for code
• Size, max.	64 Kibyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	1; OB 10
Number of delay alarm OBs	1; OB 20
·	

6ES7 671-0RC08-0YA0		
OB Number of time alarm OBs Number of process alarm OBs Number of ODK OBs Number of DPV1 alarm OBs Number isochronous mode OBs Number of startup OBs Number of asynchronous error OBs Number of synchronous error OBs	9; OB 30-38 1; OB 40 3; OB 52-54 3; OB 55-57 2; OB 61-62 2; OB 100, 102 7; OB 80, 82-85, 86, 88 2; OB 121, 122	
Nesting depth • per priority class • additional within an error OB	24 24	
CPU processing times for bit operations, min.	0.004 μs; typ.	
for fixed point arithmetic, min.	0.003 μs; typ.	
for floating point arithmetic, min.	0.004 μs; typ.	
Reference platform	Pentium IV, 2.4 GHz	
Counters, timers and their retentivity S7 counter • Number • Retentivity - can be set - lower limit - upper limit - preset • Counting range - can be set - lower limit - upper limit	2 048 Yes 0 2 047 8 Yes 0 999	
IEC counter • present • Type • Number	Yes SFB Unlimited (limited only by RAM capacity)	

SIMATIC WinAC RTX

-	inueu)	
	6ES7 671-0RC08-0YA0	
S7 timesNumberRetentivity	2 048	
- can be set - lower limit - upper limit	Yes 0 2 047	
presetTime rangelower limitupper limit	0 10 ms 9 990 s	
IEC timer • present • Type • Number	Yes SFB Unlimited (limited only by RAM	
	capacity)	
Data areas and their retentivity Retentivity without UPS and PS Extension Board	128 KB with SIMATIC IPC427C and HMI IPC477C; further SIMATIC PCs on request	
Retentivity with UPS	all data	
Flag Number, max. of which retentive Retentivity preset Number of clock memories	16 Kibyte MB 0 to MB 16383 MB 0 to MB 15 8	
Data blocks Number, max. Size, max. Retentivity adjustable	Limited only by available retentive memory (NVRAM, or file storage) 64 Kibyte Yes; via non-retain property on	
Retentivity preset	DB Yes	
Local data • adjustable, max. • preset • per priority class, max.	64 Kibyte 32 Kibyte 61 440 byte	
Address area I/O address area • overall	16 Kibyte	
 Outputs of which, distributed DP interface, inputs DP interface, outputs PN interface, inputs PN interface, outputs 	16 Kibyte 16 Kibyte 16 Kibyte 16 Kibyte 16 Kibyte 16 Kibyte	
Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default	8 Kibyte 8 Kibyte 512 byte 512 byte	
Subprocess images Number of subprocess images, max.	15	
Digital channels • Inputs • Outputs	128 000 128 000	

	6ES7 671-0RC08-0YA0
Analog channels	
• Inputs	8 000
• Outputs	8 000
Hardware configuration	
Submodules	4
 Number of submodules, max of which PROFIBUS, max. 	4 4; Supported interfaces:
of which the iboo, max.	see 1st and 2nd interface
 of which Industrial Ethernet, max. 	1; Supported interfaces: see 3rd and 4th interface
Number of operable FMs and	
CPs (recommended)	EM 15 + 15 + 1 EM 050 + 1
• FM	FM distributed: FM 350-1 / 350-2, FM 351, FM 352,
	FM 353, FM 355 / 355-2
• CP, point-to-point	2; CP 340, CP 341 distributed
• CP, LAN	Over PC CP
Time	
Clock	
Hardware clock (real-time clock) hetters beginning and expense.	Yes
 battery-backed and synchro- nizable 	Yes
Runtime meter	
• Number	8
Clock synchronization	
• supported	Yes
• to PC-CP, slave	Yes
• on Ethernet via NTP	Yes
S7 message functions	
Number of login stations for	62
message functions, max.	
SCAN procedure	No
Process diagnostic messages	Yes; ALARM_S, ALARM_SQ, ALARM_D, ALARM_DQ
simultaneously active Alarm-S blocks, max.	20; of a total of 20 for all SFCs
Alarm 8-blocks	Yes
• Number of instances for alarm	4 000
8 and S7 communication blocks, max.	
Process control messages	No
Test commissioning functions	
Status/control	
 Status/control variable 	Yes
Forcing	
• Forcing	No
Status block	Yes
Single step	Yes
Number of breakpoints	20
Diagnostic buffer	
• present	Yes
Number of entries, max.	3 200
- can be set	Yes
- preset	120

SIMATIC WinAC RTX

Technical specifications (continued)			
	6ES7 671-0RC08-0YA0		
Communication functions PG/OP communication	Yes		
Data record routing	Yes; Only with CP 5611 or integrated PROFIBUS interface of the SIMATIC PC		
Routing	Yes		
Global data communication			
• supported	No		
S7 basic communication • supported	No		
S7 communication • supported • as server • as client • User data per job, max.	Yes Yes Yes 64 Kibyte; When using BSEND/ USEND		
Web server • supported • Number of HTTP clients • User-defined websites	Yes 2 No		
Open IE communication TCP/IP Number of connections, max. Data length for connection type 01H, max. Data length for connection type 11H, max. Data length, max. ISO-on-TCP (RFC1006) Number of connections, max. Data length, max. UDP Number of connections, max. Data length, max. Mumber of connections, max.	Yes 32 Not supported 65 534 byte 65 534 byte Yes 32 65 534 byte Yes 32 1 472 byte		
overall usable for PG communication reserved for PG communication usable for OP communication reserved for OP communication reserved for OP communication	9611		
PROFINET CBA (at set setpoint communication load) • Setpoint for the CPU communication load • Number of remote interconnection partners • Number of functions, master/slave • Total of all Master/Slave connections • Data length of all incoming connections master/slave, max. • Data length of all outgoing connections master/slave, max. • Number of device-internal and PROFIBUS interconnections	20 % 64 30 1 000 6 800 byte 6 800 byte 500		

	CEC7 C74 ODCOO OVAO	
DDOEINET ODA (at aut autoriot	6ES7 671-0RC08-0YA0	
PROFINET CBA (at set setpoint communication load)		
Data length of device-internal	4 000 byte	
und PROFIBUS interconnections, max.		
• Data length per connection,	1 400 byte	
max. • Remote interconnections with		
acyclic transmission		
- Sampling frequency: Sampling time, min.	500 ms	
- Number of incoming intercon-	100	
nections - Number of outgoing intercon-	100	
nections - Data length of all incoming interconnections, max.	2 000 byte	
- Data length of all outgoing	2 000 byte	
interconnections, max Data length per connection,	1 400 byte	
max.	1 400 Dyte	
 Remote interconnections with cyclic transmission 		
- Transmission frequency:	10 ms	
Transmission interval, min Number of incoming intercon-	200	
nections - Number of outgoing intercon-	200	
nections - Data length of all incoming	4 800 byte	
interconnections, max. - Data length of all outgoing interconnections, max.	4 800 byte	
- Data length per connection, max.	250 byte	
HMI variables via PROFINET (acyclic)		
 Number of stations that can log on for HMI variables 	3	
(PN OPC/iMap)	E00 ma	
 - HMI variable updating - Number of HMI variables 	500 ms 200	
- Data length of all HMI	2 000 byte	
variables, max. • PROFIBUS proxy functionality		
- supported	Yes	
- Number of linked PROFIBUS devices	16	
- Data length per connection,	240 byte; Slave-dependent	
max.	· ·	
1st interface	CP 5611-A2, CP 5621,	
Type of interface	integrated PB interface of the SIMATIC PC	
Max. no. of simultaneously operable CPs	1	
Physics	RS 485 / PROFIBUS	
Isolated	Yes	
Power supply to interface (15 to 30 V DC), max.	does not exist	
Number of connection resources	8	
Functionality	N	
MPI DP master	No Yes	
• DP slave	No	

SIMATIC WinAC RTX

Technical specifications (continued)			
	6ES7 671-0RC08-0YA0		
DP master			
Number of connections, max.	8		
• Services	0		
- PG/OP communication	Yes		
- Routing	Yes		
- Global data communication	No		
- S7 basic communication	No		
- S7 communication	Yes		
- S7 communication, as client	Yes		
- S7 communication, as server	Yes		
- Equidistance mode support	Yes; Only in conjunction with		
la calenda como acada	isochronous mode		
- Isochronous mode	Yes		
- SYNC/FREEZE	Yes		
 Activation/deactivation of DP slaves 	Yes		
 Direct data exchange (slave- to-slave communication) 	Yes		
- DPV0	Yes		
- DPV1	Yes		
 Transmission rate, max. 	12 Mbit/s		
 Number of DP slaves, max. 	64		
 Address area 			
- Inputs, max.	16 Kibyte		
- Outputs, max.	16 Kibyte		
User data per DP slave			
- Inputs, max.	244 byte		
- Outputs, max.	244 byte		
2nd interface	00 5040 00 5040 40		
Type of interface	CP 5613, CP 5613-A2, CP 5603		
Max. no. of simultaneously operable CPs	4		
Physics	RS 485 / PROFIBUS		
Isolated	Yes		
Functionality			
• MPI	No		
DP master	Yes		
• DP slave	No		
DP master			
Number of connections, max.	50		
• Services			
- PG/OP communication	Yes		
- Routing	Yes		
- Global data communication	No		
- S7 basic communication	No		
- S7 communication	Yes		
- S7 communication, as client	Yes		
- S7 communication, as server	Yes		
- Equidistance mode support	Yes; Only in conjunction with isochronous mode		
- Isochronous mode	Yes		
- SYNC/FREEZE	Yes		
- Activation/deactivation of	Yes		
DP slaves	100		

	6ES7 671-0RC08-0YA0	
DP master		
Services		
- Direct data exchange (slave-	Yes	
to-slave communication)		
- DPV0	Yes	
- DPV1	Yes	
• Transmission rate, max.	12 Mbit/s	
Number of DP slaves, max.Address area	125	
- Inputs, max.	16 Kibyte	
- Outputs, max.	16 Kibyte	
• User data per DP slave	,	
- Inputs, max.	244 byte	
- Outputs, max.	244 byte	
3rd interface		
Type of interface	PROFINET	
Max. no. of simultaneously operable CPs	1; Intel Pro/1000 (Intel 82571EB, 82573L, 82574L, 82541PI; non-shared IRQ required); integrated IE interface SIMATIC PC 4x7B, 6x7B, 8x7B, IPC4x7C, IPC6x7C, IPC8x7C	
Physics	Ethernet	
Isolated	Yes	
Integrated switch	No	
Number of ports	1	
automatic detection of transmission speed	Yes; 10/100 Mbit/s	
Autonegotiation	Yes	
Autocrossing	Yes	
Media redundancy		
• supported	No	
Functionality		
PROFINET IO Controller	Yes	
PROFINET IO Device	No	
PROFINET CBA	Yes	
Open IE communication	Yes	
PROFINET IO Controller		
• Services	.,	
- PG/OP communication	Yes	
- Routing - S7 communication	Yes; S7 routing	
- Isochronous mode	Yes No	
- Open IE communication	Yes	
• Transmission rate, min.	100 Mbit/s	
 Transmission rate, max. 	100 Mbit/s	
Max. number of connectable IO devices for RT	128	
- of which in line, max.	128	

SIMATIC WinAC RTX

PROFINET IO Controller IIRT, supported Prioritized startup supported No Yes Prioritized startup supported No Yes Activation/deactivation of IO Devices, max. Activation/deactivation of IO Devices INUmber of IO Devices that can be simultaneously activated/deactivated, max. IO Devices changing during operation (partner ports), supported Send clock times Updating time In the start of	Technical specifications (continued)			
 IRT, supported Prioritized startup supported Prioritized startup supported Number of IO Devices, max. Activation/deactivation of IO Devices Number of IO Devices that can be simultaneously activated/deactivated, max. IO Devices changing during operation (partner ports), supported Device replacement without swap medium Send clock times Updating time Address area Inputs, max. User data per address area, max. User data consistency, max. User data per address area, max. ST routing ST routing ST routing SP communication PG/OP communication PGP communication POPEN IE communication, supported Number of connections, max. Open IE communication, supported Number of connections, max. Coap of interface Keep-alive function, supported Keep-alive function, supported Ath interface Type of interface PROFINET Max no, of simultaneously operable CPs Keep-alive function, supported Tyes PROFINET Max no, of simultaneously operable CPs Ethernet Isolated Yes Integrated switch Yes Number of contection of transmission speed Autonegotiation Autonegotiation Number of stations in the ring, Wes Switchover time on line break, typically Number of stations in the ring, Outpous time of I/O devices, and on the volume of connections max. 10 Popen IE communication, supported Yes <!--</th--><th></th><th>6ES7 671-0RC08-0YA0</th>		6ES7 671-0RC08-0YA0		
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- Number of IO Devices, max. - Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max. - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium - Send clock times - Updating time - Address area - Inputs, max Outputs, max. - User data per address area, max. - User data per address area, max. - User data consistency, max. - User data consistency, max. - User data consistency, max. SIMATIC communication - PG/OP communication - PG/OP communication - PG/OP communication - PG-OP communication - PG-OP communication - Number of connections, max. - Local port numbers used at the system end - Number of connections, max. - Local port numbers used at the system end - Number of simultaneously operable CPs - Ves		No		
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Devices - Number of IO Devices that can be simultaneously activated/deactivated, max. - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium - Send clock times - Updating time - Send clock times - Updating time - Address area - Inputs, max. - Outputs, max. - Outputs, max. - User data per address area, max. - User data consistency, max. - User data consistency, max. - User data consistency, max. - Simantic communication - PG/OP communication - PG/OP communication - PG/OP is communication - Number of connections, max. - Oopen IE communication - Open IE communication - Open IE communication - Open IE communication - Number of connections, max. - Local port numbers used at the system end - Number of interface - Max. no. of simultaneously operable CPs - Number of ports - Max. no. of simultaneously operable CPs - Physics - Ethernet - Solated - Yes - Number of ports - Autocrossing - Media redundancy - Supported - Switchover time on line break, typicially - Number of stations in the ring, - Number of stations in the ring, - Outputs (minimum value depends on communication share set for PROFINET (Month in the ring, because of III max.) - The summer of I/O devices, and on the volume of configured value depends on communication share set for PROFINET (Month in the ring, because of III max.) - The summer of I/O devices, and on the volume of Exhaptical value depends on communication share set for PROFINET (Month in the ring, because of III max.) - The summer of I/O devices, and on the volume of Exhaptical value depends on communication share set for PROFINET (Month in the ring, because of III max.) - The summer of I/O devices, and on the volume of Exhaptical value depends on communication share set or PROFINET (Month in the ring, because of III max.) - The summer of I/O devices, and on the volume of Exhaptical value depends on communication share set or PROFINET (Month in the ring) - The summer of I/O devices, and on the volum				
can be simultaneously activated/deactivated, max. • IO Devices changing during operation (partner ports), supported • Device replacement without swap medium • Send clock times • Updating time • Address area • Inputs, max. • Outputs, max. • Outputs, max. • User data per address area, max. • User data consistency, max. • User data consistency, max. • User data consistency, max. • S7 routing • S7 communication • PG/OP communication • Open IE communication • Open IE communication, supported • Number of connections, max. • Keep-alive function, supported 4th interface Type of interface Max. no. of simultaneously operable CPs Flysics Integrated switch Number of ports automatic detection of transmission speed Autocrossing Media redundancy • Supported • Switchover time on line break, typicially • Number of stations in the ring, • Supported • Switchover time on line break, typicially • Number of stations in the ring,	Devices			
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Device replacement without swap medium Send clock times Updating time In ms Updating time Updating time In ms Updating time updating the volume of configured Updating the volume of the Viby time Updating time Upd	operation (partner ports),	Yes		
Updating time 1 - 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data) Address area Inputs, max. User data per address area, max. User data consistency, max. User data consistency, max. SIMATIC communication PG/OP communication S7 routing S7 routing S7 communication Number of connections, max. Uopen IE communication Open IE communication Open IE communication Open IE communication Unumber of connections, max. Local port numbers used at the system end Keep-alive function, supported Wax. no. of simultaneously operable CPs PROFINET Max. no. of simultaneously operable CPs Type of interface Type of interface PROFINET Max. no. of simultaneously operable CPs Type of interface PROFINET T; CP 1616 (HW release 8 or above), CP 1604 (HW release 7 or higher), integrated PN interface of SIMATIC PC and S7-mEC Physics Ethernet Isolated Yes Integrated switch Yes Number of ports 3 automatic detection of transmission speed Autonegotiation Autocrossing Yes Media redundancy Symbor of stations in the ring, Number of stations in the ring,	Device replacement without	Yes		
depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data) • Address area - Inputs, max Outputs, max User data per address area, max User data consistency, max. • ST routing • PG/OP communication • PG/OP communication • PG connections, max. • Number of connections, max. • Number of connections, max. • Local port numbers used at the system end • Number of connections, supported • Number of connections, supported • Number of connections, max. • Local port numbers used at the system end • PROFINET Max. no. of simultaneously operable CPs • PROFINET Max. no. of simultaneously operable CPs • Ethernet Isolated Physics Ethernet Isolated Yes Integrated switch Yes Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Yes Media redundancy • Supported • Number of stations in the ring, Yes 200 ms Yes 200 ms	• Send clock times	1 ms		
- Inputs, max Outputs, max Outputs, max Outputs, max User data per address area, max User data consistency, max. SIMATIC communication - PG/OP communication - S7 routing - S7 communication - Number of connections, max Open IE communication - Open IE communication, supported - Number of connections, max Local port numbers used at the system end - Number of connection, supported - Number of connection, max Local port numbers used at the system end - Neep-alive function, supported - Keep-alive function, supported - Keep-alive function, supported - RoFINET - Max. no. of simultaneously operable CPs - CP to interface - PROFINET - Time to the frace interface		depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of		
- Outputs, max User data per address area, max User data consistency, max. SIMATIC communication - PG/OP communication - PG/OP communication - S7 routing - S7 communication - Number of connections, max Number of connections, max. Open IE communication - Yes - Open IE communication - Open IE communication - Yes - Open IE communication - Yes - Open IE communication - Open IE communication - Yes - Open		1C Kilouda		
 User data per address area, max. User data consistency, max. 2 kbyte 256 byte SIMATIC communication PG/OP communication S7 routing S7 communication Number of connections, max. Open IE communication Open IE communication, supported Number of connections, max. Local port numbers used at the system end Keep-alive function, supported 4th interface Type of interface PROFINET Max. no. of simultaneously operable CPs Physics Ethernet Integrated switch Number of ports automatic detection of transmission speed Autorossing Autorossing Number of stations in the ring, Number of stations in the ring, Number of stations in the ring, Sbyte 256 byte 32 42 256 byte 256 byte 32 42 256 byte 32 42 256 byte 32 42 20 page 1 21 22 23 24 25 25 26 27 23 24 25 25 25 26 27 28 29 29 20 20 20 25 26 26 27 28 29 29 20 29 20 25 26 26 27 28 29 29 29 20 20 30 32 32<	•			
- User data consistency, max. SIMATIC communication PG/OP communication PG/OP communication Signature of connections of transmission speed - Switchover time on line break, typically Pes SIMATIC communication PG/OP communication PG/OP communication PG/OP communication PG/OP communication Pes Yes Yes Yes Yes Yes Yes Yes Yes		•		
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Ath interface Type of interface Max. no. of simultaneously operable CPs 1; CP 1616 (HW release 8 or above), CP 1604 (HW release 7 or higher), integrated PN interface of SIMATIC PC and S7-mEC Physics Ethernet Isolated Yes Integrated switch Yes Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Yes Media redundancy Switchover time on line break, typically Number of stations in the ring, Number of simultaneously 1; CP 1616 (HW release 8 or above) 1; CP 1604 (HW release 8 or abo	 Local port numbers used at 	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534,		
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Max. no. of simultaneously operable CPs 1; CP 1616 (HW release 8 or above), CP 1604 (HW release 7 or higher), integrated PN interface of SIMATIC PC and S7-mEC Physics Ethernet Isolated Yes Integrated switch Yes Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Wes Media redundancy Switchover time on line break, typically Number of stations in the ring, Number of stations in the ring,				
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Isolated Yes Integrated switch Yes Number of ports 3 automatic detection of transmission speed Autonegotiation Yes Autocrossing Yes Media redundancy • supported Yes • Switchover time on line break, typically • Number of stations in the ring, 50		above), CP 1604 (HW release 7 or higher), integrated PN interface of SIMATIC PC		
Integrated switch Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, Yes 3 Yes; 10/100 Mbit/s Yes Yes Yes 200 ms	Physics	Ethernet		
Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, Satisfactory Yes; 10/100 Mbit/s Yes Yes 200 ms	Isolated	Yes		
Number of ports automatic detection of transmission speed Autonegotiation Autocrossing Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, Satisfactory Yes; 10/100 Mbit/s Yes Yes 200 ms	Integrated switch			
automatic detection of transmission speed Autonegotiation Autocrossing Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, 50				
transmission speed Autonegotiation Yes Autocrossing Yes Media redundancy • supported Yes • Switchover time on line break, typically • Number of stations in the ring, 50				
Autocrossing Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, 50	transmission speed	·		
Media redundancy • supported • Switchover time on line break, typically • Number of stations in the ring, 50				
 supported Switchover time on line break, typically Number of stations in the ring, 50 		Yes		
 Switchover time on line break, typically Number of stations in the ring, 50 		Voo		
typically • Number of stations in the ring, 50				
		200 1110		
		50		

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Change of IP address at runtime, supported	Yes	
Number of connection resources	32	
Functionality		
PROFINET IO Controller	Yes	
 PROFINET IO device 	No	
• PROFINET CBA	Yes	
 Open IE communication 	Yes	
Web server	Yes	
PROFINET IO Controller		
• Services		
- PG/OP communication	Yes	
- Routing	Yes; S7 routing	
- S7 communication	Yes	
- Isochronous mode	Yes	
- Open IE communication	Yes	
• Transmission rate, min.	100 Mbit/s	
• Transmission rate, max.	100 Mbit/s	
 Max. number of connectable IO Devices for RT 	256	
- of which in line, max.	256	
Number of IO Devices with	64	
IRT and the option "high flexi-		
bility"		
- of which in line, max.	32	
 Number of IO Devices with IRT and the option "high 	64	
performance", max.		
- of which in line, max.	32	
• IRT, supported	Yes	
 Prioritized startup supported 	Yes	
- Number of IO Devices, max.	32	
 Activation/deactivation of 	Yes	
IO Devices		
 Number of IO Devices that can be simultaneously 	8	
activated/deactivated, max.		
IO Devices changing during	Yes	
operation (partner ports),		
supported	V	
 Device replacement without swap medium 	Yes	
Send clock times	250 μs, 500 μs, 1 ms	
Updating time	0.25512 depending on the	
, ,	send cycle	
 Address area 		
- Inputs, max.	16 Kibyte	
- Outputs, max.	16 Kibyte	
 User data per address area, max. 	2 kbyte	
- User data consistency, max.	256 byte	
SIMATIC communication		
PG/OP communication	Yes	
• S7 routing	Yes	
• S7 communication	Yes	
 Number of connections, max. 	32	
Open IE communication		
Open IE communication,	Yes	
supported		
• Number of connections, max.	32	
Local port numbers used at	0, 20, 21, 25, 80, 102, 135,	
the system end	161, 34962, 34963, 34964, 65532, 65533, 65534, 65535	
	11132, 33333, 33331, 33330	

SIMATIC WinAC RTX

rechnical specifications (Cont	inded)	
	6ES7 671-0RC08-0YA0	
Isochronous mode		
Isochronous mode	Yes	
Number of DP masters with isochronous mode	2	
User data per isochronous slave, max.	128 byte	
Equidistance	Yes	
Shortest clock pulse	2.2 ms; 2.2 ms without partial process image; 2.2 ms with partial process image	
Programming		
Programming language • STEP 7	Yes; As of V5.5, Engineering Tools (optional)	
• LAD • FBD	Yes Yes	
• STL	Yes	
• SCL	Yes	
• CFC	Yes	
• GRAPH	Yes	
• HiGraph®	Yes	
Nesting levels	8	
Know-how protection • User program protection/ password protection	Yes	
Software libraries • Easy Motion Control • Software redundancy	Yes Yes; As of V1.2, only operation of WinAC RTX with WinAC RTX	
Open Development interfaces • CCX (Custom Code Extension)	Yes; WinAC ODK V4.2 or higher	
SMX (Shared Memory Extension) Inputs Outputs CMI (Controller Management Interface)	Yes; WinAC ODK V4.2 or higher 4 Kibyte 4 Kibyte Yes; WinAC ODK V4.2 or higher	
Number of simultaneously active	5	
SFCs		
DPSYC_FR	20; of a total of 20 for all SFCs	
• D_ACT_DP	20; of a total of 20 for all SFCs	
• RD_REC	20; of a total of 20 for all SFCs	

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Number of simultaneously active SFCs		
• WR_REC	20; of a total of 20 for all SFCs	
• WR_PARM	20; of a total of 20 for all SFCs	
• PARM_MOD	20; of a total of 20 for all SFCs	
• WR_DPARM	20; of a total of 20 for all SFCs	
DPNRM_DG	20; of a total of 20 for all SFCs	
• RDSYSST	20; of a total of 20 for all SFCs	
Number of simultaneously active SFBs		
• RD_REC • WR_REC	20; of a total of 20 for all SFBs 20; of a total of 20 for all SFBs	
Hardware requirements Hardware required	PC with color monitor,	
Haraware required	keyboard, mouse or pointing device for Windows	
Required memory on hard disk, min.	100 Mbyte	
Work memory, min.	1 Gbyte	
Processor	Intel Celeron M, 900 MHz or compatible	
Multi-processor system	Yes; Dual Pentium, CoreDuo, Core2Duo or compatible	
Hyper-threading	Yes	
Operating systems		
Operating system		
• Windows NT 4.0	No	
• Windows 2000	No	
Windows XP	Yes; Professional, SP2 and SP	
Windows XP embedded	Yes; With the delivery image of the SIMATIC PC	
- Supported HAL types under Windows XP	ACPI uniprocessor PC, ACPI multiprocessor PC, MPS multiprocessor PC	
Windows embedded Standard 7	No.	
• Windows 7	Yes; Professional, Enterprise, Ultimate (only 32 bit)	
Windows Vista	No	
Dimensions and weight		
Weight		
Weight, approx.	100 g; with packaging	

SIMATIC WinAC RTX

Ordering data	Order No.		Order No.
SIMATIC WinAC RTX 2010	6ES7 671-0RC08-0YA0	CP 5623 communication C processor	6GK1562-3AA00
Software PLC for PC-based automation tasks with stringent deterministic requirements; PROFIBUS and PROFINET; CD-ROM with electronic documentation d, e, f; single license, executable under Windows XP SP2 and SP3 as well as Windows 7 (32 bit)		PCI Express x1 card (32 bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A, for	
SIMATIC WinAC RTX 2010 J Upgrade	6ES7 671-0RC08-0YE0	operating system support see SIMATIC NET software; German/English	
For upgrading from basic/RTX V3.x, V4.0, V4.1 2005, 2008 and 2009;		CP 1616 communication processor	6GK1 161-6AA01
single license, executable under Windows XP SP2 and SP3 and Windows 7 (32 bit)		PCI Card (32 bit; 3.3/5 V universal key) with ASIC ERTEC 400 for connecting PCs to PROFINET IO	
CP 5611 A2 communication processor	6GK1 561-1AA01	with 4-port real-time switch (RJ45); incl. IO-Base software for	
PCI card (32 bit) for connection of a programming device or PC to PROFIBUS		PROFINET IO controller (RT operation) and NCM PC; single license for one installation, runtime software. software and	
CP 5621 communication processor		electronic manual on CD-ROM, Class A, for 32 bit Windows XP	
PCI Express x1 card (32 bit) for C connection of a programming device or PC to PROFIBUS	6GK1 562-1AA00	Professional; German/English	6GK1 160-4AU00
PCI Express x1 card (32 bit) CP 5621 and MPI cable, 5 m	6GK1 562-1AM00	CP 1604 Microbox Package Package for implementing the CP 1604 in the SIMATIC Microbox	0GK1 100-4A000
CP 5603 Microbox Package	6GK1 560-3AU00	PC; comprising the CP 1604,	
Comprising CP 5603 module and Microbox expansion frame		connection board, power supply and expansion frame for Microbox PC: for use with	
CP 5613 A2 communication processor	6GK1 561-3AA01	Development Kit DK-16xx PN IO; NCM PC	
PCI card (32 bit; 3.3 V/5 V) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master, incl. PG and FDL protocol; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32 bit Windows 2000 Professional/ Server, Windows XP Professional, German/English			

- C: Subject to export regulations AL: N and ECCN: 5D002ENCU
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC PC-based controller

SIMATIC PC-based controller

SIMATIC WinAC RTX F

Overview



- SIMATIC WinAC RTX F:
 - Optimized for applications that demand a high degree of flexibility and integration capability and that must also satisfy safety requirements up to SIL 3 (IEC 61508).
- The software solution for tasks that require hard deterministic behavior and high performance.
- With real-time expansion for assuring deterministic behavior for the control section.
- Distributed I/O can be connected over PROFIBUS and/or PROFINET, also safety-related over PROFIsafe.

Technical specifications

	6ES7 671-1RC08-0YA0
Product type designation	SIMATIC WinAC RTX F 2010
Product version	
Hardware product version	-
Firmware version	V4.6
associated programming package	STEP7 as of V5.5 + HW update / iMap V3.0 SP1 / option package S7 Distributed Safety V5.4 + SP5 / S7 F Configuration Pack V5.5 + SP6 + HF1
Memory	
Work memory	
• integrated (for program)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
integrated (for data)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
Load memory	
• integrated RAM, max.	Adjustable; depends on Non Paged Memory Pool
CPU-blocks	
DB	
Number, max.	65 535; Limited only by RAM set for data
• Size, max.	64 Kibyte
FB	
Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 Kibyte
FC	
Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 Kibyte
ОВ	
Number, max.	Limited only by RAM set for code
• Size, max.	64 Kibyte
Number of free cycle OBsNumber of time alarm OBs	1; OB 1 1; OB 10

	6ES7 671-1RC08-0YA0
OB	3207 071 111000 01710
OB Number of delay alarm OBs Number of time alarm OBs Number of process alarm OBs Number of ODK OBs Number of DPV1 alarm OBs Number isochronous mode OBs Number of startup OBs Number of asynchronous error OBs Number of synchronous error OBs	1; OB 20 9; OB 30-38 1; OB 40 3; OB 52-54 3; OB 55-57 2; OB 61-62 2; OB 100, 102 7; OB 80, 82-85, 86, 88 2; OB 121, 122
Nesting depth • per priority class • additional within an error OB	24 24
CPU processing times for bit operations, min.	0.004 μs; typ.
for fixed point arithmetic, min.	0.003 μs; typ.
for floating point arithmetic, min.	0.004 μs; typ.
Reference platform	Pentium IV, 2.4 GHz
Counters, timers and their retentivity S7 counter • Number • Retentivity - adjustable - lower limit - upper limit - preset • Counting range - adjustable - lower limit - upper limit	2 048 Yes 0 2 047 8 Yes 0 999
IEC counter • present • Type • Number	Yes SFB Unlimited (limited only by RAM capacity)

SIMATIC WinAC RTX F

Technical specifications (continued)		
	6ES7 671-1RC08-0YA0	
S7 times		
• Number	2 048	
Retentivity		
- adjustable	Yes	
- lower limit	0	
- upper limit	2 047	
- preset	0	
Time range lower limit	10 ms	
- upper limit	9 990 s	
	3 330 3	
IEC timer	Yes	
presentType	SFB	
Number	Unlimited (limited only by RAM	
	capacity)	
Data areas and their retentivity		
Retentivity without UPS and PS	128 KB with SIMATIC IPC427C	
Extension Board	and HMI IPC477C; further	
	SIMATIC PCs on request	
Retentivity with UPS	all data	
Flag		
 Number, max. 	16 Kibyte	
 of which retentive 	MB 0 to MB 16383	
Retentivity preset	MB 0 to MB 15	
Number of clock memories	8	
Data blocks		
Number, max.	Limited only by available retentive	
• Cizo may	memory (NVRAM, or file storage)	
Size, max.Retentivity adjustable	64 Kibyte Yes; via non-retain property on DB	
Retentivity adjustable Retentivity preset	Yes	
Local data	100	
adjustable, max.	64 Kibyte	
• preset	32 Kibyte	
• per priority class, max.	61 440 byte	
Address area		
I/O address area		
• overall	16 Kibyte	
Outputs	16 Kibyte	
of which, distributed	Ç	
- DP interface, inputs	16 Kibyte	
- DP interface, outputs	16 Kibyte	
- PN interface, inputs	16 Kibyte	
- PN interface, outputs	16 Kibyte	
Process image		
• Inputs, adjustable	8 Kibyte	
Outputs, adjustable	8 Kibyte	
• Inputs, default	512 byte	
• Outputs, default	512 byte	
Subprocess images	46	
 Number of subprocess images, max. 	15	
Digital channels	128 000	
InputsOutputs	128 000 128 000	
Calputo	120 000	

	6ES7 671-1RC08-0YA0
Analog channels • Inputs • Outputs	8 000 8 000
Hardware configuration Submodules	
Number of submodules, max of which PROFIBUS, max.	4 4; Supported interfaces: see 1st and 2nd interface
• of which Industrial Ethernet, max.	1; Supported interfaces: see 3rd and 4th interface
Number of operable FMs and CPs (recommended) • FM	4; FM distributed: FM 350-1, FM 350-2, FM 351, FM 352 / FM 352- 5, FM 353, FM 354, FM 355, FM 355-2
CP, point-to-pointCP, LAN	2; CP 340, CP 341 distributed Over PC CP
Time Clock • Hardware clock (real-time clock) • battery-backed and synchronizable	Yes Yes
Runtime meter • Number	8
Clock synchronization • supported • to PC-CP, slave • on Ethernet via NTP	Yes Yes Yes
S7 message functions	
Number of login stations for message functions, max.	62
SCAN procedure	No
Process diagnostic messages	Yes; ALARM_S, ALARM_SQ, ALARM_D, ALARM_DQ
simultaneously active Alarm-S blocks, max.	20; of a total of 20 for all SFCs
Alarm 8-blocks • Number of instances for alarm 8 and \$7 communication blocks, max.	Yes 4 000
Process control messages	No
Test commissioning functions Status/control • Status/control variable	Yes
Forcing • Forcing	No
Status block	Yes
Single step	Yes
Number of breakpoints	20
Diagnostic buffer present Number of entries, max. adjustable preset	Yes 3 200 Yes 120

SIMATIC WinAC RTX F

	6ES7 671-1RC08-0YA0
Communication functions	
PG/OP communication	Yes
Data record routing	Yes; Only with CP 5611 or integrated PROFIBUS interface of the SIMATIC PC
Routing	Yes
Global data communication	
• supported	No
S7 basic communication	
• supported	No
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
User data per job, max.	64 Kibyte; Depends on which block is used: BSEND/USEND or PUT/GET
Web server	
• Supported	Yes
Number of HTTP clients	2
User-defined websites	No
Open IE communication	
• TCP/IP	Yes
- Number of connections, max.	32
- Data length for connection type 01H, max.	Not supported
Data length, max.ISO-on-TCP (RFC1006)	65 534 byte Yes
- Number of connections, max.	32
- Data length, max.	65 534 byte
• UDP	Yes
- Number of connections, max.	32
- Data length, max.	1 472 byte
Number of connections	
• overall	96
 usable for PG communication 	
- reserved for PG communication	1
usable for OP communication	
- reserved for OP communication	1
PROFINET CBA (at set setpoint communication load)	
Setpoint for the CPU communication load	20 %
Number of remote interconnection partners	64
Number of functions, master/slave	30
 Total of all Master/Slave connections 	1 000
Data length of all incoming connections master/slave, max.	6 800 byte
 Data length of all outgoing connections master/slave, max. 	6 800 byte
Number of device-internal and PROFIBUS interconnections	500
Data length of device-internal und DROFINIC internal und	4 000 byte
 PROFIBUS interconnections, max. Data length per connection, max. 	

	6ES7 671-1RC08-0YA0
PROFINET CBA (at set setpoint communication load)	
 Remote interconnections with acyclic transmission 	
- Sampling frequency: Sampling time, min.	500 ms
- Number of incoming intercon- nections	100
 Number of outgoing intercon- nections 	100
- Data length of all incoming inter- connections, max.	2 000 byte
- Data length of all outgoing inter- connections, max.	2 000 byte
- Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	
- Transmission frequency: Transmission interval, min.	10 ms
- Number of incoming interconnections	200
- Number of outgoing interconnections	200
- Data length of all incoming inter- connections, max.	4 800 byte
- Data length of all outgoing inter- connections, max.	4 800 byte
- Data length per connection,	250 byte
HMI variables via PROFINET (acyclic)	
Number of stations that can log on for HMI variables (PN OPC/ iMap)	3
- HMI variable updating	500 ms
 Number of HMI variables Data length of all HMI variables, max. 	200 2 000 byte
PROFIBUS proxy functionality	V.
supported Number of linked PROFIBUS devices	Yes 16
Data length per connection, max.	240 byte; Slave-dependent
1st interface	00 5044 40 00 5004 44
Type of interface	CP 5611-A2, CP 5621, integrated PB interface of the SIMATIC PC
Max. no. of simultaneously operable CPs	1
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	does not exist
Number of connection resources	8
Functionality • MPI	No
DP masterDP slave	Yes No

SIMATIC WinAC RTX F

Technical specifications (continued)		
	6ES7 671-1RC08-0YA0	
DP master		
• Number of connections, max.	8	
• Services		
- PG/OP communication	Yes	
- Routing	Yes	
- Global data communication	No	
- S7 basic communication	No	
S7 communicationS7 communication, as client	Yes Yes	
- S7 communication, as client	Yes	
- Equidistance mode support	Yes; Only in conjunction with	
Equidicance mede cappent	isochronous mode	
- Isochronous mode	Yes	
- SYNC/FREEZE	Yes	
- Activation/deactivation of DP	Yes	
slaves - Direct data exchange (slave-to-	Yes	
slave communication) - DPV0	Yes	
- DPV1	Yes	
Transmission rate, max.	12 Mbit/s	
Number of DP slaves, max.	64	
Address area		
- Inputs, max.	16 Kibyte	
- Outputs, max.	16 Kibyte	
 User data per DP slave 		
- Inputs, max.	244 byte	
- Outputs, max.	244 byte	
2nd interface		
Type of interface	CP 5613, CP 5613-A2, CP 5603, CP 5623	
Max. no. of simultaneously operable	4	
CPs	7	
Physics	RS 485 / PROFIBUS	
Isolated	Yes	
Functionality		
• MPI	No	
DP master	Yes	
DP slave	No	
DP master		
Number of connections, max.	50	
• Services	V	
- PG/OP communication	Yes	
RoutingGlobal data communication	Yes No	
- S7 basic communication	No	
- S7 communication	Yes	
- S7 communication, as client	Yes	
- S7 communication, as server	Yes	
- Equidistance mode support	Yes; Only in conjunction with	
	isochronous mode	
- Isochronous mode	Yes	
- SYNC/FREEZE	Yes	
 Activation/deactivation of DP slaves 	Yes	
- Direct data exchange (slave-to-	Yes	
slave communication)		
- DPV0	Yes	
- DPV1	Yes	

	6ES7 671-1RC08-0YA0
DP master	
 Transmission rate, max. Number of DP slaves, max. 	12 Mbit/s 125
Address area	
- Inputs, max.	16 Kibyte
- Outputs, max.	16 Kibyte
User data per DP slave	Q44 byta
Inputs, max.Outputs, max.	244 byte 244 byte
3rd interface	244 byte
Type of interface	PROFINET
Max. no. of simultaneously operable CPs	1; Intel Pro/1000 (Intel 82571EB, 82573L, 82574L, 82541Pt; non-shared IRQ required); integrated IE interface SIMATIC PC 4x7B, 6x7B, 8x7B, IPC4x7C, IPC6x7C, IPC8x7C
Physics	Ethernet
Isolated	Yes
Integrated switch	No
Number of ports	1
Automatic detection of trans- mission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Media redundancy	
supported	No
Functionality PROFINET IO controller PROFINET IO device PROFINET CBA Open IE communication	Yes No Yes Yes
PROFINET IO controller Services - PG/OP communication - Routing - S7 communication - Isochronous mode - Open IE communication Transmission rate, min. Transmission rate, min. Transmission rate, max. Number of connectable IO devices, max. Number of connectable IO devices for RT, max of which in line, max. IRT, supported Prioritized startup supported - Number of IO devices, max. Activation/deactivation of IO devices - Number of IO devices that can be simultaneously activated/ deactivated, max.	Yes Yes; S7 routing Yes No Yes 100 Mbit/s 100 Mbit/s 128 128 128 No Yes 32 Yes

SIMATIC WinAC RTX F

lechnical specifications (continued)		
	6ES7 671-1RC08-0YA0	
PROFINET IO controller • IO devices changing during operation (partner ports), supported	Yes	
Device replacement without swap medium	Yes	
Send clock times Updating time	1 ms 1 - 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data)	
 Address area Inputs, max. Outputs, max. User data per address area, max. User data consistency, max. 	16 Kibyte 16 Kibyte 2 Kibyte 256 byte	
SIMATIC communication • PG/OP communication • S7 routing • S7 communication • Number of connections, max.	Yes Yes Yes 16	
Open IE communication Open IE communication, supported	Yes	
Number of connections, max. Local port numbers used at the system end Keep-alive function, supported	32 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535 Yes	
4th interface		
Type of interface	PROFINET	
Max. no. of simultaneously operable CPs	1; CP 1616 (HW release 8 or above), CP 1604 (HW release 7 or higher), integrated PN interface of SIMATIC PC and S7-mEC	
Physics	Ethernet	
Isolated	Yes	
Integrated switch	Yes	
Number of ports	3	
Automatic detection of trans- mission speed	Yes; 10/100 Mbit/s	
Autonegotiation	Yes	
Autocrossing	Yes	
Media redundancy • supported	Yes	
Switchover time on line break, typically	200 ms	
Number of stations in the ring, max.	50	
Change of IP address at runtime, supported	Yes	
Number of connection resources	32	
Functionality • PROFINET IO controller • PROFINET IO device • PROFINET CBA • Open IE communication • Web server	Yes No Yes Yes Yes	

	6ES7 671-1RC08-0YA0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- Routing	Yes; S7 routing
- S7 communication	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
Transmission rate, min.	100 Mbit/s
Transmission rate, max.	100 Mbit/s
Number of connectable IO devices, max.	256
 Number of connectable IO devices for RT, max. 	256
- of which in line, max.	256
Number of IO devices with IRT and	64
the option "high flexibility"	00
- of which in line, max.	32
 Number of IO devices with IRT and the option "high performance", max. 	64
- of which in line, max.	64
IRT, supported	Yes
Shared device, supported	Yes
Prioritized startup supported	Yes
- Number of IO devices, max.	32
Activation/deactivation of IO devices	Yes
 Number of IO devices that can be simultaneously activated/ deactivated, max. 	8
IO devices changing during operation (partner ports),	Yes
supportedDevice replacement without swap	Yes
medium	165
Send clock times	250 μs, 500 μs, 1 ms
Updating time	0.25512 depending on the send
. 5	cycle
Address area	
- Inputs, max.	16 Kibyte
- Outputs, max.	16 Kibyte
User data per address area, max.	2 Kibyte
- User data consistency, max.	256 byte
SIMATIC communication	
PG/OP communication	Yes
S7 routing	Yes
S7 communication	Yes
Number of connections, max.	32
Open IE communication Open IE communication, supported	Yes
 Number of connections, max. 	32
Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Isochronous mode Isochronous mode	Yes
Number of DP masters with sochronous mode	2
User data per isochronous slave, max.	128 byte

SIMATIC WinAC RTX F

Technical specifications (continued)		
	6ES7 671-1RC08-0YA0	
Equidistance	Yes	
Shortest clock pulse	2.2 ms; 2.2 ms without partial process image; 2.2 ms with partial process image	
Programming Programming language • STEP 7	Yes; As of V5.5 + HW update/S7 F Configuration Pack V5.5 + SP6 + HF1/option package S7 Distri- buted Safety V5.4 + SP5 or higher Yes	
FBDSTLSCLCFCGRAPHHiGraph®	Yes Yes Yes Yes Yes Yes Yes	
Nesting levels	8	
Know-how protection • User program protection/ password protection • Block encryption	Yes No	
Software libraries • Easy Motion Control • Software redundancy	Yes Yes; As of V1.2, only for operation of WinAC RTX (F) with WinAC RTX (F)	
Open Development interfaces CCX (Custom Code Extension) SMX (Shared Memory Extension) Inputs Outputs CMI (Controller Management Interface)	Yes; WinAC ODK V4.2 or higher Yes; WinAC ODK V4.2 or higher 4 Kibyte 4 Kibyte Yes; WinAC ODK V4.2 or higher	
Number of simultaneously active SFCs • DPSYC_FR • D_ACT_DP • RD_REC • WR_REC • WR_PARM • PARM_MOD • WR_DPARM • DPNRM_DG • RDSYSST	20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs 20; of a total of 20 for all SFCs	

	6ES7 671-1RC08-0YA0
Number of simultaneously active	
SFBs	00 ()) (00 () 00 0
• RD_REC	20; of a total of 20 for all SFBs
• WR_REC	20; of a total of 20 for all SFBs
Hardware requirements	
Hardware required	PC with color monitor, keyboard,
	mouse or pointing device for Windows
Required memory on hard disk, min.	100 Mbyte
Work memory, min.	1 Gbyte
	·
Processor	Intel Celeron M 900 MHz or compatible (older PC systems
	with Programmable Interrupt
	Controllers (PIC) are not suitable
	for WinAC RTX F 2010.)
 Multi-processor system 	No
 Hyper-threading 	Yes
Operating systems	
Operating system	
 Windows NT 4.0 	No
• Windows 2000	No
 Windows XP 	Yes; Professional, SP2 and SP3
Windows XP embedded	Yes; With the delivery image of the SIMATIC PC
- Supported HAL types under	ACPI uniprocessor PC, ACPI
Windows XP	multiprocessor PC, MPS multipro-
	cessor PC
 Windows embedded Standard 7 	No
Windows 7	Yes; Professional, Enterprise,
	Ultimate (only 32 bit)
Windows Vista	No
Dimensions and weight	
Weight	
 Weight, approx. 	100 g; with packaging

SIMATIC WinAC RTX F

Ordering data	Order No.		Order No.
SIMATIC WinAC RTX F 2010	6ES7 671-1RC08-0YA0	CP 5623 communication C	6GK1 562-3AA00
SIMATIC WinAC RTX F 2010 upgrade	6ES7 671-1RC08-0YE0	PCI Express x1 card (32 bit) for	
CP 5611 A2 communication processor	6GK1 561-1AA01	connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master	
PCI card (32 bit) for connection of a programming device or PC to PROFIBUS		or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software,	
CP 5621 communication processor		 software and electronic manual on CD-ROM, Class A, for operating system support see 	
PCI Express x1 card (32 bit) for C connection of a programming device or PC to PROFIBUS	6GK1 562-1AA00	SIMATIC NET software; German/English	201/1 101 201 201
PCI Express x1 card (32 bit) C CP 5621 and MPI cable, 5 m	6GK1 562-1AM00	CP 1616 communication processor PCI Card (32 bit; 3.3/5 V universal	6GK1 161-6AA01
CP 5603 Microbox Package	6GK1 560-3AU00	key) with ASIC ERTEC 400 for	
Comprising CP 5603 module and Microbox expansion frame		connecting PCs to PROFINET IO with 4-port real-time switch (RJ45); incl. IO-Base software for	
CP 5613 A2 communication processor	6GK1 561-3AA01	PROFINET IO controller (RT operation) and NCM PC; single license for one installation.	
PCI card (32 bit; 3.3 V/5 V) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master, incl. PG and FDL protocol; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32 bit Windows 2000 Professional/ Server, Windows XP Professional, German/English	runtime software, software and electronic manual on CD-ROM, Class A, for 32 bit Windows XP Professional; German/English		
		CP 1604 Microbox Package	6GK1 160-4AU00
		Package for implementing the CP 1604 in the SIMATIC Microbox PC; comprising the CP 1604, connection board, power supply and expansion frame for Microbox PC; for use with Development Kit DK-16xx PN IO; NCM PC	

- C: Subject to export regulations AL: N and ECCN: 5D002ENCU
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC PC-based controller

SIMATIC PC-based controller

SIMATIC WinAC ODK

Overview



- SIMATIC WinAC software PLCs support powerful interfaces which permit close meshing of the control task with PC-based applications.
- WinAC ODK allows the user to develop applications or to integrate already existing applications into the control task.

New with WinAC ODK V4.2:

- · CCX interface:
 - New SFB 65003 for asynchronous execution of ODK applications
 - Expansion of data access functions
 - Creation of Windows DLL with C# and VB
- SMX interface:
 - Access to the Shared Memory interface under IntervalZero RTX
 - Expansion of data access functions
 - Creation of Windows applications with C# and VB
- Supports MS Visual Studio 2005 and 2008 (under Windows)

Technical specifications

	6ES7 806-1CC03-0BA0	
Product type designation	SIMATIC WinAC ODK V4.2	
Programming Open Development interfaces • CCX (Custom Code Extension)	Yes; WinAC RTX 2008 (V4.4) or higher; programming languages: Microsoft Visual C++ V6.0 SP5 or higher, .net 2003, 2005, 2008; Microsoft Visual Basic 2005, 2008; 2008;	
SMX (Shared Memory Extension)	Microsoft Visual C# 2005, 2008 Yes; WinAC RTX 2008 (V4.4) or higher; programming languages: Microsoft Visual C++ V6.0 SP5 or higher, .net 2003, 2005, 2008; Microsoft Visual Basic 2005, 2008;	
CMI (Controller Management Interface)	Microsoft Visual C# 2005, 2008 Yes; WinAC RTX 2005 SP2 (V4.3) or higher; programming languages: Microsoft Visual C++ V6.0 SP5 or higher, .net 2003, 2005, 2008; Microsoft Visual Basic V6.0 SP5 or higher, .net 2003, 2005, 2008; Microsoft Visual C# .net 2003, 2005, 2008	
Hardware requirements		
Hardware required	PC with color monitor, keyboard, mouse or pointing device for Windows	
Required memory on hard disk, min.	30 Mbyte	
Work memory, min.	512 Mbyte	
Processor	Intel Pentium 800 MHz	
Software requirement Software required	Microsoft Visual Developer Studio, for details see interfaces; CCX and SMX realtime applica- tions in addition: IntervalZero SDK V8.1 (SDK version must match the WinAC RTX version)	
Operating systems Operating system • Windows XP	Yes; Professional, SP2 and SP3	
Dimensions and weight		
Weight◆ Weight, approx.	200 g	

Ordering data		Order No.
SIMATIC WinAC ODK V4.2		
for integration of C/C++ code in WinAC PLCs, executable under Windows XP SP2 or SP3; CD- ROM with electronic documen- tation		
Single license	J	6ES7 806-1CC03-0BA0

J: Subject to export regulations AL: N and ECCN: EAR99S

9

SIMATIC ET 200 distributed I/O



0/4	lustura di catila in	9/114	SIPLUS I/O modules
9/4	Introduction	9/114	SIPLUS power modules for PM-E
9/5	ET 200S		electronic modules
9/5	Introduction	9/116	SIPLUS digital electronic modules
9/7	Interface modules with CPU	9/118	SIPLUS analog electronic modules
9/7	IM 151-7 CPU	9/120	SIPLUS technology modules
9/14	IM 151-8 PN/DP CPU	9/120	SIPLUS 1 SI interface module
9/24	Master interface module for	9/121	SIPLUS 1 COUNT 24 V/100 kHz counter
	IM 151 CPU	0/4/00	module
9/25	SIPLUS interface module with CPU	9/122	SIPLUS I/O modules
9/25	SIPLUS IM 151-7 CPU	9/122	Terminal modules for power and electronic modules
9/26	SIPLUS IM 151-8 PN/DP CPU	9/125	Fail-safe I/O modules
9/27	SIPLUS master interface module for	9/126	PM-E F PROFIsafe F power module
	IM 151 CPU	9/129	F electronic modules
9/28	Interface modules with fail-safe CPU	9/132	F electronic module relays
9/28	IM 151-7 F CPU	9/134	F terminal modules
9/32	IM 151-8 F PN/DP CPU	9/136	SIPLUS fail-safe I/O modules
9/43	SIPLUS interface modules with	9/136	SIPLUS F electronic modules
0/40	fail-safe CPU	9/137	IO-Link master modules
9/43	SIPLUS IM 151-7 F CPU	9/137	4SI IO-Link electronic module
9/44	SIPLUS IM 151-8 F PN/DP CPU	9/138	4SI SIRIUS electronic module
9/45	Interface modules without CPU	9/139	Motor starters and safety motor starters
9/45	IM 151-1	9/139	General data
9/51	IM 151-3 PN	9/145	Standard motor starter
9/54	SIPLUS interface modules without CPU	9/146	Standard terminal modules
9/54	SIPLUS IM 151-1	9/148	High Feature motor starter
9/55	SIPLUS IM 151-3PN	9/151	High Feature terminal module
9/56	I/O modules	9/152	Power module
9/56	Power modules for PM-E electronic	9/153	Terminal module power module
3,33	modules	9/154	ET 200S fail-safe motor starter
9/58	Spare modules	9/157	Safety module local and PROFIsafe
9/59	Potential isolation module	9/167	Terminal modules for modules Safety
9/60	Digital electronic modules		local and PROFIsafe
9/74	Analog electronic modules	9/169	Accessories
9/92	Technology modules	9/174	Frequency converters
9/92	SSI module	9/174	ET 200S FC frequency converter
9/94	2 PULSE pulse generator	9/177	ET 200S FC fail-safe frequency converter
9/96	1STEP stepper module	9/180	Software
9/97	1 POS U positioning module	9/180	Motor starter ES
9/99	1 COUNT 24 V/100 kHz counter	9/182	STARTER commissioning tool
	module		
9/101	1 COUNT 5 V/500 kHz counter		
0/104	module		
9/104	1SI interface module		
9/106	SIWAREX CS		
9/108	SIWAREX CF		
9/110 9/110	<u>I/O modules</u> Terminal modules for power and		
9/110	electronic modules		
9/112	4 IQ-Sense and 8 IQ-Sense sensor		
0/112			

modules



9/183	ET 200M	9/256	ET 200pro
9/183	Introduction	9/256	Introduction
9/184	Interface modules	9/257	Interface modules
9/184	IM 153-1/153-2	9/257	IM 154-1 and IM 154-2
9/188	IM 153-4 PN	9/261	IM 154-4 PN
9/190	SIPLUS interface modules	9/264	IM 154-6 PN IWLAN
9/190	SIPLUS IM 153-1/153-2	9/267	IM 154-8 PN/DP CPU
9/192	SIPLUS IM 153-4 PN IO	9/274	IM 154-8 F PN/DP CPU
9/193	I/O modules	9/282	I/O modules
9/193	Digital/analog modules	9/282	Digital expansion modules
9/194	Analog input module with HART	9/288	Analog expansion modules
9/196	Analog output module with HART	9/296	Fail-safe digital expansion modules
9/198	Ex analog input module with HART	9/297	PM-E power module
9/200	Ex analog output module with HART	9/299	PM-O power module output
9/203	SIPLUS I/O modules	9/300	ET 200pro pneumatic interface
9/203	SIPLUS analog input module with	9/302	SIMATIC RF170C
	HART	9/304	SIMATIC ET200pro PS
9/204	SIPLUS analog output module with	9/307	ET 200pro FC frequency converter
		9/310	ET 200pro motor starter
9/205	o i	9/310	General data
0/206		9/313	Standard motor starters
			High Feature motor starters
		9/314	ET 200pro isolator module
		9/315	ET 200pro safety motor starter
			Solutions local/PROFIsafe – Safety module
9/211	Power supplies	0/210	
9/212	ET 200L		Accessories for ET 200pro motor starters Software
0/0/0			Motor starter ES
		9/321	WOLOI Starter ES
		9/322	ET 200eco PN
		0/00=	
	* * *	9/335	ET 200eco PN IO-Link master
	<u> </u>	9/338	ET 200eco
	<u> </u>		
	9 ,	9/346	ET 200R
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	·		
9/253	rerminal modules		
	9/183 9/184 9/184 9/188 9/190 9/190 9/192 9/193 9/194 9/196 9/200 9/203 9/203 9/204 9/205 9/206 9/208 9/208 9/209 9/211	9/183 Introduction 9/184 Interface modules 9/184 IM 153-1/153-2 9/188 IM 153-4 PN 9/190 SIPLUS interface modules 9/190 SIPLUS IM 153-1/153-2 9/192 SIPLUS IM 153-4 PN IO 9/193 I/O modules 9/194 Analog input module with HART 9/196 Analog output module with HART 9/198 Ex analog input module with HART 9/200 Ex analog output module with HART 9/203 SIPLUS I/O modules 9/204 SIPLUS analog output module with HART 9/205 SIPLUS analog output module with HART 9/206 Function modules 9/208 Special modules 9/208 Special modules 9/208 Communication 9/209 ASM 475 9/211 Power supplies 9/212 ET 200L 9/218 ET 200L 9/219 Figital electronic modules 9/223 Power supply units 9/225 Digital electronic modules 9/233 Analog electronic modules 9/240 F digital input module 9/243 F digital output module 9/244 F analog input module 9/245 Fanalog input module 9/246 F analog input module 9/247 ET 200iSP watchdog module 9/248 ET 200iSP watchdog module 9/249 ET 200iSP watchdog module	9/183 Introduction 9/256 9/184 Interface modules 9/257 9/184 IM 153-1/153-2 9/257 9/188 IM 153-4 PN 9/261 9/190 SIPLUS interface modules 9/264 9/190 SIPLUS IM 153-1/153-2 9/267 9/192 SIPLUS IM 153-4 PN IO 9/274 9/193 I/O modules 9/282 9/193 I/O modules 9/282 9/194 Analog input module with HART 9/288 9/196 Analog output module with HART 9/296 9/198 Ex analog input module with HART 9/299 9/200 Ex analog output module with HART 9/299 9/203 SIPLUS analog output module with 9/300 9/203 SIPLUS analog output module with 9/307 HART 9/307 9/204 SIPLUS Ex analog input module with 9/310 9/205 SIPLUS Ex analog input module with 9/311 9/206 Function modules 9/314 9/208 Special modules

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RS 485-IS coupler



9/349	PROFIBUS components
9/349	Power Rail Booster
9/350	Diagnostic repeater for
	PROFIBUS DP
9/352	PROFIBUS DP ASICs
9/354	Connections/interfaces
9/355	Development kits
9/356	SIPLUS PROFIBUS components
9/356	SIPLUS diagnostic repeater for
	PROFIBUS
9/357	PROFINET components
9/357	Enhanced real-time Ethernet
	controller ERTEC
9/360	Development kit for ERTEC
9/361	Development kit for Standard
	Ethernet Controllers
9/362	Network components for
	Network components for PROFIBUS
9/362	Network components for PROFIBUS RS 485 repeater for PROFIBUS
	Network components for PROFIBUS
9/362	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for
9/362 9/363 9/364	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS
9/362 9/363 9/364 9/364	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater
9/362 9/363 9/364	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater SIPLUS DP active RS485 terminating
9/362 9/363 9/364 9/364	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater
9/362 9/363 9/364 9/364	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater SIPLUS DP active RS485 terminating
9/362 9/363 9/364 9/364 9/365 9/366 9/366	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater SIPLUS DP active RS485 terminating element Network transitions PN/PN coupler
9/362 9/363 9/364 9/364 9/365 9/366	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater SIPLUS DP active RS485 terminating element Network transitions
9/362 9/363 9/364 9/364 9/365 9/366 9/366	Network components for PROFIBUS RS 485 repeater for PROFIBUS Active RS 485 terminating element SIPLUS network components for PROFIBUS SIPLUS RS 485 repeater SIPLUS DP active RS485 terminating element Network transitions PN/PN coupler

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/ printmaterial

Introduction

SIMATIC ET 200 distributed I/O

Overview



SIMATIC ET 200 offers the right solution for every application

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs, and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: Digital and analog inputs/outputs, intelligent modules with CPU functionality, safety systems, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFIBUS and PROFINET, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC Controllers and HMI units prove the unique integration of Totally Integrated Automation.

PROFIBUS

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a powerful, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

PROFIBUS DP (distributed I/O)

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

PROFINET

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO devices) and controllers (IO controllers), up to and including the solution of isochronous drive controls for motion control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as Web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

AS-Interface

AS-Interface, the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. Thus, the AS-Interface is the ideal partner for the PROFIBUS DP fieldbus.

SIMATIC ET 200 Configurator

Just a mouse click away from a tailor-made I/O station: With the SIMATIC ET 200 Configurator

First class support is even provided for configuring the ET 200 station with the ET 200 Configurator. The software tool guides the user through the configuring process and automatically creates order lists complete with accessories. It also assists with compliance with limits such as load currents, slot rules and parameters.

The configuration created in the ET 200 Configurator can be imported into STEP 7 without any problems. This reduces the engineering costs and saves double inputs.

The software tool is structured in a clear, intuitive manner: Six configuring layers make the work easy and convenient.

- General notes: General station data as well as a graphical presentation of the configured station
- Module selection: Guided selection of modules, through module suggestions
- Limits: Station size, weight, number of modules, load voltage, parameters, etc. are all displayed
- Accessories: Guided selection of the necessary accessories (module-specific or station-wide)
- Potential distribution: Graphical presentation of the potentials within a station
- Parts list: Automatic generation of a clearly understandable parts list simplifies the ordering process

The ET 200 configurator is a component of the SIMATIC Selection Tool, which is available as a configurator in the Industry Mall.

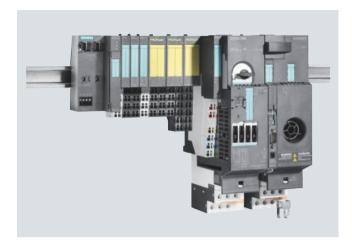
For brochures serving as selection guides for SIMATIC products refer to:

www.siemens.com/simatic/printmaterial

ET 200S

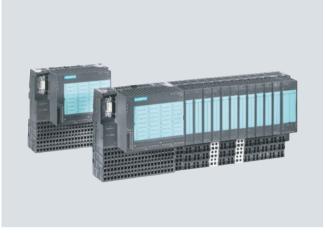
Introduction

Overview



SIMATIC ET 200S

- Distributed I/O system to degree of protection IP20 with minimal wiring outlay, also for extremely time-critical tasks such as high-speed closed-loop controls
- Can be used with integrated S7-CPU as mini PLC: - also available as fail-safe PROFIsafe version
- with optional lower-level PROFIBUS DP
- Discretely-modular design for exact adaptation to the automation task in hand.
- Interface modules available with PROFIBUS DP or PROFINET interfaces
- Can be combined from digital and analog in/output modules, technology modules, motor starters and frequency converters for the control of drives up to 7.5 or 4 kW.
- Exchange of modules during operation (hot swapping), permanent wiring with multi-conductor connection
- · Channel-specific diagnostics for high availability
- · Can be supplied with integrated fiber optic interface if required
- Transmission rates up to 12 Mbit/s
- · FastConnect using unstripped quick connection technology, screw or spring-loaded terminals
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX100 a
- Slot reservation with spare modules
- Fail-safe DI modules with safety-related signal processing according to PROFIsafe
- Option handling for simplest management of machine options



SIMATIC ET 200S COMPACT

- Block I/O to degree of protection IP20 with 32 channels. comprising terminal block and electronic block
- Discretely modular expansion to maximum of 128 channels or 12 modules
- The complete ET 200S module spectrum can be used (with the exception of PROFIsafe modules)
- Separation of terminal connections and electronics with permanent wiring
- Screw-type and spring-loaded terminal connections
- Standard terminal block with 2-wire connection system: 3-wire and 4-wire systems available using additional terminals
- Mounting on standard rail
- Hot swapping of expansion modules
- Communication via PROFIBUS
- Up to 100 byte inputs and outputs (address space)

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ET 200S

Introduction

Technical specifications	
General technical specifications	
Degree of protection	IP20
Ambient temperature	0 60 °C
Vibration resistance	2 g permanently, 5 g temporarily (motor starter max. 2 g)
Maximum configuration (none of the limits listed below must be exceeded)	
 Number of modules per IM 151, max. 	IM 151-1 BASIC: Up to 12 modules
	IM 151-1 COMPACT: Up to 12 modules
	IM 151-1 STANDARD: Up to 63 modules
	IM 151-1 HIGH-FEATURE: Up to 63 modules
	IM 151-7 CPU: Up to 63 modules
a Lina viidhh many	IM 151-3 PN: Up to 63 modules
Line width, max.	IM 151-1 BASIC: Up to 2 m
	IM 151-1 COMPACT: Up to 2 m
	IM 151-1 STANDARD: Up to 2 m IM 151-1 HIGH-FEATURE:
	Up to 2 m
	IM 151-7 CPU: Up to 1 m
	IM 151-3 PN: Up to 2 m
User data length	Depending on the number and type of connected modules
	IM 151-1 BASIC: Up to 88 byte for inputs and outputs
	IM 151-1 COMPACT: Up to 100 byte for inputs and outputs
	IM 151-1 STANDARD: Up to 244 byte for inputs and outputs
	IM 151-1 HIGH-FEATURE: Up to 244 byte for inputs and outputs
	IM 151-7 CPU: Not relevant
Parameter length	IM 151-3 PN: 256 byte Depending on the number and type of connected modules
	IM 151-1 BASIC: 198 byte
	IM 151-1 COMPACT: 218 byte
	IM 151-1 STANDARD:
	Up to 244 byte
	IM 151-1 HIGH-FEATURE:
	Up to 244 byte
	IM 151-7 CPU: Not relevant IM 151-3 PN: Not relevant
	IIVI 131-3 FIN. INOLITEIEVAITL

General technical specifications	
Requirements of the DP master	
system	
PROFIBUS DP master Programator langeth	In accordance with EN 50170
Parameter length	>32 byte, depending on the number and type of connected modules
User data length	Depending on the number and type of connected modules
diagnostic length	17 64 byte (adjustable)
Standards and approvals	
PROFIBUS	EN 50170, Volume 2
• IEC 1131	IEC 1131, Part 2
• UL	acc. to UL508 standard, File No. E 116536/E 75310 (AC modules)
• C-Tick	AS/NZS 2064 (Class A)
• CSA	acc. to standard C22.2 No. 142, File No. LR 48323/LR 44226 (AC modules)
cULus for hazardous locations	acc. to UL 508 standard, File No. E 116536 acc. to hazardous locations UL 1604, File no. E 222109
	acc. to CSA C22.2 standard, No. 142
• FM	Standard Class No. 3611, Class I, Division 2, Group A, B, C, D, Class I, Zone 2, Group IIC (without motor starter and frequency converter)
Shipbuilding	American Bureau of Shipping Bureau Veritas
	Det Norske Veritas
	Germanischer Lloyd
	Lloyds Register of Shipping
	Nippon Kaiji Kyokai
	(without motor starters and
• Ex approval Cat. 3	frequency converters) EN 50021
(for Zone 2 acc. to ATEX-100a)	(without frequency converters)
	(without nequency convertere)

Within the context of converting SIMATIC from UL / CSA to cULus, the ET 200S modules will also be converted $\,$

ET 200S

Interface modules with CPU IM 151-7 CPU

Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increases the availability of plants and machinery
- Programming via PROFIBUS DP
- Compact SIMATIC Micro Memory Card (MMC)
- Integrated 12 Mbit/s PROFIBUS DP slave/MPI interface in copper design
- Integrated CPU based on CPU S7-314
- IM 151-7 CPU FO available
- Fail-safe IM 151-7 F CPU PROFIsafe available
- Also available as IM 151-8(F) PN/DP CPU with PROFINET interface

Note:

Micro Memory Card required for operation of CPU.

Technical specifications

	6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
Product version		
Associated programming package		STEP 7 V5.2 + SP1 or higher with HW update
Supply voltages		
Rated value		
permissible range, lower limit (DC)	20.4 V	
Load voltage L+		
Rated value (DC)		24 V
Permissible range, lower limit (DC)		20.4 V
Permissible range, upper limit (DC)		28.8 V
Short-circuit protection		Yes Yes
Reverse polarity protection		Yes
Current consumption	3.5 A	
Inrush current, max.	3.5 A	700 4
Current output to backplane bus (5 V DC), max.		700 mA
from supply voltage 1L+, max.		250 mA; 280 mA with DP master module
Power losses		
Power loss, typ.		3.3 W
Memory		
Work memory		
• integrated	48 Kibyte; as of FW V1.13 48 KB; previously 24 KB	96 Kibyte; For program and data
• expandable	24 10	No
Load memory		
• pluggable (MMC)		Yes
• pluggable (MMC), max.		8 Mbyte
CPU-blocks		
Number of blocks (total)		1 024; (DBs, FCs, FBs); the maximum number
		of loadable blocks can be reduced by the
		MMC used.
DB	107	544 N. J. 41 511
Number, max.	127	511; Number range: 1 to 511
• Size, max.		16 Kibyte
FB	400	
• Number, max.	128	1 024; Number range: 0 to 2047
• Size, max.		16 Kibyte
FC	100	4.004.14
• Number, max.	128	1 024; Number range: 0 to 2047
• Size, max.		16 Kibyte
OB		40.14%
• Size, max.		16 Kibyte

ET 200S

Interface modules with CPU IM 151-7 CPU

	6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
Nesting depth		
• per priority class	8	8
additional within an error OB		4
CPU processing times		
for bit operations, min.	0.1 µs	0.1 µs
for word operations, min.	1 μs	0.2 µs
	· ·	
for fixed point arithmetic, min.	2 μs	2 µs
for floating point arithmetic, min.	20 μs	3 µs
Counters, timers and their retentivity		
S7 counter	050	050
• Number	256	256
Retentivity		
- adjusted		Yes
- lower limit		0
- upper limit		255
- preset		Z 0 to Z 7
Counting range		
- adjusted	Yes	Yes
- lower limit	1	0
- upper limit	999	999
IEC counter		2==
• Type		SFB
Number		Unlimited (limited only by RAM capacity)
S7 times		
Number	256	256
	230	230
Retentivity		V
- adjusted		Yes
- lower limit		0
- upper limit		255
- preset		No retentivity
Time range		
- lower limit	10 ms	10 ms
- upper limit	9 990 s	9 990 s
IEC timer		
• Type		SFB
Number		Unlimited (limited only by RAM capacity)
		Offill filled (Ill filed of ly by hAlvi capacity)
Data areas and their retentivity	A 129	0.4.17%
Retentive data area in total	4 Kibyte	64 Kibyte
(incl. times, counters, flags), max.		
Flag		
Number, max.	256 byte	256 byte
Retentivity available		Yes
Retentivity preset		MB 0 to MB 15
Number of clock memories		8; 1 memory byte
		o, i memory byte
Data blocks		
Number, max.		511; Number range: 1 to 511
• Size, max.		16 Kibyte
Local data		
• per priority class, max.		510 byte
Address area		
I/O address area		
Overall		2.048 buto
		2 048 byte
Outputs		2 048 byte
Process image		400
• Inputs		128 byte; Not adjustable
 Outputs 		128 byte; Not adjustable

ET 200S

Interface modules with CPU IM 151-7 CPU

	6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
Digital channels		
• Inputs		16 336
• Outputs		16 336
• Inputs, of which central		248
Outputs, of which central		248
		240
Analog channels		1.004
• Inputs		1 021
• Outputs		1 021
 Inputs, of which central 		124
Outputs, of which central		124
Addressing volume		
• Outputs	244 byte	
• Inputs	244 byte	
Hardware configuration		
Number of modules per system, max.	63	63; Centralized
Connectable programming devices/PCs	PGs/OPs with STEP 7 connectable via	
Connectable programming devices, r Cs	PROFIBUS interface	
Time		
Clock		
Hardware clock (real-time clock)		Yes
Battery-backed and synchronizable		Yes
Backup time		6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.		10 s
Runtime meter		
Number		1
Number/Number range		0
Range of values		0 to 2^31 hours (when using SFC 101)
Granularity		1 hour
Retentive		Yes; Must be restarted at each restart
		res, must be restarted at each restart
Clock synchronization		
• supported		Yes
• to MPI, master		Yes
• to MPI, slave		Yes
to DP, master		Yes
to DP, slave		Yes
• in AS, master		No
• in AS, slave		No
S7 message functions		
Number of login stations for message functions,		12; Depending on the configured connections
max.		for PG/OP and S7 basic communication
Process diagnostic messages		Yes; ALARM_S, ALARM_SC, ALARM_SQ,
		ALARM_D, ALARM_DQ
Simultaneously active Alarm-S blocks, max.		40
Test commissioning functions		
Status/control		
 Status/control variable 		Yes
 Variables 		Inputs, outputs, memory bits, DB, times,
		counters
 Number of variables, max. 		30
 of which status variables, max. 		30
 of which control variables, max. 		14
Forcing		
• Forcing		Yes
Status block		Yes
5.000		.03

ET 200S

Interface modules with CPU IM 151-7 CPU

	6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
Single step		Yes
Number of breakpoints		2
Diagnostic buffer Present Number of entries, max adjusted	Yes 100	Yes 100 No
Communication functions		
PG/OP communication		Yes
Global data communication Supported Number of GD packets, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max.		Yes 4 4 4 22 byte 22 byte
S7 basic communication Supported User data per job, max. User data per job (of which consistent), max.		Yes 76 byte 76 byte; 76 byte (with X_SEND or X_RCV); 64 byte (with X_PUT or X_GET as server)
S7 communication • supported • as server • as client • User data per job, max. • User data per job (of which consistent), max.		Yes Yes No 180 byte 64 byte
S5-compatible communication		
• supported		No
Standard communication (FMS) • supported		No
Number of connections overall usable for PG communication reserved for PG communication usable for OP communication reserved for OP communication usable for S7 basic communication Reserved for S7 basic communication usable for routing		12 11 1 11 11 10 0 4; As slave only with active interface, with IM 151-7 CPU as DP master
1st interface Type of interface		Integrated RS 485 interface
Physics		RS 485
solated		Yes
Power supply to interface (15 to 30 V DC), max.		80 mA
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		טט וווא
Functionality MPI DP master DP slave Point-to-point connection	Yes	Yes No Yes; active / passive No
MPI • Number of connections		12; Notice: 12 connections per CPU, not per interface

ET 200S

Interface modules with CPU IM 151-7 CPU

Technical specifications (continued)

Sorvices - Routing - Routing - Routing - Routing - Routing - Colobal data communication - 87 bests communication - 87 bests communication - 87 communication, as client - 87 communication, as client - 87 communication, as server - Transmission rate, max Number of connections - Services - Routing - Direct data exchange - (piene-los date communication) - DPV - Routing - Direct data exchange - (piene-los date communication) - DPV - Routing - Direct data exchange - (piene-los date exchange - (piene-los d	Technical specifications (continued)		
Services - Roluting - Roluting - Roluting - Roluting - Roluting - Sibabil data communication - ST basis communication - ST obsist communication - ST communication, as client - ST communication, as server - ST communication, as server - ST communication, as server - Transmission rate, max Ple slave - Number of connections - Roluting - Direct data exchange - Roluting - R		6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
- PROJPC communication - Global data communication - Global data communication - ST communication - SERVICES - Routing - Transmission of connections - Routing - Transmission rate, max - Automatic based rate search - Transmission rate, max - Automatic based rate search - Transmission rate, max - Automatic based rate search - Transmission rate, max - Automatic based rate search - Transfer memory - Inputs - Outputs - Outputs - Address area, max - Address area - Inputs, max - Address area - Inputs, max - Address area - Inputs, max - Address area	MPI		
- Routing - Clobal data communication - ST basic communication - ST basic communication - ST communication - ST communication - ST communication, as server - Transmission rate, max Transmission rate, max - Transmission	• Services		
- Global data communication	- PG/OP communication		Yes
- Global data communication	•		Yes: With master module
- S7 basic communication - S7 co	3		
- S7 communication selection			
- S7 communication, as alont - \$7 communication, as server - Transmission rate, max. Post size			
- S7 communication, as server - Transmission rate, max. DF stare - Routing - Direct data exchange (stave-1c-stave communication) - DPV1 - OSD file - Special services - Routing - Direct data exchange (stave-1c-stave communication) - DPV1 - OSD file - Transmission rate, max Transmission rate, max Transmission rate search - Transmission rate search - Transfer memory - Inputs - Original - O			
* Transmission rate, max. * Pervices * Services * Proces * Pour data exchange (slave-to-slave communication) * Direct data exchange (slave-to-slave communication) * Direct data exchange (slave-to-slave communication) * Direct data exchange (slave-to-slave communication) * DPVI * SSD file * Transmission rate, max. * Automatic baud rate search * Transmission rate, max. * Automatic baud rate search * Transfer memory * Inputs * Outputs * Address area, max. * Outputs * Address area, max. * Automatic baud rate search * Transfer memory * Inputs * Address area, max. * Automatic baud rate search * Transfer memory * Inputs * Address area, max. * Automatic baud rate search * Transfer memory * Dervices * External interface via master module 6EST/138-41-ROC-0-ABI * Prover supply to interface (15 to 30 V DC), max. * Pro	,		
De slave Number of connections Number of connections 11 12: Notice: 12 connections per CPU, not per interface Services - Routing - Briest data exchange (slave-to-slave communication) - DPV1 - SSO file - Transmission rate, max. 12: Mbit/s - Transmission rate, max. 12: Mbit/s - Transmission rate, max. 12: Mbit/s - Transmission rate, max. 13: Mbit/s - Transmission rate, max. 14: Mbit/s - Transmission rate, max. 15: Mbit/s - Transmission rate, max. 16: Mbit/s - Transmission rate, max. 16: Mbit/s - Transmission rate, max. 17: Mbit/s - Transmission rate, max. 18: Mbit/s - Transmission rate, max. 19: Mb			
• Number of connections • Services • Services - Routing - Direct data exchange (slave-to-slave communication) - DPV1 - OSD file - Transmission rate, max - Automatic baud rate search - Variable - V			12 Molyo
Services - Routing - Direct date exchange (slave-to-slave communication) - DPV1 - OSD file - Transmission rate, max Was distance and the state of the transfer memory - Upputs - Uupputs - Automatic beauty - Uupputs - Address area, max User data per DP slaves - PG/DP communication - User interface -		11	12: Notice: 12 connections per CPLI
- Routing - Direct data exchange (slave-to-slave communication) - DPV1 - SSD file - Transmission rate, max Was immens com/profibus-gsd 12 Mbit/s - Transmission rate, max Automatic beaut rate search - Transmission rate, max Transmission rate, m	- Number of connections	11	
- Direct data exchange (slave-to-slave communication) - DPV1 - SSD file - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Automatic baud rate search - Transfer memory - Inputs - Outputs - Address area, max Ver data per address area, max User data per address area, max No - External interface via master module 6ES7138-4HA00-0AB0 - Physics - Inputs, max Address area - Inputs, max User data per DP slaves - User data per DP slaves - Inputs, max User data per DP slave - User data per DP slave - Inputs, max User data per DP slave - Inputs, max User data per DP slave	• Services		·
- Direct data exchange (slave-to-slave communication) - DPV1 - OSD file - Transmission rate, max - Automatic baud rate search - Transfer memory - Inputs - Outputs - O	- Routing		Yes; Only when interface active and in master
(slave-to-slave communication) - DPV1 - OSD IIIe - Transmission rate, max - Automatic baud rate search - Transfer memory - Inputs - Outputs - Automatic baud rate search - Transfer memory - Inputs - Outputs - Automatic baud rate search - Transfer memory - Inputs - Outputs - Automatic baud rate search - Transfer memory - Inputs - Automatic baud rate search - Transfer memory - Uniputs - Automatic baud rate search - Transfer memory - Automatic baud rate search - Automatic baud rate search - Automatic baud rate search - Transfer memory - Automatic baud rate search - Automatic baud rate search - Transfer memory - Automatic baud rate search - Physics - Rate Sassada Rate - Physics - Rate Sassada Rate - Power supply to interface (15 to 30 V DC), max No - Power supply to interface (15 to 30 V DC), max No - No	-		mode
- DPV1 - QSD file - Transmission rate, max Automatic baud rate search - Transmission rate, max Automatic baud rate search - Transmission rate, max Automatic baud rate search - Transfer memory - Inputs - Outputs - Address area, max Ser data per address area, max Automatic baud rate search - Transfer memory - Inputs - Address area, max Automatic baud rate search - Transfer memory - Inputs - Address area, max Automatic baud rate search - Automatic baud rate		Yes	Yes
• GSD file • Transmission rate, max. • Automatic baud rate search • Transfer memory • Inputs • Outputs • Audress area, max. • User data per address area, max. • User data per DP slaves Pryse Sababa Sababa Sababa Sabab	· · · · · · · · · · · · · · · · · · ·		
• Transmission rate, max • Automatic baud rate search • Transfer memory • Inputs • Outputs • Automatic baud rate search • Transfer memory • Inputs • Automatic baud rate search • Transfer memory • Inputs • Automatic baud rate search • Automatic baud			No
• Automatic baud rate search • Transfer memory • Inputs • Outputs • Address area, max. • User clata per address area, max. 244 byte 244 byte 244 byte 244 byte 244 byte 245 byte; Up to max. size of the transfer memory 266 Interface 276 Interface 276 Interface 277 Interface 277 Interface 278 Interface 279 Interface 279 Interface 279 Interface 279 Interface 279 Interface 270 Interfac	GSD file		
• Transfer memory - Inputs - Outputs - Outputs - Address area, max See Transfer memory - Address area, max See Transfer memory 2nd Interface - Type of interfa	 Transmission rate, max. 	12 Mbit/s	
- Inputs - Outputs - Outputs - Outputs - Outputs - Address area, max User data per address area, max. 2nd interface Type of interface Type of interface External interface via master module eES7 138 4H ADO-0A80 Physics - RS 485 Isolated - Yes Power supply to interface (15 to 30 V DC), max No Power supply to interface (15 to 30 V DC), max. Functionality - MPI - No - OP master - Local Operating Network - Local Operating Network - Local Operating Network - Perform of connections, max Services - PG/OP communication - Rouling - Global data communication - S7 basic communication - S7 basic communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - S7 communication, as server - Equidistance mode support - SY Notice as server - Equidistance mode support - SY Notice as server - SYNC/FREEZE - Activation/dacativation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Address area - Inputs, max Outputs, max Outputs, max User data per DP slave - User data per DP slave	 Automatic baud rate search 		Yes; only with passive interface
- Outputs	Transfer memory		
Address area, max. User data per address area, max. 22 byte: Up to max. size of the transfer memory 2nd interface Type of interface Type of interface External interface via master module 6ES7138-4HA00-0AB0 Physics RS 485 Isolated Power supply to interface (15 to 30 V DC), max. No Functionality No Pomester No DP master No No Pomester No No Pomester No No Pomester No Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Yes - Colladicactivation of DP slaves - Direct data exchange (slave-to-Slave communication) - DPV1 - Transmission rate, max Address area - Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - User data p	- Inputs		244 byte
Address area, max. User data per address area, max. 22 byte: Up to max. size of the transfer memory 2nd interface Type of interface Type of interface External interface via master module 6ES7138-4HA00-0AB0 Physics RS 485 Isolated Power supply to interface (15 to 30 V DC), max. No Functionality No Pomester No DP master No No Pomester No No Pomester No No Pomester No Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Yes - Colladicactivation of DP slaves - Direct data exchange (slave-to-Slave communication) - DPV1 - Transmission rate, max Address area - Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - User data p	- Outputs		244 byte
2nd interface Type of interface External interface via master module eES7138-4HA00-0AB0 Physics RS 485 Isolated Yes Power supply to interface (15 to 30 V DC), max. No Functionality • MPI • NP • NP • DP master • Local Operating Network • No P master • Number of connections, max. • Services • PG/OP communication • Sor ownmunication • S7 basic communication • S7 communication, as client • S7 communication, as server • Equidistance mode support • SYNCFREEZE • Activation/deactivation of DP slaves • Direct data exchange (slave-to-slave communication) • DPV1 • Ves • Address area • Inputs, max. • User data per DP slave	Address area, max.		
Transmission rate, asserties Transmission rate, asserties Transmission rate, asserties Transmission rate, max. Notes Transmission rate, max. Notes External interface via master module 6E57138-4HA00-0AB0 External interface via master module 6E57138-4HA00-0AB0 External interface via master module 6E57138-4HA00-0AB0 Fish definition of DP slaves External interface via master module 6E57138-4HA00-0AB0 Fish definition of DP slaves Poserties External interface via master module 6E57138-4HA00-0AB0 Fish definition of Ves No No No Pusater No Yes Policie: 12 connections per CPU, not per interface Yes Services - PG/OP communication Yes Global data communication Yes; I blocks only Yes; I blocks only Yes; I blocks only Yes Yes - S7 communication, as client S7 communication, as server Equidistance mode support Yes - Transmission rate, max. No - Dept1 Yes - Transmission rate, max. No - Activation/deactivation of DP slaves - Irransmission rate, max. - Activation/deactivation - Address area - Inputs, max. - Outputs, max. - Outputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - Outputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - User data per DP slave - Inputs, max. - 244 byte			32 byte; Up to max. size of the transfer
External interface External interface via master module 6ES7138-4HA00-0AB0	,		
RS 485	2nd interface		
RS 485	Type of interface		External interface via master module
Solated Yes	Mr		
Power supply to interface (15 to 30 V DC), max. Functionality • MPI • DP master • Local Operating Network DP master • Number of connections, max. • Services - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - S7 No/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 • Transmission rate, max. • Number of DP slaves, max. - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - 244 byte	Physics		RS 485
Functionality	Isolated		Yes
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• DP master • Local Operating Network DP master • Number of connections, max. • Number of connections, max. • Services • PG/OP communication • Routing • Global data communication • S7 basic communication • S7 communication • S7 communication • S7 communication, as client • S7 communication, as server • Equidistance mode support • SYNC/FREEZE • Activation/deactivation of DP slaves • Direct data exchange (slave-to-slave communication) • DPV1 • Transmission rate, max. • Number of DP slaves, max. • Address area • Inputs, max. • User data per DP slave • Light in max. • User data per DP slave • Light in max. • User data per DP slave • Inputs, max. • User data per DP slave • Inputs, max. • User data per DP slave • Inputs, max. • User data per DP slave • Inputs, max.	• MPI		No
• Local Operating Network DP master Number of connections, max. 12; Notice: 12 connections per CPU, not per interface Services - PG/OP communication - Routing Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - SYNC/FREZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max. Number of DP slaves, max. Number of DP slaves, max. - Address area - Inputs, max. - Outputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave - Inputs, max. - User data per DP slave			
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• Services - PG/OP communication - PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max La Whit/s - Ves - Inputs, max La Kibyte - La Whit/s - La			12: Notice: 12 connections per CPLI
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- PG/OP communication - Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte	• Services		
- Routing - Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Number of DP slaves, max Address area - Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte			Yes
- Global data communication - S7 basic communication - S7 communication - S7 communication - S7 communication, as client - S7 communication, as server - SYNC/FREEZE - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Address area - Inputs, max Outputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte			
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- S7 communication, as client - S7 communication, as server - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Number of DP slaves, max Inputs, max Outputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte			
- S7 communication, as client - S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Number of DP slaves, max Inputs, max Outputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte			
- S7 communication, as server - Equidistance mode support - SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 - Transmission rate, max Number of DP slaves, max Number of DP slaves, max Inputs, max Outputs, max User data per DP slave - Inputs, max User data per DP slave - Inputs, max 244 byte			
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- SYNC/FREEZE - Activation/deactivation of DP slaves - Direct data exchange (slave-to-slave communication) - DPV1 Yes • Transmission rate, max. • Number of DP slaves, max. • Address area - Inputs, max Outputs, max. • User data per DP slave - Inputs, max. 2 44 byte			
 Activation/deactivation of DP slaves Direct data exchange (slave-to-slave communication) DPV1 Transmission rate, max. Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. User data per DP slave Inputs, max. 244 byte 			
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(slave-to-slave communication) - DPV1 Yes • Transmission rate, max. • Number of DP slaves, max. • Address area - Inputs, max Outputs, max. • Outputs, max. • User data per DP slave - Inputs, max. 244 byte			
- DPV1 Yes • Transmission rate, max. • Number of DP slaves, max. • Address area - Inputs, max Outputs, max. • User data per DP slave - Inputs, max Inputs, max. • 2 Kibyte - 1 Kibyte - 1 Kibyte - 2 Kibyte - 2 Kibyte	- Direct data exchange		Yes
 Transmission rate, max. Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. 2 Kibyte 2 Kibyte 2 Kibyte 2 44 byte 			Voe
 Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. 2 Kibyte 2 Kibyte 2 Kibyte 2 44 byte 			
 Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. 2 Kibyte 2 Kibyte 244 byte 			
 Inputs, max. Outputs, max. User data per DP slave Inputs, max. 2 Kibyte 2 Kibyte 244 byte 	 Number of DP slaves, max. 		32; Per station
 Outputs, max. User data per DP slave Inputs, max. 2 Kibyte 244 byte 			
 User data per DP slave Inputs, max. 244 byte 	Address area		
- Inputs, max. 244 byte			2 Kibyte
- Inputs, max. 244 byte	- Inputs, max. - Outputs, max.		
· ·	Inputs, max.Outputs, max.		
	Outputs, max.User data per DP slave		2 Kibyte

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Interface modules with CPU IM 151-7 CPU

	6ES7 151-7AB00-0AB0	6ES7 151-7AA20-0AB0
Isochronous mode		
Isochronous mode		No
Programming		
Configuration rules		max. 63 I/O modules per station; station width < 1 m or < 2 m; max. 10 A per load group (power module); master interface module on right next to IM 151-7 CPU (X2 interface)
Programming language		
• STEP 7		Yes
• LAD		Yes
• FBD		Yes
• STL		Yes
• SCL	Yes	Yes; Optional
• GRAPH		Yes; Optional
Command set	Binary logic operations, bracketed operations, result allocation, saving, counting, loading, transferring, comparing, shifting, rotating, complementation, calling blocks, fixed point arithmetic, floating point arithmetic, jump functions	See instruction list
Nesting levels	8	8
Know-how protection		
• User program protection/password protection	Yes	Yes
System functions (SFC)	Interrupt and error processing, copy data, clock functions, diagnostic functions, module parameterization, operating mode transitions	See instruction list
System function blocks (SFB)		See instruction list
Isolation		
Isolation checked with		500 V DC
Galvanic isolation		
between load voltage and all other switching components		Yes
between PROFIBUS DP and all other circuit components		Yes
Permissible potential difference		
between different circuits		75 V DC / 60 V AC
Environmental requirements		
Operating temperature		
• Min.	0 °C	
Dimensions and weight		
Dimensions		
• Width	60 mm	60 mm; DP master module: 35 mm
Height	119.5 mm	119.5 mm
• Depth	75 mm	75 mm
Weight • Weight, approx.	200 g	200 g; DP master module: Approx. 100 g
÷ ''	-	

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Interface modules with CPU IM 151-7 CPU

Ordering data	Order No.		Order No.
IM 151-7 CPU FO interface module (48 K)	6ES7 151-7AB00-0AB0	Label sheets DIN A4 (10 units)	
Including termination module		Each sheet contains 60 labeling strips for I/O modules and	
IM 151-7 CPU interface module (96 K)	6ES7 151-7AA20-0AB0	20 labeling strips for interface modules	
Including termination module		• petrol • red	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0
Accessories		• yellow	6ES7 193-4BB00-0AA0
MMC 64 KB ¹⁾	6ES7 953-8LF20-0AA0	• light beige	6ES7 193-4BA00-0AA0
for program backup		ET 200S distributed I/O system manuals	
MMC 128 KB ¹⁾	6ES7 953-8LG20-0AA0	are available on the Internet as	
for program backup		PDF files:	
MMC 512 KB ¹⁾	6ES7 953-8LJ20-0AA0	www.siemens.com/simatic-docu	
for program backup		Termination module	6ES7 193-4JA00-0AA0
MMC 2 MB ¹⁾	6ES7 953-8LL20-0AA0	as spare part for ET 200S	
for program backup and/or firmware update		SIMATIC S5, 35 mm DIN rail • Length: 483 mm for 19" cabinets	6ES5 710-8MA11
MMC 4 MB ¹⁾	6ES7 953-8LM20-0AA0	Length: 530 mm for 600 mm cabinets	6ES5 710-8MA21
for program backup		• Length: 830 mm for 900 mm	6ES5 710-8MA31
ММС 8 МВ ¹⁾	6ES7 953-8LP20-0AA0	cabinets	0505 540 0114 44
for program backup		• 2 m long	6ES5 710-8MA41
External prommer	6ES7 792-0AA00-0XA0		
e.g. for MMC with USB interface			
PG	On request		
with integrated MMC interface			

¹⁾ An MMC is essential for operating the CPU

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Interface modules with CPU IM 151-8 PN/DP CPU

Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- · Increase of the availability of systems and machines
- PROFINET IO controller for up to 128 IO devices

- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Technical specifications

	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
Product version		
Associated programming package	STEP7 V5.4 SP4 or higher	STEP7 V 5.5 or higher
Supply voltages		
Rated value		
 permissible range, lower limit (DC) 	20.4 V	20.4 V
External protection for supply cables (recommendation)	24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: The 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before the device protection fuse. The 24 V DC/16 A miniature circuit breaker with type C tripping characteristics trips	24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: A 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before and with type C tripping characteristic after the device protection fuse.
Mains buffering		
 Mains/voltage failure stored energy time 	5 ms	5 ms
Current consumption		
Inrush current, max.	1.8 A; typ.	1.8 A; typ.
I ² t	0.21 A ² ·s	0.13 A ² ·s
Current output to backplane bus (5 V DC), max.	700 mA	700 mA
from supply voltage 1L+, max.	380 mA; 460 mA with DP master module	352 mA; 426 mA with DP master module
Power losses		
Power loss, typ.	5.5 W	5.5 W
Memory		
Work memory		
• integrated	128 Kibyte; For program and data	192 Kibyte; For program and data
• expandable	No	No
size of retentive memory for retentive data blocks	64 kbyte	64 kbyte
Load memory		
pluggable (MMC)	Yes	Yes
pluggable (MMC), max.	8 Mbyte	8 Mbyte

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Interface modules with CPU IM 151-8 PN/DP CPU

	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
CPU-blocks		
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB		
Number, max.	511; Number range: 1 to 511	1 024; Number range: 1 to 16,000
• Size, max.	64 Kibyte	64 Kibyte
FB		
Number, max.	1 024; Number range: 0 to 2047	1 024; Number range: 0 to 7,999
• Size, max.	64 Kibyte	64 Kibyte
FC		
Number, max.	1 024; Number range: 0 to 2047	1 024; Number range: 0 to 7,999
• Size, max.	64 Kibyte	64 Kibyte
OB	*	•
• Size, max.	64 Kibyte	64 Kibyte
	o i i iliay to	o i i iliyito
Nesting depth • per priority class	16	16
additional within an error OB	4	4
	4	4
CPU processing times		
for bit operations, min.	0.1 µs	0.06 μs
for word operations, min.	0.2 µs	0.12 μs
for fixed point arithmetic, min.	2 µs	0.16 μs
for floating point arithmetic, min.	3 µs	0.59 µs
Counters, timers and their retentivity		·
S7 counter		
Number	256	256
Retentivity		
- adjusted	Yes	Yes
- lower limit	0	0
- upper limit	255	255
- preset	Z 0 to Z 7	Z 0 to Z 7
Counting range		
- adjusted	Yes	Yes
- lower limit	0	0
- upper limit	999	999
IEC counter		
• Type	SFB	SFB
• Number	Unlimited (limited only by RAM capacity)	Unlimited (limited only by RAM capacity)
S7 times		
• Number	256	256
Retentivity		
- adjusted	Yes	Yes
- lower limit	0	0
- upper limit	255	255
- preset	No retentivity	No retentivity
Time range		
- lower limit	10 ms	10 ms
- upper limit	9 990 s	9 990 s
IEC timer		
• Type	SFB	SFB
• Number	Unlimited (limited only by RAM capacity)	Unlimited (limited only by RAM capacity)

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Interface modules with CPU IM 151-8 PN/DP CPU

recilical specifications (continued)	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
Data areas and their retentivity		-
Flag		
Number, max.	256 byte	256 byte
Retentivity available	Yes	Yes
Retentivity preset	MB 0 to MB 15	MB 0 to MB 15
Number of clock memories	8; 1 memory byte	8; 1 memory byte
Data blocks		
Number, max.	511; Number range: 1 to 511	1 024; Number range: 1 to 16,000
• Size, max.	64 Kibyte	64 Kibyte
 Retentivity adjustable 	Yes; via non-retain property on DB	Yes; via non-retain property on DB
Retentivity preset	Yes	Yes
Local data		
 per priority class, max. 	510 byte; per priority class	32 768 byte; 2048 byte max. per block
Address area		
I/O address area		
Overall	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte
of which, distributed		
- Inputs	2 048 byte	2 048 byte
- Outputs	2 048 byte	2 048 byte
Process image		
 Inputs, adjustable 	2 048 byte	2 048 byte
Outputs, adjustable	2 048 byte	2 048 byte
• Inputs, preset	128 byte	128 byte
Outputs, preset	128 byte	128 byte
Subprocess images		
 Number of subprocess images, max. 	None	1; With PROFINET IO, the length of the user data is limited to 1600 byte
Digital channels		
• Inputs	16 336	16 336
• Outputs	16 336	16 336
Inputs, of which central	496	496
Outputs, of which central	496	496
Analog channels		
• Inputs	1 021	1 021
• Outputs	1 021	1 021
 Inputs, of which central 	124	124
Outputs, of which central	124	124
Hardware configuration		
Number of mounting rails that can be used	1	1
Max. length of mounting rail	Station width: <= 1 m or < 2 m	Station width: <= 1 m or < 2 m
Number of modules per system, max.	63; Centralized	63; Centralized
Time		
Clock		
 Hardware clock (real-time clock) 	Yes	Yes
 Battery-backed and synchronizable 	Yes	Yes
Backup time	6 wk; At 40 °C ambient temperature, typically	6 wk; At 40 °C ambient temperature, typically
Behavior of the clock following POWER-ON		Clock continues running after POWER OFF
Behavior of the clock following expiry of backup	Clock continues to run with the time at which	Clock continues to run with the time at which
period • Deviation per day, may	the power failure occurred	the power failure occurred 10 s; Typ.: 2 s
Deviation per day, max.	10 s	10 S, Typ 2 S

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Interface modules with CPU IM 151-8 PN/DP CPU

	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
Runtime meter		
Number	1	1
Number/Number range	0	0
Range of values	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)
Granularity	1 hour	1 hour
Retentive	Yes; must be restarted at each restart	Yes; must be restarted at each restart
Clock synchronization		
supported	Yes	Yes
to MPI, master	No	No
to MPI, slave	No	No
to DP, master	Yes; with DP master module	Yes; with DP master module
to DP, slave	Yes; with DP master module	Yes; with DP master module
in AS, master	No	No
in AS, slave	No	No
on Ethernet via NTP	Yes; as client	Yes; as client
67 message functions		
Number of login stations for message functions,	12; depending on the configured connections	12; depending on the configured connection
max.	for PG/OP and S7 basic communication	for PG/OP and S7 basic communication
Process diagnostic messages	Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ	Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ
Simultaneously active Alarm-S blocks, max.	300	300
Test commissioning functions		
Status/control		
• Status/control variable	Yes	Yes
• Variables	Inputs, outputs, memory bits, DB, times,	Inputs, outputs, memory bits, DB, times,
Vallabios	counters	counters
Number of variables, max.	30	30
of which status variables, max.	30	30
of which control variables, max.	14	14
Forcing		
Forcing	Yes	Yes
Status block	Yes	Yes; up to 2 simultaneously
Single step	Yes	Yes
Number of breakpoints	2	4
•	2	4
Diagnostic buffer		
Present	Yes	Yes
Number of entries, max.	500	500
- adjusted	No	No
- Of which powerfail-proof	100; only the last 100 entries are retained	100; only the last 100 entries are retained
Monitoring functions Status LEDs		Yes
Communication functions		
PG/OP communication	Yes	Yes
Data record routing	Yes; with DP master module	Yes; with DP master module
Routing	Yes; with DP master module	Yes; with DP master module
Global data communication		
supported	No	No
S7 basic communication		
Supported	Yes; I blocks	Yes; I blocks
User data per job, max.	76 byte	76 byte
 User data per job (of which consistent), max. 	76 byte	76 byte

ET 200S

Interface modules with CPU IM 151-8 PN/DP CPU

Technical specifications (continued)		
	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
S7 communication • Supported • as server • as client • User data per job, max.	Yes Yes Yes; via integrated PN interface and loadable FBs 180 byte	Yes Yes Yes; via integrated PN interface and loadable FBs See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
User data per job (of which consistent), max.	64 byte	
S5-compatible communication • supported	No	
Standard communication (FMS) • supported	No	
Web server • Supported • Number of HTTP clients • User-defined websites	Yes 5	Yes 5 Yes
Open IE communication • TCP/IP - Number of connections, max. - Data length for connection type 01H, max. - Data length for connection type 11H, max. - Several passive connections per port, supported • ISO-on-TCP (RFC1006) - Number of connections, max. - Data length, max.	Yes; via integrated PROFINET interface and loadable FBs 8 1 460 byte 8 192 byte Yes; via integrated PROFINET interface and loadable FBs 8 8 192 byte	Yes; via integrated PROFINET interface and loadable FBs 8 1 460 byte 32 768 byte Yes Yes; via integrated PROFINET interface and loadable FBs 8 32 768 byte
UDP Number of connections, max. Data length, max.	Yes; via integrated PROFINET interface and loadable FBs 8 1 472 byte	Yes; via integrated PROFINET interface and loadable FBs 8 1 472 byte
Number of connections overall usable for PG communication reserved for PG communication adjustable for PG communication, min. usable for OP communication reserved for OP communication adjustable for OP communication adjustable for OP communication reserved for S7 basic communication reserved for S7 basic communication adjustable for S7 basic communication adjustable for S7 communication max. max. total number of instances usable for routing PROFINET CBA	12 11 1 1 1 1 1 1 1 0 0 0 0 10; with loadable FBs 10 32 4; with DP master module	12 11 1 1 1 1 1 1 1 0 0 0 0 10; with loadable FBs 10 32 4; with DP master module
(at set setpoint communication load) • Setpoint for the CPU communication load • Number of remote interconnection partners • Number of functions, master/slave • Total of all master/slave connections • Data length of all incoming connections master/slave, max.	50 % 32 30 1 000 4 000 byte	50 % 32 30 1 000 4 000 byte

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Interface modules with CPU IM 151-8 PN/DP CPU

Technical specifications (continued)		
	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
PROFINET CBA		
(at set setpoint communication load)	4.000 byta	4,000 byta
 Data length of all outgoing connections master/slave, max. 	4 000 byte	4 000 byte
 Number of device-internal and PROFIBUS interconnections 	500	500
 Data length of device-internal und PROFIBUS interconnections, max. 	4 000 byte	4 000 byte
Data length per connection, max.Remote interconnections with acyclic	1 400 byte	1 400 byte
transmission		
- Sampling frequency: Sampling time, min.	500 ms	500 ms
- Number of incoming interconnections	100	100
- Number of outgoing interconnections	100	100
 Data length of all incoming interconnections, max. 	2 000 byte	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte	2 000 byte
- Data length per connection, max.	1 400 byte	1 400 byte
 Remote interconnections with cyclic transmission 		
 Transmission frequency: Transmission interval, min. 	1 ms	1 ms
- Number of incoming interconnections	200	200
- Number of outgoing interconnections	200	200
 Data length of all incoming interconnections, max. 	2 000 byte	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte	2 000 byte
Data length per connection, max.HMI variables via PROFINET (acyclic)	250 byte	450 byte
 Number of stations that can log on for HMI variables (PN OPC/iMap) 	3; 2x PN OPC/1x iMap	3; 2x PN OPC/1x iMap
- HMI variable updating	500 ms	500 ms
- Number of HMI variables	200	200
Data length of all HMI variables, max.PROFIBUS proxy functionality	2 000 byte	2 000 byte
- supported	Yes	Yes
- Number of linked PROFIBUS devices	16	16
- Data length per connection, max.	240 byte; slave-dependent	240 byte; slave-dependent
1st interface Type of interface	PROFINET	PROFINET
Physics	Ethernet	Ethernet
Isolated	Yes	Yes
Integrated switch	Yes	Yes
Number of ports	3; RJ45	3; RJ45
Automatic detection of transmission speed	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Media redundancy		V
Supported Cuitabayan time and line break tunically.		Yes
Switchover time on line break, typicallyNumber of stations in the ring, max.		200 ms; PROFINET MRP 50
		
Change of IP address at runtime, supported		Yes

SIMATIC ET 200 distributed I/O ET 200S

Interface modules with CPU IM 151-8 PN/DP CPU

	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
Functionality		
• MPI	No	No
DP master	No	No
DP slave	No	No
PROFINET IO device	No	Yes; Also simultaneously with
		IO controller functionality
PROFINET IO controller	Yes	Yes; also simultaneously with
		IO device
		functionality
PROFINET CBA	Yes	Yes
Open IE communication	Yes	Yes
Web server	Yes	Yes
- Number of HTTP clients	5 No.	5 No
Point-to-point connection	No	No
PROFINET IO controller		
Services		
- PG/OP communication	Yes	Yes
- Routing	Yes; with DP master module	Yes; with DP master module
- S7 communication	Yes; with loadable FBs	Yes; with loadable FBs
- Isochronous mode	No	Yes; OB 61; only for PROFINET IO
- Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP	Yes; Via TCP/IP, ISO on TCP, and UDP
 Transmission rate, max. 	100 Mbit/s; full duplex	100 Mbit/s; full duplex
 Number of connectable IO devices, max. 	128	128
 Max. number of connectable IO devices for RT 	128	128
- of which in line, max.	128	128
Number of IO devices with IRT and the option	128	128
"high flexibility"		
- of which in line, max.	61	61
Number of IO devices with IRT and the option "high performance" may		64
"high performance", max of which in line, max.		64
• IRT, supported	Yes	Yes
- Shared device, supported	165	Yes
Prioritized startup supported	Yes	Yes
- Number of IO devices, max.	32	32
Activation/deactivation of IO devices	Yes	Yes
- Number of IO devices that can be	8	8
simultaneously activated/deactivated, max.	0	0
IO devices changing during operation	Yes	Yes
(partner ports), supported		
- Max. number of IO devices per tool	8	8
 Device replacement without swap medium 	Yes	Yes
Send cycles	Adjustable: 250 µs, 500 µs and 1 ms	250 μs, 500 μs,1 ms; 2 ms, 4 ms
		(not in the case of IRT with "high flexibility"
a I ha alastia as sina a	NAtional and the state of the s	option)
Updating time	Minimum value depends on communication share set for PROFINET I/O, on the number of	Minimum value depends on communication share set for PROFINET I/O, on the number of
	I/O devices, and on the number of configured	I/O devices, and on the number of configured
	user data units.	user data units.
Updating times	250 μs - 128 ms (at signal cycle 250 μs);	250 µs to 512 ms (depends on operating mode
	500μs - 256 ms (at signal cycle 500 μs);	for more details, refer to Operating Instructions
A 1.1	1 ms - 512 ms (at signal cycle 1 ms)	"Interface Module IM151-8 PN/DP CPU")
Address area	011	
- Inputs, max.	2 kbyte	2 kbyte
- Outputs, max.	2 kbyte	2 kbyte
User data per address area, max.	OF A but a with DDOFINET HO	4 004 byte with DDOFINET HO
- User data consistency, max.	254 byte; with PROFINET I/O	1 024 byte; with PROFINET I/O
PROFINET IO device		
Services		
- PG/OP communication		Yes
Describer of		Yes
- Routing		V \A/:\- - - - -
- S7 communication		Yes; With loadable FBs
- S7 communication - Isochronous mode		No
- S7 communication		

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Interface modules with CPU IM 151-8 PN/DP CPU

Technical specifications (continued)		
	6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
PROFINET IO device		
• Services		
- PROFlenergy, supported		Yes; With SFB 73 / 74 prepared for loadable
		PROFlenergy standard FB for I-Device
Shared device, supportedNumber of IO controllers with shared device,		Yes 2
max.		2
Transfer memory		
- Inputs, max.		1 440 byte; Per IO controller with shared device
- Outputs, max.		1 440 byte; Per IO controller with shared device
Submodules		
- Number, max.		64
- User data per submodule, max.		1 024 byte
PROFINET CBA		
acyclic transmission	Yes	Yes
cyclic transmission	Yes	Yes
Open IE communication		
Open IE communication, supported	Yes; Via TCP/IP, ISO on TCP, and UDP	Yes; Via TCP/IP, ISO on TCP, and UDP
Number of connections, max.	8	8
Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534,	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534,
	65535	65535
2nd interface		
Type of interface	External interface via master module	External interface via master module
	6ES7138-4HA00-0AB0	6ES7138-4HA00-0AB0
Physics	RS 485	RS 485
Isolated	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	No	No
Functionality		
• MPI	No	No
DP master	Yes	Yes
DP slave	No	No
PROFINET IO controller	No	No
PROFINET IO device	No	No
PROFINET CBA Open IF communication	No No	No No
Open IE communication Web server	No No	No No
Local Operating Network	No	110
DP master		
Number of connections, max.	12; Notice: 12 connections per CPU, not per	
- Number of Connections, max.	interface	
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	No	No
- S7 basic communication	Yes; I blocks only	Yes; I blocks only
S7 communicationS7 communication, as client	Yes No	Yes No
- S7 communication, as ellerit	Yes	Yes
- Equidistance mode support	Yes	Yes
- Isochronous mode	No	No
- SYNC/FREEZE	Yes	Yes
- Activation/deactivation of DP slaves	Yes	Yes
- Number of DP slaves that can be	8	8
simultaneously activated/deactivated, max.	Yes	Voe
 Direct data exchange (slave-to-slave communication) 	100	Yes
- DPV1	Yes	Yes

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Interface modules with CPU IM 151-8 PN/DP CPU

Transmission rate, max		6ES7 151-8AB00-0AB0	6ES7 151-8AB01-0AB0
- Number of DP slaves, max. 3.2, Per station 32, Per station - In pus, max. 2.048 byte 2.048 byte - User stata per DP slave 2.44 byte 2.44 byte - User stata per DP slave 2.44 byte 2.44 byte - User stata per DP slave 2.44 byte 2.44 byte - Louds, max. 2.44 byte 2.44 byte - Scokronous mode Verson Verson Programming language STEP 7 Yes. VS.4 SP4 Yes - STEP 7 Yes Yes Yes - FED D Yes Yes Yes - STED 1 Yes Yes Yes - LAD Yes Yes Yes - STED 2 Yes Yes Yes - LED 4 Yes Yes Yes - STED 3 Yes Yes Yes - LED 4 Yes Yes Yes - STED 4 Yes Yes Yes - LED 5 Yes Yes Yes - STED 5 <t< td=""><td>Transmission rate, max.</td><td>12 Mbit/s</td><td>12 Mbit/s</td></t<>	Transmission rate, max.	12 Mbit/s	12 Mbit/s
- Inputs, max.		32; Per station	32; Per station
- Outputs, max.	Address area		
Secretary Palawa	- Inputs, max.	2 048 byte	2 048 byte
- inputs, max.	- Outputs, max.	2 048 byte	2 048 byte
Sockronous mode	 User data per DP slave 		
Society continues mode No	- Inputs, max.	244 byte	244 byte
Section of the content of the cont	- Outputs, max.	244 byte	244 byte
Programming language Programming language First	Isochronous mode		
Programming language	Isochronous mode	No	No
STIP 7	Programming		
- LAD Yes Yes - FBD Yes Yes - STL Yes Yes - SCL Yes; optional Yes; optional - SCPC Yes; optional Yes; optional - GRAPH Yes; optional Yes; optional - HiGraph® Yes; optional Yes; optional - HiGraph® See instruction list See instruction list Nesting levels 8 8 Alarmace Yes Yes System function blocks (SFD) See instruction list See instruction list Alarmace Alarmace Yes Alarmace Yes Yes Diagnostic functions Yes Yes Bus a			
-FBD Yes Yes -SSTL Yes optional Yes; optional -CPC Yes; optional Yes; optional -GRAPH Yes; optional Yes; optional -HiGraph® Yes; optional Yes; optional -Hidraph® See instruction list See instruction list Nesting levels 8 8 Know-how protection See instruction list See instruction list - User program protection/password protection Yes Yes - Block encryption Yes Yes System function blocks (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms (lagnostica/status information Alarms Yes Yes -Alarms (lagnostica/status information Yes Yes Diagnostic indication LED Yes Yes -Bus activity PROFINET P1-LINK (green) Yes Yes -Bus activity PROFINET P2-LINK (green) Yes Yes -Bus activity PROFINET P3-LINK (green) Yes Yes	• STEP 7	Yes; V5.4 SP4	Yes; V5.5 or higher
• STL Yes Yes • SCL Yes: optional Yes: optional • CFC Yes: optional Yes: optional • GRAPH Yes: optional Yes: optional • HiGraph® Yes: optional Yes: optional Command set See instruction list See instruction list Nesting levels 8 8 Know-how protection **Yes Yes • User program protection/password protection **Yes Yes • User program protection/password protection Yes Yes • User program protection Yes Yes • User program protection Yes Yes •	• LAD	Yes	Yes
- SCL Yes; optional Yes; optional - CFC Yes; optional Yes; optional - GRAPH Yes; optional Yes; optional - HiGraph® Yes; optional Yes; optional Command set See instruction list See instruction list Nesting levels 8 8 Know-how protection Ves Yes - Block encryption Yes Yes - System functions (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms/diagnostics/status information Yes Yes Alarms Yes Yes Diagnostic functions Yes Yes Diagnostic indication LED Yes Yes - Bus activity PROFINET P1-LINK (green) Yes Yes - Bus activity PROFINET P2-LINK (green) Yes Yes - Bus activity PROFINET P3-LINK (green) Yes Yes - Bus activity PROFINET P3-LINK (green) Yes Yes - Bus error (red) Yes	• FBD	Yes	Yes
CFC Ves: optional	• STL		Yes
• GRAPH Yes; optional Yes; optional • HiGraph® Yes; optional Yes; optional Command set See instruction list See instruction list Nesting levels 8 8 Know-how protection • User program protection/password protection • Ves • User program protection/password protection • Ves • Block encryption Yes System functions (SFC) See instruction list System function blocks (SFB) See instruction list System function blocks (SFB) See instruction list Alarms/diagnostics/status information See instruction list Alarms Yes • Alarms Yes • Diagnostics functions Yes • Diagnostic functions Yes • Diagnostic functions Yes • Diagnostic functions Yes • Pus activity PROFINET P2-LINK (green) Yes • Bus activity PR		· ·	
- HiGraph® Yes; optional Yes; optional Command set See instruction list See instruction list Nesting levels 8 8 Know-how protection - Yes • User program protection/password protection Yes Yes • Block encryption Yes Yes; With S7 block Privacy System function (SFC) See instruction list See instruction list Alarms Yes Yes Alarms Yes Yes Diagnostics Yes Yes Diagnostic functions Yes Yes Diagnostic functions Yes Yes Diagnostic functions Yes Yes Bus activity PROFINET P1-LINK (green) Yes Yes • Bus activity PROFINET P3-LINK (green) Yes Yes<			· ·
Command set See instruction list See instruction list Nesting levels 8 Nesting levels 7 Now-how protection User program protection/password protection Slock encryption 8 System functions (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms/diagnostics/status information Alarms Alarms 7 Alarms 8 Alarms 9 Nes 9	• GRAPH	· ·	
Nesting levels 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	• HiGraph®	Yes; optional	Yes; optional
Know-how protection User program protection/password protection Block encryption System functions (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms/diagnostics/status information Alarms Alarms Alarms Yes Yes Ves Diagnostic functions Plagnostic indication LED Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Yes Yes Yes Was Assembly PROFINET P3-LINK (green) Yes Yes Yes Yes Yes Yes Yes Ye	Command set	See instruction list	See instruction list
User program protection/password protection Block encryption System function (SFC) See instruction list System function blocks (SFB) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms/diagnostics/status information Alarms Alarms Alarms Yes Ves Ves Diagnostics Diagnostic functions Ves Ves Ves Diagnostic functions Ves Ves Diagnostic indication LED Sus activity PROFINET P1-LINK (green) Sus activity PROFINET P2-LINK (green) Sus activity PROFINET P3-LINK (green) Sus activity PROFINET P3-LINK (green) Yes Sus error (red) Wes Sus error (red) Yes Yes Yes Officer Soroup error SF (red) Yes Maintenance information MT (yellow) Yes Wes Solation Solation Solation Solation Between load voltage and all other switching components Permissible potential difference between different circuits To mm; DP master module: 35 mm 119.5 mm 75 mm Veight Ves Ves Ves Ves Ves Ves Ves Ves Ves Ve	Nesting levels	8	8
User program protection/password protection Block encryption State function (SFC) See instruction list System function blocks (SFB) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list See instruction list Alarms/diagnostics/status information Alarms Alarms Alarms Alarms Yes Pes Pes Diagnostics Diagnostic functions Pius activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Bus activity PROFINET P3-LINK (green) Pes See Yes Bus error (red) Maintenance information MT (yellow) Maintenance information MT (yellow) Monitoring 24 V voltage supply ON (green) Pes See Isolation Isolation Between load voltage and all other switching components Detween PROFIBUS DP and all other circuit components Permissible potential difference between different circuits Pop Maintenance Detween different circuits Permissible potential difference between different circuits Permissible potential difference Detween d			
• Block encryption Yes; With S7 block Privacy System functions (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list See instruction list Alarms/diagnostics/status information Alarms Yes - Alarms Yes Yes Diagnostics (unctions) Yes Yes Diagnostic functions Yes Yes Diagnostic indication LED Yes Yes • Bus activity PROFINET P1-LINK (green) Yes Yes • Bus activity PROFINET P2-LINK (green) Yes Yes • Bus activity PROFINET P3-LINK (green) Yes <t< td=""><td>·</td><td>Yes</td><td>Yes</td></t<>	·	Yes	Yes
System functions (SFC) See instruction list See instruction list System function blocks (SFB) See instruction list System function blocks (SFB) See instruction list Alarms/diagnostics/status information Alarms Yes Yes Diagnostics Diagnostic functions Diagnostic indication LED Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Bus activity PROFINET P3-LINK (green) Yes Bus activity PROFINET P3-LINK (green) Yes Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Yes Yes Yes Ye		.00	
System function blocks (SFB) See instruction list Alarms/diagnostics/status information Alarms Alarms Alarms Alarms Alarms Pes Diagnostics Diagnostic functions Pes Diagnostic functions Pes Diagnostic indication LED Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Pes Bus activity PROFINET P3-LINK (green) Pes Bus activity PROFINET P3-LINK (green) Pes Bus activity PROFINET P3-LINK (green) Pes Bus error (red) Pes Alarms Pes Alarms Pes Alarms Pes Alarms Pes Alarms Alarms Pes A		Soc instruction list	· · · · · · · · · · · · · · · · · · ·
Alarms/diagnostics/status information Alarms • Alarms • Alarms • Alarms Yes Yes Yes Diagnostics • Diagnostic functions Diagnostic indication LED • Bus activity PROFINET P1-LINK (green) • Bus activity PROFINET P2-LINK (green) • Bus activity PROFINET P2-LINK (green) • Bus activity PROFINET P3-LINK (green) • Bus error (red) • Bus error (red) • Yes • Yes • Yes • Yes • Group error SF (red) • Maintenance information MT (yellow) • Monitoring 24 V voltage supply ON (green) Isolation Isolation Bolation Bolation Bolation Between load voltage and all other switching components Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions • Width • Height • 119.5 mm 75 mm Weight			
Alarms Alarms Alarms Alarms Alarms Alarms Alarms Alarms Alarms Pes Diagnostics Diagnostic functions Pyes Yes Diagnostic function LED Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Yes Yes Yes Maintenance information MT (yellow) Yes Yes Alarms Alarms Yes Yes Ves Ves Ves Ves Ves Ves		See instruction list	See instruction list
Alarms Permissible potential difference properties of the properti	<u> </u>		
Diagnostics Diagnostic functions Yes Yes Diagnostic functions Pess Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Bus activity PROFINET P3-LINK (green) Yes Yes Yes Group error SF (red) Monitoring 24 V voltage supply ON (green) Yes Solution Isolation Isolation checked with Solve DC Galvanic isolation between Isolation between PROFIBUS DP and all other switching components Detween PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions Width 120 mm; DP master module: 35 mm 119.5 mm 75 mm T5 mm T5 mm T6 mm Weight		Voc	Voc
Diagnostic functions Pess Diagnostic indication LED Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Yes Yes Was Was Bus activity PROFINET P3-LINK (green) Yes Yes Yes Was Bus activity PROFINET P3-LINK (green) Yes Yes Yes Was Bus activity PROFINET P3-LINK (green) Yes Yes Yes Bus activity PROFINET P3-LINK (green) Yes Yes Was Bus activity PROFINET P3-LINK (green) Yes Yes Was Yes Yes Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Yes Yes Permissible potential difference Bus activity PROFINET P3-LINK (green) Yes Yes Yes Pas Activation Yes Yes Pas Activa		165	165
Diagnostic indication LED Bus activity PROFINET P1-LINK (green) Yes Yes Bus activity PROFINET P2-LINK (green) Yes Yes Bus activity PROFINET P3-LINK (green) Yes Yes Bus activity PROFINET P3-LINK (green) Yes Yes Bus error (red) Yes Yes Maintenance information MT (yellow) Yes Yes Monitoring 24 V voltage supply ON (green) Yes Yes Monitoring 24 V voltage supply ON (green) Yes Yes Isolation Bolation Checked with 500 V DC 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit yes Yes Permissible potential difference between different circuits 75 V DC / 60 V AC 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 119.5 mm 75 mm Teght	3	V	W
Bus activity PROFINET P1-LINK (green) Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Bus activity PROFINET P3-LINK (green) Bus error (red) Bus error (red) Maintenance information MT (yellow) Message information MT (yellow) Message information MT (yellow) Message information MT (yellow) Message information MT (yes Message information MEssage Message		res	res
Bus activity PROFINET P2-LINK (green) Bus activity PROFINET P3-LINK (green) Bus activity PROFINET P3-LINK (green) Bus error (red) Bus error (
 Bus activity PROFINET P3-LINK (green) Bus error (red) Maintenance information MT (yellow) Yes Maintenance information MT (yellow) Yes Group error SF (red) Yes Yes Yes Yes Yes Monitoring 24 V voltage supply ON (green) Yes Solation Isolation checked with 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC 75 V DC / 60 V AC Dimensions Width 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight 	, , ,		
 Bus error (red) Maintenance information MT (yellow) Group error SF (red) Monitoring 24 V voltage supply ON (green) Isolation Isolation checked with 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions Width 120 mm; DP master module: 35 mm Height Height Depth Weight Wes Yes Yes Yes To Wingh 119.5 mm 75 mm 75 mm 75 mm 75 mm 75 mm 75 mm			
 Maintenance information MT (yellow) Group error SF (red) Yes Solation Isolation checked with 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit Components Yes Yes Permissible potential difference between different circuits 75 V DC / 60 V AC To V DC / 60 V AC Dimensions and weight Dimensions Width Height 119.5 mm 75 mm 75 mm 75 mm Weight Weight	· · · · · · · · · · · · · · · · · · ·		
• Group error SF (red) • Monitoring 24 V voltage supply ON (green) Isolation Isolation checked with 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits • Width 120 mm; DP master module: 35 mm Height • Depth T5 mm T5 mm Ves Yes Yes Yes Yes 120 mm; DP master module: 35 mm 119.5 mm 75 mm Weight	()		
 Monitoring 24 V voltage supply ON (green) Isolation Isolation checked with 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits To V DC / 60 V AC Dimensions and weight Dimensions Width Height Depth Wes Yes 	,		
Isolation Isolation checked with 500 V DC 500 V DC Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm 119.5 mm 75 mm • Depth 75 mm Weight			
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Galvanic isolation between load voltage and all other switching components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC T5 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight		500 V DO	500 V DO
between load voltage and all other switching components between PROFIBUS DP and all other circuit components Yes Yes Yes Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight	Isolation checked with	500 V DC	500 V DC
components between PROFIBUS DP and all other circuit components Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight			
Components Permissible potential difference between different circuits 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight		Yes	
Permissible potential difference between different circuits 75 V DC / 60 V AC 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm • Height 119.5 mm 119.5 mm • Depth 75 mm 75 mm		Yes	Yes
between different circuits 75 V DC / 60 V AC 75 V DC / 60 V AC Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight			
Dimensions and weight Dimensions • Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm 119.5 mm 119.5 mm 75 mm Weight	•	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions • Width 120 mm; DP master module: 35 mm • Height • Depth 120 mm; DP master module: 35 mm • 119.5 mm • Depth 75 mm Weight • Width • Depth • To mm			
• Width 120 mm; DP master module: 35 mm 120 mm; DP master module: 35 mm • Height 119.5 mm 119.5 mm • Depth 75 mm 75 mm Weight	<u> </u>		
• Height 119.5 mm • Depth 75 mm Weight 119.5 mm 75 mm 75 mm		120 mm: DP master module: 35 mm	120 mm: DP master module: 35 mm
● Depth 75 mm 75 mm Weight Image: Control of the property of th			•
Weight	9		
ÿ			
Troight, approx. 100 g 020 g, or master module. Approx. 100 g	9	320 g: DP master module: Approx 100 g	320 a: DP master module: Approv. 100 a
	ποιχιτι, αρριόλ.	ozo g, Dr. master module. Approx. 100 g	523 g, Dr. Master Module. Approx. 100 g

ET 200S

Interface modules with CPU IM 151-8 PN/DP CPU

Ordering data	Order No.		Order No.
IM 151-8F PN/DP CPU interface module (192 K)	6ES7 151-8AB01-0AB0	ET 200S distributed I/O system manuals	
including termination module		are available on the Internet as	
Accessories		PDF files www.siemens.com/simatic-docu	
MMC 64 kByte 1)	6ES7 953-8LF20-0AA0	Termination module	6ES7 193-4JA00-0AA0
for program backup			6ES7 193-4JA00-0AA0
MMC 128 kByte ¹⁾	6ES7 953-8LG20-0AA0	as spare part for ET 200S	
for program backup		SIMATIC S5, 35 mm DIN rail • Length: 483 mm for 19" cabinets	6ES5 710-8MA11
MMC 512 kByte 1)	6ES7 953-8LJ20-0AA0	• Length: 530 mm for 600 mm	6ES5 710-8MA21
for program backup		cabinets • Length: 830 mm for 900 mm	6ES5 710-8MA31
MMC 2 MByte 1)	6ES7 953-8LL20-0AA0	cabinets	
for program backup and/or firmware update		• 2 m long Industrial Ethernet FC RJ45	6ES5 710-8MA41
MMC 4 MByte ¹⁾	6ES7 953-8LM20-0AA0	Plug 180	
for program backup		RJ45 connector for Industrial	
MMC 8 MByte 1)	6ES7 953-8LP20-0AA0	Ethernet with rugged metal enclosure and integrated	
for program backup		insulation displacement contacts for connecting the Industrial	
External prommer	6ES7 792-0AA00-0XA0	Ethernet FC installation cables;	
for MMC, among others, with USB		with 180° cable outlet • 1 unit	6GK1 901-1BB10-2AA0
interface		• 10 units	6GK1 901-1BB10-2AB0
PG	On request	• 50 units	6GK1 901-1BB10-2AE0
with integrated MMC interface		Industrial Ethernet FastConnect	
Label sheets DIN A4 (10 units)		Installation Cable	CVV/4 040 041140
Each sheet contains 60 label		 Fast Connect Standard Cable Fast Connect Trailing Cable 	6XV1 840-2AH10 6XV1 840-3AH10
strips for I/O modules and 20 label strips for interface		Fast Connect Marine Cable	6XV1 840-4AH10
modules		Industrial Ethernet FastConnect	6GK1 901-1GA00
petrolred	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0	Stripping Tool	
• yellow	6ES7 193-4BB00-0AA0		
• light beige	6ES7 193-4BA00-0AA0		

¹⁾An MMC is essential to operate the CPU I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

Interface modules with CPU

Master interface module for IM 151 CPU

Overview



PROFIBUS DP master interface module for IM 151-7(F) CPU/IM 151-8(F) PN/DP CPU interface modules

- Integrated 12 Mbit/s PROFIBUS DP master interface in copper design
- Facilitates parallel operation of two PROFIBUS DP interfaces on one IM 151-7 CPU
- Enables operation of a PROFIBUS DP interface on an IM 151-8(F) PN/DP CPU
- Increases the availability of plants and machinery
- Functionality corresponds to the interface of an S7-300 CPU 314-2 DP configured as DP master

Programming is with STEP7 from Version V5.2 with Service Pack 1.

Technical specifications

	6ES7 138-4HA00-0AB0
Hardware configuration Number of modules per CPU	1
Dimensions and weight	1
Dimensions	
Width	35 mm
Height	119.5 mm
• Depth	75 mm
Weight	
 Weight, approx. 	100 g

Ordering data Order No. Master interface module for 6ES7 138-4HA00-0AB0 IM 151-7 CPU / IM 151-7 F CPU / IM 151-8 PN/DP CPU / IM 151-8 F PN/DP CPU interface modules Accessories Label sheets DIN A4 (10 units) Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules petrol 6ES7 193-4BH00-0AA0 • red 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 yellow 6ES7 138-4BA00-0AA0 • light beige ET 200S distributed I/O system manuals are available in the Internet as PDF files: www.siemens.com/simatic-docu

ET 200S

SIPLUS interface module with CPU SIPLUS IM 151-7 CPU

Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increase of the availability of systems and machines
- Programming via PROFIBUS DP
- Compact SIMATIC micro memory card (MMC)
- Integrated 12 Mbit/s PROFIBUS DP slave/MPI interface in Cu version
- Integrated CPU based on the CPU S7-314
- IM 151-7 CPU FO available
- Fail-safe IM 151-7 F CPU PROFIsafe available
- Alternatively as IM 151-8 (F) PN/DP CPU with PROFINET interface

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 151-7 CPU
Order No.	6AG1151-7AA20-7AB0
Order No. based on	6ES7151-7AA20-0AB0
Ambient temperature range	-25 °C to +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Relative humidity	5 100 %, condensation permitted
Ambient conditions	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2 G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080795 hPa (-1000 +2000 m) See ambient temperature range 795 658 hPa (+2000 +3500 m) Derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; $H_2S <$ 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; $H_2S <$ 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 151-7 CPU interface H module (96 K)	6AG1 151-7AA20-7AB0
(extended temperature range and medial exposure)	
Including termination module	
Accessories	See SIMATIC IM 151-7 CPU interface module, page 9/13

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200S

SIPLUS interface modules with CPU SIPLUS IM 151-8 PN/DP CPU

Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase in the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET I/O-Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC micro memory card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7 138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS IM 151-8 PN/DP CPU		
Order No.	6AG1 151-8AB00- 4AB0	6AG1 151-8AB00- 7AB0
Order No. based on	6ES7 151-8AB00- 0AB0	6ES7 151-8AB00- 0AB0
Ambient temperature range	0 +60 °C	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS IM 151-8 PN/DP

Ambient conditions:

- Relative humidity
- Biologically active substances
- Chemically active substances
- Mechanically active substances
- Air pressure (depending on the highest positive temperature range specified)

5 ... 100%, condensation allowed Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores fauna) Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)} Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾ 1080...795 hPa (-1000 ... +2000 m) See ambient temperature range 795...658 hPa (+2000 ... +3500 m) Derating 10 K

658...540 hPa (+3500 ... +5000m)

- Derating 20K I) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Threshold / limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm;
- NH <247 ppm; O₃ <1.0 ppm; NOX <10.4 ppm
 The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

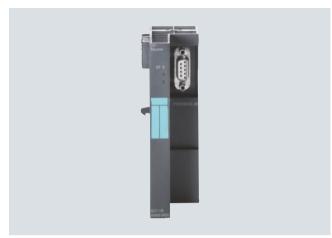
Ordering data	Order No.
SIPLUS interface module IM 151-8 PN/DP CPU	
(extended temperature range and medial exposure)	
Including termination module • For areas with extreme medial stress (conformal coating)	6AG1 151-8AB00-4AB0
 For areas with extreme medial H stress (conformal coating); ambient temperature -25 +70 °C 	6AG1 151-8AB00-7AB0
Accessories	See SIMATIC IM 151-8 PN/DP CPU interface module, page 9/23

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

SIPLUS interface modules with CPU SIPLUS master interface module for IM 151 CPU

Overview



PROFIBUS DP master interface module for interface module IM 151-7 (R) CPU / IM 151-8 (F) PN/DP CPU

- Integrated 12 Mbit/s PROFIBUS DP master interface in Cu version
- Allows parallel operation of two PROFIBUS DP interfaces on one IM 151-7 CPU
- Allows operation of one PROFIBUS DP interface with an IM 151-8 (F) PN/DP CPU
- · Increase in availability of systems and machines
- Functionality in accordance with a DP master configured interface of an S7-314 CPU

Programming is performed with STEP 7 from version V5.2 with Service Pack 1.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS master interface module for IM 151 CPU
6AG1 138-4HA00-7AB0
6ES7 138-4HA00-0AB0
-25 °C to +70 °C
Coating of the printed circuit boards and the electronic components
The technical data of the standard product applies except for the ambient conditions.
5 100 % Condensation permissible
Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
1080 795 hPa (-1000 +2000 m) See ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
Master interface module for HSIPLUS IM 151-7 CPU / IM 151-7 F CPU / IM 151-8 PN/DP CPU / IM 151-8 F PN/DP CPU interface modules	6AG1 138-4HA00-7AB0
(extended temperature range and medial exposure)	
Accessories	See SIMATIC master interface module for IM 151 CPU, page 9/24

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200S

Interface modules with fail-safe CPU IM 151-7 F-CPU

Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration through DP master modules (PROFIsafe)
- The fail-safe I/O modules of ET200S PROFIsafe can be connected in a centralized configuration
- Standard modules can be used for non-safety-relevant applications

Note:

Micro Memory Card required for operation of CPU.

Technical specifications

	6ES7 151-7FA20-0AB0
Product version	
associated programming package	STEP 7 V5.2 + SP1 or higher with HW update
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
 Short-circuit protection 	Yes
 Reverse polarity protection 	Yes
Current consumption Current output to backplane bus (5 V DC), max.	700 mA
from supply voltage 1L+, max.	250 mA; 280 mA with DP master module
Power losses	
Power loss, typ.	3.3 W
Memory	
Work memory	
• integrated	128 Kibyte; For program and data
expandable	No
Load memory	
• pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	511; Number range: 1 to 511
• Size, max.	16 Kibyte
FB	
 Number, max. 	1 024; Number range: 0 to 2047
• Size, max.	16 Kibyte

	6ES7 151-7FA20-0AB0
FC	
Number, max.Size, max.	1 024; Number range: 0 to 2047 16 Kibyte
ОВ	
• Size, max.	16 Kibyte
Nesting depth	
 per priority class 	8
additional within an error OB	4
CPU processing times	
for bit operations, min.	0.1 μs
for word operations, min.	0.2 μs
for fixed point arithmetic, min.	2 µs
for floating point arithmetic, min.	3 µs
Counters, timers and their	
retentivity	
S7 counter • Number	256
Retentivity	230
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	Z 0 to Z 7
Counting range	
- adjusted	Yes
- lower limit	0
- upper limit	999
IEC counter	
• Type	SFB
Number	Unlimited (limited only by RAM
	capacity)
S7 times	
• Number	256
Retentivity	V
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	No retentivity

ET 200S

Interface modules with fail-safe CPU IM 151-7 F-CPU

reclinical specifications (continued)		
	6ES7 151-7FA20-0AB0	
S7 times		
Time range		
- lower limit	10 ms	
- upper limit	9 990 s	
IEC timer		
• Type	SFB	
Number	Unlimited (limited only by RAM capacity)	
Data areas and their retentivity		
retentive data area in total (incl. times, counters, flags), max.	64 Kibyte	
Flag	OFC by to	
Number, max. Detentivity available.	256 byte	
Retentivity availableRetentivity preset	Yes MB 0 to MB 15	
Number of clock memories	8; 1 memory byte	
Data blocks	e, i memory byte	
Number, max.	511; Number range: 1 to 511	
• Size, max.	16 Kibyte	
Local data		
• per priority class, max.	510 byte	
Address area		
I/O address area		
Overall	2 048 byte	
Outputs	2 048 byte	
Process image		
• Inputs	128 byte; Not adjustable	
• Outputs	128 byte; Not adjustable	
Digital channels		
• Inputs	16 336	
• Outputs	16 336	
Inputs, of which central Outputs, of which central	248 248	
Outputs, of which central	240	
Analog channels	1 021	
InputsOutputs	1 021	
Inputs, of which central	124	
Outputs, of which central	124	
Hardware configuration		
Number of modules per system, max.	63; Centralized	
Time		
Clock		
Hardware clock (real-time clock)	Yes	
 Battery-backed and synchro- nizable 	Yes	
Backup time	6 wk; at 40 °C ambient temperature, typically	
Deviation per day, max.	10 s	
Runtime meter		
Number	1	
Number/Number range	0	
Range of values	0 to 2^31 hours	
• Granularity	(when using SFC 101) 1 hour	
Granularity Retentive	Yes; must be restarted at each	
	restart	

	6ES7 151-7FA20-0AB0
Clock synchronization	
 supported 	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	No
• in AS, slave	No
S7 message functions	
Number of login stations for message functions, max.	12; depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ
Simultaneously active Alarm-S blocks, max.	40
Test commissioning functions	
Status/control	V
Status/control variable Variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
of which status variables, max.	30
• of which control variables, max.	14
Forcing	
• Forcing	Yes
Status block	Yes
Single step	Yes
	2
Number of breakpoints	2
Diagnostic buffer	V
Present	Yes
Number of entries, max.	100
- adjusted	No
Communication functions	Voc
PG/OP communication	Yes
Global data communication	
Supported	Yes
Number of GD packets, max.	4
 Number of GD packets, trans- mitter, max. 	4
 Number of GD packets, receiver, max. 	4
 Size of GD packets, max. 	22 byte
 Size of GD packet (of which 	22 byte
consistent), max.	
S7 basic communication	
 supported 	Yes
User data per job, max.	76 byte
 User data per job (of which consistent), max. 	76 byte; 76 byte (with X_SEND or X_RCV); 64 byte (with X_PUT or
	X_GET as server)
S7 communication	
supported	Yes
• as server	Yes
as client	No
 User data per job, max. 	180 byte
User data per job (of which consistent) may	64 byte
consistent), max.	

ET 200S

Interface modules with fail-safe CPU IM 151-7 F-CPU

Technical specifications (continued)		
	6ES7 151-7FA20-0AB0	
S5-compatible communication • supported	No	
Standard communication (FMS) • supported	No	
Number of connections overall usable for PG communication reserved for PG communication usable for OP communication reserved for OP communication reserved for OP communication usable for S7 basic communication Reserved for S7 basic communication usable for routing	12 11 1 11 10 0 4; as slave only with active interface, with IM 151-7 CPU as DP master	
1st interface Type of interface	Integrated RS 485 interface	
Physics	RS 485	
Isolated	Yes	
Power supply to interface (15 to 30 V DC), max.	80 mA	
Functionality • MPI • DP master • DP slave • Point-to-point connection	Yes No Yes; active / passive No	
MPI Number of connections Services PG/OP communication Routing Global data communication S7 basic communication S7 communication S7 communication S7 communication S7 communication, as client Transmission rate, max.	12; Notice: 12 connections per CPU, not per interface Yes Yes; with master module Yes Yes Yes No Yes 12 Mbit/s	
DP slave • Number of connections	12; Notice: 12 connections per CPU, not per interface	
Services - Routing Direct data exchange (slave-to-slave communication) - DPV1 GSD file Transmission rate, max. Automatic baud rate search Transfer memory - Inputs - Outputs	Yes; only when interface active and in master mode Yes No www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 244 byte 244 byte	
	-,	

	6ES7 151-7FA20-0AB0
DD alova	
DP slave	20
Address area, max.	32
 User data per address area, 	32 byte; up to max. size of the transfer memory
max.	transfer memory
2nd interface	
Type of interface	External interface via master
	module 6ES7138-4HA00-0AB0
Physics	RS 485
solated	Yes
Power supply to interface (15 to 30 V DC), max.	No
Functionality	
• MPI	No
 DP master 	Yes
 Local Operating Network 	No
DP master	
Number of connections, max.	12; Notice: 12 connections per CPU, not per interface
• Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	No
- S7 basic communication	Yes; I blocks only
- S7 communication	Yes
- S7 communication, as client	No
- S7 communication, as server	Yes
- Equidistance mode support	Yes
- SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
- Direct data exchange (slave-	Yes
to-slave communication)	100
- DPV1	Yes
 Transmission rate, max. 	12 Mbit/s
 Number of DP slaves, max. 	32; Per station
• Address area	, , , , , , , , , , , , , , , , , , , ,
- Inputs, max.	2 Kibyte
- Outputs, max.	2 Kibyte
User data per DP slave	2.10,10
- Inputs, max.	244 byte
- Outputs, max.	244 byte 244 byte
Isochronous mode	Z Oyto
Isochronous mode	No
Programming	
Configuration rules	max. 63 I/O modules per station;
	station width < 1 m or
	< 2 m; max. 10 A per load group
	(power module); master interface
	module on right next to IM 151-7 CPU (X2 interface)
	IIVI 131-7 OFO (AZ IIILEITACE)
Programming language	V
• STEP 7	Yes
• LAD	Yes
• FBD	Yes
• STL	Yes
• SCL	Yes; optional
• GRAPH	Yes; optional
	, -1

ET 200S

Interface modules with fail-safe CPU IM 151-7 F-CPU

	6ES7 151-7FA20-0AB0
Command set	See instruction list
Nesting levels	8
Know-how protection • User program protection/ password protection	Yes
System functions (SFC)	See instruction list
System function blocks (SFB)	See instruction list
Isolation Isolation checked with	500 V DC
Galvanic isolation between load voltage and all other switching components	Yes
between PROFIBUS DP and all other circuit components	Yes

	6ES7 151-7FA20-0AB0
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
Width	60 mm; DP master module: 35 mm
Height	119.5 mm
• Depth	75 mm
Weight	
• Weight, approx.	200 g; DP master module: Approx. 100 g

Ordering data	Order No.
IM151-7 F CPU interface module	6ES7 151-7FA20-0AB0
For configuring a fail-safe automation system	
Accessories	
Distributed Safety V5.4 programming tool	
Task: Software for configuring fail- safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirements: STEP 7 V5.3 SP3 and higher	
Floating license	6ES7 833-1FC02-0YA5
Software Update Service	6ES7 833-1FC00-0YX2
Distributed Safety Upgrade	6ES7 833-1FC02-0YE5
From V5.x to V5.3; Floating license for 1 user	
MMC 64 kByte	6ES7 953-8LF20-0AA0
for program backup	
MMC 128 kByte	6ES7 953-8LG20-0AA0
for program backup	

	Order No.
MMC 512 kByte	6ES7 953-8LJ20-0AA0
for program backup	
MMC 2 MByte	6ES7 953-8LL20-0AA0
for program backup and/or firmware update	
MMC 4 MByte	6ES7 953-8LM20-0AA0
for program backup	
External prommer	6ES7 792-0AA00-0XA0
for MMC with USB interface	
Termination module	6ES7 193-4JA00-0AA0
as spare part for ET 200S	
SIMATIC S5, 35 mm DIN rail Length: 483 mm for 19" cabinets Length: 530 mm for 600 mm cabinets Length: 830 mm for 900 mm cabinets 2 m long	6ES5 710-8MA11 6ES5 710-8MA21 6ES5 710-8MA31 6ES5 710-8MA41

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Overview



- Interface module for SIMATIC ET 200S with integrated fail-safe CPU
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061, up to PLe according to ISO 13849-1:2006 and up to Cat. 4 according to EN 954-1
- For high-performance control solutions in ET 200S
- Increase of the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET interface with integrated 3-port switch
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Technical specifications

6ES7 151-8FB01-0AB0
STEP 7 V 5.5 or higher, Distributed
Safety V 5.4 SP4
20.4 V
24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: A 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before and with type C tripping characteristic after the device protection fuse.
5 ms
1.8 A; typ.
0.13 A ² ·s
700 mA
352 mA; 426 mA with DP master module
5.5 W
256 Kibyte; For program and data No 64 kbyte

	6ES7 151-8FB01-0AB0
Load memory	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
 Number, max. 	1 024; Number range: 1 to 16,000
• Size, max.	64 Kibyte
FB	
 Number, max. 	1 024; Number range: 0 to 7,999
Size, max.	64 Kibyte
FC	
Number, max.	1 024; Number range: 0 to 7,999
• Size, max.	64 Kibyte
OB	
Size, max.	64 Kibyte
Nesting depth	
per priority class	16
additional within an error OB	4
CPU processing times	
for bit operations, min.	0.06 µs
for word operations, min.	0.12 µs
for fixed point arithmetic, min.	0.16 µs
for floating point arithmetic, min.	0.59 µs

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Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

	6ES7 151-8FB01-0AB0
Counters, timers and their	
retentivity	
S7 counter	OFG
NumberRetentivity	256
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	Z 0 to Z 7
Counting range	201021
- adjusted	Yes
- lower limit	0
- upper limit	999
IEC counter	
• Type	SFB
Number	Unlimited (limited only by RAM
	capacity)
S7 times	
Number	256
 Retentivity 	
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	No retentivity
Time range	
- lower limit	10 ms
- upper limit	9 990 s
IEC timer	
• Type	SFB
Number	Unlimited (limited only by RAM
	capacity)
Data areas and their retentivity	
Flag	
Number, max.	256 byte
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	
Number, max.	1 024; Number range: 1 to 16,000
• Size, max.	64 Kibyte
Retentivity adjustable	Yes; via non-retain property on DE
Retentivity preset	Yes
Local data	
 per priority class, max. 	32 768 byte; 2048 byte max. per block
Address succ	SIOON
Address area	
I/O address area • Overall	2.048 byto
	2 048 byte
Outputsof which, distributed	2 048 byte
- Inputs	2 048 byte
- Outputs	2 048 byte
·	2 040 Dyte
Process image	0.040 +-
Inputs, adjustable	2 048 byte
Outputs, adjustable	2 048 byte
• Inputs, preset	128 byte
 Outputs, preset 	128 byte
Odipate, procet	,

	6ES7 151-8FB01-0AB0
Subprocess images Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to 1600 byte
Digital channels Inputs Outputs Inputs, of which central Outputs, of which central	16 336 16 336 496 496
Analog channels Inputs Outputs Inputs, of which central Outputs, of which central	1 021 1 021 124 124
Hardware configuration Number of mounting rails that can be used	1
Max. length of mounting rail	Station width: <= 1 m or < 2 m
Number of modules per system, max.	63; Centralized
Time Clock Hardware clock (real-time clock) Battery-backed and synchronizable Backup time Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Deviation per day, max.	Yes Yes 6 wk; At 40 °C ambient temperature, typically Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred 10 s; Typ.: 2 s
Runtime meter Number Number/Number range Range of values Granularity Retentive	1 0 0 to 2^31 hours (when using SFC 101) 1 hour Yes; Must be restarted at each restart
Clock synchronization supported to MPI, master to MPI, slave to DP, master to DP, slave in AS, master in AS, slave on Ethernet via NTP	Yes No No Yes; with DP master module Yes; with DP master module No No Yes; as client
S7 message functions Number of login stations for message functions, max.	12; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ
Simultaneously active Alarm-S blocks, max.	300

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Technical specifications (continued)		
	6ES7 151-8FB01-0AB0	
Test commissioning functions Status/control • Status/control variable • Variables • Number of variables, max. • of which status variables, max. • of which control variables, max.	Yes Inputs, outputs, memory bits, DB, times, counters 30 30	
Forcing • Forcing	Yes	
Status block	Yes; up to 2 simultaneously	
Single step	Yes	
Number of breakpoints	4	
Diagnostic buffer • Present • Number of entries, max. - adjusted - of which powerfail-proof	Yes 500 No 100; Only the last 100 entries are retained	
Monitoring functions Status LEDs	Yes	
PG/OP communication Data record routing	Yes Yes; with DP master module	
Routing	Yes; with DP master module	
Global data communication • supported S7 basic communication • supported	No Yes; I blocks	
User data per job, max.User data per job (of which consistent), max.	76 byte 76 byte	
 S7 communication supported as server as client User data per job, max. 	Yes Yes Yes; via integrated PN interface and loadable FBs See online help of STEP 7 (shared parameters of the SFBs/ FBs and of the SFCs/FCs of S7 Communication)	
Web server • supported • Number of HTTP clients • User-defined websites	Yes 5 Yes	
Open IE communication TCP/IP Number of connections, max. Data length for connection type 01H, max. Data length for connection type 11H, max. Several passive connections per port, supported ISO-on-TCP (RFC1006) Number of connections, max. Data length, max.	Yes; via integrated PROFINET interface and loadable FBs 8 1 460 byte 32 768 byte Yes Yes; via integrated PROFINET interface and loadable FBs 8 32 768 byte	

	CEO7 151 OFRO1 04R0
On an IE annual in the	6ES7 151-8FB01-0AB0
Open IE communicationUDPNumber of connections, max.Data length, max.	Yes; via integrated PROFINET interface and loadable FBs 8 1 472 byte
Number of connections	10
overall usable for PG communication reserved for PG communication	12 11 1
 Adjustable for PG communication, min. usable for OP communication reserved for OP communi- 	1 11 1
cation - adjustable for OP communication, min.	1
usable for S7 basic communi- cation	10
 Reserved for S7 basic communication 	0
 adjustable for S7 basic communication, min. 	0
 usable for S7 communication Adjustable for S7 communication, max. 	10; with loadable FBs 10
Max. total number of instancesusable for routing	32 4; max.
PROFINET CBA (at set setpoint communication load)	
Setpoint for the CPU communication load	50 %
Number of remote intercon- nection partners	32
 Number of functions, master/ slave 	30
Total of all Master/Slave connections	1 000
 Data length of all incoming connections master/slave, max. 	4 000 byte
 Data length of all outgoing connections master/slave, max. 	4 000 byte
 Number of device-internal and PROFIBUS interconnections 	500
Data length of device-internal und PROFIBUS interconnec- tions, max.	4 000 byte
 Data length per connection, max. 	1 400 byte
 Remote interconnections with acyclic transmission Sampling frequency: 	500 ms
Sampling time, min. - Number of incoming	100
interconnections - Number of outgoing	100
interconnections - Data length of all incoming	2 000 byte
interconnections, max Data length of all outgoing	2 000 byte
interconnections, max.Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	
- Transmission frequency: Transmission interval, min.	1 ms

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Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Technical specifications (continued)	
	6ES7 151-8FB01-0AB0
Remote interconnections with	
cyclic transmission - Number of incoming interconnections	200
Number of outgoing interconnections	200
 Data length of all incoming interconnections, max. 	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte
 Data length per connection, max. 	450 byte
 HMI variables via PROFINET (acyclic) 	
 Number of stations that can log on for HMI variables (PN OPC/iMap) 	3; 2x PN OPC/1x iMap
- HMI variable updating	500 ms
 Number of HMI variables Data length of all HMI 	200 2 000 byte
variables, max. • PROFIBUS proxy functionality	
- Supported	Yes
 Number of linked PROFIBUS devices 	16
 Data length per connection, max. 	240 byte; Slave-dependent
1st interface Type of interface	PROFINET
Physics	Ethernet
Isolated	Yes
Integrated switch	Yes
Number of ports	3; RJ45
Automatic detection of trans- mission speed	Yes
Autonegotiation	Yes
Autocrossing	Yes
Media redundancy	
supportedSwitchover time on line break,	Yes 200 ms; PROFINET MRP
typically	
 Number of stations in the ring, max. 	50
Change of IP address at runtime, supported	Yes
Functionality	N
MPI DP master	No No
• DP slave	No
PROFINET IO device	Yes; also simultaneously with
PROFINET IO controller	IO controller functionality Yes; also simultaneously with IO device functionality
• PROFINET CBA	Yes
Open IE communication	Yes
 Web server Number of HTTP clients 	Yes 5
Point-to-point connection	No
PROFINET IO controller	
• Services	V.
PG/OP communicationRouting	Yes Yes; with DP master module
- S7 communication	Yes; with loadable FBs

	6ES7 151-8FB01-0AB0
• Services	
- Isochronous mode	Yes; OB 61; only for PROFINET IO
- Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
 Transmission rate, max. 	100 Mbit/s; full duplex
Number of connectable	128
IO devices, max.	100
Max. number of connectable IO devices for RT	128
- of which in line, max.	128
Number of IO devices with IRT and the option "high flexibility"	128
- of which in line, max.	61
 Number of IO devices with IRT and the option "high perfor- mance", max. 	64
- of which in line, max.	64
• IRT, supported	Yes
- Shared device, supported	Yes
 Prioritized startup supported 	Yes
- Number of IO devices, max.	32
 Activation/deactivation of 	Yes
IO devices - Number of IO devices that	8
can be simultaneously	
activated/deactivated, max. • IO devices changing during	Yes
operation (partner ports), supported	les
- Max. number of IO devices per tool	8
Device replacement without swap medium	Yes
Send cycles	250 μs, 500 μs,1 ms; 2 ms, 4 ms
- Seria Cycles	(not in the case of IRT with "high
	flexibility" option)
 Updating time 	Minimum value depends on
	communication share set for PROFINET I/O, on the number
	of I/O devices, and on the number
	of configured user data.
Updating times	250 µs to 512 ms (depends on
- 1	operating mode; for more details,
	refer to Operating Instructions,
	"Interface Module IM151-8 PN/DP CPU")
Address area	
- Inputs, max.	2 kbyte
- Outputs, max.	2 kbyte
User data per address area,	,
max User data consistency, max.	1 024 byte; with PROFINET I/O
	1 024 Byte, Will I HOT INCT 1/O
PROFINET IO device	
• Services	V
- PG/OP communication	Yes
- Routing	Yes
- S7 communication	Yes; With loadable FBs
- Isochronous mode	No Yes; Via TCP/IP, ISO on TCP, UDP
- Open IE communication	Yes Yes
IRT, supportedPROFlenergy, supported	Yes; With SFB 73 / 74 prepared
- i noriellelgy, supported	for loadable PROFlenergy
	standard FB for I-Device
- Shared device, supported	Yes
- Number of IO controllers with	2
shared device, max.	

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Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Technical specifications (continued)	
	6ES7 151-8FB01-0AB0
Transfer memory Inputs, max. Outputs, max.	1 440 byte; Per IO controller with shared device 1 440 byte; Per IO controller with shared device
 Submodules Number, max. User data per submodule, max. 	64 1 024 byte
PROFINET CBA • acyclic transmission • cyclic transmission	Yes Yes
Open IE communication Open IE communication, supported Number of connections, max. Local port numbers used at the system end	Yes; Via TCP/IP, ISO on TCP, and UDP 8 0, 20, 21, 23, 25, 80, 102, 135, 161 8080, 34962, 34963, 34964, 65532 65533, 65534, 65535
2nd interface Type of interface	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	No
Functionality MPI DP master DP slave PROFINET IO controller PROFINET IO device PROFINET CBA Open IE communication Web server	No Yes No No No No No
DP master Services PG/OP communication Routing Global data communication S7 basic communication S7 communication S7 communication, as client S7 communication, as server Equidistance mode support Isochronous mode SYNC/FREEZE Activation/deactivation of DP slaves Number of DP slaves that can be simultaneously activated/deactivated, max. Direct data exchange (slave-to-slave communication) DPV1 Transmission rate, max. Number of DP slaves, max. Address area Inputs, max. Outputs, max.	Yes Yes No Yes; I blocks only Yes No Yes Yes No Yes Yes No Yes Yes 12 Mbit/s 32; Per station 2 048 byte 2 048 byte

	6ES7 151-8FB01-0AB0
User data per DP slave	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
Isochronous mode	
Isochronous mode	No
Programming	
Programming language	V V5.5 11.1
• STEP 7 • LAD	Yes; V5.5 or higher Yes
• FBD	Yes
• STL	Yes
• SCL	Yes; optional
• CFC	Yes; optional
• GRAPH	Yes; optional
HiGraph®	Yes; optional
Command set	See instruction list
Nesting levels	8
Know-how protection	
User program protection/	Yes
password protection	
Block encryption	Yes; with S7 block Privacy
System functions (SFC)	See instruction list
System function blocks (SFB)	See instruction list
Alarms/diagnostics/status infor-	
mation	
Alarms	
Alarms	Yes
Diagnostics	
Diagnostic functions	Yes
Diagnostic indication LED	
 Bus activity PROFINET P1-LINK (green) 	Yes
Bus activity PROFINET P2-LINK	Yes
(green)	.66
• Bus activity PROFINET P3-LINK	Yes
(green)	Vaa
Bus error (red)Maintenance information MT	Yes Yes
(yellow)	163
Group error SF (red)	Yes
Monitoring 24 V voltage supply	Yes
ON (green)	
Isolation	
Isolation checked with	500 V DC
Galvanic isolation	
between PROFIBUS DP and all	Yes
other circuit components	
Permissible potential difference between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
• Width	120 mm; DP master module:
a I laimht	35 mm
HeightDepth	119.5 mm 75 mm
· · · · · · · · · · · · · · · · · · ·	75 111111
Weight • Weight, approx.	320 g; DP master module:
- Ψοιβιπ, αρριολ.	approx. 100 g

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

6ES7 151-8FB00-0AB0	
IM151-8F PN/DP	
STEP7 V 5.4 SP4 or higher, Distributed Safety V5.4 SP4 or higher	
-	
20.4 V	
24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: The 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before the device protection fuse. The 24 V DC/16 A miniature circuit breaker with type C tripping characteristics trips	
5 ms	
1.8 A; typ.	
0.21 A ² ·s	
700 mA	
380 mA; 460 mA with DP master module	
5.5 W	
192 Kibyte; For program and data No 64 kbyte	
Yes 8 Mbyte	
1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.	
511; Number range: 1 to 511 64 Kibyte	
1 024; Number range: 0 to 2047 64 Kibyte	
1 024; Number range: 0 to 2047 64 Kibyte	
64 Kibyte	

	6ES7 151-8FB00-0AB0
CPU processing times	
for bit operations, min.	0.1 μs
for word operations, min.	0.2 μs
for fixed point arithmetic, min.	2 μs
for floating point arithmetic, min.	3 µs
Counters, timers and their	· ·
retentivity	
S7 counter	
Number	256
Retentivity	
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	Z 0 to Z 7
Counting range	
- adjusted	Yes
- lower limit	0
- upper limit	999
EC counter	
• Type	SFB
Number	Unlimited (limited only by RAM
	capacity)
S7 times	
Number	256
 Retentivity 	
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	No retentivity
Time range	
- lower limit	10 ms
- upper limit	9 990 s
IEC timer	
• Type	SFB
Number	Unlimited (limited only by RAM
	capacity)
Data areas and their retentivity	
Flag	0501
Number, max.	256 byte
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	
Number, max.	511; Number range: 1 to 511
• Size, max.	64 Kibyte
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	
 per priority class, max. 	510 byte; per priority class
Address area	
I/O address area	
Overall	2 048 byte
Outputs	2 048 byte
 of which, distributed 	
- Inputs	2 048 byte
- Outputs	2 048 byte

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Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

lechnical specifications (con	ilinuea)
	6ES7 151-8FB00-0AB0
Process image Inputs, adjustable Outputs, adjustable Inputs, preset Outputs, preset	2 048 byte 2 048 byte 128 byte 128 byte
Subprocess images • Number of subprocess images, max.	None
Digital channels Inputs Outputs Inputs, of which central Outputs, of which central	16 336 16 336 496 496
Analog channels Inputs Outputs Inputs, of which central Outputs, of which central	1 021 1 021 124 124
Hardware configuration Number of mounting rails that can be used	1
Max. length of mounting rail	Station width: <= 1 m or < 2 m
Number of modules per system, max.	63; Centralized
Time Clock Hardware clock (real-time clock) Battery-backed and synchronizable Backup time Behavior of the clock following expiry of backup period Deviation per day, max. Runtime meter	Yes Yes 6 wk; At 40 °C ambient temperature, typically Clock continues to run with the time at which the power failure occurred 10 s
NumberNumber/Number rangeRange of valuesGranularityRetentive	1 0 0 to 2^31 hours (when using SFC 101) 1 hour Yes; must be restarted at each restart
Clock synchronization • supported • to MPI, master • to MPI, slave • to DP, master • to DP, slave • in AS, master • in AS, slave • on Ethernet via NTP	Yes No No Yes; with DP master module Yes; with DP master module No No Yes; as client
S7 message functions Number of login stations for message functions, max.	12; depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ
Simultaneously active Alarm-S blocks, max.	300

6ES7 151-8FB00-0AB0	
0E37 131-01 B00-0AB0	
Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14	
Yes	
Yes	
Yes	
2	
Yes 500 No 100; only the last 100 entries are retained	
Yes	
Yes; with DP master module	
Yes; with DP master module	
No	
Yes; I blocks 76 byte 76 byte	
Yes Yes Yes; via integrated PN interface and loadable FBs 180 byte 64 byte	
No	
No	
Yes 5	
Yes; via integrated PROFINET interface and loadable FBs 8 1 460 byte 8 192 byte Yes; via integrated PROFINET interface and loadable FBs 8 192 byte	

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Technical specifications (continued)			
6ES7 151-8FB00-0AB0			
• UDP	Yes; via integrated PROFINET interface and loadable FBs		
Number of connections, max.Data length, max.	8 1 472 byte		
Number of connections			
• overall	12		
usable for PG communication	11		
 reserved for PG communi- cation 	1		
 Adjustable for PG communication, min. 	1		
 usable for OP communication 	11		
- reserved for OP communication	1		
- adjustable for OP communication, min.	1		
 usable for S7 basic communication Reserved for S7 basic commu- 	10		
nication	0		
 adjustable for S7 basic communication, min. 	0		
 usable for S7 communication Adjustable for S7 communication, max. 	10; with loadable FBs 10		
• max. total number of instances	32		
usable for routing	4; with DP master module		
PROFINET CBA (at set setpoint communication load) • Setpoint for the CPU communication load	50 %		
Number of remote intercon- nection partners	32		
Number of functions, master/ slave	30		
 Total of all Master/Slave connections 	1 000		
 Data length of all incoming connections master/slave, max. 	4 000 byte		
 Data length of all outgoing connections master/slave, max. 	4 000 byte		
 Number of device-internal and PROFIBUS interconnections 	500		
 Data length of device-internal und PROFIBUS interconnec- tions, max. 	4 000 byte		
 Data length per connection, max. 	1 400 byte		
Remote interconnections with acyclic transmission	500		
- Sampling frequency: Sampling time, min.	500 ms		
Number of incoming interconnections	100		
Number of outgoing interconnectionsData length of all incoming	2 000 byte		
interconnections, max. - Data length of all outgoing	2 000 byte		
interconnections, max. - Data length per connection,	1 400 byte		
max. Remote interconnections with	1 100 byto		
cyclic transmission - Transmission frequency: trans-	1 ms		
mission interval, min.	3		

	6ES7 151-8FB00-0AB0
Remote interconnections with	
cyclic transmission - Number of incoming interconnections	200
Number of outgoing interconnections	200
 Data length of all incoming interconnections, max. 	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte
 Data length per connection, max. 	250 byte
 HMI variables via PROFINET (acyclic) 	
 Number of stations that can log on for HMI variables (PN OPC/iMap) 	3; 2x PN OPC/1x iMap
- HMI variable updating	500 ms
 Number of HMI variables Data length of all HMI variables, max. 	200 2 000 byte
 PROFIBUS proxy functionality 	
 supported Number of linked PROFIBUS devices 	Yes 16
 Data length per connection, max. 	240 byte; Slave-dependent
1st interface	PROFINIT
Type of interface	PROFINET
Physics	Ethernet
Isolated	Yes
Integrated switch	Yes
Number of ports	3; RJ45
Automatic detection of trans- mission speed	Yes
Autonegotiation	Yes
Autocrossing	Yes
Functionality	
MPI DP master	No No
DP slave	No
PROFINET IO device	No
PROFINET IO controller	Yes
 PROFINET CBA 	Yes
Open IE communicationWeb server	Yes
- Number of HTTP clients	5
 Point-to-point connection 	No
PROFINET IO controller	
• Services	
- PG/OP communication	Yes
- Routing - S7 communication	Yes; with DP master module Yes; with loadable FBs
- Isochronous mode	No
- Open IE communication	Yes; via TCP/IP, ISO on TCP, and UDP
Transmission rate, max.	100 Mbit/s; full duplex
Number of connectable IO devices, max.	128
Max. number of connectable IO devices for RT	128
- of which in line, max.	128

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Technical specifications (continued)		
	6ES7 151-8FB00-0AB0	
PROFINET IO controller		
Number of IO devices with IRT and the option "high flexibility"	128	
- of which in line, max.	61	
IRT, supported	Yes	
Prioritized startup supported	Yes	
- Number of IO devices, max.	32	
Activation/deactivation of IO devices	Yes	
 Number of IO devices that can be simultaneously activated/ deactivated, max. 	8	
 IO devices changing during operation (partner ports), supported 	Yes	
 Max. number of IO devices per tool 	8	
 Device replacement without swap medium 	Yes	
Send cycles	Adjustable: 250 µs, 500 µs and 1 ms	
Updating time	Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data units.	
Updating times	250 µs - 128 ms (at signal cycle 250 µs); 500µs - 256 ms (at signal cycle 500 µs); 1 ms - 512 ms (at signal cycle 1 ms)	
Address area		
- Inputs, max.	2 kbyte	
 Outputs, max. User data per address area, max. 	2 kbyte	
- User data consistency, max.	254 byte; with PROFINET I/O	
PROFINET CBA		
acyclic transmissioncyclic transmission	Yes Yes	
Open IE communication		
Open IE communication, supported	Yes; Via TCP/IP, ISO on TCP, and UDP	
Number of connections, max.	8	
Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	
2nd interface		
Type of interface	External interface via master module 6ES7138-4HA00-0AB0	
Physics	RS 485	
Isolated	Yes	
Power supply to interface (15 to 30 V DC), max.	No	
Functionality		
• MPI	No	
DP master	Yes	
DP slave	No	
PROFINET IO controller	No	
PROFINET IO device	No	
PROFINET CBA	No	
Open IE communication	No	
Web server	No No	
Local Operating Network	No	

	6ES7 151-8FB00-0AB0
DP master	
Number of connections, max.	12; Notice: 12 connections per CPU, not per interface
Services PG/OP communication Routing Global data communication S7 basic communication S7 communication S7 communication, as client S7 communication, as server Equidistance mode support Isochronous mode SYNC/FREEZE Activation/deactivation of DP slaves Direct data exchange (slaveto-slave communication) DPV1 Transmission rate, max. Number of DP slaves, max. Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max.	Yes Yes No Yes; I blocks only Yes No Yes No Yes Yes Yes Yes Yes Yes Yes Yes 2 Mo Yes Yes Yes Yes Yes Yes Yes Yes 2 Mo 2 048 byte 2 44 byte
- Inputs, max.	244 byte 244 byte
Isochronous mode	~,
Isochronous mode	No
Programming Programming language • STEP 7 • LAD • FBD • STL • SCL • CFC • GRAPH • HiGraph®	Yes; V5.4 SP4 Yes Yes Yes Yes; optional Yes; optional Yes; optional Yes; optional
Command set	See instruction list
Nesting levels	8
Know-how protection • User program protection/ password protection	Yes
System functions (SFC)	See instruction list
System function blocks (SFB)	See instruction list
Alarms/diagnostics/status information	
Alarms • Alarms	Yes
Diagnostics • Diagnostic functions	Yes

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

	6ES7 151-8FB00-0AB0
Diagnostic indication LED	
 Bus activity PROFINET P1-LINK (green) 	Yes
 Bus activity PROFINET P2-LINK (green) 	Yes
 Bus activity PROFINET P3-LINK (green) 	Yes
Bus error (red)	Yes
 Maintenance information MT (yellow) 	Yes
 Group error SF (red) 	Yes
 Monitoring 24 V voltage supply ON (green) 	Yes
Isolation	
Isolation checked with	500 V DC

	6ES7 151-8FB00-0AB0
Galvanic isolation	
between load voltage and all other switching components	Yes
between PROFIBUS DP and all other circuit components	Yes
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
• Width	120 mm; DP master module: 35 mm
Height	119.5 mm
• Depth	75 mm
Weight	
Weight, approx.	320 g; DP master module: approx. 100 g

ET 200S

Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

Ordering data	Order No.		Order No.
IM 151-8F PN/DP CPU interface	6ES7 151-8FB01-0AB0	Label sheets DIN A4 (10 units)	
module (256 K) Including termination module		Each sheet contains 60 labeling strips for I/O modules and	
Distributed Safety V5.4 programming tool		20 labeling strips for interface modules	0707 400 471100 04 40
Task: Software for configuring fail-safe application programs for SIMATIC S7-300F, S7-400F, ET 200S		petrolredyellowlight beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0
Requirements: STEP 7 V5.3 SP3 and higher		ET 200S distributed I/O system manuals	
Floating license	6ES7 833-1FC02-0YA5	are available on the Internet as PDF files:	
Software Update Service	6ES7 833-1FC00-0YX2	www.siemens.com/simatic-docu	
Distributed Safety Upgrade	6ES7 833-1FC02-0YE5	Termination module	6ES7 193-4JA00-0AA0
From V5.3 to V5.4; Floating license for 1 user		as spare part for ET 200S	
Accessories		SIMATIC S5, 35 mm DIN rail	
MMC 64 KB ¹⁾	6ES7 953-8LF20-0AA0	 Length: 483 mm for 19" cabinets Length: 530 mm for 600 mm 	6ES5 710-8MA11 6ES5 710-8MA21
for program backup		cabinets	0E35 / 10-6MAZ1
MMC 128 KB ¹⁾	6ES7 953-8LG20-0AA0	 Length: 830 mm for 900 mm cabinets 	6ES5 710-8MA31
for program backup		• 2 m long	6ES5 710-8MA41
MMC 512 KB ¹⁾	6ES7 953-8LJ20-0AA0	Industrial Ethernet FC RJ45	
for program backup		Plug 180	
MMC 2 MB ¹⁾	6ES7 953-8LL20-0AA0	RJ45 plug connector for Industrial Ethernet with a rugged metal	
for program backup and/or firmware update		enclosure and integrated insulation displacement contacts	
MMC 4 MB ¹⁾	6ES7 953-8LM20-0AA0	for connecting Industrial Ethernet FC installation cables; with	
for program backup		180° cable outlet	
MMC 8 MB ¹⁾	6ES7 953-8LP20-0AA0	• 1 unit • 10 units	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0
for program backup		• 50 units	6GK1 901-1BB10-2AB0
External prommer	6ES7 792-0AA00-0XA0	Industrial Ethernet FastConnect	
e.g. for MMC with USB interface		installation cables	0004 040 04140
PG	On request	 Fast Connect standard cable Fast Connect trailing cable 	6XV1 840-2AH10 6XV1 840-3AH10
with integrated MMC interface		Fast Connect marine cable	6XV1 840-4AH10
		Industrial Ethernet FastConnect stripping tool	6GK1 901-1GA00

¹⁾ An MMC is essential for operating the CPU

ET 200S

SIPLUS interface modules with fail-safe CPU SIPLUS IM 151-7 F CPU

Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration through DP master modules (PROFIsafe)
- The fail-safe I/O modules of ET 200S PROFIsafe can be connected in a centralized configuration
- Standard modules can be used for non-safety-relevant applications

Note: Micro Memory Card required for operation of CPU.

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 151-7 F CPU Standard interface module
Order No.	6AG1 151-7FA20-2AB0
Order No. based on	6ES7 151-7FA20-0AB0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100%, condensation allowed

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 151-7 F CPU interface module	6AG1 151-7FA20-2AB0
(extended temperature range and medial exposure)	
For configuring a fail-safe automation system	
Accessories	See SIMATIC IM151-7 F CPU interface module, page 9/31

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ET 200S

SIPLUS interface modules with fail-safe CPU SIPLUS IM 151-8 F PN/DP CPU

Overview



- Interface module for SIPLUS ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase in the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET I/O-Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC micro memory card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

SIMATIC Micro Memory Card required for operation of the CPU.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS IM 151-8 F PN/DP CPU			
Order No.	6AG1 151-8FB00-2AB0		
Order No. based on	6ES7 151-8FB00-0AB0		
Ambient temperature range	-25 +60 °C		
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Ambient conditions:			
Relative humidity	5 100% Condensation permissible		

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
Interface module SIPLUS IM 151-8F PN/DP CPU	6AG1 151-8FB00-2AB0
(extended temperature range and medial exposure)	
Including termination module	
Accessories	See SIMATIC IM 151-8F PN/DP CPU interface module, page 9/42

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ET 200S

Interface modules without CPU

Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master
- 6 versions:

 - IM151-1 BASIC (RS485) IM151-1 COMPACT 32DI DC24V (RS485) IM151-1 COMPACT 16DI DC24V / 16DO DC24V/0.5A (RS485)
- IM151-1 STANDARD (RS485) IM151-1 STANDARD (FO) IM151-1 HIGH FEATURE (RS485)
- Delivery including connection module

The main differences between the IM151-1 versions:

	IM151-1 BASIC	IM151-1 COMPACT	IM151-1 STANDARD	IM151-1 FO STANDARD	IM151-1 HIGH FEATURE
Order number 6ES7 151-	1CA00-0AB0	1CA00-1BL00 1CA00-3BL00	1AA05-0AB0	1AB05-0AB0	1BA02-0AB0
Integral I/O	-	32 DI 16DI / 16 DO	-	-	-
Maximal number of I/O modules	12	12	63	63	63
Maximum station width	2 m	2 m	2 m	1 m	2 m
Maximal number of parameters	198 byte	218 byte	244 byte	244 byte	244 byte
Maximum address space for inputs and outputs	88 byte each	100 byte each	244 byte	128 byte	Depending on the DP master: 244 byte or not relevant
Maximum diagnostic length	6 to 43 byte	6 to 44 byte	6 to 122 byte	6 to 64 byte	6 to 128 byte
Protocol	DP V0	DP V0	DP V0 and DP V1	DP V0	DP V0 and DP V1
DP connection type	RS485	RS485	RS485	Fiber-optic cable	RS485
Firmware update	No	No	Yes	No	Yes
Option handling	No	No	Yes	Yes	Yes
Isochronous mode	No	No	No	No	Yes
Maximum address volume per module	8 byte	8 byte	32 byte	8 byte	32 byte
Identification data	No	No	Yes	No	Yes
Use of fail-safe modules (PROFIsafe)	No	No	No	No	Yes
I-slave-to-slave communication	No	No	No	No	Yes

ET 200S
Interface modules without CPU
IM 151-1

Technical specifications

	6ES7 151-1AA05-0AB0	6ES7 151-1AB05-0AB0	6ES7 151-1BA02-0AB0	6ES7 151-1CA00-0AB0
Supply voltages Supply voltage of electronics				
1L+	04.14	041/	041/	0414
Rated value (DC)Reverse polarity protection	24 V Yes	24 V Yes	24 V Yes	24 V Yes
				No
Mains buffering, min.	20 ms	20 ms	20 ms	INO
Current consumption Current output to backplane bus (5 V DC), max.		700 mA		
from supply voltage 1L+, max.	200 mA	200 mA	200 mA	70 mA
Power losses Power loss, typ.	3.3 W	3.3 W	3.3 W	1.5 W
Address area				
Addressing volume				
Outputs	244 byte	244 byte	244 byte	88 byte
• Inputs	244 byte	244 byte	244 byte	88 byte
Interfaces PROFIBUS DP, output current, max.	80 mA			80 mA
Interface physics, RS 485	Yes; 9-pin sub D socket		Yes	Yes; 9-pin sub D socket
Interface physics, FOC		Yes; 4x Simplex socket		
Protocols		· · · · · · · · · · · · · · · · · · ·		
PROFIBUS DP protocol	Yes	Yes	Yes	Yes
PROFIBUS DP				
Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 /19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 12 Mbit/s	12 Mbit/s	12 Mbit/s; 9.6 /19.2 /45.45 / 93.75 /187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s
Cable length, max.	1 200 m	2 m		
SYNC capability	Yes	Yes	Yes	Yes
FREECE capability	Yes	Yes	Yes	Yes
Direct data exchange (slave-to-slave communication)	Yes	Yes	Yes	Yes
Isochronous mode Isochronous mode	No	No	Yes	No
Alarms/diagnostics/status information				
Alarms				
Alarms	Yes	Yes	Yes	No
Diagnostics Diagnostic functions	Yes	Yes	Yes	Yes
Diagnostic indication LED				
Bus fault BF (red) Crayer array CF (red)	Yes	Yes	Yes	Yes
Group error SF (red)Monitoring 24 V voltage supply ON (green)	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Isolation				
Isolation checked with	500 V DC	57 V DC / 60 V AC	500 V DC	500 V DC
Galvanic isolation between backplane bus and electronics	No	No	No	No
between electronic block and PROFIBUS DP	Yes		Yes	Yes
between supply voltage and electronics	No	No	No	No

ET 200S

Interface modules without CPU IM 151-1

	6ES7 151-1AA05-0AB0	6ES7 151-1AB05-0AB0	6ES7 151-1BA02-0AB0	6ES7 151-1CA00-0AB0
Permissible potential difference				
between different circuits	75 V DC / 60 V AC	500 V DC	75 V DC / 60 V AC	75 V DC / 60 V AC
General information Vendor identification (VendorID)	806Ah	806Bh		80F3h
Dimensions and weight Dimensions				
• Width	45 mm	45 mm	45 mm	45 mm
Height	119.5 mm	119.5 mm	119.5 mm	119.5 mm
• Depth	75 mm	75 mm	75 mm	75 mm
Weight				
 Weight, approx. 	150 g	150 g	150 g	150 g

	6ES7 151-1CA00-1BL0	6ES7 151-1CA00-3BL0	
Supply voltages			
Supply voltage of electronics 1L+			
• Rated value (DC)	24 V	24 V	
Reverse polarity protection	Yes	Yes	
Current consumption	100 4 100	100 4	
from supply voltage 1L+, max.	100 mA; 100	100 mA	
Address area			
Addressing volume	100 huto	100 6.40	
OutputsInputs	100 byte 100 byte	100 byte 100 byte	
•	100 byte	100 byte	
Interfaces PROFIBUS DP, output current, max.		80 mA	
	V		
Interface physics, RS 485	Yes	Yes	
Interface physics, FOC	No	No	
Connection method			
Inputs/outputs		Screw-type and spring-loaded terminals,	
		permanent wiring; 3 and 4-wire connection	
Protocols	V	V	
PROFIBUS DP protocol	Yes	Yes	
TCP/IP protocol		No	
PROFINET IO		No	
PROFIBUS DP			
Transmission procedure	RS 485	RS 485	
Cable length, max.	1 200 m	1 200 m	
Direct data exchange	Yes	Yes	
(slave-to-slave communication)			
PROFINET IO			
Transmission rate, max.		12 Mbit/s	
Isochronous mode			
Isochronous mode	No	No	
Digital inputs			
Quantity/binary inputs	32	16	
Input voltage			
Rated value, DC	24 V	24 V	
• for signal "0"	-30 to +5 V	-30 to +5 V	
• for signal "1"	13 to 30 V	13 to 30 V	
Input current			
for signal "1", typ.	4 mA; at 24 V min. 2 mA	3 mA	

ET 200S
Interface modules without CPU
IM 151-1

Technical specifications (continued)		
	6ES7 151-1CA00-1BL0	6ES7 151-1CA00-3BL0
Input delay (for rated value of input voltage)		
• for standard inputs		2
- at "0" to "1", min. - at "0" to "1", max.	3 ms	3 ms 3 ms
Cable length	31118	31118
Cable length unshielded, max.	1 000 m	1 000 m
Digital outputs		
Quantity/binary outputs	0	16
Functionality/short-circuit strength		Yes
Limitation of inductive shutdown voltage to		L+ (-55 to -60 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output current		
• for signal "1" permissible range for 0 to 60 °C, min.		7 mA
• for signal "0" residual current, max.		0.5 mA
Output delay with resistive load		
• 0 to "1", max.		0.5 ms 1.3 ms
• 1 to "0", max.		1.31118
Switching frequency • with resistive load, max.		100 Hz
with inductive load, max.		2 Hz
• on lamp load, max.		10 Hz
Aggregate current of outputs (per group) • up to 60 °C, max.		2 A
Cable length		
Cable length unshielded, max.		1 000 m
Encoder Connectable encoders		
• 2-wire BEROS		Yes
 permissible quiescent current (2-wire BEROS), max. 		1.5 mA
Alarms/diagnostics/status information		
Alarms		
• Alarms	No	No
Diagnostics • Diagnostic functions	Yes	Yes
Diagnostic indication LED	103	163
Run mode RUN (green)		Yes
• Group error SF (red)	Yes	Yes
 Status indicator digital output (green) 		Yes
Status indicator digital input (green)	V	Yes
Monitoring 24 V voltage supply ON (green)Connection to network LINK (green)	Yes	Yes No
Transmit/receive RX/TX (yellow)		No
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation between backplane bus and electronics		No
between supply voltage and electronics		No
		INU
Galvanic isolation digital inputs • Galvanic isolation digital inputs		No
Galvanic isolation digital outputs		Voe
Galvanic isolation digital outputs		Yes

ET 200S

Interface modules without CPU IM 151-1

Technical specifications (continued)

	6ES7 151-1CA00-1BL0	6ES7 151-1CA00-3BL0
Degree of protection		
IP20	Yes	Yes
General information		
Vendor identification (VendorID)		8200H
Dimensions and weight		
Dimensions and weight		
• Width	120 mm	120 mm
Height	81 mm	81 mm
• Depth	758 mm; 58	58 mm
Weight		
 Weight, approx. 		230 g; EB only

Ordering data	Order No.		Order No.
IM 151-1 BASIC interface module	6ES7 151-1CA00-0AB0	IM 151-1 HIGH FEATURE interface module	6ES7 151-1BA02-0AB0
for ET 200S; transfer rates up to 12 Mbit/s; max. 12 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module		for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte each for I/O, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode; bus connection via 9-pin sub D incl. termination module	
IM 151-1 COMPACT 32 DI 24 V DC interface module	6ES7 151-1CA00-1BL0	Accessories	
for ET 200S; transfer rates up to		TM-C120S terminal module	6ES7 193-4DL10-0AA0
12 Mbit/s; max. 32 digital inputs, can be expanded by max. 12 power, electronic and motor start		Terminal module for ET 200S COMPACT, screw-type terminals	
modules; bus connection via 9- pin sub D incl. termination		TM-C120C terminal module	6ES7 193-4DL00-0AA0
module IM 151-1 COMPACT 16 DI 24 V	6ES7 151-1CA00-3BL0	Terminal module for ET 200S COMPACT, spring-loaded terminals	
DC / 16 DO 24 V/0.5 A interface module		TE-U120S4x10 add-on terminal	6ES7 193-4FL10-0AA0
for ET 200S; transfer rates up to 12 Mbit/s; max. 16 digital inputs and 16 digital outputs, can be expanded by max. 12 power, electronic and motor start		Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; screw-type terminals for 3-wire connection; please order two for 4-wire connection	
modules; bus connection via 9-pin sub D incl. termination module		Can also be attached to TM-E/ TM-P, provided at least 120 mm of the construction width attains the same overall height as the	
IM 151-1 STANDARD interface module	6ES7 151-1AA05-0AB0	terminal module	
for ET 200S; transfer rates up to		TE-U120C4x10 add-on terminal	6ES7 193-4FL00-0AA0
12 Mbit/s; data volumes 244 byte each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module		Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; spring-loaded terminals for 3-wire connection; please order two for 4-wire connection	
IM 151-1 FO STANDARD interface module	6ES7 151-1AB05-0AB0	Can also be attached to TM-E/ TM-P, provided at least 120 mm	
for ET 200S, transfer rates up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs; max.		of the construction width attains the same overall height as the terminal module	
63 power, electronic and starter modules can be connected; bus		ET 200S distributed I/O system manuals	
connection via integrated fiber- optic cable incl. termination module		are available on the Internet as PDF files:	
		www.siemens.com/simatic-docu	
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ET 200S

Interface modules without CPU

Ordering data	Order No.		Order No.
SIMATIC Manual Collection J	6ES7 998-8XC01-8YE0	Label sheets DIN A4 (10 units)	
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)		Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige Label sheets DIN A4 (10 units)	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0
SIMATIC Manual Collection – D Update service for 1 year	6ES7 998-8XC01-8YE2	Can be used for ET 200S COMPACT.	
Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates		Each sheet has 10 labeling strips • beige • yellow	6ES7 193-4BA10-0AA0 6ES7 193-4BB10-0AA0
PROFIBUS DP bus connector RS 485		redpetrol	6ES7 193-4BD10-0AA0 6ES7 193-4BH10-0AA0
With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s		Termination module as spare part for ET 200S	6ES7 193-4JA00-0AA0
Without PG interface		Power supply connector	
• 1 unit • 100 units	6ES7 972-0BA52-0XA0 6ES7 972-0BA52-0XB0	Spare part; for connecting the 24 V DC supply voltage	
With PG interface • 1 unit • 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0	with push-in terminals with screw-type terminals	6ES7 193-4JB00-0AA0 6ES7 193-4JB50-0AA0
100 Simplex connectors	6GK1 901-0FB00-0AA0	SIMATIC S5, 35 mm DIN rail	
For plastic fiber-optic cable incl. 5 polishing sets		 Length: 483 mm for 19" cabinets Length: 530 mm for 600 mm cabinets 	6ES5 710-8MA11 6ES5 710-8MA21
50 plug adapters	6ES7 195-1BE00-0XA0	Length: 830 mm for 900 mm	6ES5 710-8MA31
For 2 Simplex connectors each		cabinets • Length: 2 m	6ES5 710-8MA41

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200S

Interface modules without CPU IM 151-3 PN

Overview



- Interface module for linking the ET 200S to PROFINET
- Handles all data exchange with the PROFINET I/O Controller
- 3 versions:

 - IM151-3 PN STANDARD
 IM151-3 PN HIGH FEATURE and IM 151-3 PN FO: supports, in contrast to the STANDARD version, the operation of PROFIsafe F modules
- with integrated 2-port switch for line topology
- Delivery including termination module

Micro Memory Card required for operation depending on the configuration.

Technical specifications

	6ES7 151-3AA23-0AB0	6ES7 151-3BA23-0AB0
Supply voltages Supply voltage of electronics 1L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Mains/voltage failure jumpering, min.	20 ms	20 ms
Current consumption from supply voltage 1L+, max.	250 mA	250 mA
	250 IIIA	250 IIIA
Current consumption/power loss Power loss, typ.	2.5 W	2.5 W
	2.5 W	2.0 **
Address area Adressing volume		
Outputs	256 byte	256 byte
• Inputs	256 byte	256 byte
Interfaces	,	,
Automatic detection of transmission speed	Yes	Yes
Connection point		
RJ45	Yes	Yes
Protocols		
PROFINET IO	Yes	Yes
PROFINET IO		
Transmission speed, max.	100 MBit/s	100 MBit/s
Isochronous mode		
Isochronouos mode	Yes	Yes
Status information/alarms/diagnostics Alarms		
• Alarms	Yes	Yes
Diagnostics		
Diagnostic functions	Yes	Yes
Diagnostic indication LED		
Bus error BF (red)	Yes	Yes
Collective error SF (red)	Yes	Yes
 Monitoring 24 V voltage supply ON (green) 	Yes	Yes
Connection to network LINK (green)	Yes	Yes
Maintenance (yellow)	Yes	Yes

ET 200S

Interface modules without CPU IM 151-3 PN

	6ES7 151-3AA23-0AB0	6ES7 151-3BA23-0AB0
Galvanic isolation		
between backplane bus and electronics	No	No
between supply voltage and electronics	No	No
between Ethernet and electronics	Yes	Yes
General information		
Vendor identification (VendorID)	002AH	002AH
Device identifier (DeviceID)	0301	0301H
Dimensions		
Dimensions		
• Width	60 mm	60 mm
Height	119.5 mm	119.5 mm
• Depth	75 mm	75 mm
Weights		
 Weight, approx. 	120 g	135 g

Ordering data	Order No.		Order No.
IM 151-3 PN interface module		Termination Kits	
For ET 200S; transfer rates up to 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45	6ES7 151-3AA23-0AB0	SC RJ POF Plug Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, kevlar cutter, microscope, abrasive paper, grinding support	6GK1 900-0ML00-0AA0
IM 151-3 PN PROFINET High Feature interface module		IE SC RJ POF Plug Screw-in plug for on-site assembly to POF fiber optic cable	6GK1 900-0MB00-0AC0
for ET 200S; transfer rate up to 100 Mbit/s; max. 63 modules up	6ES7 151-3BA23-0AB0	(1 pack = 20 units)	
to 2 m wide can be connected; bus connection via RJ45, incl. termination module		IE SC RJ Refill Set POF Refill set for Termination Kit SC RJ POF Plug, consisting of abrasive	6GK1 900-0MN00-0AA0
IM 151-3 FO interface module	6ES7 151-3BB23-0AB0	paper and grinding plate (set of 5)	
for ET 200S; with 2 PROFINET FO-interfaces and integrated 2-port switch, max. 63 modules up to 2 m wide can be connected, incl. termination module		SC RJ POF Plug Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, buffer stripping tool, kevlar cutter, fiber breaking tool, microscope	6GK1 900-0NL00-0AA0
Accessories		Industrial Ethernet SC RJ PCF	6GK1 900-0NB00-0AC0
Industrial Ethernet FC RJ45 Plug 90 RJ45 plug connector for Industrial		Plug Screw-in plug for on-site assembly to PCF fiber optic cable (1 pack = 10 units)	
Ethernet with a rugged metal enclosure and integrated insulation displacement contacts		Industrial Ethernet Fast Connect stripping tool	6GK1 901-1GA00
for connecting Industrial Ethernet FC installation cables: with		MMC 64 KB ¹⁾	6ES7 953-8LF20-0AA0
90° cable outlet		For storing the device name	
1 unit	6GK1 901-1BB20-2AA0	MMC 128 KB ¹⁾	6ES7 953-8LG20-0AA0
10 units	6GK1 901-1BB20-2AB0	For storing the device name	
50 units	6GK1 901-1BB20-2AE0	MMC 512 KB ¹⁾	6ES7 953-8LJ20-0AA0
Industrial Ethernet FastConnect installation cables		For storing the device name	
Fast Connect standard cable	6XV1 840-2AH10		
Fast Connect trailing cable	6XV1 840-3AH10		
Fast Connect marine cable	6XV1 840-4AH10		

ET 200S

Interface modules without CPU IM 151-3 PN

Ordering data	Order No.	Order No.		
MMC 2 MB ¹⁾	6ES7 953-8LL20-0AA0	Label sheets DIN A4 (10 units)		
For storing the device name and/or firmware update		Each sheet contains 60 labeling strips for I/O modules and		
MMC 4 MB ¹⁾	6ES7 953-8LM20-0AA0	20 labeling strips for interface modules		
For storing the device name and/or firmware update		petrolred	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0	
MMC 8 MB ¹⁾	6ES7 953-8LP20-0AA0	• yellow	6ES7 193-4BB00-0AA0	
For storing the device name and/or firmware update		• light beige	6ES7 193-4BA00-0AA0	
ET 200S distributed I/O system		Termination module	6ES7 193-4JA00-0AA0	
manuals		as spare part for ET 200S		
are available on the Internet as PDF files:		Power supply connector Spare part;		
www.siemens.com/simatic-docu		for connecting the 24 V DC supply voltage		
SIMATIC Manual Collection J	6ES7 998-8XC01-8YE0	with push-in terminals	6ES7 193-4JB00-0AA0	
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)		with screw-type terminals DIN rail 35 mm Length: 483 mm for 19" cabinets Length: 530 mm for 600 mm cabinets Length: 830 mm for 900 mm cabinets 2 m long Industrial Ethernet Switches	6ES7 193-4JB50-0AA0 6ES5 710-8MA11 6ES5 710-8MA21 6ES5 710-8MA31 6ES5 710-8MA41	
SIMATIC Manual Collection - D	6ES7 998-8XC01-8YE2	Managed Industrial Ethernet		
Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates		Switches; Isochronous real time, LED diagnostics, fault signaling contact with SET button, redundant power supply • SCALANCE X202-2P IRT; 2 x 10/100 Mbit/s RJ45 ports, 2 x 100 Mbit/s POF/PCF SC RJ • SCALANCE X201-3P IRT; 1 x 10/100 Mbit/s RJ45 ports, 3 x 100 Mbit/s POF/PCF SC RJ • SCALANCE X200-4P IRT; 4 x 100 Mbit/s POF/PCF SC RJ	6GK5 202-2BH00-2BA3 6GK5 201-3BH00-2BA3 6GK5 200-4AH00-2BA3	

¹⁾ For operating the IM 151-3, an MMC is essential

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200S

SIPLUS interface modules without CPU SIPLUS IM 151-1

Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- · Handles all data exchange with the PROFIBUS DP master

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 151-1 Standard	SIPLUS IM 151-1 High Feature
Order number	6AG1 151-1AA05- 7AB0	6AG1 151-1BA02- 2AB0
Order No. based on	6ES7 151-1AA05- 0AB0	6ES7 151-1BA02- 0AB0
Ambient temperature range	-25 +70 °C	-25 +60 °C
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents
	The technical data of product applies exconditions.	cept for the ambient

	SIPLUS IM 151-1 Standard	SIPLUS IM 151-1 High Feature
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temper-	1080 795 hPa (-1 see ambient tempe	
ature range specified)	795 658 hPa (+2 derating 10 K	000 +3500 m)
	658 540 hPa (+3 derating 20 K	500 +5000 m)

- 1) ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 151-1 STANDARD interface module	6AG1 151-1AA05-7AB0
(extended temperature range and medial exposure)	
for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin D-sub incl. termination module	
SIPLUS IM 151-1 HIGH H	6AG1 151-1BA02-2AB0
(extended temperature range and medial exposure)	
for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode (clock synchronization); bus connection via 9-pin Sub-D incl. termination module	
Accessories	See SIMATIC IM 151-1, page 9/49

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

SIPLUS interface modules without CPU SIPLUS IM 151-3PN

Overview



- Interface module for connection of ET 200S PROFINET
- Handles all data exchange with the PROFINET I/O Controller
- IM 151-3 PN STANDARD
- · With integrated 2-port switch for line topology

Micro Memory Card required for CPU operation.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 151-3 PN
Order number	6AG1 151-3AA23-2AB0
Order number based on	6ES7 151-3AA23-0AB0
Ambient temperature range	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range
	795 658 hPa (+2000 +3500 m) derating 10 K
	658 540 hPa (+3500 +5000 m) derating 20 K
1)	

¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Technical documentation on SIPLUS is available under:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS IM 151-3 PN interface module	
(extended temperature range and medial exposure)	
For ET 200S; transfer rates up to H 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45	6AG1 151-3AA23-2AB0
Accessories	See SIMATIC IM 151-3 PN interface module, page 9/52

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200S

I/O modules

Power modules for PM-E electronic modules

Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding
- Diagnostic message for voltage and blown fuse (can be switched off via configuration)
- PM-E 24 V DC Standard
 - load voltage diagnostics
- PM-E 24 V DC High Feature
 - load voltage and reverse voltage diagnostics
 - with status information
 - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- 24 to 48 V DC PM-E power module
 - load voltage diagnostics
 - with status information
 - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- PM-E 24 V DC to 230 V AC power module
 - power module for universal use
- with integral replaceable fuse
- with status information
- option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM151-1 High Feature)

Technical specifications

	6ES7 138-4CA01- 0AA0	6ES7 138-4CB11- 0AB0
Product type designation	PM-E 24 V DC	
Power supply Current carrying capacity • Current carrying capacity up to 60 °C, max.	10 A	
Supply voltages Load voltage L+ • Rated value (DC) • Short-circuit protection	24 V No; external (e.g. automatic circuit breaker), tripping characteristic C Yes	
Reverse polarity protection	res	
Current consumption from load voltage 1L+ (without load), max.	4 mA	
Power losses Power loss, typ.	0.1 W	
Parameter Remark	3 byte	
Missing load voltage	Disable / enable	
Alarms/diagnostics/status information Diagnostics • Diagnostics • Missing load voltage	Yes Yes	
 Diagnostic indication LED Rated load voltage PWR (green) Group error SF (red) 	Yes Yes	
Isolation Isolation checked with	500 V DC	
Galvanic isolation primary/secondary	Yes; between rated load voltage and backplane bus, between power modules	
Dimensions and weight Dimensions • Width • Height • Depth Weight	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm
Weight, approx.	35 g	

ET 200S

I/O modules
Power modules for PM-E electronic modules

Technical specifications (continued)		Ordering data	Order No.
	6ES7 138-4CA50-0AB0	PM-E 24 V DC Standard power	
Product type designation	PM-E 24 to 48 V DC	module ¹⁾	
Power supply		For electronic modules; with	
Current carrying capacity		diagnostics	
Current carrying capacity up to	10 A	1 unit	6ES7 138-4CA01-0A
60 °C, max.		5 units	6ES7 138-4CA01-1A
Supply voltages		PM-E 24 V DC High Feature	6ES7 138-4CA60-0AI
Load voltage L+ Rated values	24 to 48 V DC	power module 1)	
Short-circuit protection	No; external (e.g. automatic	For electronic modules; with	
- Short-circuit protection	circuit breaker), tripping	diagnostics	
	characteristic B, C	24 48 V DC PM-E power	
Reverse polarity protection	Yes	module	
Current consumption		For electronic modules; with diagnostics, with status bit "load	
from load voltage 1L+ (without	12 mA	voltage" present	
load), max.		1 unit	6ES7 138-4CA50-0AI
Power losses	500 \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	5 units	6ES7 138-4CA50-1AI
Power loss, typ.	500 W; mW		
Parameter		Power module PM-E 24 48 V DC,	6ES7 138-4CB11-0AI
Remark	3 byte	42 230 V AC	
Missing load voltage	Disable / enable	For electronic modules; with	
Alarms/diagnostics/status infor-		diagnostics and fuse	
mation		Accessories	
Diagnostics • Diagnostics	Yes	Label sheets DIN A4 (10 units)	
Missing load voltage	Yes	,	
	163	Each sheet contains 60 label strips for I/O modules and	
Diagnostic indication LED Rated load voltage PWR (green)	Yes	20 label strips for interface	
Group error SF (red)	Yes	modules	
Isolation		• petrol	6ES7 193-4BH00-0A/
Isolation Isolation checked with	500 V DC	redyellow	6ES7 193-4BD00-0AA 6ES7 193-4BB00-0AA
Galvanic isolation	555 V BO	yellowlight beige	6ES7 193-4BB00-0A7
	Yes; between rated load voltage	- light beige	0E37 133-4DA00-0A7
primary/secondary	and backplane bus, between		
	power modules		
Dimensions and weight			
Dimensions			
• Width	15 mm		
• Height	81 mm		
Depth	52 mm		
Weight			
 Weight, approx. 	35 g		

Can be used for all electronic and technology modules except 2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

I: Subject to export regulations AL: N and ECCN: EAR99H $\,$

Selection tool for terminal modules

Power modules	TM-P terminal modules for power modules			
Screw-type terminal type designation	TM-P15S23-A1	TM-P15S23-A0	TM-P15S22-01	TM-P30S44-A0
Order No.: 6ES7 193	4CC20-0AA0	4CD20-0AA0	4CE00-0AA0	4CK20-0AA0
Spring-loaded terminal type designation	TM-P15C23-A1	TM-P15C23-A0	TM-P15C22-01	TM-P30C44-A0
Order No.: 6ES7 193	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come
Order No.: 6ES7 193	4CC70-0AA0	4CD70-0AA0	4CE60-0AA0	
PM-E 24 V DC	•	•	•	
PM-E 24 48 V DC	•	•	•	
PM-E 24 V DC/120/230 V AC	•	•	•	
PM-E F 24 V DC PROFIsafe				•

ET 200S

I/O modules Spare modules

Overview



- Applicable only on IM 151-1 Standard interface modules as of 6ES7151-1AA04-0AB0 and IM 151-1 High Feature as of 6ES7151-1BA02-0AB0
- Suitable for all TM-E terminal modules (15 mm and 30 mm construction width)
- Reserves one slot for any electronic module. The spare module is inserted into the reserved slot of the ET 200S configuration.
- Terminal module can be wired up for the function to be used later.
- The spare module has no connection to the terminals of the TM-E terminal module. The TM-E terminal module can therefore by completely wired up and prepared for its future purpose.
- Parameterizable diagnostic response with IM 151-1 STANDARD and IM 151-1 HIGH FEATURE
- Facilitates retroffiting of I/O modules during operation
- Options can be released via the PLC program without the need for re-engineering

Technical specifications

	6ES7 138-4AA01- 0AA0	6ES7 138-4AA11- 0AA0
Power losses Power loss, typ.	0.025 W	0.025 W
Address area Occupied address area • Inputs	according to configured module	according to configured module
Digital inputs Number of digital inputs	0	0
Parameter Remark	according to configured module	according to configured module
Alarms/diagnostics/status information Diagnostics • Diagnostic functions	No	No
Diagnostic indication LED • Status indicator digital input (green)	No	No
Dimensions and weight Dimensions • Width • Height • Depth	15 mm 81 mm 52 mm	30 mm 81 mm 52 mm
Weight • Weight, approx.	33 g	55 g

Ordering data

Order No.

Spare modules for ET 200S

for reserving unused slots
• 15 mm overall width (5 units)

• 30 mm overall width (1 unit)

6ES7 138-4AA01-0AA0 6ES7 138-4AA11-0AA0

ET 200S

I/O modules
Potential isolation module

Overview

- Potential isolation module with 4 outputs
- Output current 5 A per output / 10 A per module
- Nominal load voltage: According to the load voltage on the power module of this load voltage group
- Is suitable for all terminal modules TM-E (construction width 15 mm)

Technical specifications

Potential isolation module	6ES7138-4FD00-0AA0
Module-specific data	
Supported synchronous operation	no
Number of outputs	4
Cable length • Unshielded • Shielded	max. 600 m max. 1000 m
Parameter length	1 byte
Voltages, Currents, Potentials	
Nominal load voltage L+ (from power module)	24 48 V DC; 24 AC 230 V
Polarity reversal protection	no
Total current of the outputs (per module)	max. 10 A
Potential isolation Between the channels Between the channels and backplane bus	no Yes
Permissible potential difference Between the supply voltage and the backplane bus	75 V DC, 240 V AC
Isolation tested Between the supply voltage and the backplane bus	500 V DC, 1500 V AC
Diagnostic alarm	no
Data for selecting an actuator	
Short-circuit protection for the output	No, possible via PM-E or external
Dimensions and weight	
Dimensions W \times H \times D (mm, the total dimensions depend on the selected terminal module)	15 x 81 x 52
Weight	Approx. 33 g

Ordering data	Order No.
Potential isolation module for ET 200S	6ES7138-4FD00-0AA0
for preparing the load voltage on additional terminals, 15 mm construction width, 1 unit	
Accessories for labeling	
Label sheets DIN A4 (10 units)	
Label sheets DIN A4 (10 units) Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules • petrol • red • yellow • light beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

I/O modules Digital electronic modules

Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible during operation

Technical specifications

	6ES7 131-4BB01- 0AA0	6ES7 131-4BB01- 0AB0	6ES7 131-4BD01- 0AA0	6ES7 131-4BD01- 0AB0	6ES7 131-4BD51- 0AA0	6ES7 131-4BF00- 0AA0
Supply voltages Rated value						
• 24 V DC	Yes; from power module	Yes				
 permissible range, lower limit (DC) 	20.4 V	20.4 V				
 permissible range, upper limit (DC) 	28.8 V	28.8 V				
 reverse polarity protection 	Yes	Yes	Yes	Yes	Yes	Yes
Current consumption						
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA		10 mA
from supply voltage L+, max.	Dependent on encoder	Dependent on encoder				
Power losses Power loss, typ.	0.4 W	0.4 W	0.7 W	0.7 W	0.7 W	1.2 W
Address area Address space per module						
• with packing	2 bit	2 bit	4 bit	4 bit	4 bit	
• without packing	1 byte	1 byte				
Isochronous mode Isochronous mode						Yes; TWE = 3000 us
Digital inputs Number of digital inputs	2	2	4	4	4	8
Number of simulta- neously controllable inputs						8
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes	Yes	Yes	Yes	Yes; 2-wire sensors connectable
Input voltage • rated value, DC • for signal "0" • for signal "1"	24 V -30 to +5 V 15 to 30 V	24 V -30 to +5 V 11 to 30 V	24 V -30 to +5 V 15 to 30 V	24 V -30 to +5 V 11 to 30 V	24 V -5 to +30 V -15 to -30V	24 V -30 to +5 V 15 to 30 V
Input current • for signal "1", typ.	7 mA; at 24 V	8 mA	7 mA; at 24 V	8 mA	7 mA; at 24 V	5 mA

ET 200S

I/O modules Digital electronic modules

	6ES7 131-4BB01- 0AA0	6ES7 131-4BB01- 0AB0	6ES7 131-4BD01- 0AA0	6ES7 131-4BD01- 0AB0	6ES7 131-4BD51- 0AA0	6ES7 131-4BF00- 0AA0
Input delay (for rated value of input voltage)						
 for standard inputs 						
- parameterizable	No	Yes; 0.1 / 0.5 / 3 / 15 ms	No	Yes; 0.1 / 0.5 / 3 / 15 ms	No	No
- at "0" to "1", min.	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	2 ms
- at "0" to "1", max.	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	4.5 ms
- at "1" to "0", min.	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	2 ms
- at "1" to "0", max.	4.5 ms	0.15 / 0.6 / 3.3 / 15.15	4.5 ms	0.15 / 0.6 / 3.3 / 15.15	4.5 ms	4.5 ms
Cable length	1 000	1 000	1 000	1 000	1 000	1 000
Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
 Cable length unshielded, max. 	600 m	600 m	600 m	600 m	600 m	600 m
Encoder supply Number of outputs						0; no encoder supply
Output voltage	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	max. M +0.5 V, under load	
Output current, rated value	500 mA	500 mA	500 mA	500 mA	500 mA	
Output current, permissible range	0 to 500 mA	0 to 500 mA	0 to 500 mA	0 to 500 mA	0 to 500 mA	
Short-circuit protection		Yes; electronic		Yes; electronic		
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA
Parameter						
Remark	1 byte	3 byte	1 byte	3 byte	1 byte	3-byte parameter (not accessible for the user)
Diagnostics: short circuit		Disable/enable		Disable/enable		
Alarms/ diagnostics/status information						
Diagnostics Diagnostic	No	Yes	No	Yes	No	No
functions • Short circuit		Yes; Short-circuit of outputs to ground; module by module		Yes; Short-circuit of outputs to ground; module by module		
Diagnostic indication LED						
Group error SF (red)	No	Yes	No	Yes	No	V
 Status indicator digital input (green) 	Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel	Yes

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I/O modules
Digital electronic modules

6ES7 131-4BB01- 0AA0	6ES7 131-4BB01- 0AB0	6ES7 131-4BD01- 0AA0	6ES7 131-4BD01- 0AB0	6ES7 131-4BD51- 0AA0	6ES7 131-4BF00- 0AA0
500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes
75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
					15 mm
*		* · · · · · · ·			81 mm
52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
35 a	35 a	35 a	35 a	35 a	35 g
	No Yes	OAAO OABO 500 V DC 500 V DC No No Yes Yes 75 V DC / 60 V AC 75 V DC / 60 V AC 15 mm 15 mm 81 mm 81 mm 52 mm 52 mm	OAAO OABO OAAO 500 V DC 500 V DC 500 V DC No No No Yes Yes Yes 75 V DC / 60 V AC 75 V DC / 60 V AC 75 V DC / 60 V AC 15 mm 15 mm 15 mm 81 mm 81 mm 81 mm 52 mm 52 mm 52 mm	OAAO OABO OAAO OABO 500 V DC 500 V DC 500 V DC No No No No Yes Yes Yes 75 V DC / 60 V AC 15 mm 15 mm 15 mm 15 mm 81 mm 81 mm 81 mm 81 mm 52 mm 52 mm 52 mm 52 mm	OAAO OAAO OAAO OAAO 500 V DC 500 V DC 500 V DC 500 V DC No No No No Yes Yes Yes Yes 75 V DC / 60 V AC 15 mm 81 mm 81 mm 52 mm 15 mm 81 mm 52 mm 15 mm 81 mm 52 mm 15 mm 81 mm 52 mm 15 mm 81 mm 52 mm

	6ES7 131-4RD02- 0AB0	6ES7 131-4EB00- 0AB0	6ES7 131-4FB00- 0AB0	6ES7 131-4CD02- 0AB0	6ES7 131-4BF50- 0AA0
Supply voltages					
Rated value					
• 24 V DC	Yes; From power module			Yes	Yes; from power module
 permissible range, lower limit (DC) 	24 V			20.4 V	20.4 V
 permissible range, upper limit (DC) 	48 V			28.8 V	28.8 V
• 24 V AC	Yes				
• 120 V AC		Yes; from power module			
• 230 V AC			Yes		
 permissible range, lower limit (AC) 	24 V				
 permissible range, upper limit (AC) 	48 V				
 reverse polarity protection 	Yes; AC or DC automatic				Yes
Current consumption					
from backplane bus 3.3 V DC, max.	10 mA	6 mA	6 mA		
from supply voltage L+, max.	Dependent on encoder			Dependent on encoder	Dependent on encoder
from supply voltage L1, max.		Dependent on encoder	Dependent on encoder		
Power losses					
Power loss, typ.	0.7 W	0.5 W	0.7 W	1.6 W	1.2 W
Address area Address space per module					
 with packing 	4 bit	2 bit	2 bit	4 bit	
without packing	1 byte	1 byte	1 byte	1 byte	
Isochronous mode Isochronous mode	Yes	No	No		Yes

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I/O modules Digital electronic modules

	6ES7 131-4RD02- 0AB0	6ES7 131-4EB00- 0AB0	6ES7 131-4FB00- 0AB0	6ES7 131-4CD02- 0AB0	6ES7 131-4BF50- 0AA0
Digital inputs Number of digital inputs	4	2	2	4	8
Number of NAMUR nputs	'		-	4	Ŭ
Number of simultane- ously controllable inputs				4	
Parallel switching of				No	
nputs	Yes	Yes	Yes		Yes
curve acc. to IEC 1131, Type 1	165	165	165		165
nput voltage		100.1/	000.1/		
Rated value, AC Rated value, DC		120 V	230 V		24 V
Rated value, UC	24 V; 24 to 48 V UC				
for signal "0"	-6 to 6 V DC, 0 to 5 V AC	0 to 20 V AC	0 to 40 V AC		30 to -5 V
for signal "1"	-15 to -57.6 V DC; -15 to 57.6 V DC; 15 to 48 V AC	79 to 132 V AC	164 to 264 V AC		-15 to -30 V
Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz		
nput current					
for signal "1", typ.	10 mA; 4 to 10 mA	3 mA; 3 to 9 mA	5 mA; 5 to 15 mA		6 mA; at 24 V
 for 10 k switched contact 					
- for signal "0"				0.35 to 1.2 mA	
- for signal "1"				2.1 to 7 mA	
for unswitched					
contact - for signal "0", max.				0.5 mA	
(permissible				U.S IIIA	
quiescent current)					
- for signal "1"				typ. 8 mA	
for NAMUR encoders - for signal "0"				0.35 mA to 1.2 mA	
- for signal "1"				2.1 to 7 mA	
nput delay (for rated					
value of input voltage)					
for standard inputs - parameterizable					No
- at "0" to "1", min.		15 ms	15 ms		2 ms
- at "0" to "1", max.	15 ms	. 56	75 11.5	4.6 µs	4.5 ms
- at "1" to "0", min.		25 ms	45 ms		2 ms
- at "1" to "0", max.	15 ms			4.6 µs	4.5 ms
Encoder connection	1010 5 : 1 ::				
Fixed current limitation for wire break	18 kΩ; Rated voltage 24 V (15 V to 35 V);				
monitoring, min.	rated voltage 48 V				
	(30 V to 60 V): 39 kOhm				
Cable length					
Cable length, shielded,	1 000 m	1 000 m	1 000 m	200 m	1 000 m
max.	000	000	000		000
Cable length unshielded, max.	600 m	600 m	600 m		600 m
Encoder supply Number of outputs				1	
Output voltage	min. L+ (-0.5 V), under			min. 8.2 V, loaded	
,	load			,	

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I/O modules
Digital electronic modules

	6ES7 131-4RD02- 0AB0	6ES7 131-4EB00- 0AB0	6ES7 131-4FB00- 0AB0	6ES7 131-4CD02- 0AB0	6ES7 131-4BF50- 0AA0
Output current, rated alue	500 mA			45 mA	
Output current, permis- ible range	0 to 500 mA				
Short-circuit protection	Yes; per module			Yes; electronic	
Encoder Connectable encoders 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 2 mA; (0.5 to 2 mA), a minimum load current is necessary for wire break diagnostics.	No 1 mA	No 2 mA		Yes 1.5 mA
Parameter		2 byto	2 byto	10 byta	2 byto
Alarms/diagnostics/ status information slarms Diagnostic alarm Process alarm		3 byte	3 byte	12 byte Yes; adjusted No	3 byte
Diagnostics Diagnostic functions Diagnostic information readable Short circuit	Yes; parameterizable	No No	No No	Yes; diagnostic alarm Yes	No
Diagnostic indication ED Group error SF (red) Status indicator digital input (green)	Yes Yes; per channel	Yes; per channel	Yes; per channel	Yes Yes; per channel	No Yes; per channel
solation solation checked with	2500 V DC	2500 V DC	4000 V DC	500 V DC	500 V DC
Calvanic isolation Calvanic isolation digital aputs between the channels between the channels and the backplane bus between the channels and the load voltage L+	No Yes	No Yes	No Yes	No Yes Yes	No Yes
Permissible potential lifference petween different prouits	75 V DC / 60 V AC			75 V DC / 60 V AC	75 V DC / 60 V AC
etween M internally and the inputs		1500 V AC	1500 V AC		
Dimensions and veight Dimensions Width Height Depth	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm

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I/O modules Digital electronic modules

	6ES7 132-4BB01- 0AB0	6ES7 132-4BB01- 0AA0	6ES7 132-4BB31- 0AB0	6ES7 132-4BB31- 0AA0	6ES7 132-4BD00- 0AB0	6ES7 132-4BD02- 0AA0
Supply voltages Reverse voltage protection	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module
Load voltage L+ Rated value (DC) Reverse polarity protection	24 V; from power module Yes; polarity reversal can lead to the digital outputs being connected through	24 V; from power module Yes; polarity reversal can lead to the digital outputs being connected through	24 V; from power module Yes; polarity reversal can lead to the digital outputs being connected through	24 V; from power module Yes; polarity reversal can lead to the digital outputs being connected through	24 V; from power module Yes; polarity reversal can lead to the digital outputs being connected through	24 V; from PM Yes; polarity reversal can lead to the digital outputs being connected through
Current consumption from load voltage L+ (without load), max.	5 mA; per channel	5 mA; per module	5 mA; per channel	5 mA; per channel	5 mA; per channel	10 mA; per channel
from backplane bus 3.3 V DC, max.	10 mA	10 mA				
Power losses Power loss, typ.	0.4 W	0.4 W	1.4 W	1.4 W		0.8 W
Address area Address space per module • with packing • without packing	2 bit 1 byte	2 bit 1 byte	2 bit 1 byte	2 bit 1 byte	4 bit 1 byte	4 bit 1 byte
Isochronous mode Isochronous mode	Yes	No	Yes	No	Yes	Yes
Digital inputs Cable length Cable length, shielded, max. Cable length unshielded, max.					1 000 m 600 m	
Digital outputs Number of digital outputs	2	2	2	2	4	4
Short-circuit protection	Yes; per channel	Yes; per channel				
 Response threshold, typ. 	1.5 A	0.7 to 1.8 A	4 A	2.8 to 7.2 A	0.7 to 1.5 A	1 to 1.5 A
Limitation of inductive shutdown voltage to	-55 to -60 V, typ. L+()	-55 to -60 V, L+()	(L+)-55 to -60 V			
Lamp load, max.	2.5 W	5 W	5 W	10 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes
Output voltage • for signal "1", min.	L+ (-1 V)	L+ (-1 V)				
Output current • for signal "1" rated value	0.5 A	0.5 A	2 A	2 A	0.5 A	0.5 A
for signal "1" permissible range for 0 to 60 °C, min. for signal "1" permissible range for 0 to 60 °C, max.	7 mA 600 mA	7 mA 600 mA	7 mA 2.4 A	7 mA 2.4 A	7 mA 600 mA	7 mA 600 mA
• for signal "0" residual current, max.	0.3 mA	0.3 mA	0.5 mA	0.5 mA	0.3 mA	0.3 mA

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I/O modules
Digital electronic modules

	6ES7 132-4BB01- 0AB0	6ES7 132-4BB01- 0AA0	6ES7 132-4BB31- 0AB0	6ES7 132-4BB31- 0AA0	6ES7 132-4BD00- 0AB0	6ES7 132-4BD02- 0AA0
Output delay with resistive load						
• 0 to "1", max.	100 µs	200 µs	100 μs	200 µs	100 μs	45 µs; typical value
• 1 to "0", max.	400 μs	1.3 ms	400 μs	1.3 ms	300 µs	90 µs; typical value
Parallel switching of 2 outputs						
 for increased power 	No	No	No	No	No	No
for redundant control of a load	Yes; per module	Yes; per module	Yes; per module	Yes; per module	Yes; per module	Yes; per module
Switching frequency	400.11	400.11	400 11	400.11	400 11	00011
 with resistive load, max. 	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	800 Hz
 with inductive load, max. 	2 Hz	2 Hz	2 Hz; 0.5 H	2 Hz; 0.5 H	2 Hz	2 Hz
on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of outputs (per group) • up to 60 °C, max.	1 A	1 A	4 A	4 A	2 A	2 A
Load resistance	171	171	17.	17.	271	
range • lower limit	48 Ω	48 Ω	12 Ω	12 Ω	48 Ω	48 Ω
upper limit	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω
Cable length Cable length,	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
shielded, max.Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Parameter Remark	3 byte	1 byte	3 byte	1 byte		1 byte
Diagnostics: wire break	Disable/enable		Disable/enable			
Diagnostics: short circuit	Disable/enable		Disable/enable			
Behavior on CPU/ Master STOP, channel-wise	Substitute a value / keep last value		Substitute a value / keep last value			
Alarms/ diagnostics/status information						
Substitute values connectable	Yes; 0/1		Yes; 0/1			
Diagnostics Diagnostic	Yes; can be read	No	Yes; can be read	No	Yes	No
functions • Wire break	out Yes; channel by	140	out Yes; channel by	140	100	. 10
	channel		channel			
Short circuit	Yes; channel by channel		Yes; channel by channel		Yes; module-wise	
Diagnostic indication LED						
Group error SF	Yes		Yes		Yes; SF-LED (red)	
(red)Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes; per channel	Yes
Isolation Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC

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I/O modules Digital electronic modules

	6ES7 132-4BB01- 0AB0	6ES7 132-4BB01- 0AA0	6ES7 132-4BB31- 0AB0	6ES7 132-4BB31- 0AA0	6ES7 132-4BD00- 0AB0	6ES7 132-4BD02- 0AA0
Galvanic isolation						
Galvanic isolation digital outputs						
 between the channels 	No	No	No	No	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions and weight						
Dimensions						
 Width 	15 mm					
 Height 	81 mm					
 Depth 	52 mm					
Weight						
 Weight, approx. 	40 g					

	6ES7 132-4BF00-0AB0	6ES7 132-4BF00-0AA0
Supply voltages		
Reverse voltage protection	Yes; when using the same load voltage as on the power module	Yes
Load voltage L+		
Rated value (DC)	24 V; from power module	24 V
Reverse polarity protection	Yes; polarity reversal can lead to the digital outputs being connected through	Yes
Current consumption		
from load voltage L+ (without load), max.	5 mA; per channel	5 mA; per channel
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Power losses		
Power loss, typ.		1.5 W
Address area		
Address space per module		
with packingwithout packing	not relevant 1 byte	1 byte
	i Dyte	i Dyte
Isochronous mode Isochronous mode	Yes	Yes; jitter incumbered < 100us
Digital inputs	100	100, jitter incumbered < 1000s
Cable length		
Cable length, shielded, max.	1 000 m	1 000 m
Cable length unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs	8	8
Short-circuit protection	Yes; per channel	Yes; per channel
Response threshold, typ.	0.7 to 1.9 A	o.k.
Limitation of inductive shutdown voltage to	L+ -(47 to 60 V)	o.k.
Lamp load, max.	5 W	5 W
Controlling a digital input	Yes	Yes
Output voltage		
• for signal "1", min.	L+ (-1.0 V)	o.k.
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA	7 mA
 for signal "1" permissible range for 0 to 60 °C, max. 	600 mA	600 mA
• for signal "0" residual current, max.	0.3 mA	0.3 mA

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I/O modules
Digital electronic modules

	6ES7 132-4BF00-0AB0	6ES7 132-4BF00-0AA0
Output delay with resistive load		
• 0 to "1", max.	300 μs	300 μs
• 1 to "0", max.	600 µs	600 µs
Parallel switching of 2 outputs		
 for increased power 	No	No
 for redundant control of a load 	Yes; per module	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Aggregate current of outputs (per group)		
horizontal installation		
- up to 60 °C, max.	4 A	
 vertical installation 		
- up to 40 °C, max.	4 A; at 55°C and 24V DC	
• up to 60 °C, max.		4 A
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω
Cable length		
 Cable length, shielded, max. 	1 000 m	1 000 m
 Cable length unshielded, max. 	600 m	600 m
Parameter		
Remark	1 byte	3-byte parameter (not accessible for the user)
Alarms/diagnostics/status information		
Diagnostics		
Diagnostic functions	Yes	No
Short circuit	Yes; module-wise	
Diagnostic indication LED		
 Group error SF (red) 	Yes; SF-LED (red)	
Status indicator digital output (green)	Yes; per channel	Yes
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
Galvanic isolation digital outputs		
 between the channels 	No	No
• between the channels and the backplane bus	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	15 mm	15 mm
Height	81 mm	81 mm
• Depth	52 mm	52 mm
Weight		
Weight, approx.	40 g	40 g

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I/O modules Digital electronic modules

	6ES7 132-4BB30- 0AB0	6ES7 132-4BD32- 0AA0	6ES7 132-4FB01- 0AB0	6ES7 132-4HB01- 0AB0	6ES7 132-4HB12- 0AB0
Supply voltages Reverse voltage	Yes; when using the	Yes; when using the	Yes; when using the		
protection	same load voltage as on the power module	same load voltage as on the power module	same load voltage as on the power module		
Load voltage L+ Rated value (DC)	24 V; from power	24 V; from power	24 V; from power	24 V; from power	24 V; from power
Reverse polarity protection	module Yes	module Yes	module Yes	module Yes	module Yes
Current consumption					
rom load voltage L+ without load), max.	5 mA; per channel	10 mA; per channel	30 mA	30 mA	30 mA
rom backplane bus 3.3 V DC, max.	10 mA	10 mA	18 mA	10 mA	10 mA
Power losses Power loss, typ.	1.4 W	1.6 W	4 W	0.6 W	0.6 W
Address area Address space per module					
with packing	2 bit	4 bit	2 bit	2 bit	2 bit
without packing	1 byte	1 byte	1 byte	1 byte	1 byte
sochronous mode sochronous mode	Yes	Yes		No	No
Digital outputs Number of digital outputs	2	4	2	2	2
Short-circuit protection	Yes; per channel	Yes; per channel	Yes; via fuse in power	No; external fuse,	No; external fuse,
Response threshold, typ.	4 A	2.8 to 7.2 A	module	max. 6 A quick-acting	max. 6 A quick-acti
Limitation of inductive shutdown voltage to	-55 to -60 V	Typ. L+ (-55 to -60 V)	-55 to -60 V	No	No
_amp load, max.	5 W	10 W	100 W		
Controlling a digital nput	Yes	Yes	Yes; possible	Yes	Yes
Output voltage • for signal "1", min.	L+ (-1 V)	L+ (-1.0 V)	L+ (-1.5 V)		
Output current for signal "1" rated value	2 A	2 A	2 A	5 A	5 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA	7 mA	0.1 mA		
• for signal "1" permissible range for 0 to 60 °C, max.	2.4 A	2.4 A	2.2 A		
for signal "1" minimum load current				8 mA	8 mA
for signal "0" residual current, max.	0.5 mA	0.5 mA	3 mA		
Output delay with esistive load					
• 0 to "1", max.	100 μs	50 μs; typically 45μs	15 ms		
1 to "0", max. Parallel switching of	400 µs	120 µs; typically 90µs	15 ms		
2 outputs	No	No	No	No	No
for increased power for redundant control of a load	No Yes; per module	No Yes; per module	No Yes; per module	No No	No No

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Digital electronic modules

	6ES7 132-4BB30- 0AB0	6ES7 132-4BD32- 0AA0	6ES7 132-4FB01- 0AB0	6ES7 132-4HB01- 0AB0	6ES7 132-4HB12- 0AB0
Switching frequency with resistive load, max.	100 Hz	1 000 Hz	10 Hz	2 Hz	2 Hz
with inductive load, max.	2 Hz; 0.5 H	2 Hz; at 0.5H	0.5 Hz	0.5 Hz	0.5 Hz
on lamp load, max.	10 Hz	10 Hz	1 Hz	2 Hz	2 Hz
Aggregate current of outputs (per group) • vertical installation - up to 40 °C, max. • up to 40 °C, max. • up to 50 °C, max. • up to 60 °C, max.	4 A	4 A; at 55°C and 24V DC	2 A 1.5 A 1 A		
Load resistance range lower limit upper limit	12 Ω 3 400 Ω	12 Ω 3 400 Ω			
Cable length Cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
 Cable length unshielded, max. 	600 m	600 m	600 m	600 m	600 m
Relay outputs Switching capacity of contacts • Thermal continuous current, max.				5 A	5 A
Parameter Remark	3 byte	1 byte	3 byte	3 byte	3 byte
Diagnostics: wire break	Disable/enable		,	,	,
Diagnostics: short circuit	Disable / enable				
Behavior on CPU/Master STOP, channel-wise	Substitute a value/ keep last value, 0/1		Substitute a value/ keep last value, 0/1	Substitute a value / keep last value	
Alarms/diagnostics/ status information Substitute values connectable	Yes; 0/1			Yes; 0/1	Yes; 0/1
Diagnostics Diagnostic functions Wire break Short circuit	Yes; can be read out Yes; channel by channel Yes; channel by channel	No	No	No	No
Diagnostic indication LED					
Group error SF (red)Status indicator digital output (green)	Yes Yes	Yes	Yes	Yes	Yes
Isolation Isolation checked with	500 V DC	500 V DC	2500 V DC		
tested with Channels against backplane bus and load voltage L+ Load voltage L+				1500 V AC	2500 V DC
Load Voltage L+ against backplane bus				300 V DC	300 V DC

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I/O modules Digital electronic modules

	6ES7 132-4BB30- 0AB0	6ES7 132-4BD32- 0AA0	6ES7 132-4FB01- 0AB0	6ES7 132-4HB01- 0AB0	6ES7 132-4HB12- 0AB0
Galvanic isolation					
Galvanic isolation digital outputs					
 between the channels 	No	No	No	Yes	Yes
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes	Yes
 between the channels and the load voltage L+ 				Yes	Yes
Permissible potential difference					
between different circuits	75 V DC / 60 V AC				
Dimensions and weight					
Dimensions					
• Width	15 mm				
Height	81 mm				
• Depth	52 mm				
Weight					
 Weight, approx. 	40 g	40 g	37 g	50 g	50 g

	6ES7 132-4BF50-0AA0	6ES7 132-4BD50-0AA0
Supply voltages Reverse voltage protection	Yes; when using the same correctly polarized load voltage as on the power module	Yes; when using the same load voltage as
Load voltage L+ Rated value (DC) Reverse polarity protection	24 V; from power module Yes	24 V; from power module Yes
Current consumption from load voltage L+ (without load), max.	5 mA	5 mA; per channel
from backplane bus 3.3 V DC, max. Power losses Power loss, typ.	10 mA	10 mA 0.8 W
Address area Address space per module with packing without packing	1 byte	4 bit 1 byte
Isochronous mode Isochronous mode	Yes	Yes
Digital inputs Cable length Cable length, shielded, max. Cable length unshielded, max.		1 000 m 600 m
Digital outputs Number of digital outputs	8	4
Short-circuit protection • Response threshold, typ.	Yes; per channel 1.5 A	Yes; per channel
Limitation of inductive shutdown voltage to	Typ. 47 V	
Lamp load, max.	5 W	5 W
Controlling a digital input	Yes	Yes

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Digital electronic modules

recunical specifications (continued)		
	6ES7 132-4BF50-0AA0	6ES7 132-4BD50-0AA0
Output voltage		
• for signal "1", min.	Max. 1 V	1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C,	5 mA	5 mA
min.		
 for signal "1" permissible range for 0 to 60 °C, max. 	700 mA	700 mA
• for signal "0" residual current, max.	5 μΑ	5 µA
Output delay with resistive load		ο μ. ·
• 0 to "1", max.	300 µs	300 µs
• 1 to "0", max.	600 μs	600 μs
Parallel switching of 2 outputs	σοσ μο	σοσ μο
• for increased power	No	No
for redundant control of a load	Yes; per module	Yes; per module
	res, per module	res, per module
Switching frequency • with resistive load, max.	100 Hz	100 Hz
with resistive load, max. with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz
·	10112	10112
Aggregate current of outputs (per group) • up to 60 °C, max.	4 A	2 A
·	4 A	2 A
Load resistance range	40.0	40.0
lower limit upper limit	48 Ω 3 400 Ω	48 Ω 3 400 Ω
• upper limit	3 400 12	3 400 12
Cable length	1.000	
Cable length, shielded, max.	1 000 m	
Cable length unshielded, max.	600 m	
Parameter		
Remark	3 byte	1 byte
Alarms/diagnostics/status information		
Diagnostics		
Diagnostic functions	No	No
Diagnostic indication LED		
Status indicator digital output (green)	Yes	Yes
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
Galvanic isolation digital outputs		
between the channels	No	No
between the channels and the backplane bus	Yes	Yes
Dimensions and weight		
Dimensions		
• Width	15 mm	15 mm
Height Donth	81 mm	81 mm
• Depth	52 mm	52 mm
Weight	40	40
Weight, approx.	40 g	40 g

ET 200S

I/O modules Digital electronic modules

Ordering data	Order No.		Order No.
Digital input modules		Accessories	
Ordering unit 5 units • 2 DI 24 V DC Standard • 2 DI 24 V DC High Feature • 4 DI 24 V DC Standard • 4 DI 24 V DC High Feature • 2 DI 120 V AC • 2 DI 230 V AC • 4 DI 24 48 V UC • 4 DI 24 V DC SOURCE INPUT	6ES7 131-4BB01-0AA0 6ES7 131-4BB01-0AB0 6ES7 131-4BD01-0AA0 6ES7 131-4BD01-0AB0 6ES7 131-4EB00-0AB0 6ES7 131-4FB00-0AB0 6ES7 131-4CD02-0AB0 6ES7 131-4BD51-0AA0	Label sheets DIN A4 (10 units) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0
Ordering unit 1 unit 4 DI 24 V DC NAMUR 8 DI 24 V DC Standard 8 DI, 24 V DC, standard SOURCE INPUT	6ES7 131-4RD02-0AB0 6ES7 131-4BF00-0AA0 6ES7 131-4BF50-0AA0		
Digital output modules			
Ordering unit 5 units • 2 DO 24 V DC/0.5 A Standard • 2 DO 24 V DC/0.5 A High Feature • 2 DO 24 V DC/2 A Standard • 2 DO 24 V DC/2 A High Feature • 2 DO 24 V DC/2 A High Feature • 4 DO 24 V DC/0.5 A Standard • 4 DO, 24 V DC / 0.5 A Standard • 4 DO, 24 V DC / 0.5 A Standard • 4 DO 24 V DC/0.5 A High Feature • 8 DO 24 V DC/0.5 A High Feature • 8 DO 24 V DC/0.5 A High Feature • 4 DO 24 V DC/2 A Standard • 4 DO 24 V DC/2 A Standard • 4 DO 24 V DC/2 A High Feature • 2 DO 24 V DC to 230 V AC/2 A • 2 DO 24 V DC to 230 V AC/5 A relay, NO contact • 2 DO 2448 V DC/5 A, 24230 V AC/5 A relay, changeover contact	6ES7 132-4BB01-0AA0 6ES7 132-4BB01-0AB0 6ES7 132-4BB31-0AA0 6ES7 132-4BB31-0AB0 6ES7 132-4BD02-0AA0 6ES7 132-4BD50-0AA0 6ES7 132-4BD00-0AB0 6ES7 132-4BD32-0AA0 6ES7 132-4BD30-0AB0 6ES7 132-4F001-0AB0 6ES7 132-4FB01-0AB0 6ES7 132-4HB01-0AB0		
Ordering unit 1 unit 2 DO 2448 V DC/5 A, 24230 V AC/5 A relay, changeover contact, with manual operation 8 DO 24 V DC/0.5 A Standard 8 DO, 24 V DC / 0.5 A Standard SOURCE OUTPUT	6ES7 132-4HB50-0AB0 6ES7 132-4BF00-0AA0 6ES7 132-4BF50-0AA0		

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

I/O modules Analog electronic modules

Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions with enhanced performance, precision and resolution
- High-speed versions with extremely fast, isochronous cycle times
- Hot swapping of modules possible during operation

Note:

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

	6ES7 134-4FB01-0AB0	6ES7 134-4LB02-0AB0	6ES7 134-4GB01-0AB0	6ES7 134-4GB52-0AB0
Supply voltages Load voltage L+				
Rated value (DC)	24 V; from power module	24 V	24 V; from power module	24 V
Short-circuit protectionReverse polarity protection	Yes	Yes	Yes; destruction limit 35 mA per channel	Yes Yes
Power supply to the transmitters				
presentshort-circuit proof		No		Yes Yes
Current consumption from load voltage L+ (without load), max.	30 mA	55 mA	80 mA	225 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA
Power losses Power loss, typ.	0.6 W	0.85 W	0.6 W	2.5 W
Address area Address space per module • Address space per module, max.	4 byte	4 byte	4 byte	4 byte
Isochronous mode Isochronous mode	No	Yes	No	Yes
Analog inputs Number of analog inputs	2	2	2	2
Cable length, shielded, max.	200 m	200 m	200 m	200 m
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression	Number of active channels per module x basic conversion time	0.25 ms
Technical unit for temperature measurement adjustable • Voltage • Current • Thermocouple • Resistance thermometer • Resistance	Yes No No No No	Yes No No No No	No Yes No No No	No Yes No No No

ET 200S

I/O modules Analog electronic modules

lechnical specifications	(Continued)			
	6ES7 134-4FB01-0AB0	6ES7 134-4LB02-0AB0	6ES7 134-4GB01-0AB0	6ES7 134-4GB52-0AB0
Input ranges (rated values), voltages • 1 to 5 V • Input resistance (1 to 5 V) • -10 V to +10 V • Input resistance (-10 V to +10 V) • -5 V to +5 V • Input resistance (-5 V to +5 V)	Yes Yes Yes	Yes 800 kΩ Yes 800 kΩ Yes 800 kΩ		
Input ranges (rated values), currents • 0 to 20 mA • Input resistance (0 to 20 mA) • 4 to 20 mA			Yes; on 50 Ohm	Yes 106Ω Yes
Voltage input • permissible input voltage for voltage input (destruction limit), max.	35 V; 35 V permanent; 75 V for max. 1 ms (mark to space ratio 1:20)	35 V; 35 V permanent; 75 V for max. 1 ms		
Current input • permissible input current for current input (destruction limit), max.			40 mA	
Analog value creation				
Measurement principle	integrating		integrating	
Integration and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Integration time,	14 bit; +/-10 V: 13 bit + sign, +/-5 V: 13 bit + sign; 1 to 5 V: 13 bit	16 bit; 0 to 5 V: 15 bit, +/-10 V: 16 bit, +/-5 V: 16 bit Yes	13 bit; 4 to 20 mA: 13 bit	16 bit
parameterizableIntegration time, ms	16.7 / 20 ms		16.7 / 20 ms	
Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz	60 / 50 Hz / no	60 / 50 Hz	
Conversion time (per channel)	65 ms; 55 / 65 ms	0.04 ms; without noise suppression 17/20 ms per channel with error	65 ms; 55 / 65 ms	
Smoothing of measured values				
parameterizableStep: NoneStep: LowStep: MediumStep: High	Yes; in four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages: 1 x, 4 x, 16 x, 32 x cycle time Yes; 1 x Yes; 4 x Yes; 16 x Yes; 32 x	Yes; in four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 Yes; 4 Yes; 16 Yes; 32
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • Burden of 2-wire transmitter, max.		Yes	750 Ω	Yes

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4FB01-0AB0	6ES7 134-4LB02-0AB0	6ES7 134-4GB01-0AB0	6ES7 134-4GB52-0AB0
- , .	0E37 134-4FB01-0AB0	0E37 134-4LB02-0AB0	0E37 134-4GB01-0AB0	0E37 134-4GB32-0AB0
Errors/accuracies Linearity error (relative to input area)	+/- 0.01 %	+/- 0.01 %	+/- 0.01 %	+/- 0.03 %
Temperature error (relative to input area)	+/- 0.01 %/K	+/- 0.003 %/K	+/- 0.005 %/K	+/- 0.01 %/K
Crosstalk between the inputs, min.	-50 dB	-100 dB	-50 dB	50 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.01 %	+/- 0.05 %	+/- 0.1 %
Operational limit in overall temperature range • Voltage, relative to input area • Current, relative to input	+/- 0.6 %	+/- 0.1 %; 0.2% without interference frequency suppression	+/- 0.6 %	+/- 0.3 %
area Basic error limit (operational				
limit at 25 °C) • Voltage, relative to input area	+/- 0.4 %	+/- 0.05 %; 0.1% without interference frequency suppression		
 Current, relative to input area 			+/- 0.4 %	+/- 0.2 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • Series mode interference	70 dB	90 dB	70 dB	
(peak value of interference < rated value of input range), min.	70 05	30 dB	70 U.S	
 Common mode voltage (USS < 2.5 V), min. 	90 dB	100 dB		
Parameter				
Remark	4 byte	12 byte, 4 byte in compati- bility mode	4 byte	
Diagnostics: wire break	Disable / enable (only in measuring range 1 to 5 V)			At 4 to 20 mA
Measurement type/range	deactivated / +/-5 V / 1 to 5 V / +/-10 V	deactivated / +/-5 V / 1 to 5 V / +/-10 V	deactivated / 4 to 20 mA	4 to 20 mA, 0 to 20 mA
Interference frequency suppression				No
Group diagnostics	Disable/enable	Disable/enable	Disable/enable	1
Overflow/underflow	Disable/enable	Disable/enable	Disable/enable	1
Alarms/diagnostics/status information	<u>`</u>	·	· · · · · · · · · · · · · · · · · · ·	
Alarms ◆ Process alarm		Yes		Yes
Diagnostics Diagnostic functions Wire break	Yes; measuring range 1 to 5 V only	Yes Yes; measuring range 1 to 5 V only	Yes	Yes Yes; at 4 to 20 mA
Group errorOverflow/underflow	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Diagnostic indication LED Group error SF (red)	Yes	Yes	Yes	Yes

ET 200S

I/O modules Analog electronic modules

	6ES7 134-4FB01-0AB0	6ES7 134-4LB02-0AB0	6ES7 134-4GB01-0AB0	6ES7 134-4GB52-0AB0
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	
Galvanic isolation Galvanic isolation analog inputs				
between the channels	No	No; however, increased permissible potential difference between the inputs.	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes
 between the channels and the load voltage L+ 	Yes	Yes	No	Yes
Permissible potential difference				
between the inputs (UCM)		140 V DC/100 V AC		
between inputs and MANA (UCM)	2 V AC PP			
between MANA and M internally (UISO)	75 V DC / 60 V AC			75 V DC, 60 V AC
Dimensions				
Module width, max.		15 mm		15 mm
Dimensions and weight Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weight • Weight, approx.	40 g	45 g	40 g	
Troigitt, approx.	10 g	10 9	10 9	

	6ES7 134-4GB11- 0AB0	6ES7 134-4MB02- 0AB0	6ES7 134-4GD00- 0AB0	6ES7 134-4FB52- 0AB0	6ES7 134-4GB62- 0AB0
Supply voltages					
Load voltage L+					
Rated value (DC)	24 V; from power module	24 V	24 V; from power module	24 V	24 V
 Short-circuit protection 					Yes
 Reverse polarity protection 		Yes	Yes	Yes	Yes
Power supply to the transmitters					
• present		Yes	Yes		Yes
short-circuit proof		Yes	Yes; approx. 200 mA for module		Yes
Current consumption					
from load voltage L+ (without load), max.	30 mA	48 mA	125 mA	80 mA	80 mA; without load
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA	10 mA
Power losses					
Power loss, typ.	0.6 W	1.2 W	0.6 W	1.9 W	1.9 W
Address area Address space per module					
 Address space per module, max. 	4 byte	4 byte	8 byte	4 byte	4 byte
Isochronous mode					
Isochronous mode	No	Yes	No	Yes	Yes

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4GB11- 0AB0	6ES7 134-4MB02- 0AB0	6ES7 134-4GD00- 0AB0	6ES7 134-4FB52- 0AB0	6ES7 134-4GB62- 0AB0
Analog inputs					
Number of analog inputs	2	2	4	2	2
Cable length, shielded, nax.	200 m	200 m	200 m	200 m	200 m
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression	40 ms; 33 to 40 ms	250 μs	250 μs
Technical unit for emperature measurement adjustable					
Voltage	No	No	No	Yes	No
• Current	Yes	Yes	Yes	No	Yes
• Thermocouple	No	No	No	No	No
Resistance	No	No	No	No	No
thermometer	140	140	140	140	140
• Resistance	No	No	No	No	No
Input ranges (rated values), voltages 1 to 5 V				Yes	
Input resistance				120 kΩ	
(1 to 5 V) -10 V to +10 V				Voo	
				Yes	
Input resistance (-10 V to +10 V)				120 kΩ	
-2.5 V to +2.5 V				Yes	
Input resistance (-2.5 V to +2.5 V)				120 kΩ	
• -5 V to +5 V				Yes	
Input resistance (-5 V to +5 V)				120 kΩ	
Input ranges (rated values), currents O to 20 mA Input resistance					Yes 106 Ω
(0 to 20 mA)					100 22
• -20 to +20 mA	Yes; 50 Ohm	Yes			Yes
• 4 to 20 mA	Yes; 50 Ohm	Yes	Yes; on 25 Ohm		Yes
Voltage input • permissible input voltage for voltage input (destruction limit), max.				35 V; permanent	
Current input					
 permissible input current for current input (destruction limit), max. 	40 mA	50 mA	30 mA; limited electronically		30 mA
Analog value creation Measurement principle	integrating	Sigma Delta	integrating		
ntegrations and conversion time/resolution per channel					
Resolution with overrange (bit including sign), max.	14 bit; +/-20 mA: 14 bit, 4 to 20 mA: 13 bit	16 bit; as required	13 bit; 4 to 20 mA: 13 bit	16 bit; 15 bit: 1 to 5 V; +/-2.5 V; 16 bit: +/-10 V; +/-5 V	16 bit

ET 200S

I/O modules Analog electronic modules

	6ES7 134-4GB11- 0AB0	6ES7 134-4MB02- 0AB0	6ES7 134-4GD00- 0AB0	6ES7 134-4FB52- 0AB0	6ES7 134-4GB62- 0AB0
ntegrations and conversion time/ resolution per channel					
Integration time, parameterizable		Yes	Yes		
Integration time, ms Interference voltage suppression for interference	16.7 / 20 ms 60 / 50 Hz	60 / 50 Hz / no	16.67/20 ms 60 / 50 Hz		
frequency f1 in Hz Conversion time (per channel)	65 ms; 55 / 65 ms	0.04 ms; without noise suppression 17/20 ms per channel with error			
Smoothing of measured values					
parameterizable	Yes; in four stages by means of digital filtering	Yes; in 4 stages: 1 x, 4 x, 16 x, 32 x cycle time	Yes; in 4 stages	Yes	Yes
Step: None Step: Low Step: Medium Step: High	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 x Yes; 4 x Yes; 16 x Yes; 32 x	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 32 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 32 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 32 x cycle time
Encoder supply Number of outputs					2
Output voltage					24 V
Output current, rated value					90 mA; per channel
Output current, permis- sible range					0 to 90 mA
Short-circuit protection					Yes
Encoder Connection of signal encoders for voltage				Yes	
measurement for current measurement as 2-wire transducer					No
 burden of 2-wire trans- mitter, max. 	750 Ω	750 Ω	750 Ω		
Errors/accuracies Linearity error (relative to input area)	+/- 0.01 %	+/- 0.03 %	+/- 0.01 %	+/- 0.03 %	+/- 0.03 %
Temperature error (relative to input area)	+/- 0.005 %/K	+/- 0.03 %/K	+/- 0.003 %/K	+/- 0.01 %/K	+/- 0.01 %/K
Crosstalk between the nputs, min.	-50 dB	-100 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in settled status at 25 °C relative to input area)	+/- 0.05 %	+/- 0.01 %	+/- 0.05 %	+/- 0.1 %	+/- 0.1 %
Dperational limit in overall temperature ange Voltage, relative to input area Current, relative to input area	+/- 0.6 %	+/- 0.1 %; 0.2% without interference	+/- 0.4 %	+/- 0.3 %	+/- 0.3 %

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4GB11- 0AB0	6ES7 134-4MB02- 0AB0	6ES7 134-4GD00- 0AB0	6ES7 134-4FB52- 0AB0	6ES7 134-4GB62- 0AB0
Basic error limit (operational limit at 25 °C) • Voltage, relative to input area • Current, relative to	+/- 0.4 %	+/- 0.05 %; 0.1%	+/- 0.3 %	+/- 0.2 %	+/- 0.2 %
input area		without interference frequency suppression			
Interference voltage suppression for f = n x (fl +/- 1%), fl = inter- ference frequency					
 Series mode inter- ference (peak value of interference < rated value of input range), min. 	70 dB	90 dB	70 dB		
• common mode voltage (USS < 2.5 V), min.		100 dB			
Parameter Remark	4 byte	12 byte, 4 byte in compatibility mode	7 byte	12 byte, 4 byte in compatibility mode	
Diagnostics: wire break	Disable / enable (only in measuring range 4 to 20 mA)	Disable / enable	1		At 4 to 20 mA
Measurement type/ range	deactivated / +/- 20 mA / 4 to 20 mA	deactivated / +/- 20 mA / 4 to 20 mA	1	Deactivated / +/-5 V / 1 to 5 V / +/-10 V / +/- 2.5 V	4 to 20 mA, 0 to 20 mA, +/-20 mA
Group diagnostics	Disable / enable	Disable / enable	1	Disable / enable	Yes
Overflow/underflow	Disable / enable	Disable / enable	1	Disable / enable	Yes
Alarms/diagnostics/ status information Alarms					
 Process alarm 		Yes		Yes	Yes
Diagnostics • Diagnostic functions • Diagnostic information readable		Yes	Yes; can be read out	Yes Yes	Yes Yes
Wire break	Yes; measuring range 4 to 20 mA only	Yes; measuring range 4 to 20 mA only	Yes; measuring range 1 to 5 V only	Yes; at 1 to 5 V	Yes; only with measuring range 4 to 20 mA
Group errorOverflow/underflow	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Diagnostic indication LED					
Group error SF (red)	Yes	Yes	Yes	Yes	Yes
Isolation Isolation checked with	500 V DC		500 V DC	500 V DC	
Galvanic isolation Galvanic isolation analog inputs					
between the channels	No	No; however, increased permissible potential difference between the inputs.	No	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes	Yes	Yes
 between the channels and the load voltage L+ 	No	Yes	No	Yes	Yes

ET 200S

I/O modules Analog electronic modules

	6ES7 134-4GB11- 0AB0	6ES7 134-4MB02- 0AB0	6ES7 134-4GD00- 0AB0	6ES7 134-4FB52- 0AB0	6ES7 134-4GB62- 0AB0
Permissible potential difference between MANA and M internally (UISO)					75 V DC, 60 V AC
Dimensions Module width, max.		15 mm		15 mm	15 mm
Dimensions and weight					
Dimensions					
• Width	15 mm				
 Height 	81 mm				
• Depth	52 mm				
Weight					
 Weight, approx. 	40 g	45 g	40 g	45 g	45 g

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Supply voltages Load voltage L+					
Rated value (DC)	24 V; from power module				
 Reverse polarity protection 	Yes	Yes	Yes	Yes	Yes
Power supply to the transmitters					
presentshort-circuit proof		Yes Yes			
Current consumption		100			
from load voltage L+ (without load), max.	30 mA				
from backplane bus 3.3 V DC, max.	10 mA				
Power losses Power loss, typ.	0.6 W				
Address area Address space per module					
 Address space per module, max. 	4 byte	8 byte	8 byte	4 byte	4 byte
Isochronous mode	N.	N.			
Isochronous mode	No	No	No		No
Analog inputs Number of analog inputs	2	4; 2 for 3 or 4-wire connection	4	2	2
Cable length, shielded, max.	50 m	200 m	50 m	50 m	200 m
Constant measurement current for resistance-type transmitter, typ.		1.67 mA			1.25 mA
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable	No	No	No	Yes	Yes
Voltage Current	Yes		Yes	Yes No	Yes No
Thermocouple	Yes		Yes	Yes	Yes
 Resistance thermometer 		Yes		No	Yes
Resistance		Yes		No	Yes

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Input ranges (rated values), voltages • -80 mV to +80 mV	Yes		Yes	Yes	
• Input resistance (-80 mV to +80 mV)	1 MΩ		1 MΩ	1 MΩ	
Input ranges (rated values), thermoelements					
• Type B	Yes		Yes	Yes	
Input resistance	1 MΩ		1 MΩ	1 MΩ	
(Type B)					
• Type C				Yes	
Input resistance (Type C)				1 ΜΩ	
(Type C) • Type E	Yes		Yes	Yes	
• Input resistance (Type E)	1 ΜΩ		1 MΩ	1 ΜΩ	
• Type J	Yes		Yes	Yes	
Input resistance (type J)	1 ΜΩ		1 ΜΩ	1 ΜΩ	
• Type K	Yes		Yes	Yes	
• Input resistance (Type K)	1 ΜΩ		1 MΩ	1 ΜΩ	
Type L	Yes		Yes	Yes	
Input resistance (Type L)Type N	1 MΩ Yes		1 MΩ Yes	1 MΩ Yes	
Input resistance	1 MΩ		res 1 MΩ	res 1 MΩ	
(Type N) • Type R	Yes		Yes	Yes	
Input resistance	1 ΜΩ		1 MΩ	1 MΩ	
(Type R)					
• Type S	Yes		Yes	Yes	
 Input resistance (Type S) 	1 MΩ		1 ΜΩ	1 ΜΩ	
Type TInput resistance	Yes 1 MΩ		Yes 1 MΩ	Yes 1 MΩ	
(Type T)	1 1012.2		1 1015.2	1 1012.2	
Input ranges (rated values), resistance thermometers					
• Cu 10					Yes
 Input resistance (Cu 10) 					10 ΜΩ
• Ni 100		Yes; standard/climate			Yes
 Input resistance (Ni 100) 		2 000 kΩ			10 ΜΩ
Ni 1000 Input resistance					Yes 10 MΩ
(Ni 1000) • Ni 120					Yes
 Input resistance (Ni 120) 					10 ΜΩ
Ni 200Input resistance					Yes 10 MΩ
(Ni 200) • Ni 500					Yes
Input resistance (Ni 500)Pt 100		Yes; standard / climate			10 MΩ Voc
Input resistance		Yes; standard / climate $2000\mathrm{k}\Omega$			Yes 10 MΩ
(Pt 100)		2 000 1/22			70 IVI22

ET 200S

I/O modules Analog electronic modules

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Input ranges (rated values), resistance thermometers • Pt 1000 • Input resistance (Pt 1000) • Pt 200 • Input resistance (Pt 200) • Pt 500 • Pt 500					Yes $10 \ M\Omega$ Yes $10 \ M\Omega$
Input resistance (Pt 500)					10 ΜΩ
Input ranges (rated values), resistors • 0 to 150 Ohm • Input resistance (0 to 150 Ohm) • 0 to 300 Ohm • Input resistance (0 to 300 Ohm) • 0 to 600 Ohm • Input resistance (0 to 600 Ohm) • 0 to 3000 Ohm • Input resistance (0 to 3000 Ohm)		Yes 2 000 kΩ Yes 2 000 kΩ Yes 2 000 kΩ			Yes $10~\text{M}\Omega$ Yes $10~\text{M}\Omega$ Yes $10~\text{M}\Omega$ Yes $10~\text{M}\Omega$ Yes $10~\text{M}\Omega$
/oltage input • permissible input • voltage for voltage input (destruction limit), max.	10 V; permanent	9 V	10 V; permanent	20 V; +/-20 V, permanent	9 V
Characteristic inearization parameterizable for thermocouples for resistance thermometer	Yes; type B, E, J, K, L, N, R, S, T to IEC 584	Yes; for Pt100, Ni100 Pt100 (standard, climatic range), Ni100 (standard, climatic range)	Yes; type B, E, J, K, L, N, R, S, T to IEC 584	Yes Type B, C, E, J, K, L, N, R, S, T to IEC 584	Yes; for Ptxxx, Nixxx Ptxxx, Nixxx
Femperature compensation internal temperature compensation external temperature compensation with compensations socket	Not possible Yes; possible, one external compensating box per channel		Not possible Yes; possible, one external compensating box per channel	Yes; possible with TM- E15S24-AT, TM- E15C24-AT Yes; one external compensating box per channel	Yes
Analog value creation Measurement principle	integrating	integrating	integrating	integrating	integrating (Sigma-Delta)
Integrations and conversion time/ resolution per channel Resolution with overrange (bit including sign), max.	16 bit; 15 bit + sign	16 bit; 150 Ohm: 14 bit; 300, 600 Ohm: 15 bit, Pt100, Ni100: 16 bit	16 bit; 15 bit + sign	16 bit	16 bit; for Pt100, Ni100, Ni120, Pt200 Ni200, Pt 500, Ni 50 Pt1000, Ni1000, Cu1 15 bit + sign; for 15 300, 600, 3000 Ohm 15 bit; for PTC: 1 bit

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Integrations and conversion time/ resolution per channel					
Integration time, parameterizable	Yes	Yes	Yes		
 Integration time, ms Interference voltage suppression for interference frequency f1 in Hz 	16.7 / 20 ms 60 / 50 Hz				
Conversion time (per channel)	55 / 65 ms (additional 20 ms on activated wire-break test)	66 / 80 ms; additional conversion time for diagnostic wire break test	65 ms; 55 / 65 ms (additional 20 ms on activated wire-break test)	66 ms; 66 / 80 ms; additional conversion time for diagnostic wire break test	Basic conversion time: incl. integration time: 50 / 60 ms; additional conversion time for diagnostic wire break test: 5 / 5 ms; additional conversion time for line compensation with 3-core connection: 50/60 ms
Smoothing of measured values • parameterizable	Yes; in four stages by means of digital filtering				
Step: NoneStep: LowStep: MediumStep: High	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time
Encoder Connection of signal encoders					
 for voltage measurement for resistance measurement with 2-conductor 	Yes	Yes	Yes		Yes
• for resistance measurement with 3-conductor connection		Yes			Yes; internal compensation of the line resistances
• for resistance measurement with 4-conductor connection		Yes			Yes
Errors/accuracies Linearity error (relative to input area)	+/- 0.01 %	+/- 0.01 %	+/- 0.01 %	+/- 0.01 %	+/- 0.01 %
Temperature error (relative to input area)	+/- 0.005 %/K	+/- 0.005 %/K	+/- 0.005 %/K	+/- 0.005 %/K	+/- 0.0009 %/K
Crosstalk between the inputs, min.	-50 dB				
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.05 %	+/- 0.05 %	+/- 0.05 %	+/- 0.05 %

ET 200S

I/O modules Analog electronic modules

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Operational limit in overall temperature range					
Voltage, relative to input area	+/- 0.6 %		+/- 0.6 %	+/- 0.1 %; +/-1.5 K for thermocouples, +/-7 K for thermocouples type C,+/-2.5 K with static thermal state (ambient temperature change < 0.3 K/min)	
Resistance-type thermometer, relative to input area		+/- 0.6 %		с ,	Resistance-type transmitter: +/-0.1%; Pt100, Pt200, Pt500, Pt1000 standard: +/-1.0 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.25 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.4 K; Cu10 +/-1.5 K
Basic error limit (operational limit at 25 °C)	1.0.4.0/		+/- 0.4 %	/ 0 0F 0/	
 Voltage, relative to input area Resistance-type thermometer, relative 	+/- 0.4 %	+/- 0.4 %	+/- U.4 %	+/- 0.05 %; +/-1 K with thermocouples, +/-5 K with thermocouples type C, +/-1.5 K with static thermal state (ambient temperature change < 0.3 K/min)	Resistance-type transmitter: +/-0.05%;
to input area					Pt100, Pt200, Pt500, Pt1000 standard: +/-0.6 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.13 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.2 K; Cu10 +/-1 K
Interference voltage suppression for f = n x (fl +/- 1%), fl = inter- ference frequency					
Series mode inter- ference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	70 dB	70 dB
• common mode voltage (USS < 2.5 V) , min.	90 dB	90 dB	90 dB	90 dB	90 dB
Parameter Remark	4 byte		4 byte	4 byte	7 byte
Diagnostics: wire break	Disable / enable (wire break is detected only in thermocouples)	Disable / enable	Disable / enable (wire break is detected only in thermocouples)	Disable / enable (wire break is detected only in thermocouples)	Disable / enable

ET 200S
I/O modules
Analog electronic modules

	6ES7 134-4JB01- 0AB0	6ES7 134-4JB51- 0AB0	6ES7 134-4JD00- 0AB0	6ES7 134-4NB01- 0AB0	6ES7 134-4NB51- 0AB0
Measurement type/ range	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh- PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh- Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	deactivated/150 Ohm/ ; 300 Ohm/600 Ohm/ Pt100 climatic/ Pt100 standard; Ni100 standard / Ni100 climatic, 2, 3 or 4-wire	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh- PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh- Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh- PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh- Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	deactivated/ 150 Ohm/ 300 Ohm/ 600 Ohm/Pt100/ Pt200/ Pt500/ Pt1000 each standard or climate range/ Ni100/ Ni120/ Ni200/ Ni500/ Ni1000 each standard or climate range/ Cu10 each standard or climate range / PTC
Group diagnostics	Disable / enable	Disable / enable	Disable / enable	Disable / enable	Disable / enable
Overflow/underflow	Disable/enable	Disable/enable	Disable/enable	Disable/enable	Disable/enable
Comparison point	none / RTD		none / RTD	none / yes, internal	
Comparison point number	none/1/2/3/4/5/ 6/7/8		none/1/2/3/4/5/ 6/7/8		
Unit	Celsius		Celsius	Celsius / Fahrenheit	
Alarms/diagnostics/ status information Diagnostics • Diagnostic functions • Diagnostic information readable	Yes; can be read out Yes	Yes; can be read out	Yes; can be read out Yes		
Wire break	Yes; a break in the wire is only detected for thermocouples	Yes	Yes; a break in the wire is only detected for thermocouples	Yes; only thermo- couples	Yes
Group errorOverflow/underflow	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Diagnostic indication LED					
Group error SF (red)	Yes	Yes	Yes	Yes	Yes
Isolation Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
Galvanic isolation Galvanic isolation analog inputs					
 between the channels between the channels and the backplane 	No Yes	No Yes	No Yes	No Yes	No Yes
between the channels and the load voltage L+	Yes	Yes	Yes	Yes	Yes
Permissible potential difference between inputs and MANA (UCM)	2 V AC PP		2 V AC PP	140 V DC/100 V AC	
between MANA and M internally (UISO)	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight Dimensions					
• Width	15 mm	15 mm	15 mm	15 mm	15 mm
HeightDepth	81 mm 52 mm	81 mm 52 mm	81 mm 52 mm	81 mm 52 mm	81 mm 52 mm
Weight • Weight, approx.	40 g	40 g	40 g	40 g	40 g

ET 200S

I/O modules Analog electronic modules

	6ES7 135-4FB01-0AB0	6ES7 135-4FB52-0AB0	6ES7 135-4LB02-0AB0
Supply voltages			
Load voltage L+			
Rated value (DC)	24 V; from power module	24 V; from power module	24 V
Reverse polarity protection	Yes	Yes	Yes
Current consumption	400	400 4	
from load voltage L+ (without load), max.	130 mA	100 mA	80 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
	TOTIIA	TOTILA	TOTHA
Power losses Power loss, max.	2 W	2 W	1.2 W
Address area			
Address space per module			
• Address space per module, max.	4 byte	4 byte	4 byte
Isochronous mode			
Isochronous mode		Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Cable length, shielded, max.	200 m	200 m; max. 20m for TWA 100µs	200 m; 100m if Twa < 2ms
Voltage output, short-circuit protection	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA
Cycle time (all channels) max.	1.5 ms	0.25 ms	0.5 ms; at max. 0.5 µF
Output ranges, voltage			
• 1 to 5 V	Yes	Yes	Yes; -5 to +5 V also implemented
• -10 to +10 V	Yes	Yes; +/-5V as well	Yes
Connection of actuators			
for voltage output 2-conductor	Yes; without compensation of the line resistances	Yes; without compensation of the line resistances	Yes
connectionfor voltage output 4-conductor	Yes	Yes	Yes
connection	103	103	163
Load impedance (in rated range of			
output)			
with voltage outputs, min.	1 kΩ	1 kΩ	1 kΩ
 with voltage outputs, capacitive load, max. 	1 μF	1 μF; 0.1μF for Twa=0.1ms	0.5 µF
Destruction limits against externally			
applied voltages and currents			
Voltages at the outputs towards	15 V; max. 15 V permanent; 75 V	15 V; max. 15 V for max. 5 hours,	15 V; as required
MANA	for max. 1 s (mark to space ratio 1:20)	75 V for max. 1 s	
• Current, max.	50 mA; DC	30 mA; DC	
Analog value creation			
Integrations and conversion time/			
resolution per channel	=		101111111111111111111111111111111111111
 Resolution with overrange (bit including sign), max. 	14 bit; 1 to 5 V: 12 bit, +/-10 V: 13 bit + sign	16 bit; 1 to 5 V: 14 bit, +/-10 V: 15 bit + sign, +/-5 V: 14 bit + sign	16 bit; 15 bit + sign
Settling time	To bit I digit	10 Sit 1 digit, 17 0 V. 14 Sit + digit	
for resistive load	0.1 ms	0.05 ms	0.2 ms
• for capacitive load	0.5 ms	0.05 ms	0.5 ms; at max. 0.5µF
• for inductive load	0.5 ms	0.05 ms	0.5 ms
Errors/accuracies			
Output ripple (based on output area, bandwidth 0 to 50 kHz)	+/- 0.02 %	+/- 0.02 %	+/- 0.02 %
•			

ET 200S
I/O modules
Analog electronic modules

	6ES7 135-4FB01-0AB0	6ES7 135-4FB52-0AB0	6ES7 135-4LB02-0AB0
Linearity error (relative to output	+/- 0.02 %	+/- 0.03 %	+/- 0.01 %
area)	1.0.04.0/1/	1.0.04.0/1/	
Temperature error (relative to output area)	+/- 0.01 %/K	+/- 0.01 %/K	
Crosstalk between the outputs, min.		60 dB	60 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0.05 %	+/- 0.03 %	+/- 0.01 %
Operational limit in overall temperature range • Voltage, relative to output area	+/- 0.4 %	+/- 0.2 %	+/- 0.1 %
Basic error limit (operational limit at 25 °C)			
Voltage, relative to output area	+/- 0.2 %	+/- 0.01 %	+/- 0.05 %
Parameter		_	
Remark	7 byte	7	7 byte
Output type/range	deactivated / 1 to 5 V / +/ -10 V	deactivated / 1 to 5 V / +/ -10 V / +/- 5 V	deactivated / 1 to 5 V / +/ -10 V / +/- 5 V
Diagnostics: short circuit	Disable / enable	Disable / enable	Disable / enable
Interference frequency suppression			no
Group diagnostics	Disable / enable	Disable / enable	Disable / enable
Behavior on CPU/Master STOP	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value
Alarms/diagnostics/status information			
Substitute values connectable	Yes; 0 to 65535 (range of values must be within the rated range)	Yes; 0 to 65535 (range of values must be within the rated range)	Yes
Diagnostics • Diagnostic functions • Diagnostic information readable • Wire break • Short circuit • Group error	Yes Yes	Yes Yes No Yes Yes	Yes Yes Yes
Diagnostic indication LED • Group error SF (red)	Yes	Yes	Yes
Isolation Isolation checked with			500 V DC
Galvanic isolation Galvanic isolation analog outputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+	No Yes Yes	No Yes Yes	No Yes Yes
Permissible potential difference between MANA and M internally (UISO)	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight Dimensions • Width • Height • Depth	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm
Weight • Weight, approx.	40 g	40 g	40 g

ET 200S

I/O modules Analog electronic modules

	6ES7 135-4GB01-0AB0	6ES7 135-4MB02-0AB0	6ES7 135-4GB52-0AB0
Supply voltages			
Load voltage L+			
Rated value (DC) Reverse polarity protection	24 V; from power module	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Current consumption from load voltage L+ (without load),	150 mA	80 mA	150 mA; with load
max.			,
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
Power losses Power loss, max.	2 W	1.2 W	2.4 W; typical
Address area			
 Address space per module Address space per module, max. 	4 byte	4 byte	4 byte
Isochronous mode	4 Dyte	4 Dyte	4 Dyte
Isochronous mode		Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Cable length, shielded, max.	200 m	200 m; 100m if Twa < 2ms	200 m; max. 20m for TWA 100µs
Current output, no-load voltage, max.	18 V	18 V	18 V
Cycle time (all channels) max.	1.5 ms	0.5 ms	250 µs
Output ranges, current			
• -20 to +20 mA • 4 to 20 mA	Yes Yes	Yes Yes	Yes Yes
	res	res	res
Connection of actuators for current output 2-conductor connection	Yes	Yes	Yes
for current output 4-conductor connection	No	No	
Load impedance (in rated range of			
output)	500.0	500.0	500.0
with current outputs, max.with current outputs, inductive load,	500 Ω 1 mH	500 Ω 1 mH	500 Ω 1 mH; for TWA 100μs
max.	111111	1 11111	1 ππ, τοι τννα τουμε
Destruction limits against externally			
applied voltages and currentsVoltages at the outputs towards	15 V; max. 15 V permanent; 75 V		
MANA	for max. 1 s (mark to space ratio		
• Commont many	1:20) 50 mA: DC	FO A	15 mA; max. 15 V/5 hours
Current, max.	50 MA; DC	50 mA	(higher voltages not permissible
			even briefly)
Analog value creation			
Integrations and conversion time/ resolution per channel			
 Resolution with overrange (bit including sign), max. 	14 bit; 4 to 20 mA: 13 bit, +/-20 mA: 14 bit	16 bit	16 bit
Settling time			
for resistive load	0.1 ms	0.3 ms	0.05 ms
for capacitive load	0.5 ms	1 ms	0.05 ms; at a load of up to 500 Ohm/100 nF and a max. cable
			length of 20 m
• for inductive load	0.5 ms	0.5 ms	0.05 ms
Ex(i) characteristics Max. values of output circuits (per channel)			
Uo (output no-load voltage), max.	18 V		

ET 200S
I/O modules
Analog electronic modules

	6ES7 135-4GB01-0AB0	6ES7 135-4MB02-0AB0	6ES7 135-4GB52-0AB0
Errors/accuracies Output ripple (based on output area, bandwidth 0 to 50 kHz)	+/- 0.02 %	+/- 0.02 %	+/- 0.02 %
Linearity error (relative to output area)	+/- 0.02 %	+/- 0.01 %	+/- 0.03 %; with resistive load
Temperature error (relative to output area)	+/- 0.01 %/K	+/- 0.003 %/K	+/- 0.01 %/K
Crosstalk between the outputs, min.		60 dB	-60 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0.05 %	+/- 0.01 %	+/- 0.03 %
Operational limit in overall temperature range • Current, relative to output area	+/- 0.5 %	+/- 0.1 %	+/- 0.2 %; Specified value applies for loads from 200 to 350 Ohm, deviating operational limits for loads up to 200 Ohm and from 350 to 500 Ohm with up to 0.4%
Basic error limit (operational limit at 25 °C) • Current, relative to output area	+/- 0.3 %	+/- 0.05 %	+/- 0.1 %; Specified value applies for loads from 200 to 350 Ohm, deviating basic error limits for loads up to 200 Ohm and from 350 to 500 Ohm with up to 0.3%
Parameter			
Remark	7 byte	7 byte	7 byte
Output type/range	deactivated / +/-20 mA / 4 to 20 mA	deactivated / +/-20 mA / 4 to 20 mA	deactivated / +/-20 mA / 4 to 20 mA
Diagnostics: wire break	Disable / enable	Disable / enable	Disable / enable
Interference frequency suppression		disable / enable	
Group diagnostics	Disable / enable	Disable / enable	Disable / enable
Behavior on CPU/Master STOP	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value
Alarms/diagnostics/status			
information Substitute values connectable	Yes; 0 to 65535 (range of values must be within the rated range)	Yes	Yes
Diagnostics Diagnostic functions Diagnostic information readable Wire break Group error	Yes Yes	Yes Yes Yes	Yes Yes Yes Yes
Diagnostic indication LEDGroup error SF (red)	Yes	Yes	Yes
Isolation Isolation checked with		500 V DC	500 V DC
Galvanic isolation Galvanic isolation analog outputs Galvanic isolation analog outputs between the channels between the channels and the backplane bus between the channels and the load voltage L+	No Yes Yes	Yes No Yes Yes	Yes No Yes Yes

ET 200S

I/O modules Analog electronic modules

	6ES7 135-4GB01-0AB0	6ES7 135-4MB02-0AB0	6ES7 135-4GB52-0AB0
Permissible potential difference between MANA and M internally (UISO)	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight Dimensions • Width • Height • Depth	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm	15 mm 81 mm 52 mm
Weight • Weight, approx.	40 g	40 g	45 g

Ordering data	Order No.		Order No.
Analog input modules		Accessories for labeling	
Ordering unit 1 unit		Label sheets DIN A4 (10 units)	
2 Al U High Speed 2 Al U Standard 2 Al U High Feature 2 Al I Standard 2-wire 2 Al I High Speed 2-wire 2 Al I High Speed 4-wire 2 Al I High Speed 4-wire 2 Al I Standard 4-wire 2 Al I High Feature 2-wire/4-wire (15 bit + sign) 2 Al RTD standard 2 Al TC Standard 2 Al RTD High Feature 2 Al TC High Feature 4 Al Standard 2-wire	6ES7 134-4FB52-0AB0 6ES7 134-4FB01-0AB0 6ES7 134-4LB02-0AB0 6ES7 134-4GB01-0AB0 6ES7 134-4GB52-0AB0 6ES7 134-4GB62-0AB0 6ES7 134-4GB11-0AB0 6ES7 134-4JB51-0AB0 6ES7 134-4JB01-0AB0 6ES7 134-4JB01-0AB0 6ES7 134-4NB01-0AB0 6ES7 134-4NB01-0AB0 6ES7 134-4NB01-0AB0	Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige Accessories for systemintegrated shield connection Shield connection element Ordering unit 5 units For plugging into TM-E and TM-P	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0 6ES7 193-4GA00-0AA0
• 4 AI TC Standard	6ES7 134-4JD00-0AB0	Shield clamps	6ES7 193-4GB00-0AA0
Analog output modules		Ordering unit 5 units	
Ordering unit 1 unit		For 3 × 10 mm busbars	
• 2 AO U Standard	6ES7 135-4FB01-0AB0	Grounding terminal	8WA2 868
2 AO U High Speed2 AO U High Feature	6ES7 135-4FB52-0AB0 6ES7 135-4LB02-0AB0	Ordering unit 1 unit	
2 AO I Standard 2 AO I High Speed	6ES7 135-4GB01-0AB0 6ES7 135-4GB52-0AB0	For cable cross-sections up to 25 mm ²	
2 AO I High Feature	6ES7 135-4MB02-0AB0	3 × 10 mm busbars	8WA2 842
		Ordering unit 1 unit	

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

Technology modules SSI module

Overview



- 1-channel module for connecting SSI sensors to the ET 200S
- For position decoding and simple positioning tasks
- With two comparison operations with specifiable comparison values (standard mode)
- With a digital input for latching actual values (standard mode)
- Can be plugged into TM-E terminal module with automatic coding
- Fast mode for high-speed acquisition of encoder values (e.g. for drive controls)
- Module replacement possible during operation and when live (hot swapping)
- Simple parameterization without additional software

Note:

We supply positioning systems and prepared connection cables for counting and positioning functions as SIMODRIVE Sensors or Motion Connect 500

(also visit www.siemens.com/simatic-technology)

	6ES7 138-4DB03-0AB0
Supply voltages	
Load voltage L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
 Reverse polarity protection 	Yes
Current consumption from load voltage L+ (without load), max.	40 mA
Power losses	
Power loss, typ.	1 W
Hardware configuration Module exchange • Hot swapping the IM-DP • Module exchange under process voltage	Yes Yes

	6ES7 138-4DB03-0AB0
Digital inputs	
Number of digital inputs	1
Input voltage	
• for signal "0"	-30 to +5 V
• for signal "1"	11 to 30 V
Input current	O A
 for signal "0", max. (permissible quiescent current) 	2 mA
• for signal "1", typ.	9 mA
Cable length	
 Cable length, shielded, max. 	50 m
Encoder supply	
24 V encoder supply	V
• 24 V	Yes Yes
Short-circuit protectionOutput current, max.	500 mA
Absolute encoder (SSI) encoder	300 IIIA
supply	
 Absolute encoder (SSI) 	Yes
Output voltage	L+ (-0.8 V)
Output current, max.	500 mA
- Short-circuit protection	Yes
Encoder Number of connectable encoders,	1
max.	'
Connectable encoders	
Absolute encoder (SSI)	Yes
Encoder signals, absolute encoder	
(SSI)	
Telegram length	13, 14, 16, 21, 24 & 25 bit
Binary codeGray code	Yes Yes
Cable length, shielded, max.	320 m; At 125 kHz
Monoflop time	16/32/48/64 µs
Alarms/diagnostics/status infor-	
mation	
Diagnostic indication LED	Yes
 Group error SF (red) Status indicator digital input	Yes
(green)	.00
Status indicator backward counting (green)	Yes
counting (green)Status indicator forward counting	Yes
(green)	.00
Galvanic isolation	
Galvanic isolation digital inputs	
Galvanic isolation digital inputs	No; same potential with L+ and SSI
Galvanic isolation counter	
between the channels and	Yes
the backplane bus	
 between the channels and the load voltage L+ 	No
Dimensions and weight	
Dimensions	
• Width	15 mm
Height Donth	81 mm
• Depth	52 mm
Weight	40 g
Weight, approx.	40 g

ET 200S

Technology modules SSI module

Ordering data	Order No.		Order No.
SSI module	6ES7 138-4DB03-0AB0	Signal cable	
for connecting absolute encoders with an SSI interface		Preassembled for SSI absolute encoder 6FX2001-5, without	6FX5 002-2CC12
Accessories		Sub-D connector, UL/DESINA	
Label sheets DIN A4 (10 units)			
Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules			
• petrol	6ES7 193-4BH00-0AA0		
• red	6ES7 193-4BD00-0AA0		
• yellow	6ES7 193-4BB00-0AA0		
• light beige	6ES7 193-4BA00-0AA0		

ET 200S

Technology modules 2 PULSE pulse generator

Overview



- 2-channel pulse generator and timer module for ET 200S
- For controlling final control elements, valves, heating elements, etc.
- Pulse-width modulation (PWM)
- Pulse trains
- Pulse chains
- Frequency output
- Time-precise switching signals to 24 V DC output
- Measurement of output current
- Isochronous mode

	6ES7 138-4DD01-0AB0
Supply voltages Load voltage L+	
Rated value (DC)Reverse polarity protection	24 V; from power module Yes
Current consumption from load voltage L+ (without load), max.	40 mA
from backplane bus 3.3 V DC, max.	10 mA
Power losses Power loss, typ.	1.8 W
Digital inputs Number of digital inputs	2
Input characteristic curve acc. to IEC 1131, Type 2	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -30 to +5 V 11 to 30 V
Input current • for signal "1", typ.	9 mA
Input delay (for rated value of input voltage) Input frequency (with a time delay of 0.1 ms), max. Minimum pulse width for program reactions	20 kHz 100 μs

	6ES7 138-4DD01-0AB0
Cabla langth	0ES7 130-4DD01-0AB0
Cable lengthCable length, shielded, max.	100 m
Digital outputs	
Number of digital outputs	2
Short-circuit protection	Yes 10 A
Response threshold, typ. Limitation of inductive shutdown	L+ (-50 to -65 V)
voltage to	L+ (-50 t0 -65 V)
Lamp load, max.	10 W
Accuracy of pulse duration	+/- (time period x 100 ppm), +/-100 μs with a load <= 50 Ohm
Minimum pulse duration	100 μs
Controlling a digital input	Yes
Output voltage • for signal "1", min.	L+ (-1 V)
Output current	
 for signal "1" rated value for signal "1" permissible range for 0 to 60 °C, min. 	2 A 7 mA
• for signal "1" permissible range for 0 to 60 °C, max.	2 A
 for signal "0" residual current, max. 	0.5 mA
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	100 μs 200 μs
Switching frequency	<u> </u>
• with resistive load, max.	5 kHz
with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
Cable lengthCable length, shielded, max.	1 000 m
Cable length unshielded, max.	600 m
Encoder supply	
Output voltage	L+ (-0.8 V)
Output current, rated value	500 mA
Short-circuit protection	Yes
Encoder	
Connectable encoders	
2-wire BEROS parmingible quippent gurrent	Yes 2 mA
 permissible quiescent current (2-wire BEROS), max. 	2 MA
Pulse generator	
Number of channels	2; 1 digital input and 1 digital output per channel
Alarms/diagnostics/status information	
Diagnostic indication LED	
• Group error SF (red)	Yes
Status indicator digital output (groop)	Yes
(green)Status indicator digital input (green)	Yes

ET 200S

Technology modules 2 PULSE pulse generator

Technical specifications (continued)

• ` `	,
	6ES7 138-4DD01-0AB0
Isolation	
Isolation checked with	500 V DC
Galvanic isolation	
Galvanic isolation digital inputs	
 between the channels 	No
 between the channels and the backplane bus 	Yes
Galvanic isolation digital outputs	
between the channels	No
 between the channels and the backplane bus 	Yes
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
Width	15 mm
Height	81 mm
• Depth	52 mm
Weight	
 Weight, approx. 	40 g

Ordering data

Pulse generator and timer module 2PULSE	6ES7 138-4DD01-0AB0
For ET 200S	
Accessories	
Label sheets DIN A4 (10 units)	
Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0

ET 200S

Technology modules 1STEP stepper module

Overview



- 1-channel module for ET 200S for controlled positioning of a stepper motor
- Operating modes: absolute and relative positioning, reference point approach, set reference point and speed mode
- Connection of power units with pulse/direction interface by means of 5 V differential signals up to 510 kHz
- External stop with/without ramp via digital input
- Status display and error indication via LEDs: Errors during positioning and statuses of the digital inputs are indicated by means of LEDs and displayed at the interface to the master
- Isochronous mode

	6ES7 138-4DC01-0AB0
Encoder	
Connectable encoders	
2-wire BEROS	Yes
Drive technology	
Cable length, max.	100 m; twisted and shielded in pairs
Step-by-step controllers	
Connection for stepper motors	Differential signals for pulses (PULSE, notPULSE) and direction (DIR, notDIR) to RS422
Number of stepper motor channels	1
Alarms/diagnostics/ status information	
Diagnostic indication LED	
Description	1 green LED for status indication "Ready for positioning jobs"
 Positioning mode POS (green) 	Yes
 Group error SF (red) 	Yes
 Status indicator digital input (green) 	Yes
Dimensions and weight	
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weight	
 Weight, approx. 	40 g

	6ES7 138-4DC01-0AB0
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
Power losses	
Power loss, typ.	1.5 W
Digital inputs	
Number of digital inputs	2
Functions	Reference cams, pulse suppression, external stop, limit switch
Repeat frequency, max.	100 Hz
Input characteristic curve acc. to IEC 1131, Type 2	Yes
Input voltage	
Rated value, DC	24 V
• for signal "0"	-30 to +5 V (-15% / +20%)
• for signal "1"	11 to 30 V
Input current	
 for signal "0", max. (permissible quiescent current) 	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input	
voltage)	
for standard inputs	
- at "0" to "1", max.	4 ms
- at "1" to "0", max.	4 ms
Cable length	
 Cable length, shielded, max. 	1 000 m
 Cable length unshielded, max. 	600 m

Ordering data	Order No.
1STEP stepper module	6ES7 138-4DC01-0AB0
or simple positioning tasks with stepper motor axes	
Accessories	
Label sheets DIN A4 (10 units)	
Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

Technology modules 1 POS U positioning module

Overview



- The positioning module 1 POS U is a single-channel positioning module for ET 200S for positioning of adjusting and operating axes
- For controlled positioning by means of digital outputs according to the rapid traverse/creep speed principle
- With position value recording for
 - Incremental encoders with 5 V differential signals or 24 V signals or for SSI encoders
 - Dosing operation (single evaluation of encoder signal A only)
- Reference point approach, set actual value
- Parameter change during operation
 - Switchover difference
 - Switch-off difference
- Functions
 - Jog:
 - Direct specification of control signals by the master
 - Travel:
 - Absolute or relative
 - Axes:
 - For linear and rotary axes
 - Latch function:
 - Saving the current actual value by setting a digital input

Note

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under the names SIMODRIVE Sensor or Motion Connect 500.

	6ES7 138-4DL00-0AB0
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Current consumption	
from load voltage L+ (without load), max.	50 mA
from backplane bus 3.3 V DC, max.	10 mA
Power losses	
Power loss, typ.	2 W
Digital inputs Input characteristic curve acc. to IEC 1131, Type 2	Yes

1 P	OS U positioning module
	6ES7 138-4DL00-0AB0
Input voltage Rated value, DC for signal "0" for signal "1"	24 V -30 to +5 V 11 to 30 V
Input current • for signal "0", max. (permissible quiescent current)	2 mA
 for signal "1", typ. Cable length Cable length unshielded, max. 	9 mA 50 m
Digital outputs Short-circuit protection	Yes 0.7 to 1.8 A
Response threshold, typ. Limitation of inductive shutdown voltage to	yes; L+ -(55 to 60 V)
Lamp load, max.	5 W
Output voltage Rated value (DC) for signal "0" (DC), max.	24 V 3 V
for signal "1", min. Output current for signal "1" permissible range	L+ (-1 V) 7 mA
for 0 to 60 °C, min. • for signal "1" permissible range for 0 to 60 °C, max.	600 mA
• for signal "0" residual current, max.	0.3 mA
Output delay with resistive load O to "1", max. 1 to "0", max.	typically 150 µs typically 150 µs
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 2 Hz 10 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m
Encoder supply 5 V encoder supply • 5 V	No
24 V encoder supply24 VShort-circuit protectionOutput current, max.	Yes Yes 500 mA
Absolute encoder (SSI) encoder supply • Absolute encoder (SSI) • Output voltage • Output current, max. • Cable length, max. - Short-circuit protection	Yes L+ (-0.8 V) 500 mA
Encoder Number of connectable encoders, max.	1
Connectable encoders Incremental encoder (symmetrical) Incremental encoder (asymmetrical)	Yes Yes
Absolute encoder (SSI)2-wire BEROS	Yes Yes; type 2

ET 200S

Technology modules
1 POS U positioning module

Technical specifications (continued)		
	6ES7 138-4DL00-0AB0	
Encoder signals, incremental encoder (symmetrical) Encoder signal 5 V Signal level Terminating resistor Differential input voltage, min. Input frequency, max. Cable length, shielded, max. Encoder signal 24 V Rated value 24 V DC Input voltage for signal "0" Input voltage for signal "1" Input current, for signal "0", max. (permissible quiescent current) Input current for signal "1", typ. Input frequency, max.	to RS-422 330 Ω 1 V 500 kHz 50 m Yes 5 V 30 V 2 mA 9 mA 100 kHz	
- Cable length, shielded, max.	50 m	
Encoder signals, absolute encoder (SSI) • Cable length, shielded, max.	320 m at 125 kHz, 160 m at 250 kHz, 60 m at 500 kHz, 20 m at 1 MHz, 8 m at 2 MHz, twisted in pairs and shielded	
 Updating the encoder value Telegram runtime at 13 bit, min. Telegram runtime at 25 bit, min. Monoflop time 	7 ms 13 ms 64 ms	
Response times Send cycle of the feedback messages	1 ms	
Latch	In the case of incremental encoders: typ. 400 ms; in the case of SSI encoders: typ. 400 ms + age of the encoder value:	
Response time at switchover/ switchoff time	In the case of incremental encoders: output delay + 30 µs; in the case of SSI encoders: output delay + message frame runtime + 30 ms	
Alarms/diagnostics/status information Diagnostic indication LED Actual value falling DN (green) Actual value rising UP (green) Positioning mode POS (green) Group error SF (red) Status indicator digital input (green)	Yes Yes Yes Yes	
Galvanic isolation	V	
between backplane bus and all other circuit components	Yes	
between the channels and backplane bus	Yes	
Dimensions and weight		
Dimensions • Width • Height • Depth	30 mm 81 mm 52 mm	
Weight approx	65 a	

Ordering data	Order No.
1 POS U positioning module	6ES7 138-4DL00-0AB0
Single-channel positioning module for ET 200S for positioning the adjustment and operation axes	

• Weight, approx.

65 g

ET 200S

Technology modules 1 COUNT 24 V/100 kHz counter module

Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For the direct connection of 24 V incremental sensors or initiators
- Comparison function with predefinable comparison values
- Integrated digital output to output the reaction when the comparison value is attained
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

Note:

Siemens is able to offer distance measuring systems and preassembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

	6ES7 138-4DA04-0AB0
Supply voltages Load voltage L+ • Rated value (DC) • permissible range, lower limit	24 V 20.4 V
(DC) • permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Current consumption from load voltage L+ (without load), max.	42 mA
from backplane bus 3.3 V DC, max.	10 mA
Power losses Power loss, typ.	1 W
Hardware configuration Module exchange • Hot swapping the IM-DP • Module exchange under process voltage	Yes Yes
Digital inputs Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve acc. to IEC 1131, Type 2	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -30 to +5 V 11 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", typ.	2 mA 9 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", max.	2.5 μs; Filter off: 2.5 μs (200 kHz), filter on: 25 μs (20 kHz)
Cable length Cable length, shielded, max.	100 m; Filter 20 kHz: 100 m, filter 200 kHz: 50 m

	6ES7 138-4DA04-0AB0
Digital outputs	4
Number of digital outputs	1
Short-circuit protection	Yes
Response threshold, typ.	2.6 A to 4 A
Limitation of inductive shutdown voltage to	L+ (-50 to -60 V)
Lamp load, max.	5 W
Controlling a digital input	Yes
Output voltage Rated value (DC) for signal "0" (DC), max. for signal "1", min.	24 V 3 V L+ (-1 V)
Output current • for signal "1" permissible range for 0 to 40 °C, min.	5 mA
 for signal "1" permissible range for 0 to 40 °C, max. 	2 000 mA
 for signal "1" permissible range for 0 to 60 °C, min. 	5 mA
 for signal "1" permissible range for 0 to 60 °C, max. 	500 mA; 1000 mA at 50 °C
 for signal "0" residual current, max. 	0.5 mA
Output delay with resistive load • 0 to "1", max.	100 µs
Switching frequency with resistive load, max. with inductive load, max. on lamp load, max.	100 Hz 2 Hz 10 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m
Encoder supply 24 V encoder supply • 24 V • Short-circuit protection • Output current, max. Encoder	Yes; L+ (-0.8 V) Yes 500 mA
Number of connectable encoders, max.	1

ET 200S

Technology modules 1 COUNT 24 V/100 kHz counter module

	6ES7 138-4DA04-0AB0
Connectable encoders	
 Incremental encoder (asymmetrical) 	Yes
 24 V initiator 	Yes
2-wire BEROS	Yes
Counter	
Number of counter inputs	1; 32 bit
Minimum pulse width	2.5 µs; Filter off: 2.5 µs (200 kHz), Filter on: 25 µs (20 kHz)
Frequency measurement	
Measurement range, min.	0.1 Hz
Measurement range, max.	100 kHz
Cycle duration measurement	
Measuring range, lower limit	10 μs
Measuring range, upper limit	120 s
Speed measurement	
Measurement range, min. (lower limit)	1 1/min
Measurement range, max. (upper limit)	25 000 1/min
Parameter	
Remark	16 byte
Alarms/diagnostics/status infor-	
mation	
Diagnostics	Van
Diagnostic functions	Yes

	6ES7 138-4DA04-0AB0
Diagnostic indication LED	
Group error SF (red)	Yes
 Status indicator digital output (green) 	Yes
 Status indicator digital input (green) 	Yes
 Status indicator backward counting (green) 	Yes
 Status indicator forward counting (green) 	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	No; only opposite shielding
Galvanic isolation counter	
 between the channels and the backplane bus 	Yes
 between the channels and the load voltage L+ 	No
Dimensions and weight	
Dimensions	
• Width	15 mm
■ Height	81 mm
• Depth	52 mm
Weight	
• Weight, approx.	40 g
- ννειgrit, αρριοχ.	40 g

Order No.
6ES7 138-4DA04-0AB0
6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0
6ES7 193-4BD00-0AA0
6ES7 193-4BA00-0AA0
6ES7 193-4GA00-0AA0
6ES7 193-4GB00-0AA0
6FX2 001-4DA10 6FX2 001-4DA50 6FX2 001-4DB00 6FX2 001-4DC50

	Order No.
With synchronous flange, radial flange outlet	
- 100 pulses/revolution	6FX2 001-4FA10
- 500 pulses/revolution	6FX2 001-4FA50
- 1000 pulses/revolution	6FX2 001-4FB00
- 2500 pulses/revolution	6FX2 001-4FC50
With synchronous flange, axial	01 A2 00 1-41 C30
flange outlet	
- 100 pulses/revolution	6FX2 001-4HA10
- 500 pulses/revolution	6FX2 001-4HA50
- 1000 pulses/revolution	6FX2 001-4HB00
- 2500 pulses/revolution	6FX2 001-4HC50
With clamping flange, universal	
axial/radial cable outlet with	
connector	
 100 pulses/revolution 	6FX2 001-4NA10
- 500 pulses/revolution	6FX2 001-4NA50
- 1000 pulses/revolution	6FX2 001-4NB00
 2500 pulses/revolution 	6FX2 001-4NC50
With clamping flange, radial	
flange outlet	
- 100 pulses/revolution	6FX2 001-4QA10
- 500 pulses/revolution	6FX2 001-4QA50
- 1000 pulses/revolution	6FX2 001-4QB00
- 2500 pulses/revolution	6FX2 001-4QC50
With clamping flange, axial	
flange outlet	CEYO 004 40440
- 100 pulses/revolution	6FX2 001-4SA10
- 500 pulses/revolution	6FX2 001-4SA50
- 1000 pulses/revolution	6FX2 001-4SB00
- 2500 pulses/revolution	6FX2 001-4SC50
Signal cable	
Pre-assembled for HTL and TTL	6FX5 002-2CA12
encoder, without Sub-D	
connector, UL/DESINA	

ET 200S

Technology modules 1 COUNT 5 V/500 kHz counter module

Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For direct connection of 5 V incremental encoders (RS 422)
- Comparison function with predefinable comparison values
- 2 integrated digital outputs to output the response upon reaching the comparison value
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

Note:

Siemens is able to offer distance measuring systems and preassembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

•	0507 400 4D500 0 AD0
	6ES7 138-4DE02-0AB0
Supply voltages	
Load voltage L+	24 V
Rated value (DC)permissible range, lower limit (DC)	20.4 V
• permissible range, lower limit (bo)	28.8 V
(DC)	20.0 1
Reverse polarity protection	Yes
Current consumption	
from load voltage L+ (without load),	45 mA
max.	
from backplane bus 3.3 V DC, max.	10 mA
Power losses	
Power loss, typ.	2 W
Hardware configuration	
Module exchange	
Hot swapping the IM-DP	Yes
 Module exchange under process voltage 	Yes
Digital inputs	
Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve acc. to IEC 1131, Type 2	Yes
Input voltage	
Rated value, DC	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	11 to 30 V
Input current	
 for signal "0", max. (permissible quiescent current) 	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input	- ···· ·
voltage)	
for standard inputs	
- at "0" to "1", max.	2.5 µs
Cable length	
Cable length, shielded, max.	50 m

	6ES7 138-4DE02-0AB0
Digital outputs Number of digital outputs	2
Short-circuit protection • Response threshold, typ.	Yes 2.6 A to 4 A
Limitation of inductive shutdown voltage to	L+ (-50 to -60 V)
Lamp load, max.	10 W
Controlling a digital input	Yes
Output voltage • Rated value (DC) • for signal "0" (DC), max. • for signal "1", min.	24 V 3 V L+ (-1 V)
Output current • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C, min. • for signal "1" permissible range for 0 to 60 °C, max.	2 A 5 mA 2.4 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load • 0 to "1", max.	100 μs
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 2 Hz 10 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m
Encoder supply 24 V encoder supply • 24 V • Short-circuit protection • Output current, max.	Yes; L+ (-0.8 V) Yes 500 mA

ET 200S

Technology modules 1 COUNT 5 V/500 kHz counter module

	6ES7 138-4DE02-0AB0	
Encoder Number of connectable encoders, max.	1	
Connectable encoders Incremental encoder (symmetrical) - 2-wire BEROS	Yes Yes	
Encoder signals, incremental encoder (symmetrical) Trace mark signals Zero mark signal Input signal Input frequency, max. Cable length, shielded, max.	A, notA, B, notB, A and B offset by 90° N, notN 5 V difference signal (phys. RS 422) 650 kHz 50 m; > 500kHz: 30 m	
Counter Number of counter inputs	1; 32 bit	
Frequency measurement Measurement range, min. Measurement range, max.	0.1 Hz 500 kHz	
Cycle duration measurement Measuring range, lower limit	10 µs	
Measuring range, upper limit	120 s	
Speed measurement Measurement range, min. (lower limit)	1 1/min	
Measurement range, max. (upper limit)	25 000 1/min	
Parameter Remark	16 byte	

	6ES7 138-4DE02-0AB0
Alarms/diagnostics/status information	
Diagnostics	
 Diagnostic functions 	Yes
Diagnostic indication LED	
 Group error SF (red) 	Yes
 Status indicator digital output (green) 	Yes
 Status indicator digital input (green) 	Yes
 Status indicator backward counting (green) 	Yes
 Status indicator forward counting (green) 	Yes
 Synchronization SYN (green) 	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	No; only opposite shielding
Galvanic isolation counter	
 between the channels and the backplane bus 	Yes
 between the channels and the load voltage L+ 	No
Dimensions and weight	
Dimensions	
• Width	30 mm
Height	81 mm
Depth	52 mm
Weight	
 Weight, approx. 	65 g

Ordering data	Order No.
1 COUNT 5 V/500 kHz counter module	6ES7 138-4DE02-0AB0
For universal counting and measuring tasks with ET 200S	
Accessories	
Label sheets DIN A4 (10 units)	
Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules • petrol • red • yellow • light beige	6ES7 193-4BH00-0AA0 6ES7 193-4BD00-0AA0 6ES7 193-4BB00-0AA0 6ES7 193-4BA00-0AA0
Shield connection element	6ES7 193-4GA00-0AA0
For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 units	
Shield clamps	6ES7 193-4GB00-0AA0
For connecting braided cable shields to the busbar, 5 units	

	Order No.
SIMODRIVE Incremental shaft encoder	
with RS 422 (TTL), operating voltage 10 to 30 V • With synchronous flange, universal axial/radial cable outlet with connector - 500 pulses/revolution - 1000 pulses/revolution - 1024 pulses/revolution - 1250 pulses/revolution - 2500 pulses/revolution - 2000 pulses/revolution - 2048 pulses/revolution - 2500 pulses/revolution - 3600 pulses/revolution - 5000 pulses/revolution	6FX2 001-2DA50 6FX2 001-2DB00 6FX2 001-2DB02 6FX2 001-2DB25 6FX2 001-2DB50 6FX2 001-2DC00 6FX2 001-2DC04 6FX2 001-2DC50 6FX2 001-2DD60 6FX2 001-2DD60
With synchronous flange, radial flange outlet	CEVO 004 05450
500 pulses/revolution1000 pulses/revolution	6FX2 001-2FA50 6FX2 001-2FB00
 1024 pulses/revolution 1250 pulses/revolution 1500 pulses/revolution 2000 pulses/revolution 2048 pulses/revolution 2500 pulses/revolution 	6FX2 001-2FB02 6FX2 001-2FB25 6FX2 001-2FB50 6FX2 001-2FC00 6FX2 001-2FC04 6FX2 001-2FC50
3600 pulses/revolution5000 pulses/revolution	6FX2 001-2FD60 6FX2 001-2FF00

ET 200S

Technology modules 1 COUNT 5 V/500 kHz counter module

flange outlet - 500 pulses/revolution - 1000 pulses/revolution 6FX2 001-2HA50 6FX2 001-2HB00	With clamping flange, radial lange outlet 500 pulses/revolution 1000 pulses/revolution 1024 pulses/revolution 1250 pulses/revolution 6FX2 001-2QB00 6FX2 001-2QB02 6FX2 001-2QB02 6FX2 001-2QB25
- 1250 pulses/revolution - 1500 pulses/revolution - 2000 pulses/revolution - 2048 pulses/revolution - 2500 pulses/revolution - 3600 pulses/revolution - 5000 pulses/revolution - 1000 pulses/revolution - 1000 pulses/revolution - 1024 pulses/revolution - 10250 pulses/revolution - 1500 pulses/revolution - 1500 pulses/revolution - 2000 pulses/revolution - 2000 pulses/revolution - 2048 pulses/revolution - 2500 pulses/revolution - 3600 pulses/revolution - 5000 pulses/revolution	1500 pulses/revolution 2004 pulses/revolution 2048 pulses/revolution 3600 pulses/revolution 5000 pulses/revolution 6FX2 001-2QC00 6FX2 001-2QC00 6FX2 001-2QC50 6FX2 001-2QD60 6FX2 001-2QF00 With clamping flange, axial lange outlet 500 pulses/revolution 1000 pulses/revolution 6FX2 001-2SA50 6FX2 001-2SB00 6FX2 001-2SB00 6FX2 001-2SB00 6FX2 001-2SB00 6FX2 001-2SB00 6FX2 001-2SB00 6FX2 001-2SB25 6FX2 001-2SB50 6FX2 001-2SC50 6FX2 001-2SF00 6FX2 001-2SF00 6FX2 001-2SF00 6FX2 001-2SF00 6FX2 001-2SF00

ET 200S

Technology modules 1SI interface module

Overview



- 1-channel module for serial data exchange through point-to-point connection
- For message frames max. 200 byte long
- RS 232C, RS 422, RS 485
- 2 versions
 - ASCII and 3964(R) protocolModbus and USS protocol
- Parameter assignment through GSD file or STEP 7 (V5.1 and higher)

	6ES7 138-4DF01-0AB0	6ES7 138-4DF11-0AB0
Supply voltages Load voltage L+		
Rated value (DC)	24 V	24 V
Current consumption from backplane bus 24 V DC, max.	80 mA; typ. 20 mA	80 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Power losses Power loss, typ.	1.2 W	1.2 W
Memory Standard blocks	5 100 byte; S_SEND 2700, S_RCV 2400, S_XON 2600, S_RTS 2600, S_V24 2700, S_VSTAT 1800, S_VSET 1800	11 100 byte; Modbus: S_SEND 2700, S_RCV 2400, S_MODB 6000; USI: S_SEND 2700, S_RCV 2400, S_USST 1900, S_USSR 2600, S_USSI 1500
Interfaces Number of interfaces	1	1
RS 232C	Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)	Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)
RS 422/RS485	Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)	Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)
RS 232, cable length, shielded, max.	15 m	15 m
RS 422/485, cable length, shielded, max.	1 200 m	1 200 m
Point-to-point Integrated protocol driver • 3964 (R) • ASCII • MODBUS • Transmission speed, Modbus protocol, max. • USS • Transmission speed, USS protocol, max.	Yes Yes	Yes 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38.400, 57,600, 76,800, 115,200 bit/s Yes 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s
Transmission speed, RS 422/485 • with 3964 (R) protocol, max. • with ASCII protocol, max.	115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s 115.2 kbit/s; full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	

ET 200S

Technology modules 1SI interface module

	6ES7 138-4DF01-0AB0	6ES7 138-4DF11-0AB0
Transmission speed, RS232		
• with 3964 (R) protocol, max.	115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
with ASCII protocol, max.	115.2 kbit/s; full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
Character frame (adjustable)		
Bits per character	7 or 8	8
 Number of start/stop bits 	1 or 2	1 or 2 (USS only 1)
Bits per character frame	10	10 or 11 (USS only 11 bit)
• Parity	none, odd, even, any	none, odd, even (USI even only)
Number of byte per PLC sampling cycle		
Data quantity per PLC sampling cycle, receiving	32 byte; with IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte	32 byte; with IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte
 Data quantity per PLC sampling cycle, transmitting 	32 byte; With IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte	32 byte; With IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte
Alarms/diagnostics/status information		
Diagnostic indication LED		
 Receive RxD (green) 	Yes	Yes
 Group error SF (red) 	Yes	Yes
 Transmit TxD (green) 	Yes	Yes
Galvanic isolation		
Electrical isolation interface		
• between 422/485 and internal power supply	Yes	Yes
• between RS 232 and internal power supply	Yes	Yes
Environmental requirements		
Operating temperature		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions and weight Dimensions		
Width	15 mm	15 mm
Height	81 mm	81 mm
• Depth	52 mm	52 mm
Weight		
Weight, approx.	50 g	50 g

Ordering data	Order No.
1SI interface module ASCII and 3964(R) protocols Modbus and USS protocols	6ES7 138-4DF01-0AB0 6ES7 138-4DF11-0AB0
Accessories	
TM-E15S 26-A1 terminal module	6ES7 193-4CA40-0AA0
Ordering unit 5 units	
TM-E15S 26-A1 terminal module	6ES7 193-4CA50-0AA0
Ordering unit 5 units	

	Order No.
TM-E15N24-A1 terminal module	6ES7 193-4CA80-0AA0
Ordering unit 5 units	
TM-E15S24-01 terminal module	6ES7 193-4CB20-0AA0
Ordering unit 5 units	
TM-E15C24-01 terminal module	6ES7 193-4CB30-0AA0
Ordering unit 5 units	
TM-E15N24-01 terminal module	6ES7 193-4CB70-0AA0
Ordering unit 5 units	

ET 200S

Technology modules SIWAREX CS

Overview



SIWAREX CS weighing electronics

SIWAREX CS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Data can be accessed directly in the SIMATIC.

SIWAREX CS	
Integration in automation systems	
S7-400, S7-300, C7	Through ET 200S
IM151-7 CPU	Through backplane bus
Automation systems from other manufacturers (possible with limitations)	Through ET 200S
Communication interfaces	SIMATIC S7 (ET 200S backplane bus), RS 232, TTY
Connection of remote displays (through TTY serial interface)	Display for weight value
Adjustment of scales settings	Using SIMATIC S7/C7 IM151-7 CPU or SIWATOOL CS PC parameterization software (RS 232)
Measuring accuracy	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
Internal resolution Data format of weight values	65535 2 byte (fixed-point)
Number of measurements/second	50
Digital filter	0.05 5 Hz (in 7 steps), mean-value filter
Weighing functions	
Weight values	Gross, net
Limit values	2 (min./max.)
Zero setting function	Per command
Tare function	Per command
Tare specification	Per command
Load cells	Strain gages in 4-wire or 6-wire system

SIWAREX CS	
Load cell powering	
Supply voltage $U_{\rm S}$ (rated value)	6 V DC typical
Max. supply current	≤ 68 mA
Permissible load impedance	
• R _{Lmin}	> 87 Ω
• R _{Lmax}	< 4010 Ω
- D	With SIWAREX IS Ex interface:
• R _{Lmin} • R _{Lmax}	> 87 Ω < 4010 Ω
Load cell characteristic	1 mV/V 4 mV/V
Permissible range of measuring	-2.4 +26.4 mV
signal (at greatest set character- istic value)	-2.4 +20.4 IIIV
Max. distance of load cells	1 000 m
Intrinsically-safe load cell powering	Optional (SIWAREX IS Ex interface)
External load cell powering	Possible up to 24 V
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL _{US} Haz. Loc.
Supply voltage 24 V DC	
Rated voltage	24 V DC
Max. current consumption	150 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{\min{(IND)}}$ to $T_{\max{(IND)}}$ (operating temperature)	
Vertical installation	-10 +60 °C
Horizontal installation	-10 +40 °C
EMC requirements according to	EN 61326, EN 45501
	NAMUR NE21, Part 1
Dimensions	80 x 125 x 130 mm

Order No.
7MH4 910-0AA01

ET 200S

Technology modules SIWAREX CS

Ordering data	Order No.		Order No.
Configuration package SIWAREX CS on CD-ROM for	7MH4 910-0AK01	SIWAREX JB junction box, stainless steel housing	7MH4 710-1EA
SIMATIC S7, version V5.4 or higher		for connecting up to 4 load cells	
Software for SIWATOOL CS		in parallel	
scale adjustment		Ex interface, type SIWAREX Pi	7MH4 710-5AA
(in a range of languages) Manuals available on CD		With UL and FM approvals, but without ATEX approval	
(in a range of languages)		for intrinsically-safe connection of	
 SIWAREX CS "Getting started" 		load cells, suitable for the SIWAREX U, CS,	
SIWATOOL connection cable	7MH4 607-8CA	MS, FTA, FTC and M weighing	
from SIWAREX U/CS with serial PC interface, for 9-pin PC inter-		modules. Not approved for use in the EU.	
faces (RS 232), 3 m long		Manual for Ex interface type	C71000-T5974-C29
Installation material		SIWAREX Pi	C11000-13914-029
(mandatory)		Ex interface, type SIWAREX IS	
Terminal module	6ES7 193-4CG20-0AA0	With ATEX approval, but without	
TM-E 30 mm wide (required for each SIWAREX module)	or compatible	UL and FM approvals for intrinsically-safe connection of load cells.	
Shield contact element	6ES7 193-4GA00-0AA0	including manual.	
Contents 5 units, sufficient for 5 cables		suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF	
	CEC7 100 4CD00 04 40	weighing modules. Approved for use in the EU.	
Shield connection terminal	6ES7 193-4GB00-0AA0	With short-circuit current	7MH4 710-5BA
Contents: 5 units, sufficient for 5 cables		< 199 mA DC	
Note: one shield connection terminal is required each for the		With short-circuit current < 137 mA DC	7MH4 710-5CA
 scales connection and 		Cable (optional)	
TTY interface or		Cable Li2Y 1 x 2 x 0.75 ST +	7MH4 702-8AG
RS 232 interface		2 x (2 x 0.34 ST) - CY, orange sheath	
N busbar, galvanized	8WA2 842	to connect SIWAREX U, CS, MS,	
3 x 10 mm, 1.0 m long		FTA, FTC, M and CF to the junction box (JB), extension box	
Feeder terminal for N busbar	8WA2 868	(EB) or Ex interface (Ex-I) or	
Remote displays (option)		between two JBs, for fixed laying, occasional bending permitted,	
The digital remote displays can		10.8 mm outer diameter, for	
be connected directly to the		ambient temperature -40 +80 °C	
SIWAREX CS through the TTY interface.		Cable Li2Y 1 x 2 x 0.75 ST +	7MH4 702-8AF
The following remote display can		2 x (2 x 0.34 ST) - CY,	
be used:		blue sheath	
S102		to connect the junction box (JB) or extension box (EB) in a poten-	
Siebert Industrieelektronik GmbH P.O. Box 1180		tially explosive atmosphere to the	
D-66565 Eppelborn		Ex interface (Ex-I), for fixed laying, occasional bending	
Tel.: +49 6806/980-0 Fax: +49 6806/980-999		permitted, blue PVC insulating	
Internet: www.siebert.de		sheath, approx. 10.8 mm outer diameter, for ambient temperature	
Detailed information available		-40 +80 °C	
from manufacturer.		Cable LiYCY 4 x 2 x 0.25 mm ²	7MH4 407-8BD0
Accessories	78414 740 454	for TTY (connect 2 pairs of	
SIWAREX JB junction box, aluminium housing	7MH4 710-1BA	conductors in parallel), for connection of a remote display	
for connecting up to 4 load cells in parallel, and for connecting			

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

Technology modules SIWAREX CF

Overview



SIWAREX CF is a transmitter for connecting strain-gauge sensors for tasks such as measuring force and torque. The compact module is easy to install in all SIMATIC automation systems. Complete data access to the current measured values is then possible via the SIMATIC.

SIWAREX CF	
Integration in automation systems	
S7-400, S7-300, C7	Through ET 200S
Automation systems from other vendors	Possible through ET 200S with IM 151-1
Communication interfaces	SIMATIC S7 (ET 200S backplane bus), 8 byte, I/O area
Module parameterization	Not required (module is pre-parameterized)
Measuring properties	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	≤ 0.15 %
Signal resolution	14 bit plus 1 bit sign
Number of measurements/ second	50
Low-pass filter	Without or 2 Hz
Sensors	In accordance with the principle of expansion measurement (full bridge) 4-wire connection
Sensor feed	
Supply voltage, short-circuit-proof	6 V DC ± 5 %
Permissible sensor resistance • R _{Lmin} • R _{Lmax}	> 250 Ω < 4010 Ω

SIWAREX CF	
Permissible sensor cell coefficient	Up to 4 mV/V
Permissible range of the measuring signal	-25.2 +25.2 mV
Power Supply	
Rated voltage	24 V DC
Max. current consumption	150 mA
Current consumption from backplane bus	Typ. 10 mA
Connection to sensors in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approval zone 2 and safety	ATEX 95, cUL _{us} Haz. Loc.
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements $T_{\min \text{ (IND)}}$ to $T_{\max \text{ (IND)}}$ (operating temperature)	
Vertical installation	0 +60 °C
Horizontal installation	0 +40 °C
EMC requirements according to	NAMUR NE21, Part 1 89/386/EEC
Dimensions	30 x 80 x 50 mm

ET 200S

Technology modules SIWAREX CF

Ordering data	Order No.		Order No.
SIWAREX CF	7MH4 920-0AA01	N busbar, galvanized	8WA2 842
Weighing module for strain-gauge sensors in SIMATIC ET 200S		3 x 10 mm, 1.5 m long	
		Feeder terminal for N busbar	8WA2 868
(SIWAREX CF configuring package not required)		Accessories	
SIWAREX CF manual		SIWAREX EB extension box	7MH4 710-2AA
 German, English 		for extending sensor cables	
Free download on the Internet at: www.siemens.com/weighing- technology		SIWAREX IS Ex interface With ATEX approval, but without UL and FM approvals, for intrinsically-safe connection of load	
SIWAREX CF "Getting started"		cells, including Manual, suitable	
Sample software for easy		for the SIWAREX U, CS, MS, FTA,	
acquaintance with programming in STEP 7. Free download on the		FTC and M weighing modules. Approved for use in the EU.	
Internet at:		With short-circuit current	7MH4 710-5BA
www.siemens.com/weighing- technology		< 199 mA DC • With short-circuit current	714114 740 504
Installation material		< 137 mA DC	7MH4 710-5CA
(mandatory)		Cable (optional)	
Terminal module	6ES7 193-4CG20-0AA0	Cable Li2Y 1 x 2 x 0.75 ST + 2 x	7MH4 702-8AG
TM-E 30 mm wide (required for each SIWAREX module)	or compatible	(2 x 0.34 ST) - CY, orange sheath	
Shield contact element	6ES7 193-4GA00-0AA0	to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the	
Contents 5 units, sufficient for 5 cables		junction box (JB), extension box (EB) or Ex interface (Ex-I) or	
Shield connection terminal	6ES7 193-4GB00-0AA0	 between two JBs, for fixed laying, occasional bending permitted, 	
Content: 5 units, sufficient for 5 cables		10.8 mm outer diameter, for ambient temperature -40 +80 °C	
One shield terminal element is required per sensor cable		-40 +00 C	

ET 200S

I/O modules

Terminal modules for power and electr. modules

Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different versions for accepting power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60 % faster process wiring

Ordering data	Order No.		Order No.
TM-P terminal modules for PM-E		TM-P15C22-01	6ES7 193-4CE10-0AA0
TM-P15S23-A1 Ordering unit 1 unit 2 x 3 terminals, terminal access to	6ES7 193-4CC20-0AA0	Ordering unit 1 unit 2 x 2 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	
AUX1 bus, AUX1 interconnected to the left, screw-type terminals		TM-P15N22-01	6ES7 193-4CE60-0AA0
TM-P15C23-A1	6ES7 193-4CC30-0AA0	Ordering unit 1 unit	
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus. AUX1 interconnected		2 x 2 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	
to the left, spring-loaded terminals		TM-P30S44-A0	6ES7 193-4CK20-0AA0
TM-P15N23-A1	6ES7 193-4CC70-0AA0	Ordering unit 1 unit 7 x 2 terminals, terminal access to	
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus. AUX1 interconnected	0ES/ 193-4CC/U-UAAU	AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe	
to the left, FastConnect		TM-P30C44-A0	6ES7 193-4CK30-0AA0
TM-P15S23-A0 Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals	6ES7 193-4CD20-0AA0	Ordering unit 1 unit 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe	
TM-P15C23-A0	6ES7 193-4CD30-0AA0	TM-E terminal module for electronic modules ¹⁾	
Ordering unit 1 unit 2 x 3 terminals, terminal access to		TM-E15S24-A1	6ES7 193-4CA20-0AA0
AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals		Ordering unit 5 units 2 x 4 terminals, terminal access to	
TM-P15N23-A0	6ES7 193-4CD70-0AA0	AUX1 bus, AUX1 interconnected to the left, screw-type terminals	
Ordering unit 1 unit		TM-E15C24-A1	6ES7 193-4CA30-0AA0
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, FastConnect		Ordering unit 5 units 2 x 4 terminals, terminal access to	
TM-P15S22-01	6ES7 193-4CE00-0AA0	AUX1 bus, AUX1 interconnected to the left, spring-loaded	
Ordering unit 1 unit		terminals	
2 x 2 terminals, no terminal access to AUX1 bus, AUX1 inter-		TM-E15S24-01	6ES7 193-4CB20-0AA0
connected to the left, screw-type terminals		Ordering unit 5 units 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	

Observe project planning help for selecting the suitable TM-E and TM-P

ET 200S

I/O modules Terminal modules for power and electr. modules

Ordering data	Order No.		Order No.
TM-E15C24-01	6ES7 193-4CB30-0AA0	TM-E30S46-A1	6ES7 193-4CF40-0AA0
Ordering unit 5 units 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		Ordering unit 1 unit 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	
TM-E15S23-01	6ES7 193-4CB00-0AA0	TM-E30C46-A1	6ES7 193-4CF50-0AA0
Ordering unit 5 units 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	0E3/ 133-4CB00-0AA0	Ordering unit 1 unit 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	
TM-E15C23-01	6ES7 193-4CB10-0AA0	TM-E15S24-AT	6ES7 193-4CL20-0AA0
Ordering unit 5 units 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		Ordering unit 1 unit for internal temperature compensation with 2 Al TC High Feature, screw-type terminal	
TM-E15N23-01	6ES7 193-4CB60-0AA0	TM-E15C24-AT	6ES7 193-4CL30-0AA0
Ordering unit 5 units 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected		Ordering unit 1 unit for internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals	
to the left, FastConnect TM-E15N24-01	6ES7 193-4CB70-0AA0	Accessories for shield connection	
Ordering unit 5 units	OLO/ 190-4OD/U-UMAU	Shield connection element	6ES7 193-4GA00-0AA0
2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left. FastConnect		Ordering unit 5 units For plugging into TM-E and TM-P	0207 130-40A00-0AA0
TM-E15S26-A1	6ES7 193-4CA40-0AA0	Shield clamps	6ES7 193-4GB00-0AA0
Ordering unit 5 units 2 x 6 terminals, terminal access to		Ordering unit 5 units For busbar 3 × 10 mm	
AUX1 bus, AUX1 interconnected to the left, screw-type terminals		Grounding terminal	8WA2 868
TM-E15C26-A1 Ordering unit 5 units	6ES7 193-4CA50-0AA0	Ordering unit 1 unit for cable cross-sections up to 25 mm ²	
2 x 6 terminals, terminal access to		3 × 10 mm busbars	8WA2 842
AUX1 bus, AUX1 interconnected to the left, spring-loaded		Ordering unit 1 unit	
terminals		Accessories for coding	
TM-E15N24-A1	6ES7 193-4CA70-0AA0	Color coding plates	
Ordering unit 5 units 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left. FastConnect		Ordering unit 200 units for TM-P, TM-E • white	6ES7 193-4LA20-0AA0
TM-E15N26-A1	6ES7 193-4CA80-0AA0	yellowyellow/green	6ES7 193-4LB20-0AA0 6ES7 193-4LC20-0AA0
Ordering unit 5 units 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect		vendwysreen red blue brown turquoise	6ES7 193-4LD20-0AA0 6ES7 193-4LF20-0AA0 6ES7 193-4LG20-0AA0 6ES7 193-4LH20-0AA0
TM-E30S44-01	6ES7 193-4CG20-0AA0	Labels, inscribed	0E37 133-4E1120-0AA0
Ordering unit 1 unit		Ordering unit 1 unit	
4 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals		200 units for slot numbering (1 to 20) 10 ×	8WA8 861-0AB
TM-E30C44-01	6ES7 193-4CG30-0AA0	200 units for slot numbering	8WA8 861-0AC
Ordering unit 1 unit 4 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded		(1 to 40) 5 × 200 units for slot numbering (1 to 64) 1 ×, (1 to 68) 2 ×	8WA8 861-0DA
terminals		Labels, blank	
		200 units for slot numbering	8WA8 848-2AY

ET 200S

I/O modules

4 IQ-Sense and 8 IQ-Sense sensor modules

Overview



- The 4 IQ-Sense sensor module is an intelligent 4-channel electronic module for the ET 200S distributed I/O in PROFIBUS DP networking systems. It is used to connect photoelectric sensors using IQ-Sense technology.
- The 8×IQ-Sense sensor module is an intelligent 8-channel I/O module for SIMATIC S7-300 and ET 200M and is used to connect photoelectric and ultrasonic sensors using IQ-Sense technology. It is possible to combine different types of sensors on one module.

Standard function blocks are available for simplified handling of a SIMATIC S7. Conventional sensors cannot be operated on these modules.

The main applications of the IQ-Sense system are found in installations and machines:

- With high availability demands
- With a high probability of interaction between sensors
- With the need for high flexibility and dynamic changing of sensor parameters.

Technical specifications

	6ES7 138-4GA00-0AB0
Supply voltages Load voltage L+ • Rated value (DC)	24 V; from power module
Reverse polarity protection	Yes
Current consumption from load voltage L+ (without load), max.	300 mA
Power losses Power loss, typ.	0.85 W
Digital inputs Number of digital inputs	4
Cable length Cable length, shielded, max. Cable length unshielded, max.	50 m 50 m
Analog inputs Cycle time (all channels) max.	3.24 ms
Encoder Connectable encoders • Description	Photoelectric proximity switches with IQ-SENSE

	6ES7 138-4GA00-0AB0
Alarms/diagnostics/status information	
Diagnostics	
Diagnostic functions	Yes; Diagnostic information readable
Diagnostic indication LED	
Group error SF (red)	Yes
 Status indicator sensor channel (green) 	Yes
Isolation	
Isolation checked with	500 V DC
Galvanic isolation	
Galvanic isolation digital inputs	
 between the channels 	No
 between the channels and the backplane bus 	Yes
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions and weight	
Dimensions	
• Width	15 mm
• Height	81 mm
Depth	52 mm
Weight	
 Weight, approx. 	35 g

ET 200S

I/O modules 4 IQ-Sense and 8 IQ-Sense sensor modules

Technical specifications (continued)

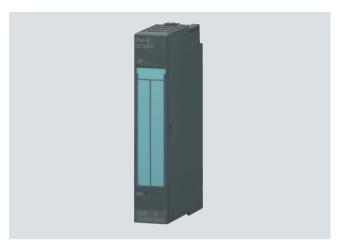
Technical specifications (continued)			
	6ES7 338-7XF00-0AB0		
Supply voltages Load voltage L+ • Rated value (DC)	24 V		
Current consumption from load voltage L+ (without load), max.	1 A		
from backplane bus 5 V DC, max.	150 mA; typically		
Connection method required front connector	20-pin		
Digital inputs Number of digital inputs	8		
Cable length Cable length unshielded, max.	50 m		
Encoder Connectable encoders Description	photoelectronic proximity switches and ultrasonic sensors with IQ-Sense, cycle time 2.88 to 6 ms		
Alarms/diagnostics/status information Diagnostic indication LED • Status indicator digital input (green)	Yes		
Isolation Isolation checked with	500 V DC		
Galvanic isolation Galvanic isolation digital inputs • between the channels • between the channels and the backplane bus	No Yes		
Dimensions and weight Dimensions and weight • Width • Height • Depth	40 mm 125 mm 120 mm		
Weight • Weight, approx.	250 g		

Ordering data	Order No.
I IQ-Sense sensor module	6ES7 138-4GA00-0AB0
8 x IQ-Sense sensor module	6ES7 338-7XF00-0AB0
Sensors	
Note:	
Sensors for connection to the sensor module are the C40 IQ-Sense diffuse sensors, the K80 IQ-Sense retroflective sensors and the M18 IQ-Sense ultrasonic sensors.	
Since July 01, 2010 the marketing and sale of these sensors has been transferred to Pepperl+Fuchs:	
Pepperl+Fuchs Vertrieb Deutschland GmbH Lilienthalstraße 200 68307 Mannheim Germany	
E-mail:fa-info@de.pepperl- fuchs.com	

ET 200S

SIPLUS I/O modules SIPLUS power modules for PM-E electr. modules

Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding
- Diagnostic message for voltage and blown fuse (can be switched off via configuration)
- Fail-safe PM-E F PROFIsafe power module for safe switching off of sequentially plugged-in 24 V DC to 10 A digital output modules or external loads; 3 additional integrated fail-safe 24 V DC / 2 A outputs
- PM-E 24 V to 48 V DC
 - with status information and diagnostics "Load voltage present"
 - for option handling
- PM-E 24 V DC to 230 V AC
 - power module for universal use
 - for option handling

Note

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	PM-E 24 V DC power module
Order No.	6AG1 138-4CA01-2AA0
Order No. based on	6ES7 138-4CA01-0AA0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical specifications	The technical data is identical to that of the based on modules.
	24 to 48 V DC PM-E power module
Order No.	6AG1 138-4CA50-2AB0
Order No. based on	6ES7 138-4CA50-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data is identical to that of the based on modules.
	PM-E power module 24 to 48 V DC / 42 to 230 V AC
Order No.	6AG1 138-4CB11-2AB0
Order No. based on	6ES7 138-4CB11-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data is identical to that of the based on modules.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa
	(+3500 +5000 m)

 $^{^{1)}}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 <$ 4.8 ppm; H $_2$ S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2$ S < 49.7 ppm; CI < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm

The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

derating 20 K

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

ET 200S

SIPLUS I/O modules SIPLUS power modules for PM-E electr. modules

Ordering data	Order No.			Order No.
PM-E power module SIPLUS		PM-E power module 24 to	Н	6AG1 138-4CB11-2AB0
(extended temperature range and		48 V DC, 24 to 230 V AC		
medial exposure)		For electronic modules; with		
PM-E 24 V DC power module 1) +	6AG1 138-4CA01-2AA0	diagnostics and fuse		
For electronic modules; with diagnostics		Accessories		siehe SIMATIC PM-E power modules, page 9/57
24 to 48 V DC PM-E power hodule	6AG1 138-4CA50-2AB0			
For electronic modules; with diagnostics; with status bit "load voltage" present				

Can be used for all electronic and technology modules except 2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

Selection tool for terminal modules

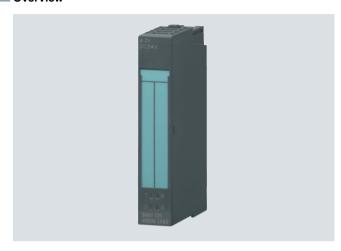
Power modules	rer modules TM-P terminal modules for power modules				
Screw-type terminal type designation	TM-P15S23-A1	TM-P15S23-A0	TM-P15S22-01	TM-P30S44-A0	
Order number 6ES7 193	4CC20-0AA0	4CD20-0AA0	4CE00-0AA0	4CK20-0AA0	
Spring-loaded terminal type designation	TM-P15C23-A1	TM-P15C23-A0	TM-P15C22-01	TM-P30C44-A0	
Order number 6ES7 193	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0	
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come	
Order number 6ES7 193	4CC70-0AA0	4CD70-0AA0	4CE60-0AA0		
PM-E 24 V DC	•	•	•		
PM-E 24 to 48 V DC	•	•	•		
PM-E 24 V DC/120/230 V AC	•	•	•		
PM-E F 24 V DC PROFIsafe				•	

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200S

SIPLUS I/O modules SIPLUS digital electronic modules

Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS digital input module 4 DI 24 V DC Standard	SIPLUS digital input module 4 DI 24 V DC High Feature	SIPLUS digital input module 8 DI 24 V DC Standard
Order number	6AG1 131-4BD01-2AA0	6AG1 131-4BD01-7AB0	6AG1 131-4BF00-7AA0
Order number based on	6ES7 131-4BD01-0AA0	6ES7 131-4BD01-0AB0	6ES7 131-4BF00-0AA0
Ambient temperature range	-25 +60 °C	-25 +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

	SIPLUS digital input module 8 DI SOURCE INPUT 24 V DC	SIPLUS digital output module 2 DO 24 V DC/0.5 A High Feature	SIPLUS digital output module 2 DO 24 V DC/2 A High Feature
Order number	6AG1 131-4BF50-7AA0	6AG1 132-4BB01-2AB0	6AG1 132-4BB31-7AB0
Order number based on	6ES7 131-4BF50-0AA0	6ES7 132-4BB01-0AB0	6ES7 132-4BB31-0AB0
Ambient temperature range	-40 +70 °C	-25 +60 °C	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

	SIPLUS digital output module 4 DO 24 V DC/0.5 A Standard	SIPLUS digital output module 4 DO 24 V DC/2 A Standard	SIPLUS digital output module 8 DO 24 V DC/0.5 A Standard
Order number	6AG1 132-4BD02-7AA0	6AG1 132-4BD32-2AA0	6AG1 132-4BF00-7AA0
Order number based on	6ES7 132-4BD02-0AA0	6ES7 132-4BD32-0AA0	6ES7 132-4BF00-0AA0
Ambient temperature range	-25 +70 °C	-25 +60 °C	-25 +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

	SIPLUS digital output module 8 DO 24 V DC/0.5 A Standard SOURCE OUTPUT	SIPLUS digital output module 2 DO 24 V DC to 230 V AC/5 A relay, NO contact	SIPLUS digital output module 2 DO 2448 V DC/5 A, 24230 V AC/5 A relay, changeover contact
Order number	6AG1 132-4BF50-7AA0	6AG1 132-4HB01-2AB0	6AG1 132-4HB12-2AB0
Order number based on	6ES7 132-4BF50-0AA0	6ES7 132-4HB01-0AB0	6ES7 132-4HB12-0AB0
Ambient temperature range	-25 +70 °C	-25 +70 °C	-25 +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

ET 200S

SIPLUS I/O modules SIPLUS digital electronic modules

Overview (continued)		Ordering data	Order No.
Ambient conditions		SIPLUS digital input modules	
Relative humidity	5 100 % Condensation permissible	(extended temperature range and medial exposure)	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	Ordering unit 5 units • 4 DI 24 V DC Standard • 4 DI 24 V DC High Feature L • 8 DI 24 V DC Standard H	6AG1 131-4BD01-2AA0 6AG1 131-4BD01-7AB0 6AG1 131-4BF00-7AA0
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	Ordering unit 1 unit 8 DI 24 V DC Source Input H	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive	SIPLUS digital output modules (extended temperature range and	
	sand, dust ²⁾	medial exposure)	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range	Ordering unit 5 units • 2 DO 24 V DC/0.5 A High H Feature	6AG1 132-4BB01-2AB0
	795 658 hPa (+2000 +3500 m) derating 10 K	2 DO 24 V DC/2 A High Feature H4 DO 24 V DC/0.5 A Standard H	6AG1 132-4BD02-7AA0
6	658 540 hPa (+3500 +5000 m) derating 20 K	 4 DO 24 V DC/2 A Standard H 2 DO 24 V DC to 230 V AC/5 A H relay, NO contact 	6AG1 132-4HB01-2AB0
 ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NI < 49 ppm; O₃ < 0.1 ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO₂ < 17.8 ppm; H₂S < 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O₃ < 1.0 ppm; NOX < 10.4 ppm The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases! 		2 DO 2448 V DC/5 A, 24230 V AC/5 A relay, changeover contact	6AG1 132-4HB12-2AB0
		Ordering unit 1 unit 8 DO 24 V DC/0.5 A Standard H 8 DO, 24 V DC / 0.5 A Standard H SOURCE OUTPUT	
		Accessories	See SIMATIC ET 200S digital
For further technical documentation on SIPLUS, see:			electronic modules, page 9/73

For further technical documentation on SIPLUS, see:

www.siemens.com/siplus-extreme

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

ET 200S

SIPLUS I/O modules SIPLUS analog electronic modules

Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-speed versions with extremely short isochronous cycle times
- Hot swapping of modules possible

Notes

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS analog electronic module 2 Al I Standard 4-wire
Order No.	6AG1 134-4GB11-2AB0
Order No. based on	6ES7 134-4GB11-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 Al I High Feature
Order No.	6AG1 134-4MB02-2AB0
Order No. based on	6ES7 134-4MB02-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 Al High Speed
Order No.	6AG1 134-4GB52-2AB0
Order No. based on	6ES7 134-4GB52-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 Al U Standard
Order No.	6AG1 134-4FB01-2AB0
Order No. based on	6ES7 134-4FB01-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 Al I Standard 2-wire
Order No.	6AG1 134-4GB01-2AB0
Order No. based on	6ES7 134-4GB01-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 4 Al I Standard 2-wire
Order No.	6AG1 134-4GD00-2AB0
Order No. based on	6ES7 134-4GD00-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 AI RTD
Order No.	6AG1 134-4JB51-7AB0
Order No. based on	6ES7 134-4JB51-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

Technical data

SIMATIC ET 200 distributed I/O

ET 200S

SIPLUS I/O modules SIPLUS analog electronic modules

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Overview (continued)

SIPLUS analog electronic module 2 Al RTD High Feature
6AG1 134-4NB51-2AB0
6ES7 134-4NB51-0AB0
-25 +60 °C
Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 Al TC High Feature
Order No.	6AG1 134-4NB01-7AB0
Order No. based on	6ES7 134-4NB01-0AB0
Ambient temperature range	0 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

SIPLUS analog electronic module 2 AO U Standard
6AG1 135-4FB01-2AB0
6ES7 135-4FB01-0AB0
-25 +60 °C
Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
The technical data are identical with those of the based-on modules.

	SIPLUS analog electronic module 2 AO U High Feature
Order No.	6AG1 135-4LB02-7AB0
Order No. based on	6ES7 135-4LB02-0AB0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).

	module 2 AO U High Feature
Technical data	The technical data are identical with those of the based-on modules.
	SIPLUS analog electronic module 2 AO I Standard
Order No.	6AG1 135-4GB01-2AB0
Order No. based on	6ES7 135-4GB01-0AB0
Ambient temperature range	-25 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride

atmosphere).

modules.

The technical data are identical with those of the based-on

Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- ¹⁾ ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; $O_3 < 0.1 \text{ ppm}$; NOX < 5.2 ppm Limit value (max. 30 min/d): $SO_2 < 17.8 \text{ ppm}$; $H_2S < 49.7 \text{ ppm}$; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; $O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm
- O₃ < 1.0 ppm; NOX < 10.4 ppm

 The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Ordering data	Order No.
SIPLUS analog input modules	
(extended temperature range and medial exposure) • 2 Al U Standard • 2 Al I Standard 2-wire • 2 Al I Standard 4-wire • 2 Al I High Feature 2-wire/4-wire (15 bit + sign) • 2 Al High Speed 2-wire • 4 Al Standard 2-wire	6AG1 134-4FB01-2AB0 6AG1 134-4GB01-2AB0 6AG1 134-4GB11-2AB0 6AG1 134-4MB02-2AB0 6AG1 134-4GB52-2AB0 6AG1 134-4GD00-2AB0

	Order No.
2 AI RTD Standard	6AG1 134-4JB51-7AB0
• 2 AI RTD High Feature H	6AG1 134-4NB51-2AB0
• 2 AI TC High Feature	6AG1 134-4NB01-7AB0
SIPLUS analog output modules	
• 2 AO U Standard	6AG1 135-4FB01-2AB0
• 2 AO U High Feature H	6AG1 135-4LB02-7AB0
• 2 AO I Standard	6AG1 135-4GB01-2AB0
Accessories	See SIMATIC ET 200S analog electronic modules, page 9/91

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

ET 200S

SIPLUS technology modules SIPLUS 1 SI interface module

Overview



- 1-channel module for serial data communication via point-to-point link
- · For message frames max. 200 byte long
- RS-232C, RS-422, RS-485
- 2 versions
 - ASCII and 3964 (R) protocols
 - Modbus and USS protocols
- Configuration via GSD file or STEP 7 (from V5.1)

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 138-4DF01- 7AB0	6AG1 138-4DF11- 7AB0
Order No. based on	6ES7 138-4DF01- 0AB0	6ES7 138-4DF11- 0AB0
Ambient temperature range	-25 °C to +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data product applies exambient conditions	cept for the
Ambient conditions		
Relative humidity	5 100 % condensation perm	nitted
D: 1 : 11 ::	O ('' '' EN	00704.0.0

- Biologically active substances
- Chemically active substances
- Mechanically active substances
- Air pressure (depending on the highest positive temperature range specified)
- 5 ... 100 % condensation permitted Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna) Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA –S71.04 severity level G1; G2; G3; GX ^{1) 2)} Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾ 1080...795 hPa (-ET 200pro ... +2000 m) See ambient temperature range 795...658 hPa (+2000 ... +3500 m) Derating 10 K 658...540 hPa (+3500 ... +5000m)
- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ <4.8 ppm H_2S <9.9 ppm; CI <0.2 ppm; HCI <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O $_3$ <0.1 ppm; NO x <5.2 ppm
 Threshold/ limit value (max. 30 min/d): SO $_2$ <17.8 ppm; H $_2S$ <49.7 ppm; CI <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O $_3$ <1.0 ppm; NOX <10.4 ppm

Derating 20K

2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
1 SI interface module	
(extended temperature range and medial exposure) • ASCII and 3964(R) protocols	6AG1 138-4DF11-7AB0
Modbus and USS protocols	6AG1 138-4DF01-7AB0
Accessories	See SIMATIC 1 SI interface module, page 9/105

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

ET 200S

SIPLUS technology modules SIPLUS 1 COUNT 24 V/100 kHz counter module

Overview



- Single-channel, intelligent 32 bit counter module for universal counting and measuring tasks
- For direct connection of 24 V incremental encoders or initiators
- Comparison functions with definable comparison values
- Integrated digital output for output of the response on reaching the comparison value
- Can be plugged onto TM-E terminal modules with automatic coding
- Hot swapping of modules possible
- Simple parameterization without additional software

Notes:

Position measuring systems and preassembled connecting cables for the counting and positioning functions are provided by SIMODRIVE Sensor or Motion Connect 500.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS 1 COUNT counter module 24 V/100 kHz
Order No.	6AG1 138-4DA04-2AB0
Order No. based on	6ES7 138-4DA04-0AB0
Ambient temperature range	-25 °C to +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; HCI < 0.66 ppm; HCI < 0.12 ppm
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS 1 COUNT counter module 24 V/100 kHz	6AG1 138-4DA04-2AB0
(extended temperature range and medial exposure)	
For universal counting and measuring tasks with ET 200S	
Accessories	See SIMATIC 1 COUNT counter module 24 V/100 kHz, page 9/100

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200S

SIPLUS I/O modules Terminal modules for power and electr. modules

Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Positive-fit connection technology to ensure enhanced vibration resistance of up to 5 g
- Different versions as receptacles for power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60% quicker process wiring

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS DP TM-P12S23-A0
Order No.	6AG1 193-4CD20-2AA0
Order No. based on	6ES7 193-4CD20-0AA0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-P15C23-A1
Order No.	6AG1 193-4CD30-2AA0
Order No. based on	6ES7 193-4CD30-0AA0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-P15C22-01
Order No.	6AG1 193-4CE10-2AA0
Order No. based on	6ES7 193-4CE10-0AA0
Ambient temperature range	-40 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-E15C23-01
Order No.	6AG1 193-4CB10-7AA0
Order No. based on	6ES7 193-4CB10-0AA0
Ambient temperature range	0 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-E15N24-01
Order No. 6AG1 193-4CB70-7AA0	
Order No. based on	6ES7 193-4CB70-0AA0
Ambient temperature range	-40 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

ET 200S

SIPLUS I/O modules Terminal modules for power and electr. modules

Overview (continued)

	SIPLUS DP TM-E15C24-A1
Order No.	6AG1 193-4CA30-2AA0
Order No. based on	6ES7 193-4CA30-0AA0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

SIPLUS DP TM-E30C46-A1
6AG1 193-4CF50-7AA0
6ES7 193-4CF50-0AA0
-40 +70 °C
Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-E15C24-A1	
Order No.	6AG1 193-4CB30-2AA0	
Order No. based on	6ES7 193-4CB30-0AA0	
Ambient temperature range	-25 +60 °C	
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).	
Technical data	The technical data are identical with those of the based-on modules.	

	SIPLUS DP TM-E15C24-AT
Order No.	6AG1 193-4CL30-7AA0
Order No. based on	6ES7 193-4CL30-0AA0
Ambient temperature range	0 +70 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

	SIPLUS DP TM-E15S26-A1	
Order No.	6AG1 193-4CA40-2AA0	
Order No. based on	6ES7 193-4CA40-0AA0	
Ambient temperature range	-25 +60 °C	
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).	
Technical data	The technical data are identical with those of the based-on modules.	

Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K	

	SIPLUS DP TM-E15C26-A1
Order No.	6AG1 193-4CA50-2AA0
Order No. based on	6ES7 193-4CA50-0AA0
Ambient temperature range	-25 +60 °C
Ambient conditions	Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the based-on modules.

1)	ISA-S71.04 severity level GX: Long-term load: SO ₂ < 4.8 ppm;
	$H_2S < 9.9 \text{ ppm}$; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm;
	$NH < 49 \text{ ppm}$; $O_3 < 0.1 \text{ ppm}$; $NOX < 5.2 \text{ ppm}$
	Limit value (max. 30 min/d): $SO_2 < 17.8$ ppm; $H_2S < 49.7$ ppm;
	Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm;
	$O_3 < 1.0 \text{ ppm}$; NOX < 10.4 ppm

- SIPLUS DP TM-E30C44-01 Order No. 6AG1 193-4CG30-2AA0 Order No. based on 6ES7 193-4CG30-0AA0 -25 ... +60 °C Ambient temperature range Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). Ambient conditions Technical data The technical data are identical with those of the based-on modules.
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see:

658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

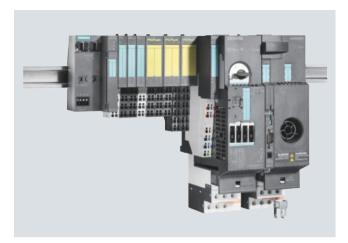
ET 200S
SIPLUS I/O modules
Terminal modules for power and electr. modules

Ordering data	Order No.		Order No.
TM-P terminal modules for PM-E po	ower modules	SIPLUS ET 200S TM-E30C44-01	6AG1 193-4CG30-2AA0
(extended temperature range and medial exposure)		Ordering unit: 1 unit 4 × 4 terminals, no terminal access	
SIPLUS ET 200S TM-P15C23-A0	6AG1 193-4CD20-2AA0	to AUX1 bus, AUX1 intercon- nected to the left, spring-loaded	
Ordering unit: 1 unit		terminals	
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the		SIPLUS ET 200S TM-E30C46-A1	6AG1 193-4CF50-7AA0
left, screw connection		Ordering unit: 1 unit 4 x 6 terminals, terminal access to	
SIPLUS ET 200S TM-P15C23-A0	6AG1 193-4CD30-2AA0	AUX1 bus, AUX1 interconnected	
Ordering unit: 1 unit 2 x 3 terminals, terminal access to		to the left, spring-loaded terminals	
AUX1 bus, AUX1 interrupted to the		SIPLUS ET 200S TM-E15C24-AT	6AG1 193-4CL30-7AA0
left, spring-loaded terminals		Ordering unit: 1 unit For internal temperature compen-	
SIPLUS ET 200S TM-P15C22-01	6AG1 193-4CE10-2AA0	sation with 2 AI TC High Feature,	
Ordering unit: 1 unit 2 x 2 terminals, no terminal access		spring-loaded terminals Accessories for shield connection	
to AUX1 bus, AUX1 intercon-			CEC7 102 4C 400 0 4 40
nected to the left, spring-loaded terminals		Shield connection element Ordering unit: 5 units	6ES7 193-4GA00-0AA0
TM-E terminal modules for		For plugging into TM-E and TM-P	
electronic modules		Shield clamps	6ES7 193-4GB00-0AA0
(extended temperature range and medial exposure)		Ordering unit: 5 units For busbar 3 × 10 mm	
SIPLUS ET 200S TM-E15C23-01	6AG1 193-4CB10-7AA0	Ground terminal	8WA2 868
Ordering unit: 5 units 2 × 3 terminals, no terminal access to AUX1 bus, AUX1 intercon- nected to the left, spring-loaded		Ordering unit: 1 unit For cable cross-sections up to 25 mm ²	
terminals		Busbars 3 x 10 mm	8WA2 842
SIPLUS ET 200S TM-E15N24-01	6AG1 193-4CB70-7AA0	Ordering unit: 1 unit	
Ordering unit: 5 units 2 × 4 terminals, no terminal access		Accessories for coding	
to AUX1 bus, AUX1 intercon-		Color coding plates	
nected to the left, FastConnect	CAC1 100 4CA00 0AA0	Ordering unit: 200 units for TM-P, TM-E	
SIPLUS ET 200S TM-E15C24-A1	6AG1 193-4CA30-2AA0	• White	6ES7 193-4LA20-0AA0
Ordering unit: 5 units 2 x 4 terminals, terminal access to		• Yellow	6ES7 193-4LB20-0AA0
AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		Yellow/greenRed	6ES7 193-4LC20-0AA0 6ES7 193-4LD20-0AA0
SIPLUS ET 200S TM-E15C24-01	6AG1 193-4CB30-2AA0	• Blue	6ES7 193-4LF20-0AA0
Ordering unit: 5 units	0AG1 193-4CB30-2AA0	• Brown	6ES7 193-4LG20-0AA0
2 × 4 terminals, no terminal access		Turquoise	6ES7 193-4LH20-0AA0
to AUX1 bus, AUX1 intercon- nected to the left, spring-loaded		Labels, inscribed	
terminals		Ordering unit: 1 set	
SIPLUS ET 200S TM-E15S26-A1 Ordering unit: 5 units	6AG1 193-4CA40-2AA0	200 units for slot numbering (1 20) 10 x	8WA8 861-0AB
2 × 6 terminals, terminal access to AUX1 bus, AUX1 interconnected		200 units for slot numbering (1 40) 5 x	8WA8 861-0AC
to the left, screw-type terminals		200 units for slot numbering	8WA8 861-0DA
SIPLUS ET 200S TM-E15C26-A1	6AG1 193-4CA50-2AA0	(1 64) 1 x, (1 68) 2 x	
Ordering unit: 5 units 2 × 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		Labels, blank 200 units for slot numbering	8WA8 848-2AY

ET 200S

Fail-safe I/O modules
____Overview

Overview



The fail-safe SIMATIC S7 CPUs, plus the fail-safe signal modules of SIMATIC ET 200S / ET200 / 200pro/ ET200eco and ET200M have been specially developed for distributed applications in manufacturing systems. Thanks to the discrete structure of the F I/Os, safety technology is only applied where actually required. The new system replaces conventional electromechanical components, such as:

- Freely programmable safe linking of sensors to actuators;
- · Selective safe shutdown of actuators:
- Hybrid configurations of F modules (F stands for fail-safe) and standard modules in a station;
- Single-bus concept, F signals and standard signals are transferred over one bus medium (PROFIBUS DP, PROFINET).

Totally Integrated Automation (TIA)

Safety technology (Safety Integrated) is a component of Totally Integrated Automation resulting in the total integration of safety and standard automation (SIMATIC S7).

Whereas today, standard automation (conventional PLCs) and safety automation (electromechanics) are still separate, these two worlds are growing closer together to form one uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation engineering for which safety technology is part of the standard automation and uniformity exists throughout the complete system.

ET 200S

Fail-safe I/O modules PM-E F PROFIsafe F power module

Overview



Fail-safe PM-E F PROFIsafe power modules for safety shutdown of standard digital output modules.

- Up to 2 fail-safe digital outputs onboard (source/sink outputs, up to 2A, up to SIL3/Cat. 4)
- The standard digital output modules can be shut down up to Cat.3 (EN 954) and SIL 2 (IEC61508) up to 10 A. The following modules can be used down-circuit of the power modules.
- 2DO / 0.5 A ST 6ES7 132-4BB01-0AA0 2DO / 0.5 A ST 6ES7 132-4BB31-0AA0 2DO / 0.5 A HF 6ES7 132-4BB01-0AB0 2DO / 0.5 A HF 6ES7 132-4BB31-0AB0 2DO / 0.5 A ST 6ES7 132-4BD31-0AA0

- 4 DO / 2 A ST 6ES7 132-4BD31-0AA0

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7-CPUs.

Technical specifications

	6ES7 138-4CF03-0AB0	6ES7 138-4CF42-0AB0
Power supply		
Current carrying capacity		
 Current carrying capacity up to 30 °C, max. 		10 A
• Current carrying capacity up to 40 °C, max.	10 A	8 A
Current carrying capacity up to 60 °C, max.	6 A	7 A
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	No	No
Current consumption		
from load voltage L+ (without load), max.	Typ. 100 mA	Typ. 100 mA
from backplane bus 24 V DC, max.	28 mA	28 mA
Power losses		
Power loss, typ.	4 W	4 W
Address area		
Address space per module		
without packing	5 byte; input and output in each case	5 byte; input and output in each case
Digital inputs		
Cable length		
 Cable length, shielded, max. 	200 m	200 m
 Cable length unshielded, max. 	200 m	200 m
Digital outputs		
Number of digital outputs	2	1; Relay
Short-circuit protection	Yes; Electronic	No
Response threshold, typ.	Response threshold (short-circuit): 5 to 12 A;	
	response threshold (external short-circuit to	
	ground): 5 to 12 A; response threshold (external short-circuit to P potential):	
	25 to 45 A	
Limitation of inductive shutdown voltage to	L+ (-2x 47 V)	
Lamp load, max.	10 W	100 W
Controlling a digital input	No	Yes
Output voltage		
• for signal "1", min.	L+ (-2.0 V), current-sourcing switch:	
,	L+ (-1.5 V), voltage drop at current-sinking	
	switch: max. 0.5 V	

ET 200S

Fail-safe I/O modules PM-E F PROFIsafe F power module

Technical specifications (continued)

	6ES7 138-4CF03-0AB0	6ES7 138-4CF42-0AB0
Output current		
• for signal "1" rated value	2 A	
 for signal "1" permissible range for 0 to 60 °C, min. 	20 mA	
• for signal "1" permissible range for 0 to 60 °C, max.	2.4 A	
for signal "0" residual current, max.	0.5 mA	
Parallel switching of 2 outputs		
• for increased power	No No	
for redundant control of a load	No	
Switching frequency	0011-	0.11-
with resistive load, max.with inductive load, max.	30 Hz 0.1 Hz	2 Hz 0.1 Hz; with inductive load according to IEC 947-5-1, 13 DC/15 AC
• on lamp load, max.	10 Hz	2 Hz
Aggregate current of outputs (per group)		
horizontal installation		
- up to 40 °C, max.	10 A	10 A
- up to 55 °C, max.	7 A	8 A
- up to 60 °C, max. • vertical installation	6 A	7 A
- up to 40 °C, max.	6 A	8 A
Load resistance range		
• lower limit	12 Ω	
• upper limit	1 kΩ	
Cable length		
Cable length, shielded, max.	200 m	
Cable length unshielded, max.	200 m	
Relay outputs		
Switching capacity of contacts • at ohmic load, up to 50 °C, max.	10 A	10 A
Alarms/diagnostics/status information	1071	
Diagnostics		
Diagnostic functions	Yes	Yes
Diagnostic information readable	Yes	Yes
 Diagnostics 	Yes	
Wire break	Yes	No
Short circuit	Yes	Yes
Missing load voltage	Yes	Yes
Diagnostic indication LED	V	V
Rated load voltage PWR (green)Group error SF (red)	Yes Yes	Yes Yes
Status indicator digital output (green)	Yes	Yes
Isolation	.00	
Isolation checked with	500 V DC	500 V DC
tested with		
 Channels against backplane bus and load voltage L+ 	500 V DC	500 V DC
Galvanic isolation		
Galvanic isolation digital outputs		
• between the channels	No	No
between the channels and the backplane bus between the channels and the lead veltage like.	Yes	Yes
• between the channels and the load voltage L+	No	No
Standards, approvals, certificates Highest safety class achievable in safety mode		
acc. to EN 954	Up to Cat. 4	With Std-DO: max. Cat.3, without Std-DO max.
GOO. TO LIV OUT	5p 10 Out. 4	Cat.4 depending on configuration
• acc. to IEC 61508	Up to SIL 3	With Std-DO: max. SIL 2, without Std-DO max. SIL 3 depending on configuration

ET 200S

Fail-safe I/O modules PM-E F PROFIsafe F power module

Technical specifications (continued)

	6ES7 138-4CF03-0AB0	6ES7 138-4CF42-0AB0
Dimensions and weight		
Dimensions		
• Width	30 mm	30 mm
Height	81 mm	81 mm
• Depth	52 mm	52 mm
Weight		
Weight, approx.	88 g	80 g

Ordering data	Order No.		Order No.
PM-E F pm power module PROFIsafe, 24 V DC	6ES7 138-4CF03-0AB0	Terminal modules for power modules	
for safe shutdown of digital output modules		TM-P30S44-A0	6ES7 193-4CK20-0AA0
PM-E F pp power module PROFIsafe, 24 V DC for safe shutdown of digital output	6ES7 138-4CF42-0AB0	Ordering unit 1 unit 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-F F PROFIsafe	
modules		TM-P30C44-A0	6ES7 193-4CK30-0AA0
Accessories		Ordering unit 1 unit	0207 100 10100 07010
IM 151-1 HIGH FEATURE interface module for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte	6ES7151-1BA02-0AB0	7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe	
each for I/O, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous		Distributed Safety V5.4 programming tool	
mode; bus connection via 9-pin Sub-D incl. terminating module		Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F.	
IM 151-3 PN HF interface module	6ES7 151-3BA23-0AB0	ET 200S Requirements: STEP 7 V5.3 SP3	
for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules		and higher Floating license	6ES7 833-1FC02-0YA5
up to 2 m wide can be connected; 2 x bus connection		Software Update Service	6ES7 833-1FC02-01A5
via RJ45 connector, incl. termi-		Distributed Safety Upgrade	6ES7 833-1FC02-0YE5
nating module		from V5.x to V5.3; Floating license	0E37 033-11 C02-01E3
IM 151-3 PN FO interface module	6ES7 151-3BB23-0AB0	for 1 user	
for ET 200S; 2 PROFINET FO		SIMATIC Manual Collection	6ES7 998-8XC01-8YE0
interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module		Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET	
		SIMATIC Manual Collection update service for 1 year	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200S

Fail-safe I/O modules F electronic modules

Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems Fail-safe digital input module

• For fail-safe reading of sensor information (1 or 2 channels)

- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard
- Certified up to Cat. 4 (EN954-1), SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A
- Certified up to Cat. 4 (EN954-1), SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital hybrid module

- 4 fail-safe inputs/3 fail-safe outputs
- Certified up to Cat. 3 (EN954-1), SIL 2 (IEC 61508), PL d (ISO 13849)

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7 CPUs.

Technical specifications

	6ES7 138-4FA04-0AB0
Supply voltages	
Rated value	
• 24 V DC	Yes
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	No
Power losses	
Power loss, typ.	4 W
Address area	
Occupied address area	
Outputs	4 byte
• Inputs	6 byte
Digital inputs	
Number of digital inputs	8; 8 single channel, 4 two-channel
Number of simultaneously control- lable inputs	8
Input characteristic curve acc. to IEC 1131, Type 1	Yes
Input voltage	
 Rated value, DC 	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	15 to 30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input	
voltage)	
 for standard inputs 	
- parameterizable	Yes
- at "0" to "1", min.	0.3 ms
- at "0" to "1", max.	17 ms
	0.3 ms
- at "1" to "0", max.	17 ms
- at "0" to "1", min. - at "0" to "1", max. - at "1" to "0", min.	0.3 ms 17 ms 0.3 ms

	6ES7 138-4FA04-0AB0
Cable length Cable length, shielded, max. Cable length unshielded, max.	200 m 200 m
Encoder supply Number of outputs	2
Output voltage	min. L+ (-1.5 V)
Output current, rated value	300 mA
Output current, permissible range	0 to 300 mA
Short-circuit protection	Yes; electronic (response threshold 0.7 A to 1.8 A)
Encoder Connectable encoders • 2-wire BEROS	No
Alarms/diagnostics/status information Alarms • Diagnostic alarm	Yes
Diagnostics Diagnostic functions Diagnostic information readable Short circuit	Yes Yes Yes
diagnostic indication LED Group error SF (red) Status indicator digital input (green)	Yes Yes
Isolation Isolation checked with	500 V DC

ET 200S
Fail-safe I/O modules
F electronic modules

Technical specifications (continued)

• ` `	,	
	6ES7 138-4FA04-0AB0	
Galvanic isolation Galvanic isolation digital inputs • between the channels • between the channels and the backplane bus • between the channels and the	No Yes No	Standards, approvals, co Highest safety class achies safety mode • acc. to EN 954 • acc. to IEC 61508
load voltage L+ Permissible potential difference		Dimensions and weight
between M internally and the inputs	75 V DC/60 V AC	Dimensions • Width • Height • Depth
		Weight approx

	6ES7 138-4FA04-0AB0
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• acc. to EN 954	Cat. 3 (single-channel), Cat. 4 (two-channel)
• acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
Dimensions and weight	
Dimensions	
• Width	30 mm
Height	81 mm
• Depth	52 mm
Weight	
Weight, approx.	78 g

	6ES7 138-4FB03-0AB0
Supply voltages	
Load voltage L+	0414
Rated value (DC)Reverse polarity protection	24 V No
. , , ,	NO
Current consumption from load voltage L+ (without load),	typ. 100 mA
max.	typ. 100 mA
from backplane bus 3.3 V DC, max.	28 mA
Power losses	
Power loss, typ.	3.5 W
Digital outputs	
Number of digital outputs	4
Short-circuit protection	Yes; electronic
Limitation of inductive shutdown	Typ. (2L+) -47 V
voltage to	
Lamp load, max.	10 W
Controlling a digital input	No
Output voltage	
• for signal "1", min.	L+ (-2.0 V), current sourcing
	switch: L+ (-1.5 V), voltage drop on current sinking switch: max.
	0.5 V
Output current	
• for signal "1" rated value	2 A
• for signal "1" permissible range	20 mA
for 0 to 60 °C, min. • for signal "1" permissible range	2.4 A
for 0 to 60 °C, max.	2.4 /\
• for signal "0" residual current, max.	0.5 mA; Current sourcing switch:
	max. 0.5 mA; current sinking switch: max. 4 mA
Parallal awitahing of 2 autouta	SWILOTI. THAN. 4 THA
Parallel switching of 2 outputs • for increased power	No
for redundant control of a load	No
Switching frequency	
with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz

	6ES7 138-4FB03-0AB0
Aggregate current of outputs (per group)	
 horizontal installation 	
- up to 40 °C, max.	6 A
- up to 55 °C, max.	5 A
- up to 60 °C, max.	4 A
 vertical installation up to 40 °C, max. 	4 A
	4 A
Load resistance range	10.0
lower limit	12 Ω 1 kΩ
• upper limit	1 K22
Cable length	222
Cable length, shielded, max.	200 m 200 m
Cable length unshielded, max.	200 m
Alarms/diagnostics/status infor- mation	
Diagnostics	
Diagnostic functions	Yes
Wire break	Yes
Short circuit	Yes
diagnostic indication LED	
Group error SF (red)	Yes
Status indicator digital output	Yes
(green)	
Isolation	
Isolation checked with	500 V DC
checked with	
Channels against backplane bus	1500 V AC
and load voltage L+	
Galvanic isolation	
Galvanic isolation digital outputs	No
between the channelsbetween the channels and	No Yes
the backplane bus	165
between the channels and	No
the load voltage L+	

ET 200S

Fail-safe I/O modules F electronic modules

Technical specifications (continued)

	6ES7 138-4FB03-0AB0
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
 acc. to EN 954 	Cat. 4
• acc. to IEC 61508	SIL 3
Dimensions and weight	
Dimensions	
• Width	30 mm
Height	81 mm
• Depth	52 mm
Weight	
 Weight, approx. 	85 g

Ordering data	Order No.
4/8 F-DI electronic module PROFIsafe 24 V DC	6ES7 138-4FA04-0AB0
30 mm construction width, up to Category 4 (EN954-1)	
4 F-DO electronic module PROFIsafe 24 V DC/2A	6ES7 138-4FB03-0AB0
30 mm construction width, up to Category 4 (EN954-1)	
4 F-DI / 3 F-DO electronic module PROFIsafe 24 V DC/2A	6ES7 138-4FC01-0AB0
30 mm construction width, up to Category 3 (EN954-1) / SIL 2 (IEC 62061)	
Accessories	
Terminal modules for electronic modules	See F terminal modules, page 9/134
IM 151-1 High Feature interface module	6ES7 151-1BA02-0AB0
for ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module	
IM 151-3 PN HF interface module	6ES7 151-3BA23-0AB0
for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module	
IM 151-3 PN FO interface module	6ES7 151-3BB23-0AB0
for ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module	

	Order No.
Distributed Safety V5.4 programming tool	
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirements: STEP 7 V5.3 SP3	
and higher	
Floating license	6ES7 833-1FC02-0YA5
Software Update Service	6ES7 833-1FC00-0YX2
Distributed Safety Upgrade	6ES7 833-1FC02-0YE5
from V5.x to V5.3; Floating license for 1 user	
SIMATIC Manual Collection J	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
SIMATIC Manual Collection – DUpdate service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7 998-8XC01-8YE2

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200S

Fail-safe I/O modules F electronic module relays

Overview



The digital electronic module 1 F-RO 24 V DC/5A 24 ... 230 V AC/5A has the following characteristics

- 1 relay output (2 NO contacts)
- Output current 5 A
- Rated load voltage 24 V DC and 24 to 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL3 (IEC61508), when the control of the F-RO module is implemented via a fail-safe output (e.g. EM 4F-DO 24 V DC/2A PROFIsafe).

Technical specifications

	6ES7 138-4FR00-0AA0
Supply voltages	
Load voltage L+ • Rated value (DC)	24 V; Supply via fail-safe output, e.g. of an F-DO
Current consumption from load voltage L+ (without load), max.	100 mA; from control voltage
from backplane bus 3.3 V DC, max.	10 mA
Power losses Power loss, typ.	2.1 W
Address area Address space per module • with packing • without packing	2 bit 1 byte
Digital inputs Cable length Cable length unshielded, max.	10 m; control cable
Digital outputs Number of digital outputs	1
Short-circuit protection	No; 6 A external fuse of duty category gL/gG
Controlling a digital input	Yes
Output current • for signal "1" rated value • for signal "1" minimum load current	5 A 5 mA
Switching frequency • with resistive load, max. • with inductive load, max.	2 Hz 0.1 Hz
Aggregate current of outputs (per group) • horizontal installation - up to 40, max. - up to 55 °C, max. - up to 60 °C, max. • vertical installation - up to 40 °C, max.	8 A 6 A; at 50 °C 5 A; up to max. 24.8 V 6 A

	6ES7 138-4FR00-0AA0
Cable length	
 Cable length, shielded, max. 	200 m
 Cable length unshielded, max. 	200 m
Relay outputs	
Switching capacity of contacts	
• Thermal continuous current, max.	5 A
Alarms/diagnostics/status information	
diagnostic indication LED	
Status indicator digital output	Yes
(green)	
Galvanic isolation	
Galvanic isolation digital outputs	
 between the channels 	Yes
 between the channels and 	Yes
the backplane bus	
between the channels and	Yes; between channels and
the load voltage L+	control voltage
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• acc. to EN 954	to Cat. 4
• acc. to EN 954	up to SIL 3
	up to 31£ 3
Dimensions and weight Dimensions	
Width	30 mm
Width Height	81 mm
Depth	52 mm
,	32 11111
Weight	00
Weight, approx.	90 g

ET 200S

Fail-safe I/O modules F electronic module relays

Ordering data	Order No.		Order No.
1 F-RO electronic module 24 V DC/5A 24 230 V AC/5A	6ES7 138-4FR00-0AA0	Distributed Safety V5.4 programming tool	
Accessories		Task: Software for configuring of	
Terminal modules for electronic modules	See F terminal modules, page 9/134	fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S	
IM 151-1 High Feature interface module	6ES7 151-1BA02-0AB0	Requirements: STEP 7 V5.3 SP3 and higher	
for ET 200S; transmission rate up		Floating license	6ES7 833-1FC02-0YA5
to 12 Mbit/s; max. 63 modules can be connected, with		Software Update Service	6ES7 833-1FC00-0YX2
isochronous mode, bus		Distributed Safety Upgrade	6ES7 833-1FC02-0YE5
connection via 9-pin Sub-D connector incl. terminating module		from V5.x to V5.3; Floating license for 1 user	
IM 151-3 PN HF interface	6ES7 151-3BA23-0AB0	SIMATIC Manual Collection	6ES7 998-8XC01-8YE0
for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface),	
IM 151-3 PN FO interface module	6ES7 151-3BB23-0AB0	SIMATIC NET (Industrial Communication)	
for ET 200S; 2 PROFINET FO interfaces, integrated 2-port		SIMATIC Manual Collection – D Update service for 1 year	6ES7 998-8XC01-8YE2
switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200S

Fail-safe I/O modules F terminal modules

Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring through self-configuring voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different versions to accommodate power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Self-shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals
- For up to 60 % faster process wiring also with FastConnect connection method (av. soon)

Ordering data

Terminal modules for power modules	
TM-P15S23-A1	6ES7 193-4CC20-0AA0
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	
TM-P15C23-A1	6ES7 193-4CC30-0AA0
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	
TM-P15S23-A0	6ES7 193-4CD20-0AA0
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals	
TM-P15C23-A0	6ES7 193-4CD30-0AA0
Ordering unit 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals	
TM-P15S22-01	6ES7 193-4CE00-0AA0
Ordering unit 1 unit 2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	
TM-P15C22-01	6ES7 193-4CE10-0AA0
Ordering unit 1 unit 2 x 2 terminals, no terminal access to AUX1 bus, AUX1 inter- connected to the left, spring-	
loaded terminals	
	6ES7 193-4CK20-0AA0
loaded terminals	6ES7 193-4CK20-0AA0
Ioaded terminals TM-P30S44-A0 Ordering unit 1 unit 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for	6ES7 193-4CK20-0AA0 6ES7 193-4CK30-0AA0

ET 200S

Fail-safe I/O modules F terminal modules

Ordering data	Order No.		Order No.
Terminal modules for electronic modules		Accessories	
		Color coding plates	
TM-E30S44-01	6ES7 193-4CG20-0AA0	Ordering unit 200 units for	
Ordering unit 1 unit		TM-P, TM-E	
4 x 4 terminals, no terminal access to AUX1 bus, AUX1 inter-		• white	6ES7 193-4LA20-0AA0
connected to the left, screw-type		• yellow	6ES7 193-4LB20-0AA0
terminals		• yellow/green	6ES7 193-4LC20-0AA0
TM-E30C44-01	6ES7 193-4CG30-0AA0	• red • blue	6ES7 193-4LD20-0AA0 6ES7 193-4LF20-0AA0
Ordering unit 1 unit		• brown	6ES7 193-4LF20-0AA0
4 x 4 terminals, no terminal		• turquoise	6ES7 193-4LH20-0AA0
access to AUX1 bus, AUX1 inter- connected to the left, spring-		Grounding terminal	8WA2 868
loaded terminals		Ordering unit 1 unit	
TM-E30S46-A1 Ordering unit 1 unit	6ES7 193-4CF40-0AA0	For cable cross-sections up to 25 mm ²	
4 x 6 terminals, terminal access to		3 × 10 mm busbars	8WA2 842
AUX1 bus, AUX1 interconnected to the left, screw-type terminals		Ordering unit 1 unit	
TM-E30C46-A1	6ES7 193-4CF50-0AA0	Labels, inscribed	
Ordering unit 1 unit		Ordering unit 1 set	
4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected		• 200 units for slot numbering (1 to 20) 10 ×	8WA8 861-0AB
to the left, spring-loaded terminals		• 200 units for slot numbering (1 to 40) 5 ×	8WA8 861-0AC
		• 200 units for slot numbering (1 to 64) 1 ×, (1 to 68) 2 ×	8WA8 861-0DA
		Labels, blank	
		200 units for slot numbering	8WA8 848-2AY

ET 200S

SIPLUS fail-safe I/O modules SIPLUS F electronic modules

Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems Fail-safe digital input module

• For fail-safe reading of sensor information (1 or 2 channels)

- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A

All modules are certified up to Cat. 4 (EN 954-1) and up to SIL 3 (IEC 61508).

The modules support PROFIsafe, both in PROFIBUS and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7-CPUs.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS electronic module 4 F-DO, PROFIsafe 24 V DC/2 A	SIPLUS electronic module 4/8 F-DI, PROFIsafe 24 V DC		
Order number	6AG1 138-4FA04-2AB0	6AG1 138-4FB03-2AB0		
Order No. based on	6ES7 138-4FA04-0AB0	6ES7 138-4FB03-0AB0		
Ambient temperature range	-25 +60 °C			
Conformal coating	Coating of the printed circuit boards and th	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product	The technical data of the standard product applies except for the ambient conditions.		
Ambient conditions				
Relative humidity	5 100%, condensation allowed			

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.		Order No.
F electronic modules SIPLUS		4 F-DO electronic module,	6AG1 138-4FB03-2AB0
(extended temperature range and medial exposure)	CAC1 100 4FA04 0AP0	PROFIsafe 24 V DC/2 A, 30 mm construction width, up to Category 4 (EN 954-1)	
4/8 F DI electronic module, H PROFIsafe 24 V DC,	6AG1 138-4FA04-2AB0	Accessories	See SIMATIC F electronic
30 mm construction width, up to Category 4 (EN 954-1)			modules, page 9/131

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

IO-Link master modules 4SI IO-Link electronic module

Overview



The electronic module 4SI IO-Link is an IO-Link master and supports the easy integration of sensors and actuators from different manufacturers in the multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

Features

- Up to 4 IO-Link devices can be connected to each IO-Link master module (3-wire connection)
- Up to 4 standard actuators or sensors (2-wire/3-wire connection) can be connected.
- The electronic module 4SI IO-Link is 15 mm in width and can be used with the following universal terminal modules:

 - TM-E15S26-A1 (screw-type terminal) TM-E15C26-A1 (spring-loaded terminal) TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP4 and higher)

Ordering data

Order No.

4SI electronic module IO-Link

6ES7 138-4GA50-0AB0

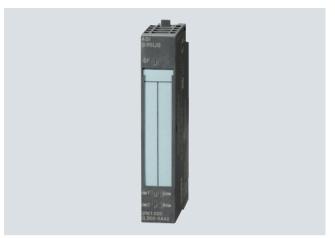
IO-Link master, Screw terminal, spring-loaded terminal or Fast Connect

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200S

IO-Link master modules 4SI SIRIUS electronic module

Overview



The electronic module 4SI SIRIUS supports easy, cost-effective connection of SIRIUS switching devices with IO-Link to the multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

Features

- Up to 4 SIRIUS switching devices (max. 16 for groups of four) can be connected to each IO-Link SIRIUS module using IO-Link (3-wire connection).
- The electronic module 4SI SIRIUS is 15 mm in width and can be used with the following universal terminal modules:

 - TM-E15S26-A1 (screw-type terminal)
 TM-E15C26-A1 (spring-loaded terminal)
 TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP5 and higher).

Ordering data

4SI SIRIUS electronic module

devices to ET 200S; 4 ports. Screw terminal, springloaded terminal or Fast Connect connection method

Order No.

6RK1 005-0LB00-0AA0

for connecting SIRIUS switching

ET 200S

Motor starters and safety motor starters
General data

Overview

ET 200S motor starter in the ET 200S I/O system

The SIMATIC ET 200S is the multifunctional and bit-modular I/O system with degree of protection IP20 and can be precisely adapted to the automation task.

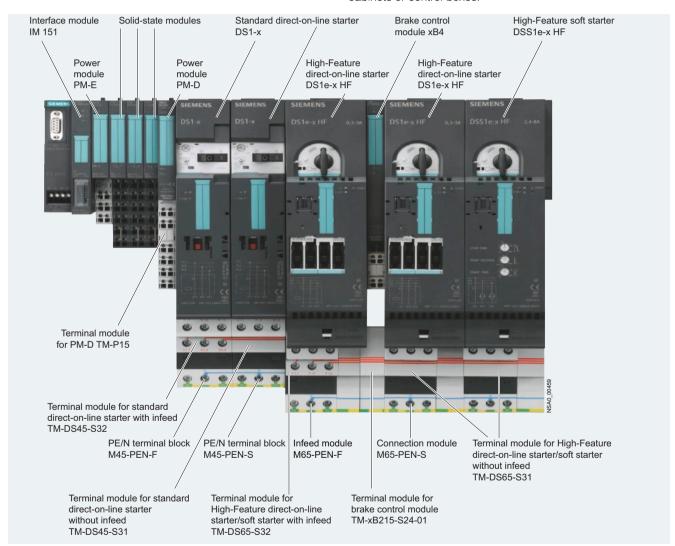
Interface modules (IM) are used for connecting the ET 200S to PROFIBUS DP or PROFINET. If interface modules with integrated S7-CPU are used, the ET 200S can be used as small controller.

The ET 200S can be made up of components from a comprehensive range of digital and analog input or output modules, technology modules, IO-Link master modules, pneumatic connections, or motor starters and frequency converters for the control of drives.

The device can be replaced easily and quickly thanks to permanent wiring and automatic reparameterization. Hot swapping during operation of the plant, i.e. removing and inserting the modules without previous disconnection, in combination with in-depth diagnostic information, guarantees a high availability of the automation system.

The ET 200S motor starters are connected to the controller through the fieldbus, either via PROFIBUS or PROFINET, by means of IM modules which are also available with CPU functionality and parameterized.

The motor starters of the ET 200S can be used to protect and switch any three-phase current loads. Due to the communication interface, they are optimally suited for use in distributed control cabinets or control boxes.



Interaction of the ET 200S motor starter components in the ET 200S I/O system

Motor starter versions

The ET 200S motor starters are available as direct, reversing or soft starters:

- Standard motor starter up to 5.5 kW (direct and reversing starter)
- High Feature motor starter up to 7.5 kW (direct, reversing and direct soft starter)
- Fail-safe motor starter up to 7.5 kW (direct and reversing starter)
 - Properties of the High Feature motor starter
 - Fail-safe functionality

ET 200S

Motor starters and safety motor starters General data

Overview (continued)

Innovation of the ET 200S High Feature motor starters

The ET 200S High Feature motor starters were completely innovated and now support acyclic services on PROFIBUS and PROFINET, as well as PROFIenergy on PROFINET.

They are now:

- Even more flexible flexible parameterization
- Integrated in TIA (Totally Integrated Automation) even more
- Even more transparent due to comprehensive diagnostic data records
- Even more predictive due to maintenance functions
- Energy-efficient through PROFlenergy

Basic functionality of the ET 200S motor starters

All versions of the ET 200S motor starters offer the following functionality. The specific functionality beyond this is described for the respective versions.

- Completely pre-wired motor starters for switching and protecting any three-phase current loads up to 7.5 kW at 400 V AC and 500 V AC
- With self-assembling 40/50 A energy bus, i.e. one-time infeed of load voltage for a group of motors
- All supply voltages are connected only once, i.e. automatically connected to the next module when mounted side-by-side
- Hot swapping is permissible
- Integrated inputs and outputs for control and status signaling
- Control of the motor starter from the controller and of the diagnostic status via cyclic process image
- Diagnostic capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching status of contactor(s) or soft starters, and system errors
- Interface for controlling an expansion module, e.g. Brake Control Modules xB1...xB4 for controlling mechanical brakes in three-phase motors for 24 V DC and 500 V DC.
- Brake Control Module xB5 and xB6 for 400 V AC
- Can be combined with safety technology for use in safetyrelevant plant units (IEC 62 061 and ISO 13 849-1)

Mouting

Since the motor starters are completely pre-wired, up to 80% of the wiring overhead can be saved. The control cabinets can be set up much quicker and require much less space.

Expansions are possible without problems by subsequently adding terminal modules.

Due to their modular terminal design (10 mm²), they also replace any previously required marshalling wiring. Due to the permanent wiring and hot swapping function (removing and inserting while energized), a motor starter can be replaced within seconds, if necessary. The motor starters are therefore ideal for use in applications with especially high availability requirements.

Parameterization and configuration

Configuration is facilitated considerably due to the bit-modular design.

The parts list for each load feeder is reduced to two important positions if the ET 200S motor starters are used: the passive terminal module and the motor starter. The ET 200S is therefore optimally suited for modular machine concepts.

All ET 200S motor starters are set up without fuse protection. Contactors or soft starters are controlled via the integrated outputs. The inputs of the motor starter evaluate the signal states of the protective devices (short circuit or overload), the switching state of contactor(s) or soft starters, and system errors.

The circuit breaker message can be freely parameterized with regard to a group fault message (group faults when circuit breaker is "off"/group fault message when circuit breaker is "off" only when there is an "on" command from the motor starter).

Brake Control Modules and optional digital inputs and outputs

With one of the optional Brake Control Modules (xB1-xB6), which are arranged to the right next to a motor starter, a mechanical holding brake on a three-phase motor can be activated from the process image of the motor starter.

The Brake Control Modules xB1-xB4 can be used to control both motors with 24 V DC brakes (xB1, xB3) as well as 500 V DC brakes (xB2, xB4).

The xB5 modules (without digital input) and xB6 modules (with two digital inputs) were newly incorporated for activating a mechanical holding brake with a rated operational voltage of 400 V AC. This supports a further motor brake voltage usually found on the market.

The 24 V DC brakes have an external supply and can be vented independently of the switching state of the motor starter. By contrast the 500 V DC brakes mostly have a direct supply from the terminal board of the motor through a rectifier module and therefore cannot be vented when the motor starter is switched off. These brakes cannot be used in combination with the DSS1e-x motor starter (soft starter).

The outputs of the brake control modules can be used alternatively for other purposes, e.g. for controlling DC valves.

With two locally acting inputs optionally available on the brake control modules (xB3, xB4) and another two on the control module of the High-Feature motor starter it is possible to realize autonomous special functions which work independently of the bus and the higher-level control system, e.g. as a quick stop on gate valve controls. In parallel with this, the states of these inputs are signaled to the control system.

Power supply via terminal modules

The power is supplied via the terminal modules for motor starters:

- The auxiliary voltages are supplied once via the PM-D or PM-DFx power module, which is to be plugged in to the left of the first motor starter..
- The load voltage is supplied at the first (left) TM-xxxxS32 terminal module of a motor starter. The other TM-xxxxS31 terminal modules are automatically supplied with power via the integrated energy bus when they are added. If the energy bus is fully utilized with 40 A for the Standard motor starter or 50 A for the High Feature motor starter, a new infeed must be set up via another TM-xxxxS32 terminal module.

ET 200S

Motor starters and safety motor starters
General data

Overview (continued)

TM-DS and TM-RS terminal modules for motor starters

- Mechanical modules in which the motor starter and expansion modules are inserted
- For constructing the permanent wiring and self-assembling voltage bus
- · For connecting the motor connection cables
- Positive-locking connection to ensure enhanced vibration resistance

Terminal modules are purely mechanical components for accommodating the ET 200S peripherals. The self-assembling voltage buses integrated in the terminal modules reduce wiring outlay to the single infeed. All modules following on the right are automatically supplied upon plugging the terminal modules together. The robust design and keyed connection technology enables use in harsh industrial conditions.

The TM-DS and TM-RS terminal modules are available in various versions for the Standard motor starters and the High-Feature motor starters.

The terminal modules with the suffix "-S32"

- The terminal modules with the suffix "-S32" have connection terminals for feeding into the integrated 40 A/50 A power bus and connection terminals for the motor connection cable. They are mounted at the beginning (left) of a power bus segment.
- An "-S32" terminal module is plugged in to set up a new load group.
- Three caps for sealing the energy bus contacts on the last terminal module of a segment are included in the delivery kit of the "-S32" terminal modules.
- Optionally expandable with PE/N blocks

The terminal modules with the suffix "-S31"

- The terminal modules with the suffix "-S31" have only connection terminals for the motor connection cable. These terminal modules follow on the right after a "-S32" terminal module.
- Optionally expandable with PE/N modules

All connecting terminals of the terminal modules for motor starters are equipped with 10 $\rm mm^2$ screw-type terminals.

Power module (page 9/152)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right.

TM-P terminal module for PM-D power module (page 9/153)

- Connection by means of screw terminals
- Light colored enclosure for visual distinction
- Always before the first TM-DS/TM-RS

ET 200S safety motor starter with integrated safety technology

The safety-oriented, communication-capable ET 200S motor starters offer a suitable solution for any safety application. The portfolio ranges from a simple local safety solution to the user-friendly version with PROFIsafe, which can be used in combination with a safe controller (see Safety Module local and PROFIsafe, page 9/157).

The safety technology is an integral and thus pre-wired component.

The ET 200S Safety motor starters Solutions comprise:

- Safety modules (page 9/158)
- Standard motor starters (page 9/145)
- High-Feature motor starters (page 9/148)
- Fail-safe motor starters (page 9/154)

System configuration with ET 200S motor starters

When setting up an ET 200S station with motor starters, a distinction can be made between the following configurations:

- Conventional ET 200S motor starter solution, comprising:
 PM-D module
- Standard motor starter or High Feature motor starter
- ET 200S safety motor starter solution, local (see page 9/157)
- ET 200S safety motor starter solutions, PROFIsafe (see page 9/161)

SIRIUS Motor Starter Block Library for SIMATIC PCS 7

With the SIRIUS motor starter PCS 7 block library, SIRIUS ET 200S motor starters (direct and reversing starters, direct-on-line soft starters) can be easily and simply integrated into the SIMATIC PCS 7 process control system. The SIRIUS motor starter PCS 7 block library contains the diagnostics and driver blocks corresponding to the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring. See catalog IC 10 Chapter 12 "Parametrization, Configuration and Visualization with SIRIUS".

Configuration tool for ET 200S station

The "SIMATIC Selection Tool" permits the quick and targeted selection of SIMATIC hardware. It is available for free as configurator in the Siemens Industry Mall. Configure your stations (e.g. S7-1200, S7-300, S7-400H) and select the desired distributed I/O (e.g. ET 200S, ET 200pro). Transfer the parts list you received to the shopping cart of the Industry Mall and use it to place orders quickly, conveniently and without errors.

Detailed information on the ET200S system can be found at:

www.siemens.com/ET200S

There you will also find a link to the SIMATIC Selection Tool.

ET 200S

Motor starters and safety motor starters General data

Overview (continued)





	SIMATIC ET 200S	SIMATIC ET 200S
	Standard motor starter	High Feature motor starter ¹⁾
Device functions (firmware features)		
Slave on the bus		
Fieldbus	✓ Depends on interface module	
Parameter assignment		
PROFIBUS/PROFINET data sets		✓
Parameter assignment via data set start-up		✓
Diagnostics		
Acyclic using data sets		✓
Diagnostic interrupt support	✓	
Diagnostics via PROFIBUS/PROFINET		✓ See manual
Process image		
Process image	✓ 3I/3O	✓ 16I/7O
Required address space per module	✓ 4 bit	✓ 2 byte
Data channels		
Manual mode local interface		✓ Through module
Motor Starter ES via local interface		✓ From end of 2011
Motor Starter ES via bus		✓ From end of 2011
Data sets (acyclic)		V From end of 2011
Parameter assignment		/
Support of PROFlenergy profile	-	during idle times
Diagnostics		✓
Measured values		✓
Statistics		✓
Commands		✓
Min/max pointer		✓
Logbook		✓
Device identification		✓
I&M data	-	✓
Inputs		
Quantity	✓ Maximum 2, via xB3, xB4, xB6	✓ Maximum 4, 2 via xB3, xB4, xB6 and 2 via module 2DI 24 V DC COM
of which in process image		√ 4
Input action	✓ End position CCW, CW	✓ Parameterizable: flexible
Quick stop		✓ Parameterizable
Outputs		
Quantity	✓ Internal, for controlling brake control module	
Output action	✓ Brake	
Brake output with add-on module		
Motor brake voltage brake control module	✓ 24 V DC: xB1/xB3, 500 V DC: xB2/xB4, 400 V	' AC: xB5/xB6
Motor protection		
Overload protection	✓ Thermal, range 1:1.3	✓ Electronic, wide range 1:10
Overload warning	Only tripping	✓ Elocitorilo, wide range 1.10
Short-circuit protection	✓ Circuit breaker	,
Full motor protection		
Motor protection, response to thermal		✓ Parameterizable: Tripping without restart, trip-
motor model overload		ping with restart, warning
Automatic reset		
Temperature sensor		
Emergency start function	(✓ with Control Unit 3RK1 903-0CG00)	/

[✔] Function available; -- Function not available.

¹⁾ The specified device functions are only completely applicable for the innovative .-OAB4 starters.

ET 200S

Motor starters and safety motor starters General data

Overview (continued)





	SIMATIC ET 200S	SIMATIC ET 200S
	Standard motor starter	High Feature motor starter ¹⁾
Device functions (firmware features)		
Device function		
Disconnecting means	✓ Rocker switch	✓ Circuit breaker
Circuit breaker message	✓	✓ Parameterizable
Current limit monitoring, lower		✓ Parameterizable, increment 3.125 %, 18.75 100 %
Current limit monitoring, upper		✓ Parameterizable, increment 3.125 %, 50 150 % (400% for the new -0AB4 starters)
Zero-current detection		✓ Parameterizable: warning, trip
Blocking protection/tripping of blocking current		✓ Parameterizable
Asymmetry	✓	✓ Parameterizable: warning, trip
Load type		✓ Parameterizable: 1-phase and 3-phase
Tripping class	✓ CLASS 10	✓ Parameterizable (via Motorstarter ES, DS) for DS1e-x and RS1e-x: Class 5 (10A),10, 15, 20 for DSS1e-x: Class 5 (10A), 10
Protection against voltage failure	✓	✓ Parameterizable: activated / deactivated
Local diagnostic functions via LEDs		
"C-STAT" switching state	✓ Red/green/yellow LEDs	
Group error "GE"	✓ Red LEDs	
"DEVICE" status		✓ Red/green/yellow LEDs
Auxiliary switch for enabling circuit of ET 200S – Safety engineering already integrated (Use up to SIL 3 (IEC 61 508) or up to category 4 (DIN EN ISO 13 849-1))	Fail-safe kit is required	3 Apart from DSS1e-x (for this max. category 1 achievable)

✓ Function available; -- Function not available

The specified device functions are only completely applicable for the innovative .-0AB4 starters.

	ET 200S Standard motor starter ET 200S High Feature motor sta		rter
	DS1-x, RS1-x	DS1e-x, RS1e-x	DSS1e-x
Device functions (firmware features)			
Control function soft starter			
Soft start function			✓
Bypass function			
Starting time			 ✓ Locally adjustable, not via bus 0 20 s
Stopping time			 ✓ Locally adjustable, not via bus 0 20 s
Stopping mode			✓ Locally adjustable, not via bus
Start voltage			✓ Locally adjustable, not via bus 30 100% of U _e
Stop voltage			✓ Locally adjustable, not via bus
Trace			

✔ Function available; -- Function not available

ET 200S

Motor starters and safety motor starters General data

Technical specifications

mm	DS1-x, RS1-x 42	DS1e-x, RS1e-x	DSS1e-x
mm	42	17	
mm	42	17	
mm		17	
mm			
	45 x (265 + 45) x (120 + 27); (45: PE/N module; 27: Auxil. switch contactor from F-Kit)	65 x (290 + 45) x (150 + 23); (45: PE/N module; 23: Contro	
mm	90 x (265 + 45) x (120 + 27); (45: PE/N module; 27: Aux. switch contactor from F-Kit)	130 x (290 + 45) x (150 + 23); (45: PE/N module; 23: Control module)	
°C	0 +60, from +40 with derating	0 +60 with horizontal moun	nting up to +40
°C	-40 +70	-40 +70	
°C	Vertical, horizontal with derating	Vertical, horizontal	
	mar dordang		
kg	1.0/1.6	1.6/2.2	1
-	1.1/1.8	1.7/2.3	1.1
g	2		
g/ms	Square 5/11		
-			
mm^2	2 x (1 2.5) ²⁾ ; 2 x (2.5 6) ²⁾ , a	according to IEC 60947: max.	1 x 10
mm ²		,	
AWG	2 x (1410)		
	` '	ies to terminal modules on a di	smounted motor starter)
	.,gr. 120 (a0 dippl	Table Tribadios of a di	22
Oper-	100 000		
ating	30 million	10 million	
cycles	TO MILLION		
A	A 00	A 40	
mA	Approx. 100	approx. 350 (after 80 ms)	Approx. 30
Α	40	50	
V	400		
			Yes, up to 480
			Yes, up to 480
•			. 55, 45 10 100
٨	10	10	0.10.110
A A	12 9	16 11	3/8/16
٨	4.1	0	
		9	
		7.5	
KVV		7.5	
\ /		4	
V	400, acc. to VDE 0106, Part 10		
	Yes		
	CLASS 10	CLASS 10/20, can be parameterized	0.3 3 A: CLASS 10/10A, can be parameterized 2.4 8 A: CLASS 10A 2.4 16 A: CLASS 10A
	Up to 1.6 A: 2 / Up to 12 A: 1	Up to 16 A: 2	Up to 16 A: 1
h	100 000		
1/h	< 80	See manual	
	°C °C °C kg g g/ms mm² mm² AWG Operating cycles mA A V V V V A A kA kW V	ing -40 +70 C Vertical, horizontal with derating kg 1.0/1.6 1.1/1.8 g 2 g/ms Square 5/11 mm² 2 x (1 2.5)²²; 2 x (2.5 6)²², 2 x (1 2.5)²²; 2 x (2.5 6)²² AWG 2 x (14 10) IP20, finger-safe (this also appl 30 million cycles of a million of a million mA Approx. 20 mA Approx. 100 A 40 V 400 V Yes, up to 500 V Yes, up to 600 A 12 A 9 A 4,1 kA 50 at 400 V kW 5.5 AC-1, AC-2, AC-3, AC-4 V 400, acc. to VDE 0106, Part 10 Yes CLASS 10 Up to 1.6 A: 2 / Up to 12 A: 1 h 100 000 See manual	Ing

 $^{^{1)}}$ Additional limits: Process image, max. design width 2 m.

²⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

ET 200S

Motor starters and safety motor starters Standard motor starter

3RK1 301-0BB00-0AA2 3RK1 301-0CB00-0AA2

F 3RK1 301-0DB00-0AA2

3RK1 301-0EB00-0AA2 3RK1 301-0FB00-0AA2

3RK1 301-0HB00-0AA2

F 3RK1 301-0GB00-0AA2

F 3RK1 301-0JB00-0AA2 F 3RK1 301-0KB00-0AA2

F 3RK1 301-1AB00-0AA2 F 3RK1 301-1BB00-0AA2

F 3RK1 301-1CB00-0AA2

F 3RK1 301-1DB00-0AA2

F 3RK1 301-1EB00-0AA2 F 3RK1 301-1FB00-0AA2

F 3RK1 301-1GB00-0AA2 F 3RK1 301-1HB00-0AA2

F 3RK1 301-1KB00-0AA2

3RK1 301-1JB00-0AA2

Overview

Functionality of the Standard motor starters

- For basic functionality, see ET 200S Motor Starter and Safety Motor Starter, General Data, Overview, page 9/140
- Direct and reversing starter up to 5.5 kW
- Energy bus up to 40 A
- With circuit breaker/contactor assembly
- Integrated disconnect functions via circuit breakers
- Can be combined with local safety technology for use in safety-relevant plant units with fail-safe kit and PM-D F modules (see Accessories, page 9/169)

Device functions (Firmware Features)

See Motor starters and safety motor starters ET 200S, General data, Overview, page 9/142.

Technical specifications

See Motor starters and safety motor starters ET 200S, General data, page 9/144.

< 0.06

0.06

0.09

0.10

0.12 0.18

0.21

0.25 0.37 0.55

0.75

0.90

1.1

1.5

1.9

2.2

3.0

4.0

5.5

Ordering data

	Setting range of the electronic release	Order No.
kW	A	

0.14 ... 0.20 0.18 ... 0.25

0.22 ... 0.32

0.28 ... 0.40 0.35 ... 0.50

0.45 ... 0.63

0.55 ... 0.80

0.70 ... 1.00 0.90 ... 1.25

1.1 ... 1.6

1.4 ... 2.0

1.8 ... 2.5

2.2 ... 3.2

2.8 ... 4.0

3.5 ... 5.0

4.5 ... 6.3

5.5 ... 8.0

7 ... 10

9 ... 12

Standard motor starters, with diagnostics, electromechanical, fuseless, expandable with brake control module



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RS1-x

	r
1-x	-
	1-x

0.14 0.20 0.18 0.25 0.22 0.32
0.28 0.40 0.35 0.50 0.45 0.63
0.55 0.80 0.70 1.00 0.90 1.25
1.1 1.6 1.4 2.0 1.8 2.5
2.2 3.2 2.8 4.0 3.5 5.0

DS1-x direct-on-line starters

RS1-x reversing starters		
< 0.06 0.06 0.09	0.18 0.25	3RK1 301-0BB00-1AA2 3RK1 301-0CB00-1AA2 3RK1 301-0DB00-1AA2
0.10 0.12 0.18		3RK1 301-0EB00-1AA2 3RK1 301-0FB00-1AA2 3RK1 301-0GB00-1AA2
0.21 0.25 0.37	0.70 1.00	3RK1 301-0HB00-1AA2 3RK1 301-0JB00-1AA2 3RK1 301-0KB00-1AA2
0.55 0.75 0.90	1.4 2.0	3RK1 301-1AB00-1AA2 3RK1 301-1BB00-1AA2 3RK1 301-1CB00-1AA2
1.1 1.5 1.9	2.8 4.0	3RK1 301-1DB00-1AA2 3RK1 301-1EB00-1AA2 3RK1 301-1FB00-1AA2
2.2 3.0 4.0 5,5	5.5 8.0 7 10	3RK1 301-1GB00-1AA2 3RK1 301-1HB00-1AA2 3RK1 301-1JB00-1AA2 3RK1 301-1KB00-1AA2

ET 200S

Motor starters and safety motor starters Standard terminal modules

Übersicht

TM-DS, TM-RS terminal modules (See also Motor starters and safety motor starters ET 200S, General data, section Terminal modules, Overview, page 9/140)

- "-S32" version with supply terminals: 2 x 3 x 10 mm² screw terminals for power bus and motor feeder
- "-S31" version without supply terminals: 1 x 3 x 10 mm² screw terminals for motor feeder
- Optionally expandable with PE/N modules (see Accessories)
- Applies only to Standard motor starters: For applications with high motor currents (> 6.3 A) or high ambient temperatures (> 40 °C) it is recommended to use the DM-V15 distance module (see Accessories) between two DS1-x motor starters

Technical specifications

TM-DS45 and TM-DS65/TM-FDS65 terminal modules

		TM-DS45	TM-DS65/TM-FDS65
Dimensions			
 Mounting dimensions (W x H x D) 	mm	45 x 264 x 100	65 x 290 x 100
Height with PE/N terminal block	mm	306	332
Depth with motor starter	mm	127	150
Depth with motor starter and F-Kit (safety technology)	mm	152	
Depth with motor starter and 2DI control module	mm		173
Rated voltages, currents and frequencies for the power bus			
 Rated insulation voltage U_i 	V	690	
• Rated operational voltage U _e	V	500 AC	
 Rated impulse withstand voltage U_{imp} 	kV	6	
Rated operational current I _e	Α	40	50
Rated frequency	Hz	50/60	
Conductor cross-sections			
• Solid	mm ²	2 x (1 2.5) ¹⁾ or 2 x (2.5 6) ¹⁾	
Finely stranded with end sleeve	mm ²	1 x 10 or 2 x (1 2.5) ¹⁾ or 2 x (2.5 6) ¹⁾ Acc. to IEC 60947	
AWG cables, solid or stranded	AWG	2 x (14 10)	
With additional three-phase feeder terminal if required Solid or stranded Finely stranded with end sleeve AWG cables, solid or stranded	mm ² mm ² AWG	1 x 2.5 25 1 x 2.5 25 1 x 12 4	
Wiring			
Required tool		Standard screwdriver size 2 and Pozi	driv 2
Tightening torque	Nm	2.0 2.5	

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

TM-RS90 and TM-RS130/TM-FRS130 terminal module

		TM-RS90	TM-RS130/TM-FRS130
Dimensions			
 Mounting dimensions (W x H x D) 	mm	90 x 264 x 100	130 x 290 x 100
Height with PE/N	mm	306	332
Depth with motor starter	mm	127	150
 Depth with motor starter and F-Kit (safety technology) 	mm	152	
 Depth with motor starter and 2DI control module 	mm		173
Rated voltages, currents and frequencies for the power bus			
 Rated insulation voltage U_i 	V	690	
 Rated operational voltage U_e 	V	500 AC	
 Rated impulse withstand voltage U_{imp} 	kV	6	
Rated operational current I _e	Α	40	50
Rated frequency	Hz	50/60	

ET 200S

Motor starters and safety motor starters Standard terminal modules

Technical specifications (continued)

TM-RS90 and TM-RS130/TM-FRS130 terminal module

		TM-RS90	TM-RS130/TM-FRS130
Conductor cross-sections			
• Solid	mm^2	2 x (1 2.5) ¹⁾ or 2 x (2.5 6) ¹⁾	
Finely stranded with end sleeve	mm ²	1 x 10 or 2 x (1 2.5) ¹⁾ or 2 x (2.5 6) ¹⁾ Acc. to IEC 60947	
AWG cables, solid or stranded		2 x (14 10)	
 With additional three-phase feeder terminal if required Solid or stranded Finely stranded with end sleeve AWG cables, solid or stranded 	mm ²	1 x 2.5 25 1 x 2.5 25 1 x 12 4	
Wiring			
Required tool		Standard screwdriver size 2 and Pozi	idriv 2
Tightening torque	Nm	2.0 2.5	
1)			

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Ordering data

		Version	Order No.
Terminal modules for standa	ard motor starters		
3RK1 903-0AB00	TM-DS45-S32 for DS1-x direct-on-line starters with incoming power bus connection including three caps for terminating the power bus	F	3RK1 903-0AB00
	TM-DS45-S31 for DS1-x direct-on-line starters without incoming power bus connection		3RK1 903-0AB10
3RK1 903-0AB10	TM-RS90-S32 for RS1-x reversing starters with incoming power bus connection including three caps for terminating the power bus		3RK1 903-0AC00
3RK1 903-0AC00	TM-RS90-S31 for RS1-x reversing starters without incoming power bus connection	F	3RK1 903-0AC10

ET 200S

Motor starters and safety motor starters High Feature motor starter

Overview

Functionality of the High Feature motor starters

- For basic functionality, see Motor Starters and Safety Motor Starters ET 200S, General Data, Overview, page 9/140
- Direct, reversing or soft starter up to 7.5 kW
- Available with wide range and in 3 setting ranges (0.3...3 A, 2.4...8 A, 2.4...16 A)
- With a combination of starter circuit breakers, electronic overload protection (parameterizable), and contactor or soft starter
- Energy bus up to 50 A
- Upper and lower current limits for plant and process monitoring
- Integrated motor blocking protection, residual current detection, and asymmetry detection
- The current motor current is measured and transmitted for diagnostics in the cyclic process image
- Control of the motor starter from the controller and detailed diagnostic status via cyclic process image
- Optional digital inputs available in the cyclic process image and functions can be flexibly assigned so that they can be adapted to any application
- Detection of the switching state of the starter circuit breaker via auxiliary switches and of the switching state of the contactor via a current flow analysis
- Integrated disconnect function via starter circuit breaker
- Local safety equipment possible (for the HF starter without an fail-safe kit, because the function of the fail-safe kit is already integrated)
- 2DI LC COM control module can be plugged in on the front to provide 2 additional parameterizable digital inputs
- Optional "Motor Starter ES" software for user-friendly commissioning and diagnostics as of 11/2011 also available for the innovated .-0AB4 starters (see page 9/180)
- PROFlenergy capable¹⁾
 - Providing the motor current in PROFlenergy-Format
- Shutdown during idle times
- Support of all acyclic DPV1 services on PROFIBUS and PROFINET¹⁾
 - Changing of parameters during operation, e.g. rated operational current parameters
 - Reading and writing of acyclic data for accurate diagnostics of the device and of the system status analysis process
- 1) Only for the innovated .-0AB4 starters

Selective protection concept for ET 200S High Feature motor starters

Thanks to the selective protection concept (separate short circuit and overload tripping) with electronic overload analysis, a number of additional advantages are gained with the High Feature motor starters, which quickly pay off especially in production processes with high plant downtime costs:

- Only two versions up to 7.5 kW thus reducing the ordering and stockkeeping overhead
- All of the settings can be parameterized via the bus which means full TIA capability
- Separate indication of overload and short circuit allows selective diagnostics
- Overload can be acknowledged by means of a remote resetideal for highly automated plants
- Current asymmetry monitoring full monitoring of the motor
- Blocking protection full monitoring of the motor
- Emergency start function in the event of an overload operability in an emergency
- Current value transmission via bus monitoring of application

- Current limit monitoring
- Parameterizable trip class overload tripping can be adapted to application
- Assignment type 2 still capable of functioning after 50 kA short circuit
- · Very long lifespan of contact piece



ET 200S High Feature Motor starter: DS1e-x direct starter (innovated .-0AB4 starter)



ET 200S High Feature motor starter: DSS1e-x (innovated .-0AB4 starter)



ET 200S High Feature motor starter: Reversing starter RS1e-x (innovated .-0AB4 starter)

ET 200S

Motor starters and safety motor starters
High Feature motor starter

Overview (continued)

PROFlenergy for ET 200S High Feature motor starter¹⁾

Rising energy costs, far-reaching ecological problems around the world, and the looming climate change require a more conscious use of energy.

PROFlenergy permits an active and effective energy management.

PROFlenergy is a multi-vendor and cross-vendor profile on PROFINET standardized by PI¹⁾ and supports the shutdown of electronic devices during idle times and the read-out of measured values.

The ET 200S HF motor starter provides the motor current in the PROFlenergy format and shuts down during idle times..

1) The manufacturer and users of the standardized communication technologies PROFIBUS und PROFINET have joined forces in PI (PROFIBUS International).

Support of the acyclic services on PROFIBUS and PROFINET¹⁾

The ET 200S HF motor starters now also provide comprehensive diagnostic data via datasets by means of the acyclic services. The new capability of reading out data from the motor starter for monitoring the devices, plants or the process is available and comprehensive. The motor starter provides three internal logbooks for device faults, trip actions of the motor starter, and events that are provided with a time stamp. These can be read out from the motor starter as needed. They provide the plant operator with comprehensive information about the system status and the process and they can be used to improve them.

1) Only for the innovated .- 0AB4 starters

The maximum internal current values or the number of motor starter activations, for example, can be read out using the min/max pointer and statistical data functions. This allows process deviations to be monitored or even an initial commissioning can be optimized.

Plant monitoring for the user is facilitated due to available statistical data or measured values.

All of the statuses of the motor starter such as the device status, the device configuration and the communication status are contained in the device diagnostics data record, thus ensuring central device and plant monitoring.

On the one hand, information (I&M) on the module used and, on the other hand, data (I&M) that is defined during the configuration such as the location designations are saved in the motor starter using the Installation and Maintenance functions (I&M). They are used to clear faults or to detect hardware changes in a system or to check the system configuration.

Supported data records:

- DS 0 S7-V1-system diagnostics (S7 diagnostic alarm)
- DS 72, 73, 75 Logbooks, device faults, trip actions, events
- DS 92 Device diagnostics
- DS 93 Command
- DS 94 Measured values
- DS 95 Statistics
- DS 96 Min/max pointer
- DS 100 Device identification
- DS 131 Device parameters
- DS 134 Maintenance
- DS 165 Comment
- DS 226 PROFlenergy technology function
- DS 231 I&M 0 (= Device identification)
- DS 232 I&M 1 (= Item designation)
- DS 233 I&M 2 (= Installation)
- DS 234 I&M 3 (= Description)

Device functions (Firmware Features)

See ET 200S Motor Starter and Safety Motor Starter, General Data, Overview, page 9/142.

Technical specifications

See ET 200S Motor Starter and Safety Motor Starter, General Data, Technical Specifications, page 9/144.

ET 200S

Motor starters and safety motor starters High Feature motor starter

Ordering data

DS1e-x

High Feature motor starter in present version (".-0AA4 starter")

Setting range of the electronic release

A

High-Feature motor starters, with diagnostics, solid-state overload protection, fuseless, expandable with brake control module

DS1e-x direct-on-line starters

0.3 ... 3
3RK1 301-0AB10-0AA4
2.4 ... 16
3RK1 301-0CB10-0AA4
3RK1 301-0CB10-0AA4
3RK1 301-0CB10-1AA4
2.4 ... 8
3RK1 301-0AB10-1AA4
2.4 ... 8
3RK1 301-0AB10-1AA4
3RK1 301-0BB10-1AA4
3RK1 301-0BB10-1AA4
3RK1 301-0BB10-1AA4
3RK1 301-0CB10-1AA4

F 3RK1 301-0AB20-0AA4 3RK1 301-0BB20-0AA4 3RK1 301-0CB20-0AA4

F: Subject to export regulations AL: N and ECCN: EAR99

High Feature motor starter in completely innovated version (".-0AB4 starter") available from June 1, 2011¹⁾

0.3 ... 3

2.4 ... 8 2.4 ... 16

DSS1e-x soft starters

Setting range of the Order No. electronic release High Feature motor starters, with diagnostics, solid-state overload protection, fuseless, expandable with brake control module DS1e-x direct starters 0.3 ... 3 3RK1 301-0AB10-0AB4 3RK1 301-0AB10-0AB4 3RK1 301-0CB10-0AB4 2.4 ... 8 2.4 ... 16 S1e-x reversing starters 0.3 ... 3 3RK1 301-0AB10-1AB4 3RK1 301-0BB10-1AB4 2.4 ... 8 3RK1 301-0CB10-1AB4 2.4 ... 16 DSS1e-x soft starters 3RK1 301-0AB20-0AB4 3RK1 301-0BB20-0AB4 3RK1 301-0CB20-0AB4 0.3 ... 3 DS1e-x 2.4 ... 8 2.4 ... 16

¹⁾ Due to the technical compatability of the present and current motor starters, there will be a change with 6 months bridging time. In case of replacement, the innovate motor starter runs in the DPV0 mode as the present motor starter also does.

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SIMATIC ET 200 distributed I/O

ET 200S

Motor starters and safety motor starters High Feature terminal modules

Overview

TM-DS, TM-RS terminal modules (See also Motor starters and safety motor starters ET 200S, General data, Overview, section Terminal modules, page 9/140)

- "-S32" version with supply terminals: 2 x 3 x 10 mm² screw terminals for power bus and motor feeder
- "-S31" version without supply terminals: 1 x 3 x 10 mm² screw terminals for motor feeder
- Optionally expandable with PE/N modules (see Accessories)

Technical specifications

See "Technical Specifications" on "Standard terminal modules", page 9/146

Ordering data

	Version		Order No.
Terminal modules for Hi	igh Feature motor starters		
00	TM-DS65-S32 for DS1e-x and DSS1e-x direct-on-line starters with incoming power bus connection including three caps for terminat- ing the power bus	F	3RK1 903-0AK00
·	TM-DS65-S31 for DS1e-x and DSS1e-x direct-on-line starters without incoming power bus connection	F	3RK1 903-0AK10
	TM-RS130-S32 for RS1e-x reversing starters with incoming power bus connection including three caps for terminat- ing the power bus	F	3RK1 903-0AL00
3RK1 903-0AK00	TM-RS130-S31 for RS1e-x reversing starters without incoming power bus connection	F	3RK1 903-0AL10

Motor starters and safety motor starters Power module

Overview

- · Disconnection of a complete group of motor starters is possible without any additional outlay (safety category 1 according to ISO 13849-1)
- PM-D power modules are plugged onto the TM-P15 terminal modules. (A PM-D power module must be followed by at least one motor starter or one frequency converter.)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right. The voltage is fed in through TM-D terminal modules to the self-assembling potential bars.

A voltage failure is signaled through PROFIBUS diagnostics to the higher-level master. Additional LEDs inform locally about the status of the auxiliary voltages.

The separation of auxiliary voltages for signal checkback and power section actuation enables the entire group to be shut down while maintaining the diagnostic capability.

Technical specifications

		PM-D power module 3RK1 903-0BA00
Rated control supply voltage <i>U</i> _s up to 60 °C	V	20.4 28
Rated operational current I _e		
 Recommended short-circuit protection 	Α	10
Melting fuse	Α	10
Miniature circuit breakers	Α	10, tripping characteristic B
Power consumption from the backplane bus	mA	≤ 10
Supplying		
 Motor starters 		Yes
 Frequency converters 		Yes
Motor starters for safety technology		No
Solid-state modules		No
• Ex(i) modules		No
Alarms		None
Diagnostic functions		Yes
 System fault/device fault 		Red "SF" LED
 Monitoring the supply voltage for solid-state modules U₁ 		Green "PWR" LED
 Monitoring the supply voltage for contactors U₂ 		Green "CON" LED
diagnostic information can be read out		Yes
Conductor cross-sections		
• Flexible with end sleeve	mm ²	1.5
• Rigid	mm^2	2.5
Mounting dimensions (W \times H \times D)	mm	15 x 195.5 x 117.5

Ordering data

Version Order No. Power module PM-D power module F 3RK1 903-0BA00 for 24 V DC with diagnostics

3RK1 903-0BA00

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SIMATIC ET 200 distributed I/O

ET 200S

Motor starters and safety motor starters
Terminal module power module

Overview

Terminal module for power module

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High-Feature motor starters and frequency converters. Power modules for voltage monitoring are plugged onto TM-P modules. TM-P modules can be used any number of times within the ET 200S. A power module must always be plugged upstream from the first motor starter/frequency converter.

Ordering data

	Version	Order No.
Townsia al mandalla for a consuma	a dula	
Terminal module for power mo	dalle	
3RK1 903-0AA00	TM-P15 S27-01 terminal module for PM-D power module	3RK1 903-0AA00

ET 200S

Motor starters and safety motor starters ET 200S fail-safe motor starter

Overview



Fail-safe motor starter ET 200S: F-DS1e-x direct-on-line starter

The fail-safe motor starter has been developed on the basis of the High-Feature motor starter (.-0AA4 starter). It differs in that, in addition to a motor starter protector and contactor assembly, a safe solid-state evaluation circuit is installed for error detection purposes which makes the motor starter fail-safe.

If the contactor to be switched fails in an EMERGENCY-STOP case, the evaluation electronics detects a fault and opens the motor starter protector in the motor starter through a shunt release in a fail-safe manner. The second redundant shutdown component is therefore no longer a main contactor, as is generally the case, but the motor starter protector installed in the motor.

All functions of the High-Feature starter are already integrated

The new fail-safe motor starters are characterized by easy, space-saving assembly as well as minimal wiring outlay.

Like the High-Feature starters, the fail-safe motor starters have a switching capacity of up to 7.5 kW (16 A) which is achieved with just two motor starter versions. Another important feature is the high availability due to the high short-circuit strength (type of coordination "2").

Use

The fail-safe motor starter is predestined for use in combination with PROFIsafe (see figure ET 200S Safety Motor Starter Solution PROFIsafe with fail-safe Motor Starters on page 6/162). Another field of application is in combination with ASIsafe or safety relays (see example 2 on page 9/160 fail-safe Motor Starters with ASIsafe and 3TK28).

High degree of flexibility with safety technology

PROFIsafe solution with PM-D F PROFIsafe

In EMERGENCY-STOP applications, the fail-safe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the fail-safe freely-programmable logic of the SIMATIC controller is used to interface with the relevant fail-safe sensor technology. The interface between PROFIsafe and installations that use conventional safety technologies is implemented through the F-CM fail-safe contact multiplier with four floating contacts.

Solution local with PM-D FX1

Fail-safe motor starter with safety relay (Version 1) or ASIsafe (Version 2, see example 2, page 9/160):

Signals with relevance for safety can be input to ET 200S through a PM-D F X1 infeed terminal module through the enabling circuits of the AS-i Safety Monitor or the safety relay to control the fail-safe motor starters which then selectively switch off the downstream motors.

Technical specifications

F-DS1e-x direct-on-line starters/F-RS1e-x reversing starter

		F-DS1e-x direct-on-line starters	F-RS1e-x reversing starters
Dimensions			
Dimensions (W x H x D)	mm	65 x 290 x 150 (incl. terminal module)	130 x 290 x 150 (incl. terminal module)
Height with PE/N module	mm	332	
Depth with 2DI control module (not safe)	mm	173	
Module-specific data			
Type of coordination		Type 2 up to $I_e \le 16 \text{ A}$ at 400 V	
Internal power supply		U1 (from PM-D F/PM-DF X1)	
Maximum achievable safety class • Acc. to IEC 61508 • Acc. to VDE 0801 • Acc. to EN 954-1		SIL 3 Shutdown class 6 (AK6) Category 4	
Safety characteristics			
Low demand • Test interval 3 months • Test interval 6 months	PFD _{AVG} (10a)	3.5 x 10 ⁻⁵ 8.0 x 10 ⁻⁵	
High demand/continuous mode • Test interval 3 months • Test interval 6 months	PFH 1/h 1/h	8.1 x 10 ⁻¹⁰ 1.8 x 10 ⁻⁹	
Proof-test interval	Years	10	

ET 200S

Motor starters and safety motor starters ET 200S fail-safe motor starter

Technical specifications (continued)

F-DS1e-x direct-on-line starters/F-RS1e-x reversing starter

		F-DS1e-x direct-on-line starters	F-RS1e-x reversing starters
Voltages, currents, potentials			
Switching capacity	A A A	Up to 7.5 kW at 400 V AC in three se 0.3 3 2.4 8 2.4 16	etting ranges:
Status, alarms, diagnostics			
Status display		SF, DEVICE and C-STAT, SG1 SG6	3
Diagnostic functions			
Group fault display		Red LED (SF)	
Diagnostic information can be read out		Available	
Control circuit			
Rated operational voltage for electronics U ₁	V	24 DC (20.4 28.8 DC)	24 DC (21.6 26.4 DC)
Reverse polarity protection for electronics U_1		Yes	
Rated operational voltage for contactor U ₂	V	24 DC (20.4 28.8 DC)	
Reverse polarity protection for contactor U_2		Yes	
Power consumption			
 From electronics supply U₁ 	mA	Approx. 40	Approx. 100
 From contactor supply U₂ Pickup Hold 	A mA	1.7 (for 80 ms) max. 350	Ī
From SG1 up to 6PickupHold	mA mA	250 (for 200 ms) max. 55	
$ullet$ Test function of the shunt release/starter protector (50 ms) from U_1	Α	Approx. 1.5	
From the backplane bus	mA	Approx. 20	
Main circuit			
Rated operational voltage U _e • Acc. to VDE 0106, part 1014, IEC 60947-1, EN 60947-1 • Protective separation between main and auxiliary circuits • UL, CSA	V V V	500 AC 400 600 AC	
Rated insulation voltage <i>U</i> _i	V	500 AC	
Rated impulse withstand voltage $U_{\rm imp}$	kV	6	
Rated frequency	Hz	50/60	

ET 200S

Motor starters and safety motor starters ET 200S fail-safe motor starter

Ordering data

Ordering data		
	Version	Order No.
Fail-safe motorstarter ET 20	OS CONTRACTOR OF THE CONTRACTO	
2	F-DS1e-x direct-on-line starters Fail-safe direct-on-line starters up to 7.5 kW at 400 V AC Mechanically switching Solid-state UE protection	
	• 0.3 3 A	3RK1 301-0AB13-0AA4
	• 2.4 8 A	3RK1 301-0BB13-0AA4
	• 2.4 16 A	3RK1 301-0CB13-0AA4
F-DS1e-x direct-on-line starter	F-RS1e-x reversing starters Fail-safe reversing starters up to 7.5 kW at 400 V AC Mechanically switching Solid-state UE protection, fuseless	
	• 0.3 3 A	3RK1 301-0AB13-1AA4
	• 2.4 8 A	3RK1 301-0BB13-1AA4
	• 2.4 16 A	3RK1 301-0CB13-1AA4
Terminal modules for fail-sa	fe motor starters	
	TM-FDS65-S32-01/S31-01 terminal module for F-DS1e-x direct-on-line starters with coding	
	 With incoming power bus connection (TM-FDS65-S32-01) 	F 3RK1 903-3AC00
	 Without incoming power bus connection (TM-FDS65-S31-01) 	F 3RK1 903-3AC10
	TM-FRS130-S32-01/S31-01 terminal module for F-RS1e-x reversing starter with coding	
	 With incoming power bus connection (TM-FRS130-S32-01) 	F 3RK1 903-3AD00
	 Without incoming power bus connection (TM-FRS130-S31-01) 	F 3RK1 903-3AD10

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview

ET 200S Safety motor starters Solutions local/PROFIsafe

The ET 200S Safety motor starter Solutions are used as preferred in all production and process automation fields in which the enhancement of plant availability and flexibility plays a key role.

- Safety motor starters Solutions local are used as preferred from the safety technology point of view for locally restricted safety applications. These motor starters are not dependent on a safe control system.
- Safety motor starters Solutions PROFIsafe are often found by contrast in safety applications of the more complex type that are interlinked. In this case a safe control system is used with the bus systems PROFINET or PROFIBUS with the PROFIsafe profile.

The ET 200S Safety motor starters Solutions comprise:

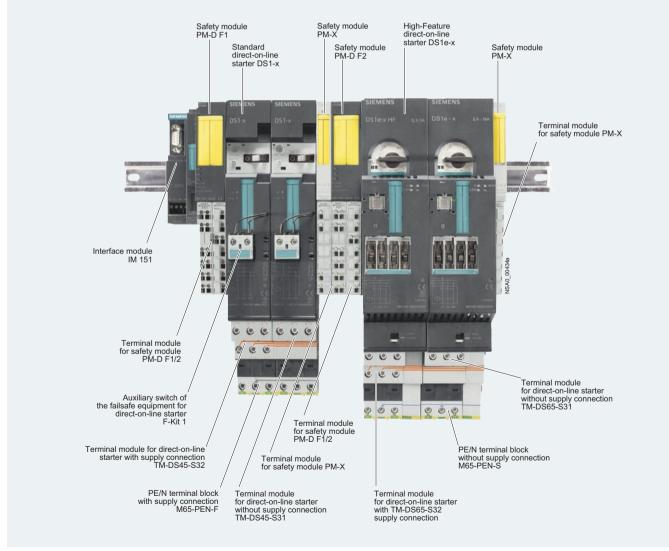
- Safety modules (page 9/158)
- Standard motor starters (page 9/145)
- High-Feature motor starters (page 9/148)
- Fail-safe motor starters (page 9/154)

With the ET 200S Solutions safety motor starters there is no complicated and hence cost-intensive configuring and wiring compared to the conventional safety systems. The ET 200S Solutions safety motor starters are designed for Category 4 according to ISO 13849-1 or SIL 3 IEC 62061.

They enable the use of safety-oriented direct-on-line starters or reversing starters in the SIMATIC ET 200S distributed peripherals system on PROFINET or PROFIBUS. The fine modular architecture of the system permits optimum imaging of machine or plant applications.

Within an ET 200S station, the Solutions safety motor starters can also be combined with Standard motor starters or High Feature motor starters without safety functions or the SIMATIC ET 200S FC frequency converters up to max. 4 kW up to Category 3 according to ISO 13849-1 or SIL 2 according to IEC 62061.

Safety motor starter ET 200S Solution local



Interplay of ET 200S safety motor starters Solutions local components

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

Components for Safety motor starter ET 200S Solution local

The Safety motor starters ET 200S Solutions local comprise:

Version 1 (see Example 1, page 9/160):

- Safety modules PMD-F1 ... 5
- PM-X module
- Standard motor starter or High Feature motor starter

Version 2 (see Example 2, page 9/160):

- Safety module PM-D FX1
- Fail-safe motor starter

Functionality of the Safety motor starters ET 200S Solutions local

- For use of Standard, High-Feature or fail-safe motor starters in systems with safety categories 2 to 4 (according to ISO 13849-1)
- Can also be used in combination with external safety relays
- · Can also be used to activate external safety systems
- No complex wiring for conventional safety technology
- Safety module available for function-monitored and automatic starting
- · Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters
- Safety modules can be plugged into the TM-PF30 terminal modules

With the Safety motor starters Solution local, the highest safety category according to ISO 13849-1 and IEC 62061 can be achieved. This means that it is possible to use it for analyzing EMERGENCY STOP circuits or for protective door monitoring and also for delayed shutdown. Using the contact multiplier, the safety-relevant signals can also be made available to external systems.

All standard safety applications can be covered by combining different TM-PF30 terminal modules. Of course, the ET 200S motor starters can also be used in combination with external safety relays or ASIsafe.

With the Safety Motor Starter Solutions local, up to 80 % of wiring is saved compared to conventional safety systems with local safety applications.

Several safety circuits can be set up using the Safety motor starters Solution local. The safety sensors are directly connected to the safety modules locally. These safety modules take over the task of the otherwise obligatory safety relay and shut down the downstream motor starters depending on the respective selected function. The cross connections required for this are already integrated in the system and do not require additional wiring. All messages of the safety modules are automatically forwarded as diagnostic messages, e.g. when there is a cross circuit in the EMERGENCY STOP circuit.

The safety module evaluates the signal state of the connected safety sensors and, using the integrated safety relays, shuts down the group(s) of downstream motor starters. The shutdown function is monitored by the module, and the auxiliary voltages likewise.

Safety-relevant system alarms, e.g. caused by actuating the EMERGENCY STOP switch or a missing auxiliary voltage, are automatically generated and reported to the interface module. It assigns a unique ID to the error. Such errors can be identified and localized via the PROFIBUS DP diagnostic module without a great deal of programming overhead.

PM-D F1/F2/F3/F4/F5 safety modules

- PM-D F1/F2/F3/F4 safety modules monitor auxiliary voltages and contain the complete functionality of a safety relay:
 - PM-D F1: For evaluation of EMERGENCY-STOP circuits with the function "monitored start".
 - PM-D F2: For monitoring of protective doors with the function "automatic start".
 - PM-D F3 : Expansion to PM-D F1/F2 for time-delayed disconnection.
 - PM-D F4: For expansion of safety circuits with other ET 200S motor starters, e.g. in a different line.
 - PM-D F5: Transmits the status from PM-D F1 ... 4 through four floating enabling circuits to external safety equipment (contact multipliers)
- The PM-D F1 and PM-D F2 modules can be combined with the PM-D F3 or PM-D F4 modules.
- A PM-D F5 can be positioned at any point between a PM-D F1 ... 4 and a PM-X¹).
- Safety modules monitor the U1 and U2 auxiliary voltages.
 A voltage failure is relayed as a diagnostic signal over the bus.
 - No additional PM-D safety module is required when the safety modules are used.
 - Each safety circuit, beginning with a PM-D F1 ... 4, must be terminated with one PM-X¹⁾ each.

1) see Accessories for Safety Module local, page 9/173



Safety Module PM-D F1

PM-D FX1 Safety module

The PM-D FX1 safety module is used to supply 1 to 6 switch-off groups. The supply voltage can be activated via 1 to 6 external safety shutdown devices (either ASIsafe Monitor or 3TK28 safety relays). This safety module is used for applications with external safety shutdown devices as needed for fully selective safety shutdown of fail-safe motor starters/frequency converters (see example 2, page 9/160).

Terminal modules for safety module (TM-PF30)

For supplying load and sensor voltage to the potential bars of the motor starters, and for connection of the 2-channel sensor circuit (e.g. EMERGENCY-STOP pushbutton) and a reset button. Different terminal modules are available for the configuration of separate safety circuits or for the cascading of safety circuits, and for applications with time-delayed disconnection. (see page 9/167).

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

Terminal module (TM-X)

For connection of an external infeed contactor (2nd shutdown possibility). With terminals for contactor coil and feedback contact. Is always required to terminate a group of safety-oriented motor starters.

Fail-safe Kit

The fail-safe Kit (F-Kit) must be added to each Standard motor starter in a safety segment in order to monitor the switching function.

F-Kit 1 supplements the DS1-x direct-on-line starter, F-Kit 2 the RS1-x reversing starter.

The F-Kits are comprised of:

- Contact supports for the terminal modules
- One or two auxiliary switch blocks for the contactor/contactors of the motor starter
- Connecting cables

High-Feature motor starters and their terminal modules come as standard with the functionality of the F-Kits integrated.

Components needed for applications with safety requirements

Components needed	Maximum achievable safety integrity according to ISO 13849-1 or IEC 62061					
	ISO 13849-1	PL b/c, category 1	PL d/PL e ¹⁾ , category 4			
	IEC 62061	SIL 1	SIL 1	SIL 2	SIL 3	
PM-D		✓				
PM-D F1/-F2/-F4			1	✓	✓	
PM-D F3			/	✓		
F-Kit 1 / F-Kit 2			√ ²⁾	√ ²⁾	√ ²⁾	
PM-X			1	✓	✓	
PM-D FX1			/	✓	✓	

¹⁾ An external incoming supply contactor is needed in the main circuit (2-channel).

Possible combinations of safety and terminal modules

Terminal module	PM-D F1	PM-D F2	PM-D F3	PM-D F4	PM-D F5	PM-X	PM-DFX1	FCM
TM-PF30 S47-B0	✓	1						
TM-PF30 S47-B1	✓	1						
TM-PF30 S47-C0			1	1				
TM-PF30 S47-C1			1	1				
TM-PF30 S47-D0					1			
TM-X15 S27-01						1		
TM-PFX30 S47-G0							1	
TM-PFX30 S47-G1							1	
TM-FCM30 S47								1

²⁾ F-Kit is only need for the Motor starter Standard; for Motor starter High Feature it is already integrated.

ET 200S

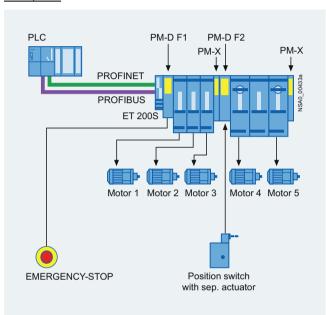
Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

Examples

The diverse possible uses of the safety motor starter Solutions local are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Example 1:



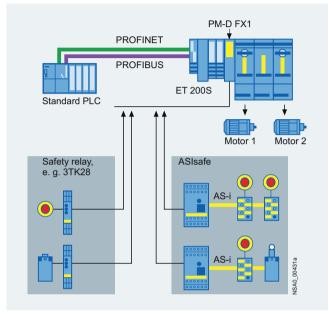
ET 200S safety motor starter Solutions local with 2 safety circuits (= switch-off groups), Standard motor starters and High-Feature motor starters.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety motor starters Solutions local are available on the Internet:

You can find more information on the Internet:

www.siemens.com/ET200S-Motorstarter

Example 2:



ET 200S safety motor starter Solutions local with 2 external safety assemblies (= safety relays or ASIsafe monitors) and with fail-safe motor starters (PM-DFX1 application). 2 of the 6 available safe switch-off groups are used

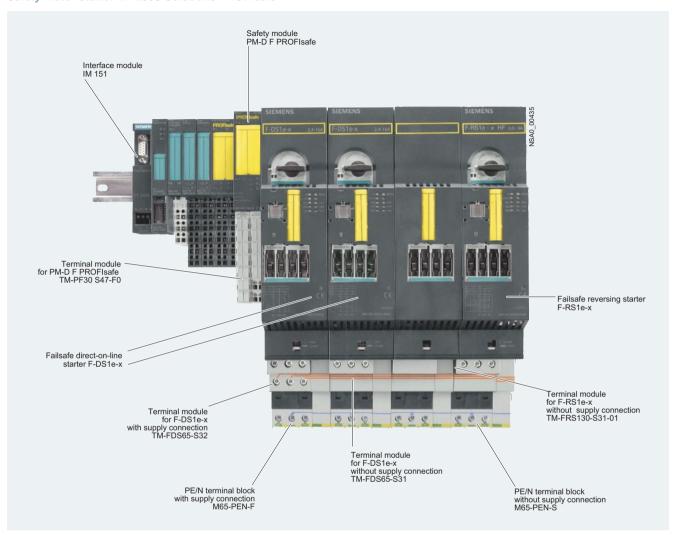
Signals with relevance for safety can be input to ET 200S through a PM-DFX1 infeed terminal module through the enabling circuits of the ASIsafe monitor or the safety relay to control the fail-safe motor starters which then selectively switch off the downstream motors.

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

Safetv Motor starter ET 200S Solutions PROFIsafe



Interplay of ET 200S Safety motor starter Solutions PROFIsafe components

Components for Safety motor starter ET 200S Solution PROFIsafe

The Safety motor starters ET 200S Solutions PROFIsafe consist of (see example, page 9/162):

- PMD-F PROFIsafe safety modules
- Fail-safe motor starter
- Safe control with the PROFINET or PROFIBUS bus systems with the PROFIsafe profile

Functionality of the Safety motor starter ET 200S Solutions PROFIsafe

- For the use of fail-safe motor starters in plants with safety category 2 to 4 according to ISO 13849-1 and SIL 2 and 3 acc. to IEC 62061. The use of Standard or High-Feature motor starters is also possible with certain assemblies
- High flexibility (any assignment of sensors to motor starters using the PLC)
- Full selectivity of disconnection of the fail-safe motor starters
- No complex wiring for conventional safety systems, e.g. no infeed contactors even in the highest safety category

- Can also be used to activate external safety systems through F-CM contact multiplier
- Safety module available for any safety function
- Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters
- Safety modules can be plugged into the TM-PF30 terminal modules

Sensor and actuator assignment are freely configurable within the framework of the distributed safety concept:

The logic of the safety functions is implemented by software. Safety-oriented PROFIsafe communication and the use of a safety-oriented control system are required. Integration of the safety technology in the standard automation is realized through a single bus system (see Advantages of PROFIsafe), using PROFIBUS as well as PROFINET.

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

High degree of flexibility with safety technology Fail-safe motor starters for PROFIsafe

In EMERGENCY-STOP applications, the fail-safe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the fail-safe freely-programmable logic of the SIMATIC controller is used to interface with the relevant fail-safe sensor technology.

Contact multiplier F-CM

The interface between PROFIsafe and installations that use conventional safety technologies is implemented through the F-CM fail-safe contact multiplier with four floating contacts

PM-D F PROFIsafe safety modules

The PM-D F PROFIsafe safety module receives the shutdown signal from the interface module of the ET 200S and safely switches off 1 to 6 switch-off groups. This safety module is used in PROFIsafe applications where there is a need for the selective safety shutdown of fail-safe motor starters/frequency converters.

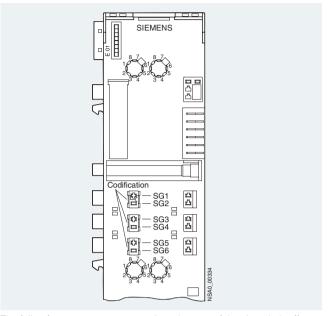


PM-D F PROFIsafe with TM-PF30 S47-F0 terminal modules

Terminal modules

The terminal assignment of the terminal modules for safe motor starters corresponds to the terminal assignment of the 45 and 65 mm terminal modules. The terminal modules for safe motor starters have a coding module in addition. This enables the safe motor starter to be assigned to one of the six switch-off groups.

The terminal module contains three coding elements which fully cover the three coding openings in the terminal module. The labeled coding element contains (in the chamber marked with the dash) the busbar tap; the non-labeled coding elements are used only to cover the coding openings. Switch-off group 1 (AG1 or SG1) is coded in the delivery state. The coding can be changed to switch-off group 2 by releasing the coding element and turning it through 180°. Changing the coding to switch-off group 3 is possible by exchanging the labeled and blank coding elements. In this case the dash on the labeled coding element must correlate with the dash of the required switch-off group (symbolized busbar).



The fail-safe motor starters are assigned to one of the six switch-off groups.

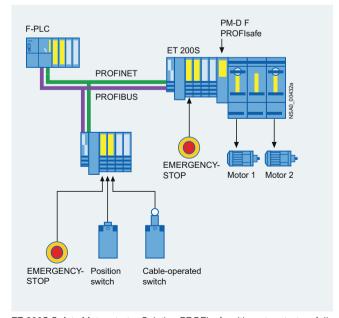
Example:

The diverse possible uses of the Safety motor starter Solutions PROFIsafe are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with safety motor starters Solution PROFIsafe are available on the Internet:

You can find more information on the Internet at:

www.siemens.com/ET200S



ET 200S Safety Motor starter Solution PROFIsafe with motor starters failsafe and fully selective disconnection (PM-DF PROFIsafe application)

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Overview (continued)

Within an ET 200S station the fail-safe motor starters are assigned to one of 6 safety segments. For plants with distributed configuration, the shutdown signals of these safety segments are preferably issued by a higher-level, safety-oriented control system via PROFIsafe. This permits the greatest flexibility for assigning the motor starters to different safety circuits.

Alternatively, an ET 200S F CPU can also be used for control purposes.

If a safety-oriented SIMATIC CPU is used, the ET 200S is available as a safety-oriented peripheral. Nevertheless, in such a station it is possible to configure conventional motor starters and input/output modules mixed with modules with safety functions.

Thanks to the PROFIsafe profile, the safety functions are available in the complete network, which means that the Safety motor

starter Solutions PROFIsafe enable the selective disconnection of fail-safe motor starters or the disconnection of a group of Standard and High-Feature motor starters regardless of where and on which peripheral station the safe control devices were connected. As such, this solution provides an unprecedented level of flexibility and reduction of wiring for applications in wide-spread plants or with a sporadic demand for changes in the assignment of safety segments.

The Solution PROFIsafe safety motor starters are ideally suited for safety concepts with Cat. 2 to 4 according to ISO 13849-1 or up to SIL 3 according to IEC 62061.

Each safety module switches up to 6 switch-off groups for fail-safe motor starters/frequency converters.

Technical specifications

PM-D F1, F2, F3, F4 and F5 safety modules		
Mechanical endurance	Oper-	10 x 10 ⁶
Electrical endurance	ating cycles	200 000 at I _e
Utilization categories		DC-13
Control times • Minimum command duration	ms	200
Recovery time	S	<1
Off-delay	ms	30
Control circuit U₁ • Rated control supply voltage U _S	V	24 DC
 Operating range DC up to 60 °C 		0.85 1.2 x U _s
Power consumption	W	2.4
Recommended short-circuit protection		gG 2 A
Output OUT+/OUT- for control of expansion modules		24 V DC/< 50 mA (PTC fuse)
Switched auxiliary circuit U ₂ • Rated control supply voltage U _S	V	24 DC
 Operating range DC up to 60 °C 		0.85 1.2 x U _s
 Rated operational current I_e (13 24 V DC) 	Α	4
$ullet$ Uninterrupted thermal current $I_{ m th}$	Α	5
Recommended short-circuit protection for enabling and signaling circuits		Fuse links: NH type 3NA, DIAZED type 5SB, NEOZED type 5SE Operational class gG 6 A
Supplying • Motor starters		Yes
Solid-state modules		No
• Ex(i) modules		No
BG certification		Yes
UL-, CSA certification		Yes
Cable length for EMERGENCY-STOP and ON pushbuttons	m	Max. 1000
Mounting dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Enabling circuits with PM-D F5		4 (floating)

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Technical specifications (continued)

mm	30 x 196.5 x 117.5 (incl. terminal module)
°C	0 +60
	IP20
	SIL 3 Shutdown class 5 and 6 Category 4
	10 years
V	21.6 26.4 DC up to 60 °C
Α	6 Internal protection with 7 A melting fuse (quick)
Α	Melting fuse gG 6.3
	Yes Yes No
mA mA mA	≤ 10 ≤ 35 ≤ 15
	None
	Red "SF" LED Green PWR LED Green LED SG1 SG6 Yes
	Yes Yes
	°C V A A

F-CM contact multipliers		
Dimensions		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Module-specific data		
Number of relay outputs		4 (4 x 1-channel or 2 x 2-channel safe coupling/contact multiplication)
Internal power supply for bar		U1 (from PM-D F/PM-D FX1)
Maximum achievable safety class • Acc. to IEC 61508 • Acc. to VDE 0801 • Acc. to EN 954		SIL3 AK 6 Cat. 4
Voltages, currents, potentials		
Switching capacity of the relay outputs		Utilization category DC-13 ($I_{\rm e}/U_{\rm e}$): 1.5 A / 24 V
Electrical separation Between outputs and backplane bus Between outputs and power supply Between outputs Between outputs/power supply and shield		Yes Yes Yes Yes
Status, alarms, diagnostics		
Status display		PWR and STAT
Alarms: diagnostic alarm		None
diagnostic functions • Group fault display • Diagnostic information can be read out • Monitoring the supply voltage for solid-state modules <i>U</i> ₁ (PWR) • Monitoring the switching state of the enabling circuit		Yes Red LED (SF) Available Green PWR LED Red/green STAT LED

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Technical specifications (continued)

PM-D F PROFIsafe safety modules		
Dimensions		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Module-specific data		
Number of outputs, source input		6 switch-off groups (safety group 1 6)
Internal power supply for bar		U1
Assigned address range		
• In PAE	byte	5
• In PAA	byte	5
Maximum achievable safety class • Acc. to IEC 61508		SIL3
• Acc. to VDE 0801		AK 6
• Acc. to EN 954		Cat. 4
Voltages, currents, potentials		
Control supply voltage	V	24 DC
Electrical separation		
Between outputs and backplane bus		Yes
Between outputs and power supply Detween supply		No No
Between outputsBetween outputs/power supply and shield		Yes
Status, alarms, diagnostics		
Status display		Green LED per SG
		Green LED for electronics supply
		Green LED for load voltage
Alarms: Diagnostic alarm		"TO"
Diagnostic functions		
Group fault display Diagnostic information and harmad authority		Red LED (SF) Available
Diagnostic information can be read out		Available
Settings Module address		Diverse:
Module address		
		1. Using a safety-oriented parameter in the parameterization message frame over the backplane bus $$
		2. Using the 10-pole DIL switch (binary-coded) on the left side of the module
		The received address is then compared with the DIL switch setting.

ET 200S

Motor starters and safety motor starters Safety module local and PROFIsafe

Ordering data

	Version	Order No.
Safety modules local		
	PM-D F1 With diagnostics Safety module for EMERGENCY-STOP application Monitored start	F 3RK1 903-1BA00
	PM-D F2 With diagnostics Safety module for protective door monitoring Automatic start	F 3RK1 903-1BB00
3RK1 903-3DA00	PM-D F3 With diagnostics Safety module for expanding PM-D F1/2 for another voltage group Time-delayed 0 to 15 s	3RK1 903-1BD00
	PM-D F4 With diagnostics Safety module for expanding PM-D F1/2 for another voltage group	3RK1 903-1BC00
	PM-D F5 With diagnostics Safety module for expanding PM-D F14 with four floating enabling circuits Contact multipliers	3RK1 903-1BE00
	PM-D FX1 With diagnostics Infeed terminal module for supply of 1 to 6 switch-off groups	F 3RK1 903-3DA00
	FC-M contact multipliers With 4 safe floating contacts	3RK1 903-3CA00
PROFIsafe safety modules		
	PM-D F PROFIsafe safety modules For PROFIBUS and PROFINET For fail-safe motor starters For fail-safe contact multipliers With six switch-off groups (SG1 to SG6)	F 3RK1 903-3BA01
	F-CM contact multipliers With 4 safe floating contacts	3RK1 903-3CA00

ET 200S

Terminal modules for safety modules local and PROFIsafe

Overview

Terminal module for safety modules PM-D F1/F2/F3/F4/F5

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High-Feature motor starters and frequency converters. Safety modules for voltage monitoring are plugged onto TM-P modules. TM-P modules can be used any number of times within the ET 200S. A safety module must always be plugged upstream from the first motor starter.

Different safety circuits can be functionally separated or else cascaded using different terminal modules. Each group in such a case must be terminated with a PM-X connection module.

TM-PF30 S47-B1

The terminal module is always positioned at the beginning of a safety segment and accommodates the PM-DF1 safety module for EMERGENCY-STOP applications or the PM-DF2 safety module for protective door monitorings. The 24 V supply voltages for the electronics (U1) and those for supplying the contactors (U2) of the motor starters must be connected along with the 2-channel connection of the safety sensors (e.g. EMERGENCY-STOP pushbuttons) to this terminal module. Connections for the ON button (enabling) and safe output of the safety module are available in addition.

TM-PF30 S47-B0

The terminal module is used to cascade lower level safety segments and accommodates the PM-DF1 safety module for EMERGENCY-STOP applications or the PM-DF2 safety module for protective door monitorings. No other auxiliary voltage has to be connected to this terminal module. The supply comes from the preceding PM-DF1 or PM-DF2 module over the potential bars of the terminal modules. Once the potential of the preceding safety module is disconnected, this sub-potential also has no voltage.

TM-PF30 S47-C1

The terminal module is always positioned at the beginning of a safety segment expansion in a new station, e.g. at an interlace point. It accommodates the PM-D F3 safety module for time-delayed shutdown or the PM-D F4 safety module for direct shutdown in separately located ET 200S stations. The 24 V supply voltages for the electronics (U1) and those for supplying the contactors (U2) are fed in new. The shutdown command from an upstream ET 200S station is received through a safe input. Separate terminals are available to connect the feedback circuit to the upstream ET 200S station. No safety sensors can be connected to this terminal module.

TM-PF30 S47-C0

The terminal module is used to cascade lower level safety segments and accommodates the PM-D F3 safety module for time-delayed shutdown or the PM-D F4 safety module. Only the U2 supply voltage for the contactors must be connected to this terminal module. The U1 supply comes from the preceding safety module (sub-potential group) over the potential bars of the terminal modules. No safety sensors can be connected to this terminal module.

TM-PF30 S47-D0

The terminal module is used to accommodate the PM-D F5 safety module. On this terminal module, safe signals can be relayed to external systems through four groups, each with two safety relay contacts configured with redundancy. The terminal module must always be positioned between one of the above mentioned terminal modules and a terminal module for the TM-X connection module. No safety sensors can be connected to this terminal module.

Terminal modules for PM-X safety module (TM-X)

TM-X15 S27-01

For connection of an external infeed contactor (second shutdown option) for category 3 and 4. The connection module (PM-X Safety Module) is plugged on the right alongside the last motor starter of a safety segment. On the TM-X terminal module there are the terminals for connecting the positively driven NC contact of the contactors as well as the terminals for connecting the contactor coil. If no contactor with redundant switching is required, e.g. for category 2 (ISO 13849-1), the feedback circuit has to be closed at these terminals with a jumper. In applications with external safety relays it is also used instead of the safety module as interface to the external safety relay.

ET 200S

Terminal modules for safety modules local and PROFIsafe

Technical specifications

Ordering data

Terminal modules for safety modules loca

Version Order No.

	Terminal modules		
	TM-PF30 S47-B1 For PM-D F1/2 Safety Modules With infeed U1/U2 and sensor connection	F	3RK1 903-1AA00
	TM-PF30 S47-B0 For PM-D F1/2 Safety Modules With sensor connection	F	3RK1 903-1AA10
	TM-PF30 S47-C1 For PM-D F3/4 Safety Modules With infeed U1/U2 and control input IN+/IN-	F	3RK1 903-1AC00
3RK1 903-1AA00	TM-PF30 S47-C0 For PM-D F3/4 Safety Modules With infeed U2		3RK1 903-1AC10
	TM-PF30 S47-D0 For PM-D F5 Safety Modules		3RK1 903-1AD10
	TM-X15 S27-01 For PM-X Safety Module	F	3RK1 903-1AB00
	TM-P15-S27-01 terminal module For PM-D power module		3RK1 903-0AA00
	TM-PFX30 S47-G0/G1 terminal module For PM-D FX1 safety modules (infeed terminal module)		
	Infeed left (TM-PFX30 S47-G0)	F	3RK1 903-3AE10
	Infeed center (TM-PFX30 S47-G1)	F	3RK1 903-3AE00
	TM-FCM30 S47-F01 terminal module For F-CM contact multipliers		3RK1 903-3AB10

F 3RK1 903-3AA00

3RK1 903-3AB10

F: Subject to export regulations AL: N and ECCN: EAR99

Terminal modules for Safety modules PROFIsafe

TM-PF30 S47-F0 terminal module For PM-D F PROFIsafe safety modules

TM-FCM30 S47-F01 terminal module

For F-CM contact multipliers

ET 200S

Motor starters and safety motor starters
Accessories

Overview

Accessories for Standard motor starters

Control kit

The control kit for the Standard motor starter provides the possibility of testing the motor during start-up or service by actuating the motor starter protector. Using the control kit with the motor starter protector tripped, the contactor is mechanically locked in ON position.

Control unit

With the control unit the contactor coils of the Standard motor starter can be directly controlled using 24 V DC. The motor starter can thus be started as normal using a on-site control point without PLC or bus.

Note:

The control unit cannot be used in combination with the safety system or a brake control module.

DM-V15 distance module

- Passive module without bus connection and terminals
- Does not need a separate terminal module
- Follows a TM-DS45 or TM-RS90 or TM-xB if required
- Does not need to be taken into account when configuring the GSD file

The distance module is available for applications with high motor currents or high ambient temperatures involving Standard motor starters. It can be used to the right and left of a DS1-x direct-on-line starter or to the right of an xB1-4 brake module in order to improve heat removal to the side. The distance module is a completely passive module and does not need to be taken into account with regard to the control system during configuration. Details of the distance module can be found in the manual "SIMATIC ET 200S". If you have any queries concerning the use of the distance module, contact the Technical Support for Siemens Industrial Controls (fax: +49(0)911/895-5907).

Accessories for High-Feature motor starters

2DI 24 V DC COM control module

The 2DI 24 V DC COM control module is plugged onto the interface on the front of the motor starter. The module provides two inputs which can receive signals from the process and be assigned directly to the starter.

The functionality can be selected from a list of various control functions as part of the PROFIBUS parameterization. On-site control point, emergency start and quick stop, for example, are available as functions. The signal levels can also be parameterized (NO/NC). For more extensive control functions the two inputs of a xB3 or x4 brake control module, which is plugged in alongside on the right, can be integrated in addition. The signal states of all inputs are transmitted in parallel with the internal use to the higher-level control system.

When a motor starter is replaced, the parameterization is automatically transmitted by download to the new starter. The inputs on the motor starter ensure autonomous operation, e.g. in the event of PLC failure, on the one hand and short response times through direct processing in the starter on the other hand. Another advantage results from the direct assignment of functions to modular machine concepts.

The 2DI 24 V DC COM control module has in addition a PC interface for connecting the Switch ES Motor Starter parameterization and diagnostic software (Version 2.0 and higher). The module works solely on High-Feature motor starters with ES Motor Starter interface. The Logo!-PC cable is used as connecting

cable between the 2DI 24 V DC COM control module and the High-Feature motor starter.

Accessories for Standard and High-Feature motor starters

PE/N bridge module

PE/N bridge modules are used to bridge gaps in the PE/N bus which are caused, for example, by using brake control modules, PM-D(F) power modules or a PM-X connection module. If a bridge module is used, the supply must not be fed in anew. They are available in widths of 15 and 30 mm.

L123 bridge modules

The L123 bridge modules are used to bridge gaps in the power bus (see above). They are available in widths of 15 and 30 mm.

Brake control module

for motors with mechanical brake (see also motor starters and safety motor starters ET 200S, General data, Overview, section Brake Control Module, page 9/140)

Terminal modules for brake control modules

The TM-xB terminal modules are used to accommodate the xB1, xB2, xB3 and xB4 brake control modules. The TM-xB terminal module must always follow directly after a terminal module for Standard motor starters, High-Feature motor starters or frequency converters as control of the solid-state braking switch is provided through an output of the motor starter/frequency converter. The xB215 terminal modules for the brake control modules have not only the terminals for connecting the cable for the motor brake but also the terminals of the two local acting inputs. These local inputs are not evaluated by a frequency converter, which is why the xB215 terminal module can only be switched behind a motor starter.

Accessories for Standard, High Feature, Fail-safe

PE/N terminal block

The PE/N terminal block is required for direct connection of the protective conductor in the motor cable without intermediate terminals. It is plugged together with the terminal module for motor starters or frequency converters before the latter is mounted on the standard mounting rail. With two PE terminals and one N terminal the "-F" version is connected to the "-S32" terminal modules for motor starters or frequency converters. The "-S" version is combined with the "-S31" terminal module. The "F" terminal modules are delivered with two caps for closing the PE/N bus contacts on the final terminal module of a segment. The modules for the Standard motor starters have a width of 45 mm and the modules for the High-Feature motor starters and frequency converters have a width of 65 mm.

There is no electrical connection between the terminals of the PE/N terminal block and the integrated shielding of the frequency converter. The PE/N terminal block must therefore not be used for the shielding of the motor cable.

Accessories for Safety Module local

The fail-safe Kit (F-Kit) is needed for Standard motor starters in a safety segment (see Safety Module local and PROFIsafe, Overview, page 9/159).

ET 200S

Motor starters and safety motor starters Accessories

Technical specifications

xB1, xB2, xB3, xB4, xB5, xB6 Brake Control Modules

SIMATIC ET 200 distributed I/O

Internally Internally Internally Number of inputs 0			xB1	xB3	xB2	xB4	xB5	xB6	
Externally through terminal module From brake rectifier through terminal module Rated operational current A 4 0.7 0.7 0.5 Reverse polarity protection	Dimensions (W x H x D)	mm	15 x 196.5 x 125	.5 including termin	al module on 7.5 r	mm standard mour	nting rail		
Rated operational current	Rated operational voltage	V	24 DC		500 DC (min. 100	0)	400 AC		
Reverse polarity protection No, in the event of polarity reversal the brake is released and the overload/short-circuit protection is not effective Nouncerous - Section of the terminal module for the brake control module Number of outputs Number of inputs O 2 Address space needed per module With summary Without summary Without summary O 1 byte O 2 bit O 2 bit O 1 byte O 1 by	Energy supply		Externally throug	h terminal module		ier through termi-	External through	terminal module	
Overload/short-circuit protection Ves, solid-state Conductor cross-section of the terminal module for the brake control module Number of outputs 0 1 (used internally) Number of inputs 0 2 1 (used internally) Number of inputs 0 2 2 0 2 Address space needed per module • With summary • Without summary • Without summary • Group fault "SF" • Switching state for brake "STAT" • Inputs 1 and 5 Parameters (default values underlined) • Brake overload diagnostics • Input delay • Input delay • Disable/Enable	Rated operational current	Α	4		0.7		0.5		
Conductor cross-section of the terminal module module for the brake control module Number of outputs	Reverse polarity protection					sed and the	Not relevant	t	
Mumber of outputs 1 x 1.5 with end sleeve Number of inputs 0 1 (used internally) 0 1 (used internally) 0 1 (used internally) Number of inputs 0 2 0 2 0 2 Address space needed per module Vith summary 0 2 bit 0 2 bit 0 2 bit 0 2 bit Without summary 0 1 byte Diagnostic functions Group fault "SF" Red LED Switching state for brake "STAT" Yellow LED Green LED O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ O/0.1/0.5/3/ <	Overload/short-circuit protection		Yes, solid-state				1 A safety fuse		
Internally Int	Conductor cross-section of the terminal module for the brake control module	mm ²	1 x 2.5 without e 1 x 1.5 with end						
Address space needed per module • With summary 0 2 bit 0 2 bit 0 2 bit 0 2 bit 0 1 byte 0 2 bit 0 0 1 byte 0 1 byte 0 2 bit 0 0 1 byte 0 0 1 byte 0 0 0 0 0	Number of outputs		0		0		0	1 (used inter- nally)	
 With summary 0 2 bit 0 2 bit 0 1 byte 0 2 bit 0 0 2 bit 0 1 byte 0 1 byte 0 1 byte 0 2 bit 0 1 byte 0 0 0 0 0 0 0 0	Number of inputs		0	2	0	2	0	2	
Without summary 0 1 byte 0 1 byte 0 1 byte 0 1 byte Diagnostic functions Group fault "SF" Red LED Switching state for brake "STAT" Inputs 1 and 5 Parameters (default values underlined) Brake overload diagnostics Disable/Enable Input delay MS O/0.1/0.5/3/ O/0.1/	Address space needed per module								
Diagnostic functions • Group fault "SF" Red LED • Switching state for brake "STAT" Yellow LED • Inputs 1 and 5 Green LED Green LED Green LED Green LED Parameters (default values underlined) • Brake overload diagnostics Disable/Enable Disable/Enable O/0.1/0.5/3/ 0/0.1/0.5/3	With summary		0	2 bit	0	2 bit	0	2 bit	
 Group fault "SF" Switching state for brake "STAT" Inputs 1 and 5 Parameters (default values underlined) Brake overload diagnostics Input delay Pisable/Enable O/0.1/0.5/3/ - O/0.1/0.5/3/ - O/0.1/0.5/3/ - O/0.1/0.5/3/ - O/0.1/0.5/3/ - 	Without summary		0	1 byte	0	1 byte	0	1 byte	
Switching state for brake "STAT" Yellow LED Inputs 1 and 5 Green LED Orean LED	Diagnostic functions								
• Inputs 1 and 5	Group fault "SF"		Red LED						
Parameters (default values underlined) • Brake overload diagnostics Disable/Enable Disable/Enable 0/0.1/0.5/3/ 0/0.1/0.5/3/ 0/0.1/0.5/3/ 0/0.1/0.5/3/	 Switching state for brake "STAT" 		Yellow LED						
• Brake overload diagnostics Disable/Enable Disable/Enable • Input delay ms 0 / 0.1 / 0.5 / 3 / 0 / 0.1 / 0.5 / 3 / 0 / 0.1 / 0.5 / 3 /	• Inputs 1 and 5			Green LED		Green LED		Green LED	
• Input delay ms 0/0.1/0.5/3/ 0/0.1/0.5/3/ 0/0.1/0.5	Parameters (default values underlined)								
	Brake overload diagnostics			Disable/Enable		Disable/Enable			
10	• Input delay	ms		0 / 0.1 / 0.5 / <u>3</u> / 15		0 / 0.1 / 0.5 / <u>3</u> / 15		0 / 0.1 / 0.5 / <u>3</u> / 15	

Ordering data

	Version	Order No.
Accessories for Standard mot	or starters	
	Control kit for manually operating the contactor contacts during start-up and servicing (one set contains five control kits)	3RK1 903-0CA00
3RK1 903-0CA00 3RK1 903-0CG00	Control unit for direct contactor control (manual control) 24 V DC	3RK1 903-0CG00
3RK1 903-0CD00	DM-V15 distance module for DS1-x direct-on-line starters with high temperatures or high current loading 15 mm wide	3RK1 903-0CD00

ET 200S

Motor starters and safety motor starters
Accessories

Ordering data (continued) Version Order No. **Accessories for Standard motor starters** PE/N M45-PEN-F terminal block 3RK1 903-2AA00 45 mm wide including two caps in combination with TM-DS45-S32 / TM-RS90-S32 3RK1 903-2AA00 PE/N M45-PEN-S terminal block 3RK1 903-2AA10 45 mm wide in combination with TM-DS45-S31 / TM-RS90-S31 3RK1 903-2AA10 **Accessories for High-Feature motor starters** 2DI LC COM control module F 3RK1 903-0CH20 Digital input module with 2 inputs (cable length up to 100 m) for local motor starter functions for mounting onto the front of motor starters, operational voltage 24 V DC (supplied from U_1), shortcircuit proof, floating contact with serial interface for connecting motor starters ES, connection using LOGO!-PC cable LOGO! PC cable 6ED1 057-1AA00-0BA0 for connecting the High-Feature motor starter with ES interface switch to 3RK1 903-0CH20 Hand-held device 3RK1 922-3BA00 for ET 200S High-Feature motor starters, (also for ET 200pro and ECOFAST), for on-site operation. A serial interface cable must be ordered separately. 3RK1 922-3BA00 M65-PEN-F terminal block 3RK1 903-2AC00 65 mm wide, including two caps, in combination with TM-DS65-S32 / TM-RS130-S32 M65-PEN-S terminal block 3RK1 903-2AC10 65 mm wide, in combination with TM-DS65-S31 / TM-RS130-S31 Accessories for Standard / High-Feature motor starters M15-PE/N bridge module 3RK1 903-0AH00 15 mm wide for bridging a 15 mm module 3RK1 903-0AH00 3RK1 903-0AJ00 M30-PE/N bridge module 30 mm wide for bridging a 30 mm module

3RK1 903-0AJ00

ET 200S

Motor starters and safety motor starters Accessories

Ordering data (continued)

Ordering data (continued)	
	Version	Order No.
Accessories for Standard	motor startars	
Accessories for Standard	M15-L123 bridge module	3RK1 903-0AE00
	15 mm wide for bridging a 15 mm module	
3RK1 903-0AE00		
	M30-L123 bridge module 30 mm wide for bridging a 30 mm module	3RK1 903-0AF00
3RK1 903-0AF00		
3RK1 903-0AF20	Sealing caps for L123 bridge modules and PE/N	3RK1 903-0AF20
011117 000 0711 20	Brake control modules	
	for motors with mechanical brakes • xB1 for motor starters 24 V DC/4 A	F 3RK1 903-0CB00
	• xB2 for motor starters 500 V DC/0.7 A	3RK1 903-0CC00
	 xB3 for motor starters 24 V DC / 4 A / 2 DI 24 V DC local control with diagnostics, with two inputs 	F 3RK1 903-0CE00
3RK1 903-0CB00	 xB4 for motor starters 500 V DC / 0.7 A / 2 DI 24 V DC local control with diagnostics, with two inputs 	F 3RK1 903-0CF00
	xB5 for motor starter 400 V AC without digital input	3RK1 903-0CJ00
	xB6 for motor starter 400 V AC wth two digital inputs	3RK1 903-0CK00
	Terminal modules for brake control modules	
	• TM-xB15 S24-01 for xB1 or xB2	3RK1 903-0AG00
	• TM-xB215 S24-01 for xB3 or xB4	F 3RK1 903-0AG01
Accessories for fail-safe		
	PE/N M65-PEN-F terminal blocks With incoming connection, with caps	3RK1 903-2AC00
	M65-PEN-S terminal blocks without incoming connection	3RK1 903-2AC10
Accessories for power mo		6ES7 193-4LA10-0AA0 6ES7 193-4LB10-0AA0 6ES7 193-4LC10-0AA0 6ES7 193-4LD10-0AA0 6ES7 193-4LF10-0AA0 6ES7 193-4LG10-0AA0

ET 200S

Motor starters and safety motor starters Accessories

Ordering data (continued)

	Version		Order No.
Accessories for safety mod	dules local		
<u></u>	PM-X safety module (connection module) With diagnostics, plugged-in on TM-X15 S27-01 Module for connecting a safety group and for connecting an external infeed contactor or for the connection to an external safety circuit	F	3RK1 903-1CB00
	F-Kit 1 Fail-safe equipment for DS1-x ¹⁾ Standard motor starters	F	3RK1 903-1CA00
3RK1 903-1CA00	F-Kit 2 Fail-safe equipment for RS1-x ¹⁾ Standard motor starters	F	3RK1 903-1CA01
3RK1 903-1CA01			

¹⁾ The function of the fail-safe kit is already integrated into High-Feature motor starters.

ET 200S

Frequency converters ET 200S FC frequency converter

Overview



Components of the ET 200S FC frequency converter

Application

- New application possibilities are opened up for the ET 200S system where permanent control of the speed of asynchronous motors is required.
- The frequency converter handles frequency control and vector control for more complex drive tasks. In addition, the converter also supports torque control for conveyor applications, winding and unwinding drives, as well as hoisting gear. Together with a motor encoder, the range extends up to closed-loop controls for exact control of speeds and torques.
- The advantages of line-commutated power regeneration are primarily evident in continuous regenerative operation.
 Examples include unwinding units, lowering of loads with hoisting gear, or electric braking of large centrifugal masses.
- Together with an intelligent header module (IM 151 CPU) and the ET 200S FC frequency converter, the I/O station is expanded to become a complete automation solution for machine modules and plant sections.

Technical specifications

	Control unit	Converter power modules		
	ICU24	IPM25, FS A Frame size A	IPM25, FS B Frame size B	
Selection features				
Integral safety functions according to Category 3 of EN 954-1 or according to SIL2 of IEC 61508	-	-	-	
Output	-	0.75 kW	2.2 kW	4.0 kW
Rated input current (at 50° C ambient temperature)	-	1.9 A	5.7 A	9.6 A
Rated output current (at 50° C ambient temperature)	-	2.1 A	5.9 A	10.2 A
Mounting dimensions (W x H x D) in mm (including terminal module)	15 x 220 x 156	65 x 290 x 156	130 x 290 >	: 156
Electrical data				
Line voltage	380 V to 480 V 3 AC +1	0 % / -10 %		
Line frequency	47 Hz to 63 Hz			
Overload capability	cycle time 300 s	rated output current (i.e. 150 % overloat ated output current (i.e. 200 % overload	, ,,	
Output frequency	0 Hz to 650 Hz			
Pulse frequency	8 kHz (standard), 2 kHz	to 16 kHz (in 2 kHz steps)		
Standard short circuit current rating SCCR (Short Circuit Current Rating) 1)	10 kA			
Skipped frequency range	1, programmable			
Converter efficiency	≥96 % at rated load of the	ne motor		
Typical power loss at 420 V input voltage ²⁾ and motor with rated load (motor and regener-	10 W	40 W (Pulse frequency 8 kHz)	110 W	160 W
ative mode)		65 W (Pulse frequency 16 kHz)	140 W	200 W
		30 W (Pulse frequency 4 kHz)	80 W	130 W
Typical power loss at 420 V input voltage ²⁾ and motor during no-load operation, 50 Hz	10 W	35 W (Pulse frequency 8 kHz)	70 W	110 W

¹⁾ Applies to industrial industrial control cabinet installations according to NEC Article 409 / UL 508A.

²⁾ The power loss varies according to the input voltage.

ET 200S

Frequency converters ET 200S FC frequency converter

Technical specifications (continued)

	With horizontal design of station	-10 °C to + 50 °C/to +60 °C with derating			
Operating temperature	With vertical design of station	-10 °C to + 40 °C			
Degree of protection	IP20				
Mechanical data					
Connectable motors	 Low-voltage asynchronous motors Motor cable lengths: max. 50 m (shielder if an output reactor or an LC filter is used 	d) max. 100 m (unshielded) d, longer cable lengths are possible			
Protection features for	Undervoltage, overvoltage, ground faults, protection Pt , converter overtemperature,	short circuits, stall prevention, thermal motor motor blocking protection			
Braking functions		 Regenerative braking operation without brake chopper and pulsed resistor Control of an electrical holding brake via an optional Brake Control Module 			
Operating functions	Jogging mode, free function blocks (FFB), interruption due to power failure, bumples:	Jogging mode, free function blocks (FFB), positioning deceleration ramp, automatic restart following interruption due to power failure, bumpless connection of converter to rotating motor			
Control method	 V/f control – linear (M~n) with/without fluxizable Vector control – with or without encoder Torque control 	x current control (FCC), quadratic ($M\sim n^2$) or parameter-			
Functions					
Interfaces	 RS232 interface with USS protocol for cor software Slot for an optional memory card (MMC) PTC/KTY84 interface for motor temperation 	 Connection to PROFIBUS or PROFINET over the ET 200S backplane bus RS232 interface with USS protocol for commissioning on the PC using the STARTER commissioni software Slot for an optional memory card (MMC) for uploading or downloading parameter settings PTC/KTY84 interface for motor temperature monitoring Speed sensor interface (Sub-D connector) for unipolar HTL incremental position encoder 			

Derating data

Pulse frequency

Compliance with standards

Output	Rated output current in A at a pulse frequency of							
kW	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.75	2.1	2.1	2.1	2.1	1.05	1.05	1.05	1.05
2.2	5.9	5.9	5.9	5.9	5.3	5.3	5.3	5.3
4.0	10.2	10.2	10.2	10.2	5.1	5.1	5.1	5.1

UL, cUL, CE, c-tick, according to low-voltage directive 2006/95/EG, EMC directive 89/336/EEC

The current data apply to an ambient temperature of 50 °C unless specified otherwise.

Ordering data Order No.



Control unit
 Control modes: V/f, FCC, SLVC, VC with encoder, torque control

• Motor encoder input: HTL unipolar

• Motor temperature input: PTC/KTY

6SL3 244-0SA00-1AA1



IPM25 converter power module

380 V - 480 V 3 AC +10/-10 %

47 Hz - 63 Hz

Overload: 150 % 60 s 200 % 3 s

Power: 0.75 kW E 6SL3 225-0SE17-5UA3

E: Subject to export regulations AL: 91999 and ECCN: EAR99 F: Subject to export regulations AL: N and ECCN: EAR99

ET 200S

Frequency converters ET 200S FC frequency converter

Ordering data Order No.



IPM25 converter power module

380 V - 480 V 3 AC +10/-10 %

47 Hz - 63 Hz

Overload: 150 % 60 s 200 % 3 s

Power:

2.2 kW

4.0 kW

E 6SL3 225-0SE22-2UA3

E 6SL3 225-0SE24-0UA3

Necessary components and accessories:

Accessories	Order No.		Order No.
TM-ICU15 terminal module	3RK1 903 3EA10	Terminal module for brake	
for IC24/ICU24F Control Unit		control modules • TM-xB15 S24-01 for xB1 or xB2	3RK1 903-0AG00
TM-IPM65 terminal module		See also page 9/172	5711X1 000 071000
for IPM25 power unit, 0.75 kW of frequency converter		RS232/null-modem cable (5 m)	6ES7 901-1BF00-0XA0
with supply cable connection for power bus (TM-IPM65-S32)	3RK1 903-3EC00	Connecting cable for commissioning the ET 200S FC frequency	
 without supply cable connection 	3RK1 903-3EC10	converter with the "STARTER" PC	
for power bus (TM-IPM65-S31)		PM-D power module F	3RK1 903-0BA00
TM-IPM130 terminal module		for 24 V DC with diagnostics	
for IPM25 power unit, 2.2 kW and 4.0 kW of frequency converter		See also page 9/152	
with supply cable connection for	3RK1 903-3ED00	TM-P15 S27-01 terminal module	3RK1 903-0AA00
power bus (TM-IPM130-S32)without supply cable connection	3RK1 903-3ED10	for PM-D power module See also page 9/153	
for power bus (TM-IPM130-S31)		MMC parameter memory for E	6SL3 254-0AM00-0AA0
EMC filter for frequency converter		frequency converter	
converter connected upstream of common power bus of the frequency		suitable for MMC slot of the ICU24 / ICU24F Control Unit; other memory cards not accepted	
converter in order to achieve EMC class A, EMC-compliant		IOP Handheld E	6SL3 255-0AA00-4HA0
design with shielded motor		for use with SIMATIC ET 200S FC	
cables necessary25 A rated currentF	6SL3 203-0BE22-5AA0	frequency converter or SIMATIC ET 200pro FC Included in the	
• 50 A rated current F		scope of delivery: • IOP	
Output reactor		Handheld housing	
for IPM25 power unit • 0.75 kW	6SE6 400-3TC00-4AD2	Batteries (4 AA)Charger (international)	
• 2.2 kW and 4.0 kW	6SE6 400-3TC01-0BD3	RS232 connecting cable (Length 3 m, can only be used)	
LC filter for IPM25 power unit		for SINAMICS G120 and	
0.75 kW2.2 kW and 4.0 kW	6SE6 400-3TD00-4AD0 6SE6 400-3TD01-0BD0	SIMATIC ET 200S FC) • USB cable (length 1 m)	
Brake control modules	03E0 400-31D01-0DD0	,	
ffor motors with mechanical brake			
See also page 9/169 ff.			
• xB1 for frequency converter 24 V DC / 4 A	3RK1 903-0CB00		
• xB2 for frequency converter 500 V DC / 0.7 A	3RK1 903-0CC00		

E: Subject to export regulations AL: 91999 and ECCN: EAR99

ET 200S

Frequency converters ET 200S FC fail-safe frequency converter

Overview



Components of the ET 200S FC fail-safe frequency converter

Application

- When stepless speed control of induction motors is required, new applications are opened up for the ET 200S system.
- The frequency converter handles both frequency control and vector control for more complex drive tasks. In addition, the converter also supports torque control in conveyor applications, winding and unwinding drives as well as hoists. With a motor encoder, the range also includes closed-loop control for precise speed and torque control.
- The advantages of the line-commutated energy feedback are primarily evident in continuous regenerative operation.
 Examples include unwinding units, lowering of loads with hoisting gear, or electric braking of large centrifugal masses.
- In combination with an intelligent module head (IM 151 CPU) and the ET 200S FC frequency converter, the I/O station matures to a complete automation solution for machine modules and plant sections.
- The integrated safety functions considerably reduce the overhead for drive solutions in plant sections which pose a potential danger. Monitoring of the safely reduced speed in encoderless standard induction motors is unique in drive engineering.

Technical specifications

	0	On a second and December Mandada a	
	Control unit	Converter Power Modules	
	ICU24F	IPM25, FS A Frame size A	IPM25, FS B Frame size B
Selection features			
 Integral safety functions according to Category 3 of EN 954-1 or according to SIL2 of IEC 61508 	 Safe Torque Off (STO) Safely Limited Speed (SLS)¹⁾ Safe Stop 1 (SS1)¹⁾ 	-	-
Output	-	0.75 kW	2.2 kW 4.0 kW
 Rated input current (at 50 °C ambient temperature) 	-	1.9 A	5.7 A 9.6 A
 Rated output current (at 50 °C ambient temperature) 	-	2.1 A	5.9 A 10.2 A
 Mounting dimensions (W x H x D) in mm (including terminal module) 	15 x 220 x 156	65 x 290 x 156	130 x 290 x 156
Electrical data			
Line voltage	380 V to 480 V 3 AC + 10 %/-10	%	
ine frequency	47 Hz to 63 Hz		
Overload capability		utput current (i.e. 150 % overload put current (i.e. 200 % overload) f	
Output frequency	0 Hz to 650 Hz		
Pulse frequency	8 kHz (standard), 2 kHz to 16 kH	Hz (in 2 kHz steps)	
Standard short circuit current rating SCCR (Short Circuit Current Rating) 2)	10 kA		
Skipped frequency range	1, programmable		
Converter efficiency	≥96 % at rated load of the motor	r	
Converter emoleracy	_oo /o at rated load of the motor		

¹⁾ The safety functions "Safely Limited Speed" and "Safe Stop 1" are certified for asynchronous motors without encoders - these safety functions are not permitted for pull-through loads as in the case of lifting gear and winders.

²⁾ Applies to industrial control cabinet installations according to NEC Article 409 / UL 508A.

ET 200S

Frequency converters ET 200S FC fail-safe frequency converter

Technical specifications (continued)

Typical power loss at 420 V input voltage 1)	10 W	40 W	110 W	160 W
and motor with rated load (motor and regenerative mode)		(Pulse frequency 8 kHz) 65 W	140 W	200 W
		(Pulse frequency 16 kHz) 30 W (Pulse frequency 4 kHz)	80 W	130 W
Typical power loss at 420 V input voltage ¹⁾ and motor during no-load operation, 50 Hz	10 W	35 W (Pulse frequency 8 kHz)	70 W	110 W
Interfaces	 Connection to PROFIBUS or F RS232 interface with USS prot software Activation of the integrated sa (PM-D F X1) Slot for an optional memory ca PTC/KTY84 interface (Sub-D of Speed sensor i	ocol for commissioning on the Po fety functions via PROFIsafe (Pl ard (MMC) for uploading or dow connector) for motor temperatur	C using the STA M-D F PROFIsation Inloading parante monitoring	e) or terminals
Functions				
Open-loop/closed-loop control procedure	V/f control – linear (M~n) with/izable Vector control – with or withou Torque control		C), quadratic (M	√n ²) or parameter-
Operating functions	Jogging mode, free function blo interruption due to power failure	ocks (FFB), positioning decelerate, bumpless connection of conve	tion ramp, autor erter to rotating	natic restart following motor
Braking functions	Regenerative braking operationControl of an electromechanic	on without brake chopper and p cal holding brake via an optional	ulse resistor Brake Control	Module
Protective functions	Undervoltage, overvoltage, grouprotection (Pt, or sensor) inverte	und faults, short circuits, stall pr er overtemperature, motor block	evention, motor king protection	thermal
Connectable motors	Low-voltage asynchronous max. 50 Motor cable lengths: max. 50 If an output reactor or an LC file.			
Mechanical data				
Degree of protection	IP20			
Operating temperature	With vertical design of station	-10 °C to +4	0 °C	
	With horizontal design of station	-10 °C to +5	0 °C/to +60 °C	with derating
Standards				
Compliance with standards	UL, cUL, CE, c-tick, low-voltage	e directive 73/23/EEC, EMC dire	ctive 89/336/EE	С

¹⁾ The power loss varies according to the input voltage.

Derating data

Pulse frequency

Output		Rated output current in A at a pulse frequency of						
kW	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.75	2.1	2.1	2.1	2.1	1.05	1.05	1.05	1.05
2.2	5.9	5.9	5.9	5.9	5.3	5.3	5.3	5.3
4.0	10.2	10.2	10.2	10.2	5.1	5.1	5.1	5.1

The current data apply to an ambient temperature of 50 °C unless specified otherwise.

ET 200S

Frequency converters ET 200S FC fail-safe frequency converter

Ordering data			Order No.
	Control modes: V/f, FCC, SLVC, VC with encoder, torque control Motor encoder input: HTL unipolar Motor temperature input: PTC/KTY Integrated safety functions	F	6SL3 244-0SA01-1AA1
	IPM25 converter power module 380 V - 480 V 3 AC +10/-10 % 47 Hz - 63 Hz Overload: 150 % 60 s 200 % 3 s Power: 0.75 kW	E	6SL3 225-0SE17-5UA3
	IPM25 converter power module 380 V - 480 V 3 AC +10/-10 % 47 Hz - 63 Hz Overload: 150 % 60 s 200 % 3 s Power: 2.2 kW 4.0 kW	E	6SL3 225-0SE22-2UA3 6SL3 225-0SE24-0UA3

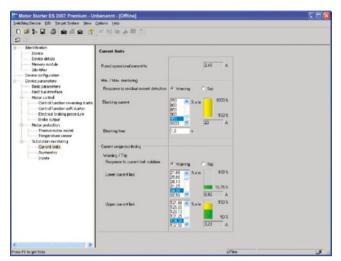
E: Subject to export regulations AL: 91999 and ECCN: EAR99 F: Subject to export regulations AL: N and ECCN: EAR99

For required components and accessories see Frequency converter ET 200S FC, page 9/176

ET 200S

Software Motor <u>starter ES</u>

Overview



Motor starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor starter ES is used for start-up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200S, ET 200pro, ECOFAST and M200D product families.

Interfacing is performed

- · over the local interface on the device
- with PROFIBUS DP V1 capable motor starters from any point in PROFIBUS or in PROFINET (applies for ET 200pro/ ECOFAST/M200D)
- With PROFINET capable motor starters from any point in PROFINET or in PROFIBUS (applies to M200D)

Using Motor starter ES, the communication-capable motor starters are easily parameterized during start-up, monitored during normal operation and successfully diagnosed for service purposes.

Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an object manager.

Types of delivery and license

Motor starter ES is available as follows:

- Floating license the license for any one user at any one time
 - Authorizes any one user
 - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
 - Only the actual use of the program has to be licensed
 - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for Motor starter ES 2007:

Upgrade

Switching from an old to a new version with expanded functions, e.g. upgrade from Motor starter ES 2006 to Motor Starter ES 2007

Powerpack

Special pack for switching within the same software version to a more powerful version with more functionality, e.g. Powerpack Motor starter ES 2007 for switching from Standard to Premium

- Software Update Service
 To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades
- License Download
 User-friendly license key download from our Mall (currently
 only for customers from Germany) as an easy and quick way
 for you to receive additional licenses for your software.

System requirements

ES 2007 Motor starter planning, start-up and diagnostic software for ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-i Standard, PROFIBUS, PROFINET)	
Operating system	Windows XP Professional (Service Pack 2, Service Pack 3), Windows 7 Professional (32 bit), Enterprise (32 bit), Ultimate (32 bit)
Processor	≥ Pentium 800 MHz/1 GHz (Windows 7)
RAM	≥ 512 MB/≥ 1 GB (Windows 7)
Monitor resolution	≥ 1024 x 768
Free space on hard disk	≥ 400 Mbyte
CD-ROM/DVD drive	Yes (only for installation from CD)
Serial interface (COM)	Yes
PC cable/parameterization cable/connection cable	Yes
PROFIBUS card/PROFIBUS processor	Optional, for parameterization and diagnostics through PROFIBUS
Ethernet interface/PROFINET card	Optional, for parameterization and diagnostics through PROFINET

¹⁾ Additional free storage is recommended, e.g. for page file.

Order No.

ET 200S

Software Motor starter ES

Ordering data

ES 2007 Motor starter planning, start-up and diagnostic software

for ECOFAST Motor Starter, SIMATIC ET 200S Starter High Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-i Standard, PROFIBUS, PROFINET)

	Version	Order No.
Basic Motor starter ES 2007		
	Floating license for one user	
	E-SW, software and documentation on CD, 3 languages (English/German/French), communication via system interface	
	• License key on USB stick, class A, incl. CD	3ZS1 310-4CC10-0YA5
	• License key download, class A, without CD	3ZS1 310-4CE10-0YB5
Standard Motor starter ES 2007		
	Floating license for one user	
	E-SW, software and documentation on CD, 3 languages (English/German/French), communication via system interface	
	• License key on USB stick, class A, incl. CD	3ZS1 310-5CC10-0YA5
	• License key download, class A, without CD	3ZS1 310-5CE10-0YB5
Premium Motor starter ES 2007		
	Floating license for one user	
	E-SW, software and documentation on CD, 3 languages (English/German/French), communication via system interface or PROFIBUS	
	• License key on USB stick, class A, incl. CD	3ZS1 310-6CC10-0YA5
	License key download, class A, without CD	3ZS1 310-6CE10-0YB5

Accessories

Optional accessories			
	for ET 200S High Feature Motor starter		
	Control module 2DI DC 24 V COM, for ET 200S High Feature starter, starter Fail-safe A	F	3RK1 903-0CH10
	LOGO! PC cable		6ED1 057-1AA00-0BA0
	for ET 200pro and MD200D Motor starter		
	RS232 interface cable, serial data connection between ET 200pro MS/FC, M200D and Laptop/PC/PG or MS		3RK1 922-2BP00
	for ECOFAST High Feature Motor starter (interface cable)		
	PC cable		3RK1 911-0BN20
	USB-to-serial-adapter	D	3UF7 946-0AA00-0
	for connecting a serial PC cable (for connection to serial PC interface/RS 232) recommended for use in connection with SIMOCODE pro 3UF7, modular safety system 3RK3, soft starter 3RW44, Motor starter ET 200S/ECOFAST/ET 200pro, AS-i safety monitor, AS-i analyzer		

D: Subject to export regulations AL: N and ECCN: 5D992

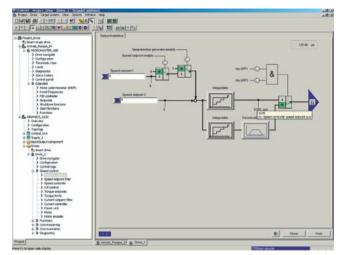
Version

F: Subject to export regulations AL: N and ECCN: EAR99

ET 200S

Software STARTER commissioning tool

Overview



The user-friendly STARTER commissioning tool can be used for:

- · Commissioning,
- · Optimizing and
- Diagnostics

This software can be operated either as a standalone PC application, integrated in SIMATIC STEP 7 with TIA compatibility via Drive ES Basic, or it can be integrated into the SCOUT engineering system (for SIMOTION). The basic functions and handling are the same in both cases.

In STARTER, MICROMASTER 4 devices and the SIMATIC ET 200S FC and SIMATIC ET 200pro FC frequency converters are also supported in addition to the SINAMICS drives.

The project wizards can be used to create the drives within the structure of the project tree.

Beginners are supported by solution-based dialog guidance, whereby a standard graphics-based display maximizes clarity when setting the drive parameters.

First commissioning is guided by a wizard which makes all the basic settings in the drive. Therefore, getting a motor up and running is merely a question of setting a few of the drive parameters as part of the drive configuration process.

The individual settings required are made using graphics-based parameterization screens, which also precisely visualize the principle of operation of the drive.

Examples of individual settings that can be made include:

- · How terminals are used
- · Bus interface
- Setpoint channel (e.g., fixed setpoints)
- Closed-loop speed control (e.g., ramp-function generator, limits)
- BICO interconnections
- Diagnostic

For experts, the expert list can be used to specifically and quickly access individual parameters at any time. An individual compilation of frequently used parameters can be saved in dedicated user lists.

In addition, the following functions are available for optimization purposes:

- Self-optimization of the controller settings (depending on drive unit)
- Trace (for SINAMICS S120 only)

Diagnostic functions provide information about:

- · Control/status words
- · Parameter status
- · Conditions of use
- Communication states

Performance features

- User-friendly: only a small number of settings need to be made for successful first commissioning: The motor starts to rotate
- Solution-based dialog-based user guidance simplifies commissioning
- Self-optimization functions reduce manual effort for optimization

Minimum hardware and software requirements

PG or PC Pentium III min. 800 MHz (recommended > 1 GHz)

512 MB work memory (1 GB recommended)

Screen resolution 1024 × 768 pixels, 16 bit color depth

Free hard disk memory: min. 2 GB

Microsoft Windows 2000 SP4

Microsoft Windows 2003 Server SP1, SP2

Microsoft Windows XP Professional SP2, SP3

Microsoft Windows Vista Business SP1 1)

Microsoft Windows Vista Ultimate SP1 1)

Microsoft Internet Explorer V6.0 or higher

DCC cannot be used. STARTER can be used on these operating systems only if it does not include the DCC option.

Ordering data Order No. STARTER commissioning tool For SINAMICS and MICROMASTER on DVD-ROM English, French, German, Italian, Spanish Order No. 6SL3 072-0AA00-0AG0 FOR NO.

ET 200M

Introduction

Application



- Modular I/O system with degree of protection IP20, particularly suitable for user-specific and complex automation tasks
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Consists of a PROFIBUS DP IM 153 connection, up to eight or twelve I/O modules of the S7-300 automation system (assembly with bus connections or active bus modules) and if required a power supply
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Can be supplied with integrated fiber optic interface if required
- Transmission rates up to 12 Mbit/s
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX100 a
- Fail-safe digital in/outputs as well as analog inputs for safetyoriented signal processing in accordance with PROFIsafe
- Support of modules with expanded user data, e.g. HART modules with HART minor variables

General technical data ET 200M	
Connection system	Screw connection, spring-loaded connection and FastConnect with permanent wiring
Degree of protection	IP20
Ambient temperature on vertical wall (preferred mounting position) • with horizontal assembly • with other assembly	0 +60 °C 0 +40 °C
Relative humidity	5 95% (RH stress level 2 according to IEC 1131-2)
Air pressure	795 1080 hPa
Mechanical stress • Vibrations	IEC 68, parts 2 - 6: 10 57 Hz (constant amplitude 0.075 mm) 57 150 Hz (constant acceleration 1 g)
• Shock	IEC 68, parts 2 - 27 half-sine, 15 g, 11 ms

ET 200M

Interface modules IM 153-1/153-2

Overview



The ET 200M system with various interface modules is available for the decentralized use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

IM 153-1 Standard

The IM 153-1 is one reasonably priced version that is best suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

IM 153-2 High Feature

For higher requirements in manufacturing technology, such as the use of F-technology or the highest performance in conjunction with clock synchronization, the IM 153-2 High Feature is available. This IM is also designed for use with the PCS 7 in the field of manufacturing applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1ms.

	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA82-0XB0
Power supply			
Input voltage			
 rated value, 24 V DC 	Yes		
 permissible range, lower limit (DC) 	20.4 V		
 permissible range, upper limit (DC) 	28.8 V		
Input current			
 rated value at 24 V DC 	625 mA	650 mA	650 mA
Output voltage			
 rated value, 5 V DC 	Yes	Yes	Yes
Output current			
• for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
Supply voltages			
Rated value			
• 24 V DC		Yes	Yes
 permissible range (ripple included), lower limit (DC) 	20.4 V	20.4 V	20.4 V
 permissible range (ripple included), upper limit (DC) 	28.8 V	28.8 V	28.8 V
External protection for supply cables (recommendation)	not necessary	2.5 A	2.5 A
Mains buffering			
 Mains/voltage failure stored energy time 	5 ms	5 ms	5 ms
Current consumption			
Current consumption, max.	350 mA; At 24 V DC	600 mA	600 mA
Inrush current, typ.	2.5 A	3 A	3 A
l²t	0.1 A ^{2.} s	0.1 A ² ·s	0.1 A ² ·s

ET 200M

Interface modules IM 153-1/153-2

	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA82-0XB0
Power losses			
Power loss, typ.	3 W	5.5 W	5.5 W
Address area			
Addressing volume			
Outputs	128 byte	244 byte	244 byte
• Inputs	128 byte	244 byte	244 byte
Hardware configuration Number of modules per DP slave interface, max.	8	12	12
Communication functions Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
Interfaces PROFIBUS DP, output current, max.	90 mA	70 mA	70 mA
Interface physics, RS 485	Yes	Yes	Yes
Interface physics, FOC	No	No	No
Connection method PROFIBUS DP	9-pin sub D socket	9-pin sub D	9-pin sub D
PROFIBUS DP	·	•	·
Transmission procedure	RS 485	RS 485	RS 485
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
Automatic detection of trans- mission speed	Yes	Yes	Yes
SYNC capability	Yes	Yes	Yes
FREECE capability	Yes	Yes	Yes
Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; Sender	Yes; Sender
1st interface DP slave			
• GSD file	(for DPV1) SIEM801D.GSD;	SI04801.GSG	SI0480E.GSG
	SI01801D.GSG	V	
Automatic baud rate search	Yes	Yes	Yes
Programming Configuration software			
• STEP 7	STEP 7 / COM PROFIBUS / non- Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
Time stamping			
Accuracy		1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers		15	15
Messages per message buffer		20	20
Number of stampable digital inputs, max.		128; Max. 128 signals/station; max. 32 signals/slot	128; Max. 128 signals/station; max 32 signals/slot
Time format		RFC 1119	RFC 1119
Time resolution		0.466 ns	0.466 ns
Time interval for transmitting the message buffer if a message is present		1 000 ms	1 000 ms
Time stamp on signal change		rising / falling edge as signal entering or exiting	rising / falling edge as signal entering or exiting

ET 200M

Interface modules IM 153-1/153-2

	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA82-0XB0
Isolation			
Isolation checked with	Isolation voltage 500 V	Isolation voltage 500 V	Isolation voltage 500 V
Environmental requirements			
Operating temperature			
• Min.	0 °C	0 °C	-25 °C
• max.	60 °C	60 °C	60 °C
Air pressure			
 Operating altitude above sea level, max. 	3 000 m	3 000 m	3 000 m
Degree of protection			
IP20	Yes	Yes	Yes
General information			
Vendor identification (VendorID)	801Dh	801Eh	801Eh
Dimensions and weight			
Dimensions			
• Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm
Weight			
 Weight, approx. 	360 g	360 g	360 g

	6ES7 195-7HD10-0XA0
Accessories	
belongs to product	ET 200M
Dimensions and weight	
Dimensions	
• Width	97 mm
Height	92 mm
• Depth	30 mm
Weight	
Weight, approx.	133 g

	6ES7 195-7HA00-0XA0	6ES7 195-7HB00-0XA0	6ES7 195-7HC00-0XA0
Dimensions and weight			
Dimensions			
• Width	97 mm	97 mm	97 mm
Height	92 mm	92 mm	92 mm
• Depth	30 mm	30 mm	30 mm
Weight			
Weight, approx.	111 g	140 g	127 g

ET 200M

Interface modules IM 153-1/153-2

Ordering data	Order No.		Order No.
IM 153-1 interface module		Accessories	
Slave interface for connecting an ET 200M to PROFIBUS DP		PROFIBUS bus connector	
 Standard temperature range 	6ES7 153-1AA03-0XB0	90° outgoing cable, terminating resistor with disconnecting	
IM 153-2 interface module		function, up to 12 Mbit/s, FastConnect	
Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems		Without PG interface 1 unit	6ES7 972-0BA52-0XA0
High Feature	6ES7 153-2BA02-0XB0	• 100 units	6ES7 972-0BA52-0XB0
 High Feature with extended temperature range 	6ES7 153-2BA82-0XB0	With PG interface • 1 unit	6ES7 972-0BB52-0XA0
Active IM 153 /IM 153 bus module	6ES7 195-7HD10-0XA0	• 100 units	6ES7 972-0BB52-0XB0
For two IM 153-2 High Feature		SIMATIC DP DIN rail for ET 200M	
modules for designing redundant systems		Accommodates up to 5 bus	
Bus module for ET 200M		modules; for hot-swapping function	
To accommodate a power	6ES7 195-7HA00-0XA0	• Length: 483 mm (19")	6ES7 195-1GA00-0XA0
supply and an IM 153 module for the hot-swapping function		• Length: 530 mm	6ES7 195-1GF30-0XA0
during RUN time, incl. bus		• Length: 620 mm	6ES7 195-1GG30-0XA0
module cover		• Length: 2000 mm	6ES7 195-1GC00-0XA0
 To accommodate two 40-mm 	6ES7 195-7HB00-0XA0 SIMATIC S7-300 DIN rail		
wide I/O modules for the hot- swapping function		• Length: 160 mm	6ES7 390-1AB60-0AA0
To accommodate one 80-mm	6ES7 195-7HC00-0XA0	• Length: 480 mm (19")	6ES7 390-1AE80-0AA0
wide I/O module for the hot-	0E37 133-711000-0XA0	• Length: 530 mm	6ES7 390-1AF30-0AA0
swapping function		• Length: 830 mm	6ES7 390-1AJ30-0AA0
ET 200M redundancy bundle	6ES7153-2AR03-0XA0	• Length: 2000 mm	6ES7 390-1BC00-0AA0
Comprising two IM 153-2 High		S7 Manual Collection	6ES7 998-8XC01-8YE0
Feature modules and one IM 153/IM 153 bus module		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
		S7 Manual Collection, update service for 1 year	6ES7 998-8XC01-8YE2
		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	

D: Subject to export regulations AL: N and ECCN: 5D992 J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

Interface modules IM 153-4 PN

Overview



- To connect ET 200M to PROFINET IO (via copper line, RJ45) as an IO device
- 2 versions:
- IM 153-4 PN STANDARD
- IM 153-4 PN HIGH FEATURE: supports, in contrast to the STANDARD version, the operation of PROFIsafe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 byte each
- Active bus backplane to hot-swap modules available as an option
- Baud rate 10 Mbit/s / 100 Mbit/s (autonegotiation / full duplex)
- I&M functions in accordance with PROFIBUS International guideline order no. 3.502, Version V1.1

Note:

Micro Memory Card with at least 64 KB required if not all the stations in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

	6ES7 153-4AA01-0XB0	6ES7 153-4BA00-0XB0
Power supply		
Output voltage		
Rated value, 5 V DC	Yes	Yes
Output current		
• for backplane bus (5 V DC), max.	1.5 A	1.5 A
Supply voltages		
Rated value		
• 24 V DC	Yes	Yes
 permissible range (ripple included), lower limit (DC) 	20.4 V	18.5 V
 permissible range (ripple included), upper limit (DC) 	28.8 V	30.2 V
External protection for supply cables (recommendation)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)
Mains buffering		
 Mains/voltage failure stored energy time 	5 ms	5 ms
Current consumption		
Current consumption, max.	600 mA	600 mA
Inrush current, typ.	4 A	4 A
l²t	0.09 A ² ·s	0.09 A ² ·s
Power losses		
Power loss, typ.	6 W; typical	6 W; typical
Address area		
Addressing volume		
 Outputs 	192 byte	192 byte
• Inputs	192 byte	672 byte; extended HART user data
Hardware configuration Number of modules per DP slave interface, max.	12	12
Communication functions		
Bus protocol/transmission protocol	PN IO	PN IO
Alarms/diagnostics/status information		
Diagnostic indication LED		
 Connection to network LINK (green) 	Yes	Yes
Transmit/receive RX/TX (yellow)	Yes	Yes
Isolation		
Isolation checked with	500 V DC	Between Profinet and 24 V supply: 1500 V AC Between functional grounding and 24 V supply 500 V DC

ET 200M

Interface modules IM 153-4 PN

Technical specifications (continued)

	6ES7 153-4AA01-0XB0	6ES7 153-4BA00-0XB0
Environmental requirements		
Operating temperature		
• Min.	0 °C	0 °C
• Max.	60 °C	60 °C
Air pressure		
 Operating altitude above sea level, max. 	2 000 m	2 000 m
Degree of protection		
IP20	Yes	Yes
General information		
Vendor identification (VendorID)	002AH	002AH
Device identifier (DeviceID)	0302H	0302H
Dimensions and weight		
Dimensions		
• Width	40 mm	40 mm
Height	125 mm	125 mm
• Depth	118 mm	118 mm
Weight		
• Weight, approx.	215 g; approx.	215 g

Ordering data	Order No.	
IM 153-4 PN interface module		S7 Manual Collection
I/O device to connect an ET 200M to PROFINET		Electronic manuals on DVD, multi-language:
Standard	6ES7 153-4AA01-0XB0	S7-200, TD 200, S7-300, M7- C7, S7-400, M7-400, STEP 7
High Feature	6ES7 153-4BA00-0XB0	Engineering Tools, Runtime Software, SIMATIC DP
Accessories		(Distributed I/O), SIMATIC HI
Bus modules for ET 200M		(Human Machine Interface), SIMATIC NET
 To accommodate a power supply and an IM 153 for the hot- swapping function during RUN, incl. bus module cover 	6ES7 195-7HA00-0XA0	(Industrial Communication) S7 Manual Collection updateservice for 1 year
To accommodate two 40-mm wide I/O modules for the hot- swapping function	6ES7 195-7HB00-0XA0	Scope of delivery: Current DVD "S7 Manual Collection" and the three
 To accommodate one 80-mm wide I/O module for the hot- swapping function 	6ES7 195-7HC00-0XA0	subsequent updates Industrial Ethernet FC RJ45 Plug 180
SIMATIC Micro Memory Card		_
64 KB ¹⁾	6ES7 953-8LF20-0AA0	RJ45 plug connector for Indu Ethernet with a rugged metal
SIMATIC DP DIN rail for ET 200M		housing and integrated insula displacement contacts for connecting Industrial Etherne
Accommodates up to 5 bus modules;		installation cables; with 180° cable outlet
for hot-swapping function • Length: 483 mm (19")	6ES7 195-1GA00-0XA0	1 unit
• Length: 530 mm	6ES7 195-1GF30-0XA0	10 units
• Length: 620 mm	6ES7 195-1GG30-0XA0	50 units
• Length: 2000 mm	6ES7 195-1GC00-0XA0	Industrial Ethernet Fast
SIMATIC S7-300 DIN rail		Connect installation cables
Length: 160 mm	6ES7 390-1AB60-0AA0	 Fast Connect standard cab Fast Connect trailing cable
Length: 480 mm (19")	6ES7 390-1AE80-0AA0	Fast Connect marine cable
Length: 530 mm	6ES7 390-1AF30-0AA0	Industrial Ethernet Fast
Length: 830 mm	6ES7 390-1AJ30-0AA0	Connect
Length: 2000 mm	6ES7 390-1BC00-0AA0	Stripping Tool
		1) To operate the IM153-4, an I

S7 Manual Collection	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
S7 Manual Collection update D service for 1 year	6ES7 998-8XC01-8YE2
Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	
Industrial Ethernet FC RJ45 Plug 180	
RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
1 unit	6GK1 901-1BB10-2AA0
10 units	6GK1 901-1BB10-2AB0
50 units	6GK1 901-1BB10-2AE0
Industrial Ethernet Fast Connect installation cables • Fast Connect standard cable • Fast Connect trailing cable • Fast Connect marine cable	6XV1 840-2AH10 6XV1 840-3AH10 6XV1 840-4AH10
Industrial Ethernet Fast Connect	
Stripping Tool	6GK1 901-1GA00
1) To operate the IM153-4, an MMC is	required with at least 64 KB memory.

Order No.

To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

SIPLUS IM 153-1/153-2

Overview



Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS IM 153-1	SIPLUS IM 153-2	SIPLUS IM 153-2
Order number	6AG1 153-1AA03-2XB0	6AG1 153-2BA02-7XY0	6AG1 153-2BA02-7XB0
Order No. based on	6ES7 153-1AA03-0XB0	6ES7 153-2BA02-0XB0	6ES7 153-2BA02-0XB0
Ambient temperature range	-40 +70 °C Startup temperature -25 °C	-25 +60 °C	-40 +70 °C Startup temperature -25 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes	No
Conformal coating	Coating of the printed circuit boards and the electronic components		
Technical data	The technical data of the standard product applies except for the ambient conditions.		

SIPLUS bus module	for accommodating a PS and an IM 153	for accommodating two 40 mm wide I/O modules
Order number	6AG1 195-7HA00-2XA0	6AG1 195-7HB00-7XA0
Order No. based on	6ES7 195-7HA00-0XA0	6ES7 195-7HB00-0XA0
Ambient temperature range	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

SIPLUS bus module	for accommodating an 80 mm module	for accommodating 2 IM 153-2
Order number	6AG1 195-7HC00-2XA0	6AG1 195-7HD10-2XA0
Order No. based on	6ES7 195-7HC00-0XA0	6ES7 195-7HD10-0XA0
Ambient temperature range	-25 +70 °C	-25 +70 °C
Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	

ET 200M

SIPLUS interface modules SIPLUS IM 153-1/153-2

Overview (continued)		Ordering data	Order No.
Ambient conditions		IM 153-1 interface module	
Relative humidity	5 100 % Condensation permissible	Slave interface for connecting an ET 200M to PROFIBUS DP • Standard temperature range L	6AG1 153-1AA03-2XB0
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal	IM 153-2 interface module	0AG1 193-1AA03-2AD0
Chemically active substances	spores (except fauna) Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)	Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems • High Feature H	0.101.100.22.102.17.20
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	Active IM 153/IM 153 bus module For two IM 153-2 High Feature modules for designing redundant	6AG1 195-7HD10-2XA0
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) see ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K 658 540 hPa (+3500 +5000 m) derating 20 K	systems Bus module for ET 200M To accommodate a power supply and an IM 153 for the hotswapping function during RUN, incl. bus module cover To accommodate two 40 mm wide I/O modules for the hotswapping function	6AG1 195-7HA00-2XA0 6AG1 195-7HB00-7XA0
$^{1)}$ ISA-S71.04 severity level GX: Lor $\rm H_2S < 9.9~ppm;~Cl < 0.2~ppm;~HC$ NH < 49 ppm; O $_3 < 0.1~ppm;~NC$ Limit value (max. 30 min/d): SO $_2$ Cl < 1.0 ppm; HCl < 3.3 ppm; HF	Čľ < 0.66 ppm; HF̄ < 0.12 ppm; IX < 5.2 ppm < 17.8 ppm; H₂S < 49.7 ppm;	To accommodate one 80 mm wide I/O module for the hot swapping function Accessories	6AG1 195-7HC00-2XA0 See SIMATIC ET 200M IM 153-1/153-2, page 9/187
 O₃ < 1.0 ppm; NOX < 10.4 ppm The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases! 		H: Subject to export regulations AL: L: Subject to export regulations AL: !	

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

ET 200M

SIPLUS interface modules SIPLUS IM 153-4 PN IO

Overview



- For connection of ET 200M as IO device to PROFINET IO (copper, RJ-45)
- 2 versions:
 - IM 153-4 PN STANDARD
 - IM 153-4 PN HIGH FEATURE: additionally to the STANDARD version, operation of PROFIsafe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 byte each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbit/s / 100 Mbit/s (Autonegotiation/Full Duplex)
- I&M functions according to PNO-Guideline Order-No. 3.502, Version V1.1

Notes:

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; neighbor detection).

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

	SIPLUS ET 200 M IM 153-4 PN	
Order number	6AG1 153-4AA01-7XB0	
Order No. based on	6ES7 153-4AA01-0XB0	
Ambient temperature range	-25 °C + 70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % Condensation permissible	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX ^{1) 2)}	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range specified)	1080 795 hPa (-1000 +2000 m) See ambient temperature range 795 658 hPa (+2000 +3500 m) derating 10 K658 540 hPa (+3500 +5000 m) derating 20 K	

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; H $_2 \rm S < 9.9$ ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 < 0.1$ ppm; NOX < 5.2 ppm Limit value (max. 30 min/d): SO $_2 < 17.8$ ppm; H $_2 \rm S < 49.7$ ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 < 1.0$ ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here: www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS ET 200 M interface H connection IM 153-4 PN	6AG1 153-4AA01-7XB0
(extended temperature range and medial exposure)	
IO device to connect an ET 200M to PROFINET ¹⁾	
Accessories	See SIMATIC ET 200M interface module IM 153-4 PN, page 9/189

¹⁾ To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200M

I/O modules Digital/analog modules

Overview digital modules



- Digital inputs/outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information see SIMATIC S7-300, Chapter 5.

Overview analog modules



- Analog inputs and outputs
- For solving even more complex tasks with analog process signals
- For connecting analog actuators and sensors without additional amplifiers

For further information see SIMATIC S7-300, Chapter 5.

ET 200M

I/O modules Analog input module with HART

Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundancy switching
- Firmware update
- HART minor variables

recinical specifications	
	6ES7 331-7TF01-0AB0
Supply voltages Load voltage L+ • Rated value (DC) • Reverse polarity protection	24 V Yes
Current consumption from load voltage L+ (without load), max.	20 mA
from backplane bus 5 V DC, max.	120 mA
Current consumption/ power loss Power loss, typ.	1.5 W
Connection method Required front connector	20-pin
Isochronous mode Isochronous mode	No
Analog inputs Number of analog inputs	8
Cable length, shielded, max.	800 m
Input ranges (rated values), currents • 0 to 20 mA	Yes
Current input • permissible input current for current input (destruction limit), max.	40 mA
Analog value creation Measurement principle	Sigma Delta
Integrations and conversion time/ resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, ms Basic conversion time, including integration time, ms Interference voltage suppression for interference frequency f1 in Hz	16 bit Yes 20 ms@50 Hz/16.6 ms@60 Hz/ 100 ms@100 Hz 65ms@50Hz / 55ms@60Hz / 305ms@100Hz 60 / 50 / 10 Hz

	6ES7 331-7TF01-0AB0
Encoder Connection of signal encoders • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer	Yes Yes
Errors/accuracies Operational limit in overall temperature range • Current, relative to input area	+/- 0.15 %
Basic error limit (operational limit at 25 °C) • Current, relative to input area	+/- 0.1 %
Alarms/diagnostics/status information Alarms • Diagnostic alarm • Limit value alarm Diagnostics	Yes Yes
Diagnostic information readable Isolation Isolation checked with	Yes 500
Galvanic isolation Galvanic isolation analog inputs • between the channels • between the channels, in groups of • between the channels and the backplane bus	No 8 Yes
Dimensions and weight Dimensions and weight • Width • Height • Depth	40 mm 125 mm 117 mm
Weight • Weight, approx.	205 g

ET 200M

I/O modules Analog input module with HART

Ordering data	Order No.		Order No.
SM 331 HART analog input	6ES7 331-7TF01-0AB0	Label cover	6ES7 392-2XY00-0AA0
module 8 inputs, 0/4 20 mA, HART for ET 200M with IM 153-2 interface module		(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Accessories		Labeling strips	6ES7 392-2XX00-0AA0
Front connectors • 20-pin, with screw-type contacts - 1 unit	6ES7 392-1AJ00-0AA0	(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
- 100 units	6ES7 392-1AJ00-1AB0	S7-SmartLabel V3.0	
20-pin, with spring contacts1 unit100 units	6ES7 392-1BJ00-0AA0 6ES7 392-1BJ00-1AB0	Software for machine labeling of modules directly from the STEP 7 project	
20-pin, with FastConnect		Single license J	2XV9 450-1SL03-0YX0
- 1 unit	6ES7 392-1CJ00-0AA0	Upgrade single license J	2XV9 450-1SL03-0YX4
LK 393 cable guide Mandatory for operation in	6ES7 393-4AA00-0AA0	Labeling sheets for machine printing	
hazardous areas		For 16-channel signal modules,	
SIMATIC DP DIN rail for ET 200M		DIN A4, for printing with laser printers; 10 units	
For insertion of up to 5 bus		petrol	6ES7 392-2AX00-0AA0
modules for • Length: 483 mm (19")	6ES7 195-1GA00-0XA0	light beige	6ES7 392-2BX00-0AA0
• Length: 483 mm	6ES7 195-1GA00-0XA0	yellow	6ES7 392-2CX00-0AA0
SIMATIC S7-300 DIN rail	3_3. 100 10. 00 07.0 10	red	6ES7 392-2DX00-0AA0
• Length: 160 mm	6ES7 390-1AB60-0AA0		
• Length: 480 mm (19")	6ES7 390-1AE80-0AA0		
• Length: 530 mm	6ES7 390-1AF30-0AA0		
• Length: 830 mm	6ES7 390-1AJ30-0AA0		
Length: 2000 mm	6ES7 390-1BC00-0AA0		

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

I/O modules Analog output module with HART

Overview



- For plugging into ET 200M exclusively with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundancy switching
- Firmware update
- HART minor variables

	6ES7 332-8TF01-0AB0
Supply voltages	
Load voltage L+	
Rated value (DC)	24 V
Current consumption	
from load voltage L+ (without load), max.	350 mA
from backplane bus 5 V DC, max.	110 mA
Power losses	
Power loss, typ.	6 W
Connection method	
Required front connector	20-pin
Analog outputs	
Number of analog outputs	8
Cable length, shielded, max.	800 m
Current output, no-load voltage, max.	24 V
Output ranges, current	
• 0 to 20 mA	Yes
• -20 to +20 mA	No
• 4 to 20 mA	Yes
Load impedance (in rated range of	
output)	750 Ω
with current outputs, max.with current outputs, inductive	10 mH
load, max.	10 11111
Analog value creation	
Integrations and conversion time/	
resolution per channel	40.1%
 Resolution with overrange (bit including sign), max. 	16 bit
Settling time	
for resistive load	0.1 ms
for inductive load	0.5 ms

	6ES7 332-8TF01-0AB0
Errors/accuracies	
Operational limit in overall temperature range	
Current, relative to output area	+/- 0.2 %
Basic error limit (operational limit at 25 °C)	
Current, relative to output area	+/- 0.1 %
Alarms/diagnostics/status information	
Substitute values connectable	Yes
Alarms • Diagnostic alarm	Yes
	165
DiagnosticsDiagnostic information readable	Yes
Isolation	
Isolation checked with	500 V DC
Galvanic isolation Galvanic isolation analog outputs • between the channels and the backplane bus	Yes
Dimensions and weight	
DimensionsWidth	40 mm
Height	125 mm
Depth	117 mm
Weight	
 Weight, approx. 	220 g

ET 200M

I/O modules Analog output module with HART

Ordering data	Order No.		Order No.
SM 332 HART analog output module	6ES7 332-8TF01-0AB0	S7 Manual Collection	6ES7 998-8XC01-8YE0
HART analog output, 8 outputs, 0/4 20 mA, HART for ET 200M with IM 153-2		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7,	
Accessories		Engineering Tools, Runtime Software, SIMATIC DP	
Front connector (1 unit)	6ES7 392-1AJ00-0AA0	(Distributed I/O), SIMATIC HMI (Human Machine Interface).	
20-pin, with screw contacts		SIMATIC NET (Industrial Commu-	
LK 393 cable guide	6ES7 393-4AA00-0AA0	nication)	
Mandatory for operation in hazardous areas		S7 Manual Collection update D service for 1 year	6ES7 998-8XC01-8YE2
SIMATIC DP mounting rail for ET 200M		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	
For mounting of up to 5 bus modules for		S7-SmartLabel V3.0	
Length: 483 mmLength: 530 mm	6ES7 195-1GA00-0XA0 6ES7 195-1GF30-0XA0	Software for machine labeling of modules directly from the STEP 7	
SIMATIC S7-300 mounting rail		projectSingle License	2XV9 450-1SL03-0YX0
Length: 160 mmLength: 480 mm	6ES7 390-1AB60-0AA0 6ES7 390-1AE80-0AA0	Upgrade Single License J	
• Length: 530 mm • Length: 830 mm	6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0 6ES7 390-1AJ30-0AA0	Labeling sheets for machine printing	2779 430-13203-0174
• Length: 2000 mm	6ES7 390-1BC00-0AA0	For 16-channel signal modules,	
Label cover	6ES7 392-2XY00-0AA0	DIN A4, for printing with laser	
(10 units, spare part) for signal		printers; 10 units	0F07 000 04 V00 04 40
modules (not 32-channel modules), function modules and		petrol	6ES7 392-2AX00-0AA0
CPU 312 IFM		light beige	6ES7 392-2BX00-0AA0
Labeling strips	6ES7 392-2XX00-0AA0	yellow	6ES7 392-2CX00-0AA0
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM		red	6ES7 392-2DX00-0AA0

D: Subject to export regulations AL: N and ECCN: 5D992 J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

I/O modules Ex analog input module with HART

Overview



- For connecting HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

	6ES7 331-7TB00-0AB0		
Supply voltages Load voltage L+ • Rated value (DC) • Reverse polarity protection	24 V Yes		
Power supply to the transmitters • Present • Rated value (DC) • Short-circuit proof • No-load voltage (DC)	Yes 15 V; at 22 mA Yes; approx. 30 mA 29.6 V		
Current consumption from backplane bus 5 V DC, max.	100 mA		
from supply voltage L+, max.	180 mA		
Power losses Power loss, typ.	4.5 W		
Analog inputs Number of analog inputs	2		
Cable length, shielded, max. • Current	400 m Yes		
Input ranges (rated values), currents • 0 to 20 mA • Input resistance (0 to 20 mA) • 4 to 20 mA • Input resistance (4 to 20 mA) Current input • Permissible input current for	Yes 50Ω Yes 50Ω		
current input (destruction limit), max.			
Analog value creation Measurement principle	Sigma Delta		
Integrations and conversion time/ resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, ms Basic conversion time, including integration time, ms Interference voltage suppression for interference frequency f1 in Hz	Yes 2.5 / 16.67 / 20 / 100 ms 2.5 / 16.67 / 20 / 100 (1 channel enabled); 7.5 / 50 / 60 / 300 (2 channels enabled) 10 / 50 / 60 / 400 Hz		

	6ES7 331-7TB00-0AB0
Facaday	0E37 331-71D00-0AD0
Encoder Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Max. values of input circuits (per channel)	
 Co (permissible external capacity), max. 	62 nF
 lo (short-circuit current), max. Lo (permissible external inductivity), max. 	96.1 mA 3 mH
Po (power of load), max.	511 mW
• Uo (output no-load voltage), max.	26 V
 Um (fault voltage), max. 	250 V; DC
 Ta (permissible ambient temper- ature), max. 	0.6 °C
Errors/accuracies	
Linearity error (relative to input area)	+/- 0.01 %
Temperature error (relative to input area)	+/- 0.01 %
Crosstalk between the inputs, min.	130 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %
Operational limit in overall temperature range	
Current, relative to input area	+/- 0.45 %; from 0/4 to 20 mA
Basic error limit (operational limit at 25 °C) • Current, relative to input area	+/- 0.1 %; From 0/4 to 20 mA
	T/- U. 1 /0, FIUIT U/4 tO 20 IIIA
Interference voltage suppression for $f = n \times (fl + /- 1\%)$, $fl = interference$ frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB
Common mode interference, min.	130 dB

ET 200M

I/O modules Ex analog input module with HART

Technical specifications (conti	nued)
	6ES7 331-7TB00-0AB0
Alarms/diagnostics/status information Alarms	
Diagnostic alarm Limit value alarm	Yes; parameterizable Yes; parameterizable, channels 0 and 1
Diagnostics Diagnostic functions	Yes; can be set in parameters, red LED, alarm message
 Diagnostic information readable Overrange Wire break in signal transmitter cable 	Yes; red LED, signal Yes; red LED, signal
Short circuit of the signal encoder cable	Yes; red LED, signal
HART communication active	Yes; green LED (H)
Diagnostic indication LED Group error SF (red) Channel error indicator F (red)	Yes Yes
Isolation	
tested with Channels against backplane bus and load voltage L+	1500 V AC
Channels among one another Load voltage L+ against backplane bus	1500 V AC 500 V DC
Galvanic isolation between the channels and backplane bus	Yes
Galvanic isolation analog inputs Galvanic isolation analog inputs	Yes
Galvanic isolation analog outputs • between the channels • between the channels and the load voltage L+	Yes Yes
Permissible potential difference between the inputs (UCM)	60 V DC / 30 V AC
Environmental requirements Operating temperature	00.00
• max.	60 °C
Standards, approvals, certificates FM approval	Available soon
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
Test number KEMA	KEMA 97; ATEX3039 X
Type of protection acc. to KEMA	II3 (2) G Eex nA [ib] IIC T4
Dimensions and weight	
Dimensions • Width	40 mm
Height	125 mm
• Depth	120 mm
Weight • Weight, approx.	260 g

Ordering data	Order No.
SM 331 HART analog input module	6ES7 331-7TB00-0AB0
2 inputs, 0/4 20 mA, HART for ET 200M with IM 153-2 interface module	
Accessories	
Front connector ¹⁾	
20-pin, with screw contacts	
• 1 unit	6ES7 392-1AJ00-0AA0
• 100 units	6ES7 392-1AJ00-1AB0
LK 393 cable guide	6ES7 393-4AA00-0AA0
Mandatory for operation in hazardous areas	
SIMATIC DP mounting rail for ET 200M	
For mounting of up to 5 bus modules for	
Length: 483 mmLength: 530 mm	6ES7 195-1GA00-0XA0 6ES7 195-1GF30-0XA0
SIMATIC S7-300 mounting rail	0_07 100 101 00 0/A0
• Length: 160 mm	6ES7 390-1AB60-0AA0
• Length: 480 mm	6ES7 390-1AE80-0AA0
• Length: 530 mm	6ES7 390-1AF30-0AA0
Length: 830 mmLength: 2000 mm	6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0
Label cover	6ES7 392-2XY00-0AA0
	0E37 392-2X 100-0AA0
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling strips	6ES7 392-2XX00-0AA0
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
S7-SmartLabel V3.0	
Software for machine labeling of modules directly from the STEP 7 project	
Single License J	2XV9 450-1SL03-0YX0
Upgrade Single License J	2XV9 450-1SL03-0YX4
Labeling sheets for machine printing	
For 16-channel signal modules, DIN A4, for printing with laser printers; 10 units	
petrol	6ES7 392-2AX00-0AA0
light beige	6ES7 392-2BX00-0AA0
yellow	6ES7 392-2CX00-0AA0
red	6ES7 392-2DX00-0AA0

A connector with spring-loaded terminals cannot be used if the cable guide is used.

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

I/O modules
Ex analog output module with HART

Overview



- For using HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AO HART, Ex
- 2 current outputs in 2 channel groups (single-channel isolation)
- Output type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable
- Read-back capability of the analog outputs

	6ES7 332-5TB00-0AB0
Cumply valtages	0E37 332-31B00-0AB0
Supply voltages Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Current consumption	
from backplane bus 5 V DC, max.	100 mA
from supply voltage L+, max.	150 mA
Power losses Power loss, typ.	3.5 W
Analog outputs Number of analog outputs	2
Cable length, shielded, max.	400 m
Voltage output, short-circuit protection	Yes
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	5 ms
Output ranges, current	
• 0 to 20 mA	Yes
• 4 to 20 mA	Yes
Connection of actuators • for current output 2-conductor connection	Yes
Load impedance (in rated range of	
output)	650 Ω
with current outputs, max.with current outputs, inductive	7.5 mH
load, max.	7.311111
Destruction limits against externally	
applied voltages and currents	770V 171/ 0 F V
 Voltages at the outputs towards MANA 	max. 17 V / -0.5 V
• Current, max.	60 mA / -1 A
Analog value creation	
Integrations and conversion time/ resolution per channel	
 Resolution with overrange (bit including sign), max. Conversion time (per channel) 	12 bit; Output value; 8 bit (+ sign) read back value 40 ms

	6ES7 332-5TB00-0AB0
Settling time	
for resistive load	2.5 ms
for capacitive load	4 ms
for inductive load	2.5 ms
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Max. values of output circuits (per channel)	
 Co (permissible external capacity), max. 	230 nF
 lo (short-circuit current), max. 	66 mA
 Lo (permissible external inductivity), max. 	7.5 mH
Po (power of load), max.	506 mW
• Uo (output no-load voltage), max.	19 V
• Um (fault voltage), max.	60 V; DC
 Ta (permissible ambient temper- ature), max. 	60 °C
Errors/accuracies	
Output ripple (based on output area, bandwidth 0 to 50 kHz)	+/- 0.02 %
Linearity error (relative to output area)	+/- 0.03 %
Temperature error (relative to output area)	+/- 0.01 %
Crosstalk between the outputs, min.	130 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0.005 %
Operational limit in overall temperature range	
Current, relative to output area	+/- 0.55 %
Basic error limit (operational limit at 25 °C)	
Current, relative to output area	+/- 0.15 %

ET 200M

I/O modules
Ex analog output module with HART

	6ES7 332-5TB00-0AB0
Alarms/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms Diagnostic alarm	Yes; Parameterizable
Diagnostics Diagnostic functions Diagnostic information readable Diagnostics Overrange Wire break Mire break in actuator cable HART communication active	Yes; Parameterizable Yes Yes Yes Yes; as of output value > 0.5 mA Yes Yes; green LED (H)
Diagnostic indication LED Group error SF (red) Channel error indicator F (red)	Yes; Additional group message per channel Yes; per channel
Isolation tested with Channels against backplane bus and load voltage L+ Channels among one another Load voltage L+ against backplane bus	1500 V AC 1500 V AC 500 V DC

	6ES7 332-5TB00-0AB0
Galvanic isolation between the channels and backplane bus	Yes
Galvanic isolation analog outputs Galvanic isolation analog outputs between the channels between the channels and the load voltage L+	Yes Yes Yes
Permissible potential difference	
between the outputs (UCM)	60 V DC/30 V AC
between M internally and the outputs	60 V DC / 30 V AC
Standards, approvals, certificates	
FM approval	Available soon
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
Test number KEMA	97 ATEX 2359 X
Type of protection acc. to KEMA	II3 (2) G Eex nA [ib] IIC T4
Dimensions and weight Dimensions	
• Width	40 mm
Height	125 mm
Depth	120 mm
Weight	
 Weight, approx. 	280 g

ET 200M

I/O modules Ex analog output module with HART

Ordering data	Order No.		Order No.
SM 332 HART analog output	6ES7 332-5TB00-0AB0	S7-SmartLabel V3.0	
module HART analog output, 8 outputs, 0/4 20 mA, HART for ET 200M with IM 153-2		Software for machine labeling of modules directly from the STEP 7 project Single License	2XV9 450-1SL03-0YX0
Accessories		Upgrade Single License J	
Front connectors		Labeling sheets for machine	27/9 430-13203-0174
20-pin, with screw contacts		printing	
• 1 unit • 100 units	6ES7 392-1AJ00-0AA0 6ES7 392-1AJ00-1AB0	For 16-channel signal modules, DIN A4, for printing with laser	
LK 393 cable guide	6ES7 393-4AA00-0AA0	printers; 10 units	
Mandatory for operation in		petrol	6ES7 392-2AX00-0AA0
hazardous areas		light beige	6ES7 392-2BX00-0AA0
SIMATIC DP mounting rail for ET 200M		yellow	6ES7 392-2CX00-0AA0
For mounting of up to 5 bus		red	6ES7 392-2DX00-0AA0
modules for		S7 Manual Collection J	6ES7 998-8XC01-8YE0
Length: 483 mmLength: 530 mm	6ES7 195-1GA00-0XA0 6ES7 195-1GF30-0XA0	Electronic manuals on DVD, multi-language:	
SIMATIC S7-300 mounting rail	0207 133-101 30-0XA0	S7-200, TD 200, S7-300, M7-300,	
• Length: 160 mm	6ES7 390-1AB60-0AA0	C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime	
• Length: 480 mm	6ES7 390-1AE80-0AA0	Software, SIMATIC DP	
• Length: 530 mm	6ES7 390-1AF30-0AA0	(Distributed I/O), SIMATIC HMI (Human Machine Interface),	
Length: 830 mmLength: 2000 mm	6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0	SIMATIC NET	
Label cover	6ES7 392-2XY00-0AA0	(Industrial Communication)	0505 000 0V004 0V50
(10 units, spare part) for signal	0ES/ 392-2X100-0AA0	S7 Manual Collection update D service for 1 year	6ES7 998-8XC01-8YE2
modules (not 32-channel modules), function modules and CPU 312 IFM		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	
Labeling strips	6ES7 392-2XX00-0AA0		
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM			

- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

SIPLUS I/O modules SIPLUS analog input module with HART

Overview



- Can only be plugged into ET 200M with IM153-2 and IM 153-2 FO
- 8 AI HART
- · Redundant connection
- Firmware update
- · HART secondary variables

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 331-7TF01- 7AB0	6AG1 331-7TF01- 4AB0
Order No. based on	6ES7 331-7TF01- 0AB0	6ES7 331-7TF01- 0AB0
Ambient temperature range	-25 °C to +70 °C	0 °C to +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions Relative humidity Biologically active substances Chemically active substances Mechanically active substances	5 100 % Condensation perm Conformity with EN 3B2 mold and fung. (except fauna) Conformity with EN 3C4 incl. salt mist a severity level G1; G Conformity with EN 3S4 including cond	60721-3-3, Class al spores 60721-3-3, Class nd ISA-S71.04 2; G3; GX ^{1) 2)} 60721-3-3, Class
Air pressure (depending on the highest positive temper- ature range specified)	3S4 including conductive sand, dust ²⁾ 1080 795 hPa (-1000 +2000 m) See ambient temperature range 795658 hPa (+2000 +3500 m) Derating 10 K 658540 hPa (+3500 +5000m) Derating 20K	

- 1) ISA-S71.04 severity level GX: Long-term load: $SO_2 < 4.8 \text{ ppm}$; $H_2S < 9.9 \text{ ppm}$; CI < 0.2 ppm; CI < 0.66 ppm; CI < 0.12 ppm;
- The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SM 331 HART analog input module	
(extended temperature range and medial exposure)	
8 inputs, 0/4 to 20 mA, HART for HET 200M with IM 153-2 interface module	6AG1 331-7TF01-7AB0
8 inputs, 0/4 to 20 mA, HART for HET 200M with IM 153-2 interface module; only medial exposure	6AG1 331-7TF01-4AB0
Accessories	see SIMATIC ET 200M analog module with HART, page 9/195

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200M

SIPLUS I/O modules SIPLUS analog output module with HART

Overview



- Pluggable exclusively in ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- · Redundant connection
- Firmware update
- HART secondary variables

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 332-8TF01- 2AB0	6AG1 332-8TF01- 4AB0	
Order No. based on	6ES7 332-8TF01- 0AB0	6ES7 332-8TF01- 0AB0	
Ambient temperature range	-25 °C to +60 °C	0 °C to +60 °C	
Conformal coating	Coating of the printe the electronic comp	ed circuit boards and conents	
Technical data	The technical data of the standard product applies except for the ambient conditions.		
Ambient conditions			
Relative humidity	5 100 %, condensation perm	iitted	
 Biologically active substances 	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)		
 Chemically active substances 	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S71.04 severity level G1; G2; G3; GX ^{1) 2)}		
 Mechanically active substances 	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾		
Air pressure (depending on	1080795 hPa (-10	000 +2000 m)	
the highest positive temper-	See ambient temperature range		
ature range specified)	795658 hPa (+2000 +3500 m)		
	Derating 10 K		
	658540 hPa (+35	00 +5000m)	
	Derating 20K	,	

- 1) ISA-S71.04 severity level GX: Long-term load: SO₂ <4.8 ppm; H₂S <9.9 ppm; CI <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O₃ <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO₂ <17.8 ppm; H₂S <49.7 ppm; CI <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O₃ <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data		Order No.
SIPLUS SM 332 analog output module with HART		
(medial exposure)		
HART analog output, 8 outputs, 0/4 - 20 mA, HART for ET 200M, with IM 153-2	Н	6AG1 332-8TF01-4AB0
Additionally with expanded temperature range	Н	6AG1 332-8TF01-2AB0
Accessories		See SIMATIC SM 332 analog output module with HART, page 9/197

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

ET 200M

SIPLUS I/O modules SIPLUS Ex analog input module with HART

Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 331-7TB00- 7AB0	6AG1 331-7TB00- 4AB0
Order No. based on	6ES7 331-7TB00- 0AB0	6ES7 331-7TB00- 0AB0
Ambient temperature range	-25 °C to +70 °C	0 °C to +60 °C
Conformal coating	Coating of the printe	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions Relative humidity Biologically active substances Chemically active substances Mechanically active substances Air pressure (depending on the highest positive temperature range specified)	conditions. 5 100 % Condensation permissible Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna) Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA–S7- severity level G1; G2; G3; GX ^{1) 2)} Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dus 1080 795 hPa (-1000 +2000 m)	

- 11 ISA-S71.04 severity level GX: Long-term load: SO $_2 < 4.8$ ppm; H $_2 S < 9.9$ ppm; CI < 0.2 ppm; HCI < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O $_3 <$ 0.1 ppm; NOX < 5.2 ppm Threshold / limit value (max. 30 min/d): SO $_2 <$ 17.8 ppm; H $_2 S <$ 49.7 ppm; CI < 1.0 ppm; HCI < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O $_3 <$ 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SM 331 HART analog input module	
(extended temperature range and medial exposure)	
2 inputs, 0/4 to 20 mA, HART for ET 200M with IM 153-2 interface module	6AG1 331-7TB00-7AB0
2 inputs, 0/4 to 20 mA, HART for HET 200M with IM 153-2 interface module; only medial exposure	6AG1 331-7TB00-4AB0
Accessories	see SIMATIC ET 200M Ex analog input module with HART, page 9/199

H: Subject to export regulations AL: 91999 and ECCN: EAR99H I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200M

Function modules

Overview



Function modules unburden the CPU of work-intensive tasks such as counting, positioning and controlling

Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Control modules

Function modules	
Counting	FM 350-1 counter module
o o a manag	FM 350-2 counter module
Positioning	
 of rapid traverse and creep speed drives 	FM 351 positioning module
• of stepper motors	FM 353 positioning module
 of servo motors 	FM 354 positioning module
Position and path control	FM 357-2 path and position control module ¹⁾
SSI position detection	SM 338 POS input modules
Electronic cam control	FM352 electronic cam controller
High speed logic operation	FM 352-5 high speed Boolean processor
Controlling	FM 355 controller module
	FM 355-2 temperature controller module
Weighing and proportioning electronics	SIWAREX

1) Not for ET 200M

ET 200M

Function modules

Overview (continued)

Applicability with ET 200M distributed I/O device

Almost all function modules can be used in the ET 200M distributed I/O device. In doing so, the following details must be observed:

		IM 153-1	ng in behind 1AA03-0XB0)	IM 153-2	ng in behind 2BA02-0XB0)	IM 153-2 FC	ig in behind) 2BB00-0XB0)	For plugging in behind IM 153-4 PN (6ES7 153- 4AA00-0XB0)
		configurab	le with					
Module	Order No.	STEP 71)	GSD ²⁾	STEP 71)	GSD ²⁾	STEP 71)	GSD ²⁾	STEP 7 ¹⁾
FM 350-1 counter module	6ES7 350-1AH03-0AE0							
FM 350-2 counter module	6ES7 350-2AH01-0AE0							
FM 351 positioning module	6ES7 351-1AH01-0AE0							
FM 352 cam controller	6ES7 352-1AH02-0AE0							
FM 352-5 high speed Boolean processor	6ES7 352-5AH00-0AE0	□ ³⁾		□ ³⁾		□ ³⁾		
FM 352-5 high speed Boolean processor	6ES7 352-5AH10-0AE0	□ ³⁾		□ ³⁾		□ ³⁾		
FM 353 positioning module	6ES7 353-1AH01-0AE0							
FM 354 positioning module	6ES7 354-1AH01-0AE0							
FM 355 C controller module	6ES7 355-0VH10-0AE0							
FM 355 S controller module	6ES7 355-1VH10-0AE0							
FM 355-2 C temper- ature controller module	6ES7 355-2CH00-0AE0							
FM 355-2 S temper- ature controller module	6ES7 355-2SH00-0AE0							
SM 338 POS input module	6ES7 338-4BC01-0AB0							

□: configurable

Note:

Position measurement systems and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

www.siemens.com/simatic-technology

For further information see SIMATIC S7-300, Chapter 5.

^{--:} not configurable

¹⁾ Configuration using the meta-knowledge integrated into STEP 7 (in hardware catalog under PROFIBUS DP > ET200M > IM 153-1 / IM 153-2 or PROFINET IO > I/O > ET 200M > IM153-4 PN).

Configuration using GSD file (after installation of the GSD file configurable from the Hardware Catalog under PROFIBUS DP > Additional field devices > I/O > ET200M). During configuration on the CP 342-5 as DP master, S5 (IM 308C) as DP master or external masters, the GSD file must be configured.

³⁾ Visible and configurable only with the corresponding configuration package in STEP 7.

ET 200M

Special modules, communication

Overview special modules



The special modules offer functions for diagnostics as well as commissioning to the user.

For further information see SIMATIC S7-300, Chapter 5.

Overview Communication



- Communication modules for data exchange using point-to-point coupling
- Communication modules for the connection of identification systems

For further information see SIMATIC S7-300, Chapter 5.

ET 200M

ASM 475

Overview



The ASM 475 is a low-cost module for connecting the MOBY D, U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

Communication modules	ASM 475	ASM 475 (with MOBY U file handler)	
Serial interface to the reader	RS422		
Connection point for reader	Max. 2 units via screw or spring-loaded terminals in the front connector		
Interface/cable length, max. connectable length	RS422 / 1 000 m, depending on reader and cable type		
Readers that can be connected	MOBY U/D, RF 200 / RF300 / RF600, MV400	MOBY U	
Interface for 24 V DC	Via screw terminals in front connector		
SIMATIC S7 function blocks	FC/FB45, FC55 (multitag)	FC56	
Transponder addressing	Direct access via addresses	Access via DOS-like file system	
Commands	Initialize transponder, read data from transponder, write data to transponder, etc.	Format transponder, read file, write file, etc.	
Supply voltage • Rated value • Permissible range	24 V DC 20 30 V DC		
Electrical isolation between S7-300 and MOBY	Yes		
Current consumption from S7 bus terminal, max.	100 mA		
Power loss, typically	1 W		
Ambient temperature			
During operation • Horizontal configuration of SIMATIC • Vertical configuration of SIMATIC	0 +60 °C 0 +40 °C		
During transportation and storage	-40 +70 °C		
Dimensions W x H x D (mm)	40 x 125 x 120		
Weight	Approx. 0.2 kg		

ET 200M

ASM 475

Ordering data	Order No.		Order No.
MOBY ASM 475 communication module for SIMATIC S7-300 and ET 200M, parameterizable	6GT2 002-0GA10	SIMATIC RF200 / RF300 / RF600/ MV400 connecting cable preassembled, between the ASM 475 and RF200 / RF300 / RF600 /	
Accessories		MV400, IP65, straight connector, PUR material, suitable for cable	
Front connector (1 x per ASM 475) • with screw terminals	6ES7 392-1AJ00-0AA0	carriers, CMG approval, in the following lengths ¹ :	6GT2 891-4EH20
with spring-loaded terminals MOBY U connecting cable preassembled, between the ASM 475 and reader, angled connector, PUR material, in the following lengths:	6ES7 392-1BJ00-0AA0	Extension cable SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable carriers, straight connector	6GT2 891-4EH50
2 m	6GT2 091-4EH20	2 m	6GT2 891-4FH20
5 m	6GT2 091-4EH50	5 m	6GT2 891-4FH50
10 m	6GT2 091-4EN10	10 m	6GT2 891-4FN10
20 m	6GT2 091-4EN20	20 m	6GT2 891-4FN20
50 m	6GT2 091-4EN50	50 m	6GT2 891-4FN50
pre-assembled, between ASM 475 and reader, straight connector, PUR material, in the following lengths:		DVD "RFID Systems Software & J Documentation"	6GT2 080-2AA20
2 m	6GT2 091-6EH20		
5 m	6GT2 091-6EH50		
10 m	6GT2 091-6EN10		
50 m	6GT2 091-6EN50		
MOBY D connecting cable preassembled, between ASM 475 and reader D1xS, 9-pole Sub-D plug, PUR material, CMG approved, suitable for cable carriers, in the following lengths:			
5 m	6GT2 491-4EH50		
20 m	6GT2 491-4EN20		
50 m	6GT2 491-4EN50		

¹⁾ The connecting cables can be extended using the RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200M

Power supplies

Overview



- Load current supplies for S7-300/ET 200M
- To convert the line voltage to the required operating voltage 24 V DC
- Output current 2 A, 5 A or 10 A

For further information see SIMATIC S7-300, Chapter 5.

ET 200L

ET 200L

Application



ET 200L is a small, compact I/O device with degree of protection IP20.

The ET 200L is mainly used for applications in the low-end performance range which require few inputs/outputs as well as for applications where space is limited.

The ET 200L is a passive node (slave) on PROFIBUS DP with transmission rates up to 1.5 Mbit/s.

	6ES7 131-1BH01-0XB0	6ES7 131-1BL01-0XB0
Supply voltages		
Rated value		
• 24 V DC	Yes	Yes
 Reverse polarity protection 	Yes	Yes
Hardware configuration		
Rack		
Required terminal block	TB 16L	TB 32L
Connection method		
Inputs/outputs	Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection	Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection
PROFIBUS DP		
Transmission rate, max.	1.5 Mbit/s	1.5 Mbit/s
Direct data exchange (slave-to-slave communication)	Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)	Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)
Digital inputs		
Number of digital inputs	16	32
Input voltage		
Rated value, DC	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	5 mA	5 mA
Input delay (for rated value of input voltage)		
 for standard inputs 		
- at "0" to "1", min.	2 ms	2 ms
- at "0" to "1", max.	4.5 ms	4.5 ms
Cable length		
• Cable length for NAMUR input, shielded, max.	1 000 m	1 000 m
Galvanic isolation between PROFIBUS DP and all other circuit components	Yes	Yes
Galvanic isolation digital inputs		
• between the channels	No	No
• between the channels and PROFIBUS DP	Yes	Yes

ET 200L

ET 200L

	6ES7 131-1BH01-0XB0	6ES7 131-1BL01-0XB0
Environmental requirements Operating temperature • Horizontal installation, min.	0 °C	0 °C
Horizontal installation, max.	60 °C; 40°C for other mountings	60 °C; 40°C for other mountings
Air pressure • Permissible range, min. • Permissible range, max.	795 hPa 1 080 hPa	795 hPa 1 080 hPa
Relative humidity Operation, min. Operation, max.	5 % 95 %; RH class 2 in accordance with IEC 1131-2	5 % 95 %; RH class 2 in accordance with IEC 1131-2
Vibrations • Operation, checked according to IEC 60068-2-6	Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g)	Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g)
Shock test • checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms
Degree of protection	Yes	Yes
Dimensions and weight Dimensions • Width • Height • Depth	145 mm 60 mm 60.5 mm	145 mm 60 mm 60.5 mm

	6ES7 132-1BH00-0XB0	6ES7 132-1BL00-0XB0
Supply voltages		
Rated value		
• 24 V DC	Yes	Yes
 Reverse polarity protection 	Yes	Yes
Mains buffering, min.	20 ms	20 ms
Load voltage 2L+		
Rated value (DC)	24 V; 1L+, 2L+, 3L+	24 V; 1L+, 2L+, 3L+
Current consumption		
from load voltage L1 (without load), max.	50 mA; per load group (L1+ or L2+ / L3+)	100 mA; per load group (L1+ or L2+ / L3+)
from supply voltage L+, max.	70 mA; L4+ / L5+	70 mA; L4+ / L5+
Power losses		
Power loss, typ.	5 W	7 W
Hardware configuration		
Rack		
 Required terminal block 	TB 16L	TB 32L
Communication functions		
Bus protocol/transmission protocol	PROFIBUS DP	PROFIBUS DP
Connection method		
Inputs/outputs	Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection	Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection
PROFIBUS DP		
Transmission rate, max.	1.5 Mbit/s	1.5 Mbit/s
SYNC capability	Yes	Yes
Direct data exchange (slave-to-slave communication)	Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)	Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)

SIMATIC ET 200 distributed I/O ET 200L

ET 200L

	6ES7 132-1BH00-0XB0	6ES7 132-1BL00-0XB0
Digital outputs		
Number of digital outputs	16	32
Short-circuit protection	Yes; Electronic	Yes; Electronic
Response threshold, typ.	0.7 A	0.7 A
Limitation of inductive shutdown voltage to	typ. (L1+ or L2+ / L3+) -55 V	typ. (L1+ or L2+ / L3+) -55 V
Lamp load, max.	5 W	5 W
Controlling a digital input	Yes	Yes
Output voltage • rated value (DC) • for signal "1", min.	24 V Ua - 3 V	24 V Ua - 3 V
Output current • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C, max. • for signal "0" residual current, max.	0.5 A 0.5 A 1 mA	0.5 A 0.5 A 1 mA
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	50 ms 200 ms	50 ms 200 ms
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No Yes; only outputs of the same group	No Yes; only outputs of the same group
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz 8 Hz	100 Hz 0.5 Hz 8 Hz
Aggregate current of outputs (per group) all other mounting positions up to 40 °C, max. up to 60 °C, max. up to 40 °C, max. horizontal arrangement, up to 60 °C, max.	2 A 4 A 3 000 mA 2 000 mA	2 A 4 A 3 000 mA 2 000 mA
Load resistance range • lower limit • upper limit	41 Ω 28 000 Ω	41 Ω 28 000 Ω
Cable length Cable length, shielded, max. Cable length unshielded, max.	1 000 m 600 m	1 000 m 600 m
Alarms/diagnostics/status information Alarms • Alarms	No	No
Diagnostics Diagnostic functions	Yes	Yes
Diagnostic indication LED Bus fault BF (red) Status indicator digital output (green) Status indicator digital input (green) Monitoring 24 V voltage supply ON (green)	Yes Yes Yes Yes	Yes Yes Yes Yes
Isolation Isolation checked with	500 V DC	500 V DC
Galvanic isolation between PROFIBUS DP and all other circuit components	Yes	Yes

ET 200L

ET 200L

	6ES7 132-1BH00-0XB0	6ES7 132-1BL00-0XB0	
Galvanic isolation digital outputs			
 between the channels 	No	No	
 between the channels and PROFIBUS DP 	Yes; Optocoupler	Yes	
Environmental requirements			
Operating temperature			
 Horizontal installation, min. 	0 °C	0 °C	
 Horizontal installation, max. 	60 °C; 40°C for other mountings	60 °C; 40°C for other mountings	
Air pressure			
 Permissible range, min. 	795 hPa	795 hPa	
 Permissible range, max. 	1 080 hPa	1 080 hPa	
Relative humidity			
Operation, min.	5 %	5 %	
• Operation, max.	95 %; RH class 2 in accordance with IEC 1131-2	95 %; RH class 2 in accordance with IEC 1131-2	
Vibrations			
Operation, checked according to IEC 60068-2-6	Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g)	Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g)	
Shock test			
 checked according to IEC 60068-2-27 	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms	
Degree of protection			
IP20	Yes	Yes	
General information			
Vendor identification (VendorID)	0016h	0011h	
Dimensions and weight			
Dimensions			
• Width	145 mm	145 mm	
Height	60 mm	60 mm	
• Depth	60.5 mm	60.5 mm	
Weight			
Weight, approx.	130 g	150 g	

	6ES7 133-1BL01-0XB0
Supply voltages	
Rated value	
• 24 V DC	Yes
Reverse polarity protection	Yes
Hardware configuration Rack	
 Required terminal block 	TB 32L
Connection method	
Inputs/outputs	Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection
PROFIBUS DP	
Transmission rate, max.	1.5 Mbit/s
Direct data exchange (slave-to- slave communication)	Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)
Digital inputs	
Number of digital inputs	16
Input voltage	
 rated value, DC 	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	13 to 30 V

	6ES7 133-1BL01-0XB0
Input current • for signal "1", typ.	5 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", min at "0" to "1", max.	2 ms 4.5 ms
Cable length Cable length for NAMUR input, shielded, max.	1 000 m
Digital outputs Number of digital outputs	16
Short-circuit protection	Yes; Electronic
Output voltage • rated value (DC) • for signal "1", min.	24 V Ua - 3 V
Output current • for signal "1" permissible range for 0 to 60 °C, max. • for signal "0" residual current, max.	0.5 mA 1 mA
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz 8 Hz

ET 200L

ET 200L

	6ES7 133-1BL01-0XB0		
Aggregate current of outputs (per group)			
• up to 60 °C, max.	4 A		
Cable length Cable length, shielded, max.	1 000 m		
Galvanic isolation between PROFIBUS DP and all other circuit components	Yes		
Galvanic isolation digital inputs • between the channels • between the channels and PROFIBUS DP	No Yes		
Environmental requirements Operating temperature • horizontal installation, min. • horizontal installation, max.	0 °C 60 °C; 40°C for other mountings		
Air pressure • permissible range, min. • permissible range, max.	795 hPa 1 080 hPa		

	6ES7 133-1BL01-0XB0
Relative humidity	
• Operation, min.	5 %
Operation, max.	95 %; RH class 2 in accordance with IEC 1131-2
Vibrations	
Operation, checked according to IEC 60068-2-6	Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g)
Shock test	
 checked according to IEC 60068-2-27 	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
• Width	145 mm
Height	60 mm
• Depth	60.5 mm

	6ES7 193-1CH00-0XA0	6ES7 193-1CH10-0XA0	6ES7 193-1CH20-0XA0	6ES7 193-1CL00-0XA0	6ES7 193-1CL10-0XA0
Dimensions and weight					
Dimensions					
 Width 	145 mm	145 mm	191 mm	191 mm	191 mm
• Height	100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30- 0XA0): 82 mm	100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30- 0XA0): 82 mm	100 mm; Height with electronics block from top edge (with bus connector): 98.5 mm	100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30- 0XA0): 82 mm	100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30- 0XA0): 82 mm
Depth	40.5 mm	40.5 mm	40.5 mm	40.5 mm	40.5 mm
Weight • Weight, approx.	230 g	230 g	283 g	350 g	350 g

ET 200L

ET 200L

Ordering data	Order No.
Electronic block for ET 200L	
with digital inputs/outputs for 24 V DC	
• 16 DI	6ES7 131-1BH01-0XB0
• 32 DI	6ES7 131-1BL01-0XB0
• 16 DO; 0.5 A	6ES7 132-1BH00-0XB0
• 32 DO; 0.5 A • 16 DI/16 DO; 0.5 A	6ES7 132-1BL00-0XB0 6ES7 133-1BL01-0XB0
Terminal block for ET 200L and ET 200L-SC	
for mounting the electronic blocks	
TB 16L • 16 channels, screw-type terminals	6ES7 193-1CH00-0XA0
16 channels, spring-loaded terminals	6ES7 193-1CH10-0XA0
TB 32L • 32 channels, screw-type	6ES7 193-1CL00-0XA0
terminals	
 32 channels, spring-loaded terminals 	6ES7 193-1CL10-0XA0
Add-on terminal for ET 200L and ET 200L-SC	
16 channels; 1 tier	
Screw-type terminals	6ES7 193-1FH20-0XA0
Spring-loaded terminals	6ES7 193-1FH50-0XA0
16 channels; 2 tiersScrew-type terminals	6ES7 193-1FH30-0XA0
Spring-loaded terminals	6ES7 193-111130-0XA0
32 channels; 1 tier	
Screw-type terminals	6ES7 193-1FL20-0XA0
Spring-loaded terminals	6ES7 193-1FL50-0XA0
32 channels; 2 tiers	0000 400 451 00 0V40
Screw-type terminalsSpring-loaded terminals	6ES7 193-1FL30-0XA0 6ES7 193-1FL60-0XA0
· opinig-loaded terriiriais	0E01 130-11 E00-0AA0

	Order No.
Accessories	
Labeling sheet with strips for 10 electronic blocks for • 16-channel electronic blocks incl. add-on terminals	6ES7 193-1BH00-0XA0
 32-channel electronic blocks incl. add-on terminals 	6ES7 193-1BL00-0XA0
PROFIBUS bus connector 90° cable outlet, FastConnect terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 1 unit	6ES7 972-0BA52-0XA0
90° cable outlet, FastConnect terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 100 units	6ES7 972-0BA52-0XB0
Angular outgoing cable, insulation displacement terminals, without bus termi- nating resistor, without PG connection socket, up to 1.5 Mbit/s	6ES7 972-0BA30-0XA0
90° cable outlet, FastConnect terminating resistor with isolating function, with PG socket, up to 12 Mbit/s 1 unit	6ES7 972-0BB52-0XA0
90° cable outlet, FastConnect terminating resistor with isolating function, with PG socket, up to 12 Mbit/s 100 units	6ES7 972-0BB52-0XB0

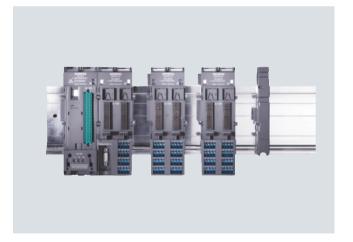
ET 200iSP

Introduction

Overview







- Fail-safe distributed I/O system to IP30 degree of protection for use in hazardous gaseous and dusty areas, i.e. in Zones 1 and 2 as well as 21 and 22
- Sensors and actuators can also be situated directly in Zone 0 or 20.
- Individual configuration and flexible expansion with the modular design for optimization to the respective automation task
- Independent wiring enables prewiring without the electronics connected
- Optimized for integration into process control systems (e.g. SIMATIC PCS 7)
- Parameters can be assigned using SIMATIC PDM
- Optimal integration of HART field devices (HART transparency)
- Fail-safe digital inputs and outputs as well as analog inputs for the safety-related signal processing according to PROFIsafe
- Connection to PROFIBUS DP via isolating transformers
- Module replacement (hot swapping) and configuration expansion (Configuration in Run) possible during operation
- Extensive diagnostic possibilities
- Condensation-proof modules in temperature range -20°C to +70°C
- EMC in accordance with NE 21 (on Namur recommendation)
- Full redundancy of PROFIBUS and power supply

Technical specifications

• PROFIBUS

• Shipbuilding approval

• IEC

• CE

SIMATIC ET 200 distributed I/O

ET 200iSP

Introduction

General			
Degree of protection	IP30		
Ambient temperature	-20°C +70°C		
Medial load		In accordance with ISA-S71.04 severity level G1;G2;G3 (with the exception of NH3 here only Level G2)	
EMC	Electromagnetic compatibility in	accordance with NE21	
Vibration-proof	0.5 g permanently, 1 g periodically		
Approvals, standards ATEX IECEX INMETRO CFMus	II 2 G (1) GD I M2 Zone 1 Zone 1 Class I,II,II	Ex de [ia/ib] IIC T4 Ex de [ia/ib] I Ex de [ia/ib] IIC T4 BR-Ex de [ia/ib] IIC T4 BI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G	
• cULus	Class I,II,II	Zone 1, AEx de [ia/ib] IIC T4 Division 2, Groups A, B, C, D, E, F, G T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G	
	Class I	Zone 1, AEx de [ia/ib] IIC T4	

In accordance with 94/9/EG (ATEX 100a), 89/336/EEC and 73/23/EEC

EN 50170, Volume 2

In accordance with 94/9/EG (ATEX 100 Classification companies

• ABS (American Bureau of Shipping)

• BV (Bureau Veritas)

• DNV (Det Norske Veritas)

• GL (Germanischer Lloyd)

• LRS (Lloyds Register of Shipping)

• Class NK (Nippon Kaiji Kyokai)

IEC 61131, Part 2

ET 200iSP

IM 152-1 interface module

Overview



- The IM 152 interface module is plugged onto the corresponding terminal module TM-IM/EM (to be ordered separately). For redundant operation, two IM 152 are used. They are plugged onto the TM-IM/IM.
- The interface module IM 152 has the following properties: Connects the ET 200iSP to PROFIBUS DP

 - Prepares data for the fitted electronic modules
 - The PROFIBUS address of ET 200iSP can be adjusted by switch
 - Slot for MMC
 - Firmware updating over PROFIBUS DP or MMC
- Shutting down the 24 V DC supply voltage at the terminal module TM-PS also shuts down the interface module IM 152.
- The maximum address size is 244 byte inputs and 244 byte

Technical specifications

	6ES7 152-1AA00-0AB0
Supply voltages	
Mains buffering, min.	f
Current consumption	
from supply voltage 1L+, max.	30 mA
Current consumption/ power loss	
Power loss, typ.	0.5 W
Interfaces	
Interface physics, RS 485	Yes; (intrinsically safe)
Protocols	
PROFIBUS DP protocol	Yes
PROFIBUS DP	
Transmission rate, max.	1.5 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s
SYNC capability	Yes
FREECE capability	Yes
Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher
Isochronous mode	
Isochronous mode	No
Alarms/diagnostics/status information	
Alarms	
• Alarms	Yes
Acyclic function, interrupts	Yes
Acyclic function, parameters	Yes
Diagnostics	V
Diagnostic functions	Yes
Diagnostic indication LED	
Bus fault BF (red) Organization OF (red)	Yes
Group error SF (red)Monitoring 24 V voltage supply	Yes Yes
ON (green)	103

	6ES7 152-1AA00-0AB0
Time stamping	
Description	for each digital input, digital input module, total ET 200iS
Accuracy	20 ms
Number of stampable digital inputs, max.	64; for accuracy class 20 ms
Time format	RFC 1119 Internet (ISP)
Time resolution	1 ms
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
Galvanic isolation between supply voltage and electronics	Yes
Standards, approvals, certificates	
CE mark	Yes
Type of protection acc. to EN 50020 (CENELEC)	II2 G Ex ib IIC T4 and I M2 Ex ib I
Type of protection acc. to KEMA	04 ATEX 1243
General information Vendor identification (VendorID)	8110H
Dimensions and weight Dimensions and weight	
Width	30 mm
HeightDepth	129 mm 136.5 mm
Weight	
Weight, approx.	245 g

IM 152-1 interface module

Technical specifications (continued)

	6ES7 193-7AA00-0AA0	6ES7 193-7AA10-0AA0	6ES7 193-7AB00-0AA0
Standards, approvals, certificates			
CE mark	No	No	No
Type of protection acc. to EN 50020 (CENELEC)	No	No	No
Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
Dimensions and weight			
Dimensions and weight			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm
Weight			
Weight, approx.	235 g	235 g	195 g

Ordering data Order No.			Order No.		
IM 152		Labels, blank	8WA8 848-2AY		
• ET 200iSP-IM 152-1	6ES7 152-1AA00-0AB0	Ordering unit: 1 set with 200 units			
Terminal module for IM 152 inc	el.	each for slot numbering			
termination module TM-IM/EM60S	6ES7 193-7AA00-0AA0	S7-300 mounting rails			
• TM-IM/EM60C	6ES7 193-7AA00-0AA0	Standard rail 585 mm	6ES7 390-1AF85-0AA0		
• TM-IM/IM	6ES7 193-7AB00-0AA0	Standard rail 885 mm	6ES7 390-1AJ85-0AA0		
Accessories		Stainless steel enclosure IP66			
ET 200iSP manual		for hazardous zone 1 in protection class EEx e			
German	6ES7 152-1AA00-8AA0	· ·			
• English	6ES7 152-1AA00-8BA0	Empty enclosure without instal- lation of modules, for use in a			
Connectors	6ES7 972-0DA60-0XA0	gaseous area, IP65 (IP54 when			
PROFIBUS connector with active	e	using a breather gland) • Wall enclosure 650 x 450 x 230.	6DL2 804-0AD30		
terminating resistor		for installation of max.	UDLZ 004-UAD30		
for RS 485-IS circuit; 1.5 Mbit/s		15 ET 200iSP modules, for use in			
RS 485-IS coupler	6ES7 972-0AC80-0XA0	a gaseous area, with 3 rows of M16 cable entries (41 units) and			
Isolating transformer for coupling	a	2 rows of blanking plugs			
of PROFIBUS DP and	9	 Wall enclosure 650 x 450 x 230, 	6DL2 804-0AD50		
PROFIBUS RS 485-IS		for installation of max. 15 ET 200iSP modules, for use in			
Labeling sheet		a gaseous area, with 5 rows of			
DIN A4, perforated, each		M16 cable entries (66 units)			
consisting of 10 sheets of 30 strip each for electronic modules, and		Wall enclosure 950 x 450 x 230, for installation of max.	6DL2 804-0AE30		
20 strips each for IM 152	u 	25 ET 200iSP modules, for use in			
• petrol	6ES7 193-7BH00-0AA0	a gaseous area, with 3 rows of			
• red	6ES7 193-7BD00-0AA0	M16 cable entries (68 units) and 2 rows of blanking plugs			
• yellow	6ES7 193-7BB00-0AA0	Wall enclosure 950 x 450 x 230.	6DL2 804-0AE50		
• light beige	6ES7 193-7BA00-0AA0	for installation of max.	UDIE OUT UNEOU		
Labels, inscribed		25 ET 200iSP modules, for use in a gaseous area, with 5 rows of			
Ordering unit: 1 set with 200 unit	ts	M16 cable entries (111 units)			
each for slot numbering		Empty enclosure without instal-			
• 10 x slots 1 to 2	8WA8 861-0AB	lation of modules, for use in a			
• 5 x slots 1 to 40	8WA8 861-0AC	dusty area, IP65			
• 1 x slot 1 to 64 2 x slots 1 to 68	8WA8 861-0DA	Wall enclosure 650 x 450 x 230, for installation of max.	6DL2 804-0DD30		
		15 ET 200iSP modules, for use in			
		a dusty area, with 3 rows of M16			
		cable entries (41 units) and 2 rows of blanking plugs			
		I: Subject to export regulations AL: N	LEOON EARONI		

IM 152-1 interface module

Ordering data	Order No.		Order No.
Empty enclosure without installation of modules, for use in a dusty area, IP65 • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in	6DL2 804-0DD50 6DL2 804-0DE30	Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)	6DL2 804-1AE50
a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)	6DL2 804-0DE50	Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components must be ordered separately • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16	6DL2 804-1DD30
Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately		cable entries (41 units) and 2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16	6DL2 804-1DD50
 Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs Wall enclosure 650 x 450 x 230. 	6DL2 804-1AD30	cable entries (66 units) • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-1DE30
for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of	6DL2 804-1AE30	Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)	6DL2 804-1DE50
M16 cable entries (68 units) and 2 rows of blanking plugs			

ET 200iSP

Power supply units

Overview



The power supply (PS) is plugged into the associated terminal module TM-PS-A or TM-PS-B (with redundancy; to be ordered separately).

The power supply unit fulfills the following functions:

- It provides reliable isolated power supply for the ET 200iSP with the necessary operating voltages for
 - logic (through the backplane bus)
 - PROFIBUS DP interface of IM 152-1
 - power bus (for supplying the electronic modules)
- Takes over the safety limit of the output voltage
- Has an explosion-proof metal enclosure (explosion protection EEx d)
- Can be redundantly configured

Technical specifications

	6ES7 138-7EA01-0AA0	6ES7 138-7EC00-0AA0
Supply voltages		
Load voltage L+		
Rated value (DC)	24 V	
Reverse polarity protection	Yes	
Load voltage L1		
Rated value (AC)		230 V; 120/230 V AC
 Permissible range, lower limit (AC) 		85 V
 Permissible range, upper limit (AC) 		264 V
 Permissible frequency range, lower limit 		47 Hz
Permissible frequency range, upper limit		63 Hz
Current consumption		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 V AC:0.45A at
		rated voltage 120 V AC:0.75A
Power losses		
Power loss, typ.	20 W	5 W; 5W + 1.2 x total power losses of
		the electronic modules
Power loss, max.		21.3 W
Ex(i) characteristics		
Max. values of input circuits (per channel)		
 Um (fault voltage), max. 	250 V; DC	264 V; AC/DC
Alarms/diagnostics/status information		
Status indicator	Yes	Yes
Alarms		
• Alarms	No	No
Diagnostics		
Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
Diagnostic indication LED		
Group error SF (red)	No	No
Galvanic isolation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No

Power supply units

	6ES7 138-7EA01-0AA0	6ES7 138-7EC00-0AA0
Standards, approvals, certificates		
CE mark	Yes	Yes
Type of protection acc. to EN 50020 (CENELEC)	Ex de [ib]IIC T4	Ex de [ib]IIC T4
Type of protection acc. to KEMA	04 ATEX 2263	09 ATEX 0156
Dimensions and weight		
Dimensions		
• Width	60 mm	60 mm
Height	190 mm	190 mm
• Depth	136.5 mm	136.5 mm
Weight		
 Weight, approx. 	2 700 g	2 700 g

	6ES7 193-7DA10-0AA0	6ES7 193-7DB10-0AA0	6ES7 193-7DA20-0AA0	6ES7 193-7DB20-0AA0
Standards, approvals, certificates				
CE mark			Yes	Yes
Type of protection acc. to EN 50020 (CENELEC)			II 2 G (1) GD and I M2 Ex e [ia/ib] IIC T4; Ex e [ia/ib] I	II 2 G (1) GD and I M2 Ex e [ia/ib] IIC T4; Ex e [ia/ib] I
Test number KEMA			04 ATEX 2242	04 ATEX 2242
Dimensions and weight Dimensions and weight				
• Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm	52 mm
Weight • Weight, approx.			230 g	230 g

Ordering data	Order No.
PS 24 V DC power supply module	6ES7 138-7EA01-0AA0
TM-PS-A Standard terminal module	6ES7 193-7DA10-0AA0
TM-PS-B terminal module for redundant operation	6ES7 193-7DB10-0AA0

	Order No.		
PS 120/230 V AC power supply module	6ES7 138-7EC00-0AA0		
TM-PS-A UC Standard terminal module	6ES7 193-7DA20-0AA0		
TM-PS-B UC terminal module for redundant operation	6ES7 193-7DB20-0AA0		

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ET 200iSP

Digital electronic modules

Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals).
- When plugged in, the modules are automatically uniquely coded mechanically.
- Modules can be replaced under potentially explosive conditions during runtime.

Technical specifications

	6ES7 131-7RF00-0AB0
Supply voltages	
Rated value	
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Digital inputs	
Number of inputs	8
Number of NAMUR inputs	8
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", min.	2.8 µs
- at "0" to "1", max.	3.5 µs
- at "1" to "0", min.	2.8 ms
- at "1" to "0", max.	3.5 µs
Cable length	
 Cable length, shielded, max. 	500 m
Encoder	
Number of connectable encoders, max.	8
Connectable encoders	
NAMUR encoder	Yes
NAMUR encoder	
 Input current, for signal "0", max. 	1.2 mA
 Input current, for signal "1", min. 	2.1 mA
Integrated Functions	
Frequency meter	Yes
Frequency measurement	Yes; (Gate time) 50 ms; 200 ms; 1 s
Number of frequency meters	2
Counter	
Number of counter inputs	2; normal and periodic count function
Input frequency, max.	5 kHz; with a cable length of 20 m: 5 kHz; with a cable length of 100 m: 1 kHz; with a cable length of 200 m: 500 Hz

6ES7 131-7RF00-0AB0
Yes; Parameterizable No
Yes Yes Yes; R load < 150 Ohm with NAMUR sensor/sensor and NAMUR changeover contact/ sensor to DIN 19234
Yes
No Yes
60 V DC / 30 V AC
Yes
II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
04 ATEX 1248
30 mm 129 mm 136.5 mm
255 g

Digital electronic modules

	6ES7 132-7RD01-0AB0	6ES7 132-7RD11-0AB0	6ES7 132-7RD22-0AB0
Current consumption			
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA	
from backplane bus 3.3 V DC, max.	10 mA	10 mA	
Power losses			
Power loss, typ.	2.5 W	2.1 W	2.8 W
Address area Address space per module • without packing	2 byte	2 byte	2 byte
Digital inputs Cable length • Cable length, shielded, max. • Cable length unshielded, max.			20 m 20 m
Digital outputs Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
Short-circuit protection	Yes; Ex i function	Yes	Yes
No-load voltage Uao (DC)	23.1 V	17.4 V	17.4 V
Internal resistor Ri	275 Ω	150 Ω	167 Ω
Trend key points E • Voltage Ue (DC) • Current le	17.1 V 20 mA	13.2 V 27 mA	10.7 V 40 mA; 80 mA when outputs connected in parallel
Output current • for signal "1" rated value	0.02 A	0.03 A	
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	2 ms 1.5 ms	2 ms 1.5 ms	2 ms 1.5 ms
Parallel switching of 2 outputs • for increased power	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
Switching frequency • with resistive load, max. • with inductive load, max.	100 Hz 2 Hz	100 Hz 2 Hz	100 Hz 2 Hz
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 500 m	500 m 500 m	500 m 500 m
Ex(i) characteristics Max. values of output circuits (per channel) • Co (permissible external capacity), max. • Io (short-circuit current), max. • Lo (permissible external inductivity), max. • Po (power of load), max. • Uo (output no-load voltage), max. • Ta (permissible ambient temper-	70 °C	70 °C	241 nF; for IIC, 1507nF for IIB 118 mA 1.7 mH; For IIC, 10.4 mH for IIB 572 mW 19.4 V

Digital electronic modules

	6ES7 132-7RD01-0AB0	6ES7 132-7RD11-0AB0	6ES7 132-7RD22-0AB0
Parameter Remark		14 byte	
Diagnostics: wire break	yes	yes	yes
Diagnostics: short circuit	yes	yes	yes
Behavior on CPU/Master STOP, channel-wise	yes	yes	Substitute a value/keep last value
Interrupts/diagnostics/status information			
Status indicator			Yes
Substitute values connectable			Yes
Alarms • Alarms • Diagnostic alarm	Yes	No Yes	No Yes; parameterizable
Diagnostics Diagnostic functions Diagnostic information readable Wire break Short circuit	Yes Yes; R > 10 kOhm, I < 100 μA Yes; R< 800 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes Yes Yes	Yes Yes; R > 10 kOhm, I < 100 µA Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)
diagnostic indication LED Group error SF (red) Status indicator digital output (green)	Yes Yes	Yes Yes	Yes Yes; per channel
Galvanic isolation Galvanic isolation digital outputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+			No Yes Yes
Permissible potential difference between different circuits			60 V DC/30 V AC
Standards, approvals, certificates CE mark	Yes	Yes	Yes
Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	
Type of protection acc. to KEMA	not relevant	not relevant	04 ATEX 1249
Dimensions and weight Dimensions • Width • Height • Depth	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm
Weight • Weight, approx.	255 g	255 g	255 g

Digital electronic modules

	6ES7 132-7GD00-0AB0	6ES7 132-7GD10-0AB0	6ES7 132-7GD21-0AB0	6ES7 132-7GD30-0AB0
Current consumption				
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA; with actuator supply	400 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA		
Power losses Power loss, typ.	2.5 W	2.1 W	2.8 W	2.8 W
Address area				
Address space per module • without packing	2 byte	2 byte	2 byte	2 byte
Digital inputs				
Cable lengthCable length, shielded, max.			20 m	20 m
Cable length unshielded, max.			20 m	20 m
Digital outputs				
Number of digital outputs	4; additionally 1 intrinsi- cally-safe input for L shutdown	4; additionally 1 intrinsi- cally-safe input for L shutdown	4; additionally 1 intrinsi- cally-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown
Short-circuit protection	Yes; Ex i function	Yes; Ex i function	Yes	Yes
No-load voltage Uao (DC)	23.1 V	17.4 V	17.4 V	25.5 V
Internal resistor Ri		150 Ω	167 Ω	260 Ω
Trend key points E				
Voltage Ue (DC)Current le	17.1 V 20 mA	13.2 V 27 mA; 54 mA when outputs connected in	10.7 V 40 mA	19.8 V 22 mA
		parallel		
Output current • for signal "1" rated value	0.02 A	0.02 A		
Output delay with resistive				
load • 0 to "1", max.	2 ms	2 ms	2 ms	2 ms
• 1 to "0", max.	1.5 ms	1.5 ms	1.5 ms	1.5 ms
Parallel switching of 2				
outputs • for increased power	No; for Ex reasons not possible; nor for predecessor	Yes	Yes	No
Switching frequency				
 with resistive load, max. 	100 Hz	100 Hz	100 Hz	100 Hz
with inductive load, max.	2 Hz	2 Hz	2 Hz	2 Hz
Cable length Cable length, shielded,	500 m	500 m	500 m	500 m
max.Cable length unshielded, max.	500 m	500 m	500 m	500 m
Ex(i) characteristics				
Max. values of output circuits				
 (per channel) Co (permissible external capacity), max. lo (short-circuit current), 			241 nF; for IIC, 1507nF for IIB 118 mA	81 nF; for IIC, 651nF for IIB 110 mA
Max. Lo (permissible external			1.7 mH; For IIC, 10.4 mH	1.7 mH; For IIC, 11.5 mH
inductivity), max.Po (power of load), max.Uo (output no-load voltage),			for IIB 572 mW 19.4 V	for IIB 764 mW 27.9 V
max. • Ta (permissible ambient temperature), max.	70 °C	70 °C		

Digital electronic modules

Parameter Remark Diagnostics: wire break Diagnostics: short circuit Behavior on CPU/Master STOP, channel-wise Alarms/diagnostics/status information Status indicator Substitute values connectable Alarms • Alarms • Diagnostic alarm Diagnostics	14 byte yes yes yes Yes	14 byte yes yes yes	yes yes Substitute a value/keep last value Yes Yes	yes yes Substitute a value/keep last value Yes Yes
Diagnostics: short circuit Behavior on CPU/Master STOP, channel-wise Alarms/diagnostics/status information Status indicator Substitute values connectable Alarms • Alarms • Diagnostic alarm	yes yes	yes	yes Substitute a value/keep last value Yes	yes Substitute a value/keep last value Yes
Behavior on CPU/Master STOP, channel-wise Alarms/diagnostics/status information Status indicator Substitute values connectable Alarms • Alarms • Diagnostic alarm	yes	•	Substitute a value/keep last value Yes	Substitute a value/keep last value Yes
STOP, channel-wise Alarms/diagnostics/status information Status indicator Substitute values connectable Alarms • Alarms • Diagnostic alarm		yes	last value Yes	Yes
information Status indicator Substitute values connectable Alarms • Alarms • Diagnostic alarm	Yes			
connectable Alarms • Alarms • Diagnostic alarm	Yes		Yes	Yes
Alarms Diagnostic alarm	Yes			
Diagnostics		Yes	No Yes; parameterizable	Yes; parameterizable
Diagnostic functions Diagnostic information readable Wire break Short circuit	Yes Yes; R > 10 kOhm, I < 100 µA Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes Yes; R > 10 kOhm, I < 100 µA Yes; R< 800 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes; R > 10 kOhm, I < 100 µA Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes; R > 10 kOhm, I < 100 μA Yes; R < 80 Ohm
diagnostic indication LED Group error SF (red) Status indicator digital output (green)	Yes Yes	Yes Yes	Yes Yes; per channel	Yes Yes; per channel
Galvanic isolation Galvanic isolation digital outputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+			No Yes Yes	No Yes Yes
Permissible potential difference				
between different circuits			60 V DC/30 V AC	60 V DC/30 V AC
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia
Type of protection acc. to KEMA	Not relevant	Not relevant	04 ATEX 1249	04 ATEX 1249
Dimensions and weight Dimensions • Width • Height • Depth	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm
Weight • Weight, approx.	255 g	255 g	255 g	255 g

Digital electronic modules

	6ES7 132-7HB00-0AB0
	6ES7 132-7HB00-0AB0
Current consumption from load voltage L+ (without load), max.	120 mA
Current consumption/ power loss Power loss, typ.	1 W
Digital outputs Quantity/binary outputs	2
Functionality/short-circuit strength	Yes
Output current • for signal "1" rated value	2 A
Output delay with resistive load • 0 to "1", max. • 1 to "0", max.	8 ms 3 ms
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No No
Switching frequency • with resistive load, max. • with inductive load, max.	0.5 Hz; see data in manual 0.2 Hz; see data in manual
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 500 m
Relay outputs Switching capacity of contacts at ohmic load, up to 60 °C, max. thermal continuous current, max.	2 A; see data in manual 2 A; see data in manual
Ex(i) characteristics Max. values of output circuits (per channel) • Uo (output no-load voltage), max. • Um (fault voltage), max. • Ta (permissible ambient temperature), max.	60 V 250 V 70 °C

	6ES7 132-7HB00-0AB0
Alarms/diagnostics/status information	
Substitute values connectable	Yes
Alarms • Alarms • Diagnostic alarm • Process alarm	No Yes No
Diagnostics Diagnostic information readable Wire break Short circuit	Yes No; cannot be determined in contact power circuit No; cannot be determined in contact power circuit
diagnostic indication LED Group error SF (red) Status indicator digital output (green)	Yes Yes; per channel
Galvanic isolation Galvanic isolation digital outputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+	Yes Yes Yes; channels and power bus
Standards, approvals, certificates CE mark	Yes
Type of protection acc. to EN 50020 (CENELEC)	II 2 G and I M2 Ex eibmb IIC T4; Ex eibmb I
Type of protection acc. to KEMA	07 ATEX 0180
Dimensions and weight Dimensions and weight • Width • Height • Depth	30 mm 129 mm 136.5 mm
Weight • Weight, approx.	280 g

	6ES7 193-7CA00-0AA0	6ES7 193-7CA10-0AA0	6ES7 193-7CB00-0AA0
Standards, approvals, certificates			
CE mark	No	No	Yes
Type of protection acc. to EN 50020 (CENELEC)	No	No	II 2 G and I M2 Ex deib IIC T4; Ex deib I
Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions and weight Dimensions and weight			
• Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm
Weight			
 Weight, approx. 	275 g	275 g	340 g

Digital electronic modules

Ordering data	Order No.		Order No.
Digital input modules		Labeling sheet	
8 x DI Namur		DIN A4, perforated, each	
Digital input module 8 DI NAMUR	6ES7 131-7RF00-0AB0	 consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151 	
Digital output modules for EEX i		• petrol	6ES7 193-7BH00-0AA0
4 x DO; 1 additional intrinsically		• red	6ES7 193-7BD00-0AA0
safe input for "H" shut-off		• yellow	6ES7 193-7BB00-0AA0
Digital output module 4 DO 23.1 V DC/20 mA	6ES7 132-7RD01-0AB0	• light beige Labels. inscribed	6ES7 193-7BA00-0AA0
	6ES7 132-7RD11-0AB0	Ordering unit 1 set with 200 units each for slot numbering	
Digital output module 4 DO 17.4 V DC/40 mA	6ES7 132-7RD22-0AB0	• 10 x slots 1 to 2 • 5 x slots 1 to 40	8WA8 861-0AB 8WA8 861-0AC
4 x DO; 1 additional intrinsically		Labels, blank	8WA8 848-2AY
safe input for "L" shut-off		Ordering unit 1 set with 200 units	
Digital output module 4 DO 23.1 V DC/20 mA	6ES7 132-7GD00-0AB0	each for slot numbering	
	CEC7 100 70D10 04D0	S7-300 mounting rails	
Digital output module 4 DO 17.4 V DC/27 mA	6ES7 132-7GD10-0AB0	Standard rail 585 mm	6ES7 390-1AF85-0AA0
Digital output module 4 DO 17.4 V DC/40 mA	6ES7 132-7GD21-0AB0	Standard rail 885 mm	6ES7 390-1AJ85-0AA0
	6ES7 132-7GD30-0AB0	Stainless steel enclosure IP66 for hazardous zone 1 in	
4 DO 25.4 V DC/22 mA	0201 102 1 GB00 0AB0	protection class EEx e	
Digital output modules for EEX e		Empty enclosure without instal- lation of modules, for use in	
Digital output module 2 DO relay, 60 V UC, 2 A	6ES7 132-7HB00-0AB0	gaseous area, IP65 (IP54 when using a breather gland)	
Terminal modules		Wall enclosure 650 x 450 x 230, for installation of max.	6DL2 804-0AD30
TM-EM/EM60S	6ES7 193-7CA00-0AA0	15 ET 200iSP modules, for use in	
For accommodating all electronic modules except 2 DO relay; screw-type terminals		gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs	ODI 0 004 04 DE0
TM-EM/EM60C	6ES7 193-7CA10-0AA0	 Wall enclosure 650 x 450 x 230, for installation of max. 	6DL2 804-0AD50
For accommodating all electronic modules except 2 DO relay; spring-loaded terminals		15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230.	6DL2 804-0AE30
TM-RM/RM 60S	6ES7 193-7CB00-0AA0	for installation of max.	ODEZ OUT-UMESU
For accommodating digital output module 2 DO relay and spare modules; screw-type terminal		25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	
Accessories		 Wall enclosure 950 x 450 x 230, 	6DL2 804-0AE50
ET 200iSP manual		for installation of max. 25 ET 200iSP modules, for use in	
• German	6ES7 152-1AA00-8AA0	gaseous area, with 5 rows of M16	
English	6ES7 152-1AA00-8BA0	cable entries (111 units)	
Connectors			
PROFIBUS connector with active terminating resistor	6ES7 972-0DA60-0XA0		
For RS 485-IS circuit; 1.5 Mbit/s			
RS 485-IS coupler	6ES7 972-0AC80-0XA0		
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS			

Digital electronic modules

Ordering data	Order No.		Order No.
Empty enclosure without installation of modules, for use in dusty area, IP65 • Wall enclosure 650 x 450 x 230.	6DL2 804-0DD30	Enclosure with installation of modules, for use in dusty area, IP65; the ET 200iSP components must be ordered separately	
for installation of max. 15 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs		Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (41 units) and	6DL2 804-1DD30
Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (66 units)	6DL2 804-0DD50	2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in dusty area, with 5 rows of M16	6DL2 804-1DD50
Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs Wall-restriction of the cable of the cable entries (100 miles).	6DL2 804-0DE30	cable entries (66 units) • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-1DE30
Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (111 units)	6DL2 804-0DE50	Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in dusty area, with 5 rows of M16	6DL2 804-1DE50
Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately		- cable entries (111 units)	
Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs	6DL2 804-1AD30		
Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)	6DL2 804-1AD50		
Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-1AE30		
Wall enclosure 950 x 450 x 230, for installation of max. 5 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)	6DL2 804-1AE50		

Analog electronic modules

Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals)
- When plugged in, the modules are automatically uniquely coded mechanically
- Modules can be replaced under potentially explosive conditions during runtime

Technical specifications

	6ES7 134-7SD00-0AB0	6ES7 134-7SD51-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
Supply voltages Power supply to the transmitters				
short-circuit proofsupply current, max.			Yes 23 mA; per channel	
Current consumption			000 4	
from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
Current consumption/ power loss				
Power loss, typ.	0.4 W	0.4 W	2.7 W	0.4 W
Analog inputs Number of analog inputs	4	4	4	4
Cable length, shielded, max.	50 m	500 m	500 m	500 m
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
 Voltage 	Yes	No	No	No
Current	No	No	Yes	Yes
Thermocouple	Yes	No	No	No
Resistance thermometer	No	Yes	No	No
Resistance	No	Yes	No	No
Input ranges (rated values), voltages				
• -80 mV to +80 mV	Yes			
 Input resistance (-80 mV to +80 mV) 	1 000 kΩ			
Input ranges (rated values), currents				
• 4 to 20 mA			Yes	Yes; min. 295 Ohm

Analog electronic modules

	6ES7 134-7SD00-0AB0	6ES7 134-7SD51-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
Input ranges (rated values), thermoelements				_
• Type B	Yes			
Input resistance (Type B)	1 000 kΩ			
• Type C	Yes			
Input resistance (Type C)	1 000 kΩ			
• Type E	Yes			
Input resistance (Type E)	1 000 kΩ			
• Type J	Yes			
Input resistance (type J)	1 000 kΩ			
• Type K	Yes			
Input resistance (Type K)	1 000 kΩ			
• Type L	Yes			
Input resistance (Type L)	1 000 kΩ			
• Type N	Yes			
Input resistance (Type N)	1 000 kΩ			
• Type R	Yes			
Input resistance (Type R)	1 000 kΩ			
• Type S	Yes			
Input resistance (Type S)	1 000 kΩ			
• Type T	Yes			
Input resistance (Type T)	1 000 kΩ			
• Type U	Yes			
Input resistance (Type U)	1 000 kΩ			
Input ranges (rated values),				
resistance thermometers				
• Ni 100		Yes		
• Input resistance (Ni 100)		2 000 kΩ		
• Pt 100		Yes		
Input resistance (Pt 100)		2 000 kΩ		
Input ranges (rated values),				
resistors		.,		
• 0 to 600 Ohm		Yes; also 1000 Ohm		
• Input resistance		1 000 kΩ		
(0 to 600 Ohm)				
Current input				
permissible input current			90 mA	50 mA
for current input (destruction limit), max.				
Characteristic linearization	V	V		
parameterizable	Yes	Yes		
• for thermocouples	1			
for resistance thermometer		yes		
Temperature compensation				
internal temperature compen- action				
sation	sensor module			
external temperature compensation with compen-	Yes; via temperature value, acquired by an analog			
sations socket	module of the same			
	ET 200iSP station			

Analog electronic modules

0-0AB0 6ES7 134-7TD50-0AB0
na-Delta) integrating (Sigma-Delta)
12 bit; + sign
Yes
30
50 / 60 Hz
Yes; in 4 stages
ne Yes; 1 x cycle time
ne Yes; 4 x cycle time me Yes; 32 x cycle time
me Yes; 64 x cycle time
, ,
Yes
+/- 0.015 %
+/- 0.005 %/K
-50 dB
+/- 0.01 %
+/- 0.15 %

Analog electronic modules

recunical specifications (continued)			
	6ES7 134-7SD00-0AB0	6ES7 134-7SD51-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
Basic error limit (operational limit at 25 °C) • Voltage, relative to input area • Current, relative to input area • Resistance-type thermometer, relative to input area	+/- 0.1 %	+/- 0.1 %; applies for resistances standard +/- 0.5K climatic +/- 0.2K	+/- 0.1 %	+/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency • Series mode interference (peak value of interference < rated value of input range), min. • Common mode interference,	70 dB 90 dB	70 dB 90 dB	70 dB	70 dB
min.				
Alarms/diagnostics/status information Alarms • Diagnostic alarm • Limit value alarm	Yes; parameterizable Yes; parameterizable	Yes Yes	Yes; parameterizable Yes; parameterizable	Yes; parameterizable Yes; parameterizable
Diagnostics	roo, parametenzasie		roo, parametenzasie	roo, parametenzasio
Diagnostic information readable	Yes	Yes	Yes	Yes
Wire breakShort circuitGroup error		Yes Yes Yes	Yes Yes	Yes
Diagnostic indication LED • Group error SF (red)	Yes	Yes	Yes	Yes
Galvanic isolation Galvanic isolation analog inputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+	Yes; functional, yes Yes	No Yes Yes; channels and Power Bus	No Yes	No Yes
Standards, approvals,				
certificates CE mark	Yes	Yes	Yes	Yes
Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
Type of protection acc. to KEMA	04 ATEX 1246	04 ATEX 1247	04 ATEX 1244	04 ATEX 1245
Dimensions and weight Dimensions and weight • Width • Height • Depth	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm	30 mm 129 mm 136.5 mm
Weight • Weight, approx.	230 g	230 g	230 g	230 g

ET 200iSP

Analog electronic modules

	6ES7 135-7TD00-0AB0
Current consumption	
from load voltage1L+, max.	330 mA
Power losses	
Power loss, max.	2.7 W
Analog outputs	
Number of analog outputs	4
Cable length, shielded, max.	500 m
Output ranges, current	
• 4 to 20 mA	Yes
Connection of actuators	
for current output 2-conductor connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
Analog value creation	
Integrations and conversion time/	
resolution per channel	
Resolution with overrange (bit is a leafly as	14 bit
(bit including sign), max.	
Settling time	4
for resistive load for capacitive load	4 ms 40 ms
for inductive load	40 ms
Errors/accuracies	40 1110
Linearity error (relative to output	+/- 0.015 %
area)	1, 0.010 /0
Temperature error	+/- 0.005 %/K
(relative to output area)	
Crosstalk between the outputs, min.	-50 dB
Repeat accuracy in settled status at	+/- 0.01 %
25 °C (relative to output area)	

	6ES7 135-7TD00-0AB0
Operational limit in overall temperature range	
 Current, relative to output area 	+/- 0.15 %
Basic error limit (operational limit at 25 °C)	
Current, relative to output area	+/- 0.1 %
Alarms/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
Diagnostic alarm	Yes
Diagnostics Diagnostic information readable Wire break Short circuit	Yes Yes Yes
Diagnostics indication LED • Group error SF (red)	Yes
Galvanic isolation Galvanic isolation analog outputs • between the channels • between the channels and the backplane bus	No Yes
Standards, approvals, certificates Type of protection acc. to	II2 G (1) GD Ex ib[ia] IIC T4 and
EN 50020 (CENELEC)	M2 Ex ib[ia] I
Type of protection acc. to KEMA	04 ATEX 1250
Dimensions and weight Dimensions	
• Width	30 mm
Height	129 mm
Depth	136.5 mm
Weight	
 Weight, approx. 	265 g

	6ES7 193-7CA00-0AA0	6ES7 193-7CA10-0AA0	6ES7 193-7CB00-0AA0
Standards, approvals, certificates			
CE mark	No	No	Yes
Type of protection acc. to EN 50020 (CENELEC)	No	No	II 2 G and I M2 Ex deib IIC T4; Ex deib I
Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions and weight			
Dimensions and weight			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm
Weight			
 Weight, approx. 	275 g	275 g	340 g

Analog electronic modules

Ordering data	Order No.		Order No.
Analog input modules		Stainless steel enclosure IP66	
4 AI I 2WIRE HART	6ES7 134-7TD00-0AB0	for hazardous zone 1 in protection class EEx e	
4 AI I 4WIRE HART	6ES7 134-7TD50-0AB0	Empty enclosure without instal-	
4 AI RTD	6ES7 134-7SD51-0AB0	lation of modules, for use in a	
4 AI TC	6ES7 134-7SD00-0AB0	gaseous area, IP65 (IP54 when using a breather gland)	
Analog output modules		• Wall enclosure 650 x 450 x 230,	6DL2 804-0AD30
4 AO I HART	6ES7 135-7TD00-0AB0	for installation of max. 15 ET 200iSP modules, for use in	
Terminal modules		a gaseous area, with 3 rows of	
TM-EM/EM60S	6ES7 193-7CA00-0AA0	M16 cable entries (41 units) and 2 rows of blanking plugs	
Terminal module E60S (screw-type terminal)		 Wall enclosure 650 x 450 x 230, for installation of max. 	6DL2 804-0AD50
TM-EM/EM60C	6ES7 193-7CA10-0AA0	15 ET 200iSP modules, for use in a gaseous area, with 5 rows of	
Terminal module E60C		M16 cable entries (66 units)	ODI 0 004 04500
(spring-loaded terminal)		 Wall enclosure 950 x 450 x 230, for installation of max. 	6DL2 804-0AE30
Accessories		25 ET 200iSP modules, for use in	
ET 200iSP manual • German	6ES7 152-1AA00-8AA0	a gaseous area, with 3 rows of M16 cable entries (68 units) and	
English	6ES7 152-1AA00-8AA0	2 rows of blanking plugs	CDI 0 004 04 550
Connectors		 Wall enclosure 950 x 450 x 230, for installation of max. 	6DL2 804-0AE50
PROFIBUS connector with active terminating resistor	6ES7 972-0DA60-0XA0	25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)	
For RS 485-IS circuit; 1.5 Mbit/s		Empty enclosure without instal-	
RS 485-IS coupler	6ES7 972-0AC80-0XA0	lation of modules, for use in a	
Isolating transformer for coupling		dusty area, IP65 • Wall enclosure 650 x 450 x 230,	6DL2 804-0DD30
of PROFIBUS DP and PROFIBUS RS 485-IS		for installation of max. 15 ET 200iSP modules, for use in	6DL2 804-0DD30
Labeling sheet		a dusty area, with 3 rows of M16	
DIN A4, perforated, each		cable entries (41 units) and 2 rows of blanking plugs	
consisting of 10 sheets of 30 strips each, used for electronic modules		• Wall enclosure 650 x 450 x 230,	6DL2 804-0DD50
and 20 strips, used for IM 151		for installation of max. 15 ET 200iSP modules, for use in	
• petrol	6ES7 193-7BH00-0AA0	a dusty area, with 5 rows of M16	
redyellow	6ES7 193-7BD00-0AA0 6ES7 193-7BB00-0AA0	cable entries (66 units) • Wall enclosure 950 x 450 x 230,	6DL2 804-0DE30
light beige	6ES7 193-7BA00-0AA0	for installation of max.	12 EL 00 / 02 E00
Labels, inscribed		25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16	
Ordering unit 1 set with 200 units		cable entries (68 units) and	
each for slot numbering	014/4.0.004.0.4.D	2 rows of blanking plugs • Wall enclosure 950 x 450 x 230,	6DL2 804-0DE50
10 x slots 1 to 25 x slots 1 to 40	8WA8 861-0AB 8WA8 861-0AC	for installation of max.	
Labels, blank	8WA8 848-2AY	25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16	
Ordering unit 1 set with 200 units	OWNO OTO ENI	cable entries (111 units)	
each for slot numbering			
S7-300 mounting rails			
Standard rail 585 mm	6ES7 390-1AF85-0AA0		
Standard rail 885 mm	6ES7 390-1AJ85-0AA0		

Analog electronic modules

Ordering data	Order No.		Order No.
Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)	6DL2 804-1AD30 6DL2 804-1AD50 6DL2 804-1AE30 6DL2 804-1AE50	Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components must be ordered separately • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)	6DL2 804-1DD30 6DL2 804-1DD50 6DL2 804-1DE30 6DL2 804-1DE50
 2 rows of blanking plugs Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units) Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in 	6DL2 804-1AE30	for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16	6DL2 804-1DE30

ET 200iSP

Fail-safe electronic modules F digital input module

Overview



- Digital inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 8 F-DI Ex NAMUR has the following features:

- Suitable for the connection of encoders from the hazardous area
- 8 inputs 1-channel (SIL2/Category 3/PLe) or 4 inputs 2-channel (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Suitable for the following sensors:
 - According to IEC 60947-5-6 or NAMUR (with diagnostic evaluation)
 - Wired mechanical contacts (with diagnostic evaluation)
- Unwired mechanical contacts (with deactivated diagnostics)
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- Channel-selective passivation
- Supports time stamping
- Can only be used in safety mode

Technical specifications

	6ES7 138-7FN00-0AB0
Current consumption	
from supply voltage L+, max.	150 mA; (int. power bus)
Power losses	
Power loss, typ.	1.4 W
Address area	
Occupied address area	
Outputs	4 byte
• Inputs	6 byte
FH technology	
Module for fail-safe applications	Yes
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Input current	
• for signal "1", typ.	9.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", min.	0.7 ms
- at "0" to "1", max.	16 ms; Parameterizable
- at "1" to "0", min.	0.7 ms
- at "1" to "0", max.	16 ms; Parameterizable
Cable length	
 Cable length, shielded, max. 	500 m
Cable length unshielded, max.	200 m
Encoder supply	
Number of outputs	8
Output voltage	8 V DC

	6ES7 138-7FN00-0AB0
Encoder Number of connectable encoders, max.	8
Connectable encoders NAMUR encoder	Yes
NAMUR encoder • Input current, for signal "0", max. • Input current, for signal "1", min.	1.2 mA 2.1 mA
Parameter Diagnostics: wire break	Channel by channel
Diagnostics: short circuit	Channel by channel
Alarms/diagnostics/status information Status indicator	Yes
Alarms • Diagnostic alarm • Process alarm	Yes; Parameterizable No
Diagnostics • Diagnostic functions • Diagnostic information readable • Wire break • Short circuit	Yes Yes Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor Yes; R load < 150 Ohm with NAMUR sensor/sensor and NAMUR changeover contact/ sensor to DIN 19234
Diagnostic indication LED • Group error SF (red)	Yes

ET 200iSP

Fail-safe electronic modules F digital input module

Technical specifications (continued)

•	,
	6ES7 138-7FN00-0AB0
Isolation	
Isolation checked with	350 V AC/1 min between the shield and backplane bus connection 350 V AC/1 min between the shield and I/O 2830 V AC/1 min between backplane bus connection and I/O
Galvanic isolation	
between the channels and backplane bus	Yes
Galvanic isolation digital inputs	
 between the channels 	No
 between the channels and the backplane bus 	Yes
Permissible potential difference	
between different circuits	60 V DC / 30 V AC
Standards, approvals, certificates	
CE mark	Yes

	6ES7 138-7FN00-0AB0
Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 Gb and I M2 Ex ib[ia Ma] I Mb
Type of protection acc. to KEMA	10 ATEX 0056
Highest safety class achievable in safety mode acc. to EN 954 acc. to IEC 61508 Performance level acc. to EN ISO 13849-1	Cat. 3 (single-channel), Cat. 4 (two-channel) SIL 3 PLe
Dimensions and weight Dimensions • Width • Height • Depth	30 mm 129 mm 136.5 mm
Weight • Weight, approx.	288 g

Ordering data	Order No.		Order No.
F digital input modules		Labels, inscribed	
8 F-DI Ex NAMUR	6ES7 138-7FN00-0AB0	Ordering unit: 1 set with 200 units	
Terminal modules		each for slot numbering • 10 x slots 1 to 2	8WA8 861-0AB
TM-EM/EM60S	6ES7 193-7CA00-0AA0	• 5 x slots 1 to 40	8WA8 861-0AC
Terminal module E60S (screw-type terminal)		Labels, not inscribed	8WA8 848-2AY
TM-EM/EM60C	6ES7 193-7CA10-0AA0	 Ordering unit: 1 set with 200 units each for slot numbering 	
Terminal module E60C (spring-loaded terminal)		Distributed Safety V5.4 programming tool	
Accessories		Task: Software for configuring fail-	
ET 200iSP Manual • German • English	6ES7 152-1AA00-8AA0 6ES7 152-1AA00-8BA0	safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirements: STEP 7 V5.3 SP3 and higher	
Cable connector		Floating License	6ES7 833-1FC02-0YA5
PROFIBUS cable connector with active terminating resistor	6ES7 972-0DA60-0XA0	Software Update Service (requires current software	6ES7 833-1FC00-0YX2
For RS 485-IS electric circuit; 1.5 Mbit/s		version) S7 F Systems RT License	6ES7 833-1CC00-6YX0
RS 485-IS coupler	6ES7 972-0AC80-0XA0	For processing safety-related	
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS		user programs, for one AS 412F/ FH, AS 414F/FH or AS 417F/FH	
Labeling sheet			
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151			
• petrol • red	6ES7 193-7BH00-0AA0		
• red • yellow	6ES7 193-7BD00-0AA0 6ES7 193-7BB00-0AA0		
• light beige	6ES7 193-7BA00-0AA0		

Fail-safe electronic modules F digital input module

Ordering data	Order No.		Order No.
S7 F Systems V6.1	6ES7 833-1CC02-0YA5	SIMATIC Safety Matrix Editor J V6.2	6ES7 833-1SM42-0YA5
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License		Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment	
for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2		1 language (English), executes with Windows 2000 Professional or Windows XP Professional,	
2 languages (German, English)		single license for 1 installation	
Type of delivery: Certificate of License as well as software and electronic documentation on CD		Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD	
SIMATIC Safety Matrix Tool V6.2 Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment		SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels	
Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels		2 languages (English/German), runs under Windows 2000 Profes- sional, Windows XP Professional, Windows 2003 Server Type of delivery: Certificate of License and authorization	
1 language (English), executes with Windows XP Professional,		diskette; software and electronic documentation on CD	
Type of delivery: Certificate of License and authorization		Floating License for 1 installation J	6ES7 833-1SM62-0YA5
diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD		Floating License upgrade from J V6.x to V6.2	6ES7 833-1SM62-0YE5
Floating License for 1 installation J	6ES7 833-1SM02-0YA5		
Floating License upgrade from J V5.x/V6.x to V6.2	6ES7 833-1SM02-0YE5		

ET 200iSP

Fail-safe electronic modules F digital output module

Overview



- Digital outputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 4 F-DO Ex 17.4 V/40 mA has the following properties:

- Suitable for the connection of actuators from the hazardous area
- 4 outputs, PP-switching (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Max. output current 40 mA
- Rated load voltage 17.4 V DC
- Short-circuit, overload and wire-break monitoring
- Suitable for Ex i solenoid valves, DC current relays and actuators
- To increase the power rating, two digital outputs can be connected in parallel for one actuator
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- · Channel-selective passivation
- Can only be used in safety mode

Technical specifications

	6ES7 138-7FD00-0AB0
Current consumption from load voltage L+ (without load), max.	510 mA; (int. power bus)
Power losses Power loss, typ.	5.3 W; max.
Digital outputs Number of digital outputs	4
Short-circuit protection • Response threshold, typ.	Yes Depending on the "short-circuit level" parameter
Controlling a digital input	No
No-load voltage Uao (DC)	17.4 V
Internal resistor Ri	167 Ω
Trend key points E • Voltage Ue (DC) • Current le	10 V 40 mA
Output voltage • for signal "1", min.	max. 17.4 V
Output current • for signal "0" residual current, max.	10 μΑ
Parallel switching of 2 outputs • for increased power • for redundant control of a load	Yes No
Switching frequency • with resistive load, max. • with inductive load, max.	30 Hz 2 Hz
Load resistance range lower limit upper limit	270 Ω 18 kΩ
Cable length Cable length, shielded, max. Cable length unshielded, max.	500 m 500 m

	6ES7 138-7FD00-0AB0
Parameter	
Diagnosis: wire break	yes
Diagnosis: short circuit	yes
Alarms/diagnostics/status information	
Status indicator	Yes
Substitute values connectable	Yes
Alarms • Diagnostic alarm	Yes; Parameterizable
Diagnostics • Diagnostic information readable • Wire break • Short circuit	Yes Yes Yes
Diagnostic indication LED • Group error SF (red) • Status indicator digital output (green)	Yes Yes
Isolation Isolation checked with	370 V for 1 min
Galvanic isolation Galvanic isolation digital outputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+	No Yes Yes
Permissible potential difference between different circuits	60 V DC/30 V AC

ET 200iSP

Fail-safe electronic modules F digital output module

Technical specifications (continued)

	6ES7 138-7FD00-0AB0
Standards, approvals, certificates	
CE mark	Yes
Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
Type of protection acc. to KEMA	10 ATEX 0057
Highest safety class achievable in safety mode acc. to EN 954 acc. to IEC 61508 Performance level acc. to EN ISO 13849-1	Up to Cat. 4 SIL 3 PLe

	6ES7 138-7FD00-0AB0
Dimensions and weight	
Dimensions	
Width	30 mm
Height	129 mm
• Depth	136.5 mm
Weight	
 Weight, approx. 	285 g

Ordering data	Order No.
Digital output module	
4 F-DO Ex 17.4 V/40 mA	6ES7 138-7FD00-0AB0
Terminal modules	
TM-EM/EM60S	6ES7 193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM60C	6ES7 193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
Accessories	
ET 200iSP Manual German English	6ES7 152-1AA00-8AA0 6ES7 152-1AA00-8BA0
Cable connector	
PROFIBUS cable connector with active terminating resistor	6ES7 972-0DA60-0XA0
For RS 485-IS electric circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7 972-0AC80-0XA0
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheet	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151 • petrol • red • yellow • light beige	6ES7 193-7BH00-0AA0 6ES7 193-7BD00-0AA0 6ES7 193-7BB00-0AA0 6ES7 193-7BA00-0AA0

ET 200iSP

Fail-safe electronic modules F digital output module

Ordering data	Order No.		Order No.
S7 F Systems V6.1	6ES7 833-1CC02-0YA5	SIMATIC Safety Matrix Editor J	6ES7 833-1SM42-0YA5
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License		V6.2 Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment	
for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2		1 language (English), executes with Windows 2000 Professional or Windows XP Professional,	
2 languages (German, English)		single license for 1 installation	
Type of delivery: Certificate of License as well as software and electronic documentation on CD		Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD	
SIMATIC Safety Matrix Tool V6.2		SIMATIC Safety Matrix Viewer	
Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment		V6.2 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several	
Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels		operator control levels 2 languages (English/German), runs under Windows 2000 Profes- sional, Windows XP Professional, Windows 2003 Server Type of delivery: Certificate of License and authorization	
1 language (English), executes with Windows XP Professional,		diskette; software and electronic documentation on CD	
Type of delivery: Certificate of		Floating License for 1 installation J	6ES7 833-1SM62-0YA5
License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD		Floating License upgrade from J V6.x to V6.2	6ES7 833-1SM62-0YE5
Floating License for 1 installation J	6ES7 833-1SM02-0YA5		
Floating License upgrade from J V5.x/V6.x to V6.2	6ES7 833-1SM02-0YE5		

ET 200iSP

Fail-safe electronic modules F analog input module

Overview



- Analog inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The analog electronic module 4 F-AI Ex HART has the following properties:

- Suitable for the connection of encoders from the hazardous
- 4 analog inputs 1-channel (SIL2/Cat.3/PLe) or 4 inputs 2-channel (SIL3/Category 4/PLe, with two 4 F-AI Ex HART
- Electrical isolation between channels and the backplane bus
- Input ranges:0 to 20 mA4 to 20 mA
- Suitable for the following sensors:
 - 2-wire transducers
 - HART field devices
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- HART communication (HART protocol versions 5, 6, 7)
- Firmware update
- Identification data I&M
- Can only be used in safety mode

Technical specifications

	6ES7 138-7FA00-0AB0
Supply voltages Power supply to the transmitters • short-circuit proof • Supply current, max.	Yes 25 mA; Plus 4 mA per channel
Current consumption from supply voltage L+, max.	490 mA; (int. power bus)
Power losses Power loss, typ.	5.4 W; max.
Address area Address space per module • Address space per module, max.	16 byte; 12 byte in the I area / 4 byte in the O area
Analog inputs Number of analog inputs	4
Cable length, shielded, max.	500 m
Cycle time (all channels) max.	See data in manual
Technical unit for temperature measurement adjustable • Voltage • Current • Thermocouple • Resistance thermometer • Resistance	No Yes No No No
Input ranges (rated values), currents • 4 to 20 mA	Yes; and 0 to 20 mA
Analog value creation Measurement principle	integrating (Sigma-Delta)

	6ES7 138-7FA00-0AB0
Integrations and conversion time/ resolution per channel	
 Resolution with overrange (bit including sign), max. 	16 bit
Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz	Yes 50 / 60 Hz
Smoothing of measured values • parameterizable • Step: None • Step: Low • Step: Medium • Step: High	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time
Encoder Connection of signal encoders • for current measurement as 2-wire transducer • burden of 2-wire transmitter, max.	Yes 750 Ω
Errors/accuracies Linearity error (relative to input area)	+/- 0.015 %
Temperature error (relative to input area)	+/- 0.005 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.015%

ET 200iSP

Fail-safe electronic modules F analog input module

Technical specifications (continued)

6ES7 138-7FA00-0AB0
+/- 0.35%
+/- 0.1 %
40 dB
50 dB
Yes; Parameterizable
Yes Yes Yes
Yes
No Yes Yes; Power bus

	6ES7 138-7FA00-0AB0
Permissible potential difference	
between the inputs (UCM)	60 V DC / 30 V AC
Standards, approvals, certificates	
CE mark	Yes
Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
Type of protection acc. to KEMA acc. to EN 954	10 ATEX 0058 Cat. 3 (single-channel), Cat. 4 (two-channel)
• acc. to IEC 61508	SIL 3
 Performance level acc. to EN ISO 13849-1 	PLe
Dimensions and weight	
Dimensions	
Width	30 mm
• Height	129 mm
Depth	136.5 mm
Weight	
 Weight, approx. 	299 g

Ordering data	Order No.
F analog input module	
4 F-AI Ex HART	6ES7 138-7FA00-0AB0
Terminal modules	
TM-EM/EM60S	6ES7 193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM60C	6ES7 193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
Accessories	
ET 200iSP Manual • German • English	6ES7 152-1AA00-8AA0 6ES7 152-1AA00-8BA0
Cable connector	
PROFIBUS cable connector with active terminating resistor	6ES7 972-0DA60-0XA0
For RS 485-IS electric circuit; 1.5 Mbit/s	

	Order No.
RS 485-IS coupler	6ES7 972-0AC80-0XA0
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheet	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151 • petrol • red • yellow • light beige	6ES7 193-7BH00-0AA0 6ES7 193-7BD00-0AA0 6ES7 193-7BB00-0AA0 6ES7 193-7BA00-0AA0
Labels, inscribed	
Ordering unit: 1 set with 200 items each for slot numbering • 10 x slots 1 to 2 • 5 x slots 1 to 40	8WA8 861-0AB 8WA8 861-0AC

ET 200iSP

Fail-safe electronic modules F analog input module

Ordering data	Order No.	Order No.	
Labels, not inscribed	8WA8 848-2AY	SIMATIC Safety Matrix Tool V6.2	
Ordering unit: 1 set with 200 units each for slot numbering		Creation, configuration, compi- lation, loading and online monitoring of the Safety Matrix in	
Distributed Safety V5.4 programming tool		a SIMATIC PCS 7 environment	
Task: Software for configuring fail- safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirements: STEP 7 V5.3 SP3 and higher		Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels	
Floating License	6ES7 833-1FC02-0YA5	1 language (English), executes with Windows XP Professional.	
Software Update Service (requires current software version)	6ES7 833-1FC00-0YX2	Type of delivery: Certificate of License and authorization diskette for Safety Matrix Tool and	
S7 F Systems RT License For processing safety-related	6ES7 833-1CC00-6YX0	Safety Matrix Viewer; software and electronic documentation on	
user programs, for one AS 412F/ FH, AS 414F/FH or AS 417F/FH		CD Floating License for 1 installation J	6ES7 833-1SM02-0YA5
S7 F Systems V6.1	6ES7 833-1CC02-0YA5	Floating License upgrade from J V5.x/V6.x to V6.2	6ES7 833-1SM02-0YE5
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2 2 languages (German, English) Type of delivery: Certificate of License as well as software and electronic documentation on CD		SIMATIC Safety Matrix Editor V6.2 Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment 1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD	6ES7 833-1SM42-0YA5
		SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels 2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD Floating License for 1 installation J Floating License upgrade from J V6.x to V6.2	6ES7 833-1SM62-0YA5 6ES7 833-1SM62-0YE5

ET 200iSP

ET 200iSP watchdog module

Overview



- The watchdog module will be plugged onto the (to be ordered separately) associated terminal module (screw connection or spring-loaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

Technical specifications

	6ES7 138-7BB00-0AB0
Supply voltages	
Rated value	
• permissible range, lower limit (DC)	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Digital inputs	
Number of inputs	0
Dimensions and weight	
Dimensions	
Width	30 mm
Height	129 mm
• Depth	136,5 mm

Ordering data		Order No.
Watchdog module	Ι	6ES7 138-7BB00-0AB0
Terminal modules		
TM-EM/EM60S	I	6ES7 193-7CA00-0AA0
Terminal module E60S (screw-type terminal)		
TM-EM/EM60C	Ι	6ES7 193-7CA10-0AA0
Terminal module E60S (spring- loaded terminal)		
Accessories		
ET 200iSP product manual • German • English		6ES7 152-1AA00-8AA0 6ES7 152-1AA00-8BA0

Connectors	
PROFIBUS connector with	6ES7 972-0DA60-0XA0
active termination resistor	0E37 972-0DA00-0XA0
for RS485-IS circuit; 1.5 Mbit/s	
	6ES7 972-0AC80-0XA0
RS 485-IS Coupler	0ES/ 9/2-UAC60-UAA0
Isolating transformer for coupling from PROFIBUS DP	
and	
PROFIBUS RS 485-IS	
Labeling sheet	
DIN A4, perforated, each	
consisting of 10 sheets of 30	
strips each, used for electronic	
modules and 20 strips, used for IM 151	
• petrol	6ES7 193-7BH00-0AA0
• red	6ES7 193-7BD00-0AA0
• yellow	6ES7 193-7BB00-0AA0
• light beige	6ES7 193-7BA00-0AA0
Labels, inscribed	
Ordering unit 1 set with 200 units	
each for slot numbering	
• 10 x slots 1 to 2	8WA8 861-0AB
• 5 x slots 1 to 40	8WA8 861-0AC
Labels, blank	8WA8 848-2AY
Ordering unit 1 set with 200 units each for slot numbering	
S7-300 mounting rail	
Standard rail 585 mm	6ES7 390-1AF85-0AA0
Standard rail 885 mm	6ES7 390-1AJ85-0AA0
Stainless steel enclosure IP66	
for Ex-Zone 1 in protection class EEx e,	
Empty housing without instal-	
lation of modules, for use in a	
gaseous area, IP65 (IP54 when using a breather gland)	
• Wall housing 650 x 450 x 230,	6DL2 804-0AD30
for installation of max.	
15 ET 200iSP modules, for use	
in a gaseous area, with 3 rows of M16 cable glands	
(41 units) and 2 rows of	
blanking plugs	
• Wall housing 650 x 450 x 230,	6DL2 804-0AD50
for installation of max. 15 ET 200iSP modules, for use	
in a gaseous area, with 5 rows	
of M16 cable glands	
(66 units)	

ET 200iSP watchdog module

Ordering data	Order No.		Order No.
Empty housing without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland) • Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use	6DL2 804-0AE30	Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland), ET 200iSP components must be ordered separately • Wall housing 650 x 450 x 230,	6DL2 804-1AD50
in a gaseous area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs • Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (111 units)	6DL2 804-0AE50	for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (66 units) • Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands	6DL2 804-1AE30
Empty housing without installation of modules, for use in a dusty area, IP65 • Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (41 units) and 2 rows of	6DL2 804-0DD30	(68 units) and 2 rows of blanking plugs • Wall housing 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (111 units)	6DL2 804-1AE50
blanking plugs • Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (66 units)	6DL2 804-0DD50	Enclosure with installation of modules, for use in a dusty area, IP65, the ET 200iSP components must be ordered separately • Wall housing 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use	6DL2 804-1DD30
Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs Wall housing 950 x 450 x 230,	6DL2 804-0DE30 6DL2 804-0DE50	in a dusty area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs • Wall housing 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of	6DL2 804-1DD50
for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (111 units) Enclosure with installation of		M16 cable glands (66 units) • Wall housing 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of	6DL2 804-1DE30
ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland), ET 200iSP components must be ordered separately • Wall housing 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs	6DL2 804-1AD30	M16 cable glands (68 units) and 2 rows of blanking plugs • Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (111 units)	6DL2 804-1DE50

ET 200iSP

Spare module

Overview



- The spare module is plugged onto the relevant terminal module (to be ordered separately; screw-type or springloaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

Technical specifications

	6ES7 138-7AA00-0AA0
Standards, approvals, certificates	
CE mark	Yes
Type of protection acc. to EN 50020 (CENELEC)	II2 G EEx ib IIC T4
Test number KEMA	04 ATEX 1251
Dimensions and weight Dimensions and weight	
• Width	30 mm
Height	129 mm
Depth	136.5 mm
Weight	
 Weight, approx. 	180 g

	6ES7 193- 7CA00- 0AA0	6ES7 193- 7CA10- 0AA0	6ES7 193- 7CB00- 0AA0
Standards, approvals, certificates			
CE mark	No	No	Yes
Type of protection acc. to EN 50020 (CENELEC)	No	No	II 2 G and I M2 Ex deib IIC T4; Ex deib I
Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions and weight			
Dimensions and weight			
 Width 	60 mm	60 mm	60 mm
 Height 	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm
Weight			
Weight, approx.	275 g	275 g	340 g

	Spare module
Ordering data	Order No.
Spare module	6ES7 138-7AA00-0AA0
Terminal modules	
TM-EM/EM 60S	6ES7 193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM 60C	6ES7 193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
TM-RM/RM 60S	6ES7 193-7CB00-0AA0
for accommodating digital output module 2 DO relay and spare modules; screw-type terminal	
Accessories	
ET 200iSP manual	
GermanEnglish	6ES7 152-1AA00-8AA0 6ES7 152-1AA00-8BA0
Connectors	0207 102 1717/00 027/0
PROFIBUS connector with active terminating resistor	6ES7 972-0DA60-0XA0
for RS 485-IS circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7 972-0AC80-0XA0
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheet	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151 • petrol • red • yellow • light beige	6ES7 193-7BH00-0AA0 6ES7 193-7BD00-0AA0 6ES7 193-7BB00-0AA0 6ES7 193-7BA00-0AA0
Labels, inscribed	
Ordering unit 1 set with 200 units each for slot numbering • 10 x slots 1 to 2 • 5 x slots 1 to 40	8WA8 861-0AB 8WA8 861-0AC
Labels, blank	8WA8 848-2AY
Ordering unit 1 set with 200 units each for slot numbering	
S7-300 mounting rails	
Standard rail 585 mm	6ES7 390-1AF85-0AA0
Standard rail 885 mm	6ES7 390-1AJ85-0AA0

ET 200iSP

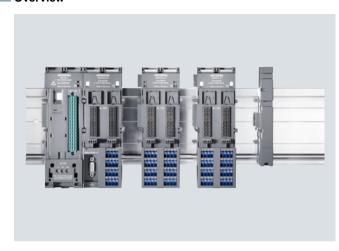
Spare module

Ordering data	Order No.	Order No.	
Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e		Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP	
Empty enclosure without instal- lation of modules, for use in a gaseous area, IP65 (IP54 when		components must be ordered separately	
using a breather gland) • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and	6DL2 804-0AD30	Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs Wall enclosure 650 x 450 x 230.	6DL2 804-1AD30 6DL2 804-1AD50
2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of	6DL2 804-0AD50	for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)	6DL2 804-1AD30
M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of	6DL2 804-0AE30	Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-1AE30
M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of	6DL2 804-0AE50	 Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units) 	6DL2 804-1AE50
M16 cable entries (111 units) Empty enclosure without instal-		Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components	
lation of modules, for use in a dusty area, IP65 • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and	6DL2 804-0DD30	must be ordered separately • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs	6DL2 804-1DD30
2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)	6DL2 804-0DD50	 Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units) 	6DL2 804-1DD50
Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-0DE30	Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs	6DL2 804-1DE30
Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)	6DL2 804-0DE50	 Wall enclosure 950 x 450 x 230, If or installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units) 	6DL2 804-1DE50

ET 200iSP

Terminal modules

Overview



- Mechanical modules for accommodating the power supply unit, interface and electronic modules
- For setting up the fixed wiring via self-assembling voltage buses
- Different versions for accommodating electronic modules
- Automatic encoding of the electronic modules
- Self-assembling shielding of the backplane bus for high data security
- Alternatively with screw or spring-loaded terminals

Ordering data	Order No.		Order No.
TM-PS terminal modules		TM-EM/EM terminal modules	
TM-PS A for accommodating a 24 V DC power supply	6ES7 193-7DA10-0AA0	TM-EM/EM60S I for accommodating two electronic modules, screw terminals	6ES7 193-7CA00-0AA0
TM-PS A UC for accommodating a 110/230 V AC power supply	6ES7 193-7DA20-0AA0	TM-EM/EM60S I for accommodating two electronic modules, screw terminals, black	6ES7 193-7CA20-0AA0
TM-PS B for accommodating an additional, redundant 24 V DC power supply	6ES7 193-7DB10-0AA0	TM-EM/EM60C I for accommodating two electronic modules, spring-loaded terminals	6ES7 193-7CA10-0AA0
TM-PS B UC	6ES7 193-7DB20-0AA0	TM-RM/RM terminal module	
for accommodating an additional, redundant 110/230 V AC power supply		TM-RM/RM for accommodating two relay modules, screw terminals	6ES7 193-7CB00-0AA0
TM-IM/xx terminal modules		Thodales, serew terminals	
TM-IM/EM60S for accommodating the IM152-1 and an electronic module, including power termination module; screw terminals	6ES7 193-7AA00-0AA0		
TM-IM/EM60S for accommodating the IM152-1 and an electronic module, including power termination module; screw terminals, black	6ES7 193-7AA20-0AA0		
TM-IM/EM60C for accommodating the IM152-1 and an electronic module, including power termination module; spring-loaded terminals	6ES7 193-7AA10-0AA0		
TM-IM/IM for accommodating two IM152-1 modules in redundant mode, including power termination module	6ES7 193-7AB00-0AA0		

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC ET 200 distributed I/O ET 200iSP

RS 485-IS coupler

Overview



- Coupler for converting PROFIBUS DP into PROFIBUS RS485-IS intrinsically safe (protection type intrinsically safe i)
- Required for connecting intrinsically safe PROFIBUS DP stations (e.g. ET 200iS, ET 200iSP) and on all third-party devices that have an Ex i DP connection
- Additional use as a repeater in the hazardous area
- Acts as a safety barrier
- Passive bus node, configuration not required
- Certified according to ATEX 100a

Technical specifications RS 485-IS Coupler		
Dimensions and weight		
Dimensions W x H x D (mm)	80 x 125 x 130	
Weight	Approx. 500 g	
Technical specifications – General		
Degree of protection	IP20	
Ambient temperature	- 20 °C + 60 °C	
Standards and approvals		
• PROFIBUS	IEC 61784-1: 2002 Ed1 CP 3/1	
EU directive	94/9/EG (ATEX 100a)	
• CENELEC	II 3 (2) G EEx nA[ib] IIC T4	
UL and CSA	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC	
• FM	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AlS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC	
• IEC	IEC61131-2, Part 2	
• CE	Conforming with 89/336/EWG Conforming with 73/23/EWG	
 Ship-building certification 	Classification companies	
	ABS (American Bureau of Shipping)	
	BV (Bureau Veritas)	
	DNV (Det Norske Veritas)	
	GL (Germanischer Lloyd)	
	• LRD (Lloyds Register of Shipping)	
	• Class NK (Nippon Kaiji Kyokai)	
Module-specific data	oldoo mii ingomialiji ngomalij	
Data transmission rate on PROFIBUS DP.	0.6: 10.2: 45.45: 02.75: 197.5: 500 Uhit/o	
PROFIBUS RS 485-IS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s 1.5 Mbit/s	
Bus protocol	PROFIBUS DP	
Voltages, currents, potentials		
Nominal supply voltage for RS 485-IS coupler • Polarity reversal protection • Voltage drop bypass	24 V DC (20.4 28.8 V) Yes Min. 5 ms	

SIMATIC ET 200 distributed I/O ET 200iSP

RS 485-IS coupler

Technical specifications (continued	Technical specifications	(continued)
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PROFIBUS RS 485-IS bus termination switch

Traductive I are a Wilder to P.O. 100 December 1			
Technical specifications RS 485-IS Coupler			
Potential isolation for 24 V power supply • to PROFIBUS DP - tested with • to PROFIBUS RS 485-IS - tested with	Yes 500 V DC Yes 500 V AC		
Current consumption RS 485-IS coupler (24 V DC), max.	150 mA		
Power loss of the module, typically	3 Watts		
Status, alarms, diagnostics			
Status display	No		
Alarms	None		
Diagnostic functions • Bus monitoring PROFIBUS DP (primary) • Bus monitoring PROFIBUS RS 485-IS (secondary) • Monitoring 24 V power supply	Yes Yellow LED "DP1" Yellow LED "DP2" Green LED "ON"		
Technical safety notice	G. 66.7 ZZZZ		
V _{DC}	±4.2 V		
I _{SC}	±93 mA		
P_0	0.1 Watts		
V _{max}	±4.2 V		
L _I	0		
C _i	0		
U _m	250 V AC		
T_a	−25 +60 °C		
RS 485-IS segment			
Permitted cable length on a single line • 9.6 187.5 kbit/s • 500 kbit/s • 1.5 Mbit/s	RS 485-IS 1000 m 400 m 200 m	DP Ex i 200 m 200 m 200 m	
Number of PROFIBUS DP nodes that can be connected, max.	31	16	

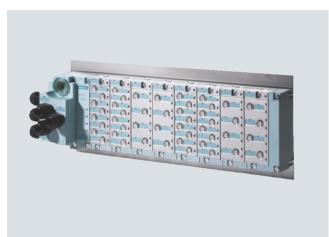
Ordering data	Order No.		Order No.
RS 485-IS coupler	6ES7 972-0AC80-0XA0	Mounting rail	
Isolating transformer for coupling		160 mm	6ES7 390-1AB60-0AA0
PROFIBUS DP to PROFIBUS RS 485-IS		482 mm	6ES7 390-1AE80-0AA0
Accessories		530 mm	6ES7 390-1AF30-0AA0
PROFIBUS cable connector	6ES7 972-0DA60-0XA0	830 mm	6ES7 390-1AJ30-0AA0
with active terminating resistor		2000 mm	6ES7 390-1BC00-0AA0
for RS 485-IS electric circuit; 1.5 Mbit/s		PROFIBUS Fast Connect bus cable	6XV1 830-0EH10
PROFIBUS cable connector	6ES7 972-0BA30-0XA0	Standard type with special design	
for the intrinsically safe PROFIBUS, 1.5 Mbit/s		for quick mounting, 2-core, shielded, sold by the meter: max. delivery unit 1000 m, minimum order quantity 20 m	

integrated, can be added

ET 200pro

Introduction

Overview



- Distributed I/O system with degree of protection IP65/67 for cabinet-free use at the machine.
- Small, multifunctional complete solution: Digital inputs/ outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: Direct, ECOFAST or M12 7/8"
- Power module for easy implementation of load groups
- Module replacement during operation (hot swapping)
- Easy installation as well as permanent wiring
- Data transmission rates of up to 12 Mbit/s
- Extensive diagnostics: Module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
- Versions: Direct and reversing starters Standard and High-Feature
- Fail-safe modules with safety-related signal processing according to PROFIsafe

General technical specifications				
Electronic modules	Digital inputs/outputs			
	Analog inputs			
	 Analog outputs 			
Motor starter				
Cables and connections	M12 and M8 round connector with standard assignment for actuator/ sensor			
Transmission rate, max.	12 Mbit/s (PROFIBUS DP), 100 Mbit/s (PROFINET IO)			
Supply voltage	24 V DC			
Current consumption of one ET 200pro (internal and encoder supply, non-switched voltage), up to 55 °C, max.	≤5 A			
Current consumption of one ET 200pro per infeed (IM, PM, switched voltage, up to 55 °C, max.)	10 A			
For overall configuration with looping through (several ET 200pro), up to 55 °C, max.	16 A (with connecting module, directly)			
Degree of protection	IP65/66/IP67 for interface, digital and analog modules			
Material	Thermoplastic (reinforced with glass fiber)			
Ambient conditions				
Temperature	from 0 55 °C (-25 °C on request)			
Relative humidity	from 5 100%			
Atmospheric pressure	from 795 1080 hPa			
Mechanical stress • Vibrations	Vibration test conforming to IEC 60068, Part 2-6 (sinusoidal)			
• Shock	 Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules 2 g motor starters Shock test according to IEC 680068 Part 2 - 27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules 15 g, 11 ms duration for motor starters 			
Approvals	UL, CSA or cULus			

ET 200pro Interface modules IM 154-1 and IM 154-2

Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

	6ES7 154-1AA01-0AB0	6ES7 154-2AA01-0AB0
Supply voltages Supply voltage of electronics 1L+ Rated value (DC) Short-circuit protection Reverse polarity protection	24 V Yes; over exchangeable fuses Yes; against destruction	24 V Yes; over exchangeable fuses Yes; against destruction
Rated value • 24 V DC • Permissible range, lower limit (DC) • Permissible range, upper limit (DC)	Yes 20.4 V 28.8 V	Yes 20.4 V 28.8 V
Current consumption from supply voltage 1L+, max.	200 mA	200 mA
Power losses Power loss, typ.	5 W	5 W
Address area Addressing volume Outputs Inputs	244 byte 244 byte	244 byte 244 byte
PROFIBUS DP Automatic detection of transmission speed	Yes	Yes
1st interface Type of interface	PROFIBUS DP	PROFIBUS DP
Physics	RS 485	RS 485
FunctionalityDP slave	Yes	Yes
DP slave • Services - SYNC/FREEZE - Direct data exchange (slave-to-slave communication) • Transmission rate, min. • Transmission rate, max.	Yes Yes 9.6 kbit/s 12 Mbit/s	Yes Yes 9.6 kbit/s 12 Mbit/s
Parameter		
DPV1 operation	possible	possible
Process alarm	parameterizable	parameterizable
Swapping interrupt	parameterizable	parameterizable
Startup if setpoint not equal to actual configuration	parameterizable	parameterizable

ET 200pro Interface modules IM 154-1 and IM 154-2

Technical specifications (continued)

	6ES7 154-1AA01-0AB0	6ES7 154-2AA01-0AB0
Alarms/diagnostics/status information		
Diagnostic indication LED		
Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
 Monitoring 24 V voltage supply ON (green) 	Yes	Yes
Load voltage monitoring 24 V DC (green)	Yes	Yes
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
between supply voltage and electronics	Yes	Yes
Environmental requirements		
Operating temperature		
• Min.	-25 °C	-25 °C
• Max.	55 °C	55 °C
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• Max.	70 °C	70 °C
Degree of protection		
IP67	Yes	Yes
General information		
Vendor identification (VendorID)	8118H	8119H
Dimensions and weight		
Dimensions		
• Width	90 mm	90 mm
• Height	130 mm	130 mm
• Depth	59.3 mm	59.3 mm
Weight		
Weight, approx.	375 g	375 g

Ordering data	Order No.		Order No.
IM154-1 interface module	6ES7 154-1AA01-0AB0	CM IM DP M12, 7/8" connection	6ES7 194-4AD00-0AA0
For ET 200pro; for communication between ET 200pro and higher- level masters over PROFIBUS DP		For connecting PROFIBUS DP and the 24 V power supply to	
IM154-2 High Feature interface module	6ES7 154-2AA01-0AB0	PROFIBUS interface modules, 2 x M12 and 2 x 7/8"	
For ET 200pro; for communication between ET 200pro and higher-		Accessories for CM IM DP ECOFAST	
level masters over PROFIBUS DP; support of PROFIsafe		PROFIBUS ECOFAST hybrid cable, preassembled	
Accessories		With 2 ECOFAST connectors,	
CM IM DP ECOFAST connection module For connecting PROFIBUS DP	6ES7 194-4AA00-0AA0	trailing-type cable 2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ² • 1.5 m long • 3.0 m long	6XV1 830-7BH15 6XV1 830-7BH30
and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections		• 5.0 m long • 10 m long	6XV1 830-7BH50 6XV1 830-7BN10 6XV1 830-7BN15
CM IM DP direct connection module	6ES7 194-4AC00-0AA0	• 15 m long • 20 m long	6XV1 830-7BN20
For connecting PROFIBUS DP and the 24 V power supply		25 m long30 m long35 m long	6XV1 830-7BN25 6XV1 830-7BN30 6XV1 830-7BN35
directly to the PROFIBUS interface modules, up to six M20 screwed cable glands		• 40 m long • 45 m long	6XV1 830-7BN40 6XV1 830-7BN45
		• 50 m long	6XV1 830-7BN50

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro Interface modules IM 154-1 and IM 154-2

Ordering data	Order No.		Order No.
PROFIBUS ECOFAST hybrid cable GP, preassembled		PROFIBUS FC Robust bus cable	6XV1 830-0JH10
With 2 ECOFAST connectors,		With PUR sheath for use under	
trailing-type cable		conditions of extreme mechanical	
2 x CŬ 0.64 mm² and		stress and aggressive chemicals,	
4 x Cu 1.5 mm ²		2-core, shielded, sold by the	
• 1.5 m long	6XV1 860-3PH15	meter, minimum order quantity 20 m, maximum order quantity	
• 3.0 m long	6XV1 860-3PH30	1000 m	
• 5.0 m long	6XV1 860-3PH50		CVV/4 000 0 A L I 4 O
• 10 m long	6XV1 860-3PN10	Power line	6XV1 830-8AH10
• 15 m long	6XV1 860-3PN15	5-core, 5 x 1.5 mm ² , trailing type,	
• 20 m long	6XV1 860-3PN20	sold by the meter, minimum order	
• 25 m long	6XV1 860-3PN25	quantity 20 m, maximum order quantity 1000 m	
• 30 m long	6XV1 860-3PN30	<u> </u>	
• 35 m long	6XV1 860-3PN35	Accessories for CM IM DP M12,	
• 40 m long	6XV1 860-3PN40	7/8"	
• 45 m long	6XV1 860-3PN45	PROFIBUS M12 connecting	
• 50 m long	6XV1 860-3PN50	cable	
PROFIBUS ECOFAST hybrid		Preassembled with two M12	
cable, non-assembled		connectors, 5-pin	
Trailing-type cable		• 1.5 m long	6XV1 830-3DH15
2 x CU 0.64 mm ² and		• 2.0 m long	6XV1 830-3DH20
4 x Cu 1.5 mm ²		• 3.0 m long	6XV1 830-3DH30
• 50 m long	6XV1 830-7AN50	• 5.0 m long	6XV1 830-3DH50
• 100 m long	6XV1 830-7AT10	• 10 m long	6XV1 830-3DN10
PROFIBUS ECOFAST hybrid		• 15 m long	6XV1 830-3DN15
cable GP, non-assembled		7/8" connecting cable to power supply	
Trailing-type cable			
2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ²		5-core, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8"	
◆ 50 m long	6XV1 860-4PN50	connectors, 5-pin	
O	6XV1 860-4PT10	• 1.5 m long	6XV1 822-5BH15
• 100 m long	0AV1800-4F110	• 2.0 m long	6XV1 822-5BH20
PROFIBUS ECOFAST hybrid		• 3.0 m long	6XV1 822-5BH30
connector 180		• 5.0 m long	6XV1 822-5BH50
ECOFAST Cu,		• 10 m long	6XV1 822-5BN10
2 x Cu, 4 x 1.5 mm ² ,		• 15 m long	6XV1 822-5BN15
HANBRID connector	CCK1 00F 0CA00		
with male insert, 5 per pack with female insert. Finer pack	6GK1 905-0CA00 6GK1 905-0CB00	M12 cable connector	
• with female insert, 5 per pack	6GK1 903-0CB00	For ET 200eco, with axial cable	
PROFIBUS ECOFAST hybrid		outlet	
connector angular		• with male insert, 5 per pack	6GK1 905-0EA00
ECOFAST Cu,		 with female insert, 5 per pack 	6GK1 905-0EB00
2 x Cu, 4 x 1.5 mm ² ,		PROFIBUS M12 bus termination	6GK1 905-0EC00
HANBRID connector	6CV1 005 00000	connector	
with male insert, 5 per pack with formula insert, 5 per pack	6GK1 905-0CC00	with pin insert	
with female insert, 5 per pack	6GK1 905-0CD00	7/8" cable connector	
Accessories for CM IM DP direct		For ET 200eco, with axial cable	
PROFIBUS trailing cable	6XV1 830-3EH10	outlet	00K4 00F 0F400
Max. acceleration 4 m/s ² , at least 3,000,000 bending cycles,		with male insert, 5 per pack with famula insert, 5 per pack	6GK1 905-0FA00
bending radius 60 mm, 2-core		with female insert, 5 per pack	6GK1 905-0FB00
shielded, sold by the meter,		M12 sealing cap	3RX9 802-0AA00
minimum order quantity 20 m,		For protection of unused M12	
maximum order quantity 1000 m PROFIBUS FC Food bus cable	6XV1 830-0GH10	connections with ET 200pro	
		Sealing cap 7/8"	6ES7 194-3JA00-0AA0
With PE sheath for use in the food and beverages industry, 2-core,		For protecting unused 7/8"	
shielded, sold by the meter,		connections for ET 200pro;	
minimum order quantity 20 m,		10 units per pack	

ET 200pro Interface modules IM 154-1 and IM 154-2

Ordering data	Order No.		Order No.
General accessories		PROFIBUS Fast Connect bus cable	6XV1 830-0EH10
ET 200pro rack Narrow, for interface, electronic and power modules 500 mm 1000 mm 2000 mm, can be cut to length	6ES7 194-4GA00-0AA0 6ES7 194-4GA60-0AA0 6ES7 194-4GA20-0AA0	Standard type with special design for fast assembly, 2-core, shielded, sold by the meter; max. length that can be supplied 1000 m, minimum order quantity 20 m	
Compact, for interface, electronics and power modules 500 mm 1000 mm 2000 mm, can be cut to length Wide, for interface, electronics, power modules and motor	6ES7 194-4GC70-0AA0 6ES7 194-4GC60-0AA0 6ES7 194-4GC20-0AA0	PROFIBUS Hybrid Standard Cable GP Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm²) for supplying data and energy for ET 200pro	6XV1 860-2R
starters - 500 mm - 1000 mm	6ES7 194-4GB00-0AA0 6ES7 194-4GB60-0AA0	Technical product data For CAX applications, one-off license	6ES7 991-0CD01-0YX0
 2000 mm, can be cut to length Wide, for I/O modules and motor starters 500 mm 1000 mm 2000 mm 	6ES7 194-4GB20-0AA0 6ES7 194-4GD00-0AA0 6ES7 194-4GD10-0AA0 6ES7 194-4GD20-0AA0	SIMATIC Manual Collection Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime	6ES7 998-8XC01-8YE0
Spare fuse 12.5 A quick-response, for interface and power modules, 10 items per package unit		Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) SIMATIC Manual Collection – D Update service for 1 year	6ES7 998-8XC01-8YE2
		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200pro Interface modules IM 154-4 PN

Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

	6ES7 154-4AB10-0AB0
Supply voltages Supply voltage of electronics 1L+ • Rated value (DC) • Short-circuit protection	24 V Yes; fuse in lower part is exchangeable, the fuse on the IM-I P is not
Reverse polarity protection	Yes; against destruction
Rated value • 24 V DC • permissible range, lower limit (DC) • permissible range, upper limit (DC)	Yes 20.4 V; Unit [V] 28.8 V; Unit [V]
Current consumption from backplane bus 3.3 V DC, max.	Not applicable
from supply voltage 1L+, max.	400 mA; dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
Power losses Power loss, typ.	6 W; dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher
Memory Micro Memory Card	No; internal memory medium
Address area Addressing volume Outputs Inputs	256 byte 256 byte
Interfaces automatic detection of transmission speed	Yes
Protocols PROFINET IO	Yes

	6ES7 154-4AB10-0AB0
PROFINET IO	
Transmission rate, max.	100 Mbit/s
Services	ARP, PING, SNMP
Parameter	
Diagnostic alarm	1
Process alarm	1
Swapping interrupt	1
identifier-related diagnostic data	1
Module status	1
Channel-related diagnostics	1
Startup if setpoint not equal to actual configuration	1
Hot swapping of modules	1
Alarms/diagnostics/status information	
Diagnostic indication LED Bus fault BF (red)	Yes; additional LEDs (MAINT, P1/2 LINK, P1/2 RX/TX) available
 Group error SF (red) Monitoring 24 V voltage supply ON (green) 	Yes Yes
 Load voltage monitoring DC 24 V (green) 	Yes
Isolation	
Isolation checked with	500 V DC
Galvanic isolation between backplane bus and electronics	No
between supply voltage and electronics	Yes

ET 200pro Interface modules IM 154-4 PN

Technical specifications (continued)

	6ES7 154-4AB10-0AB0
Environmental requirements Operating temperature • Min. • max.	-25 °C 55 °C
Storage/transport temperature • Min. • max.	-40 °C 70 °C
Degree of protection IP65	Yes
IP66 IP67	Yes Yes

	6ES7 154-4AB10-0AB0
General information	
Vendor identification (VendorID)	0x002A
Device identifier (DeviceID)	0x0305
Dimensions and weight	
Dimensions	
Width	90 mm
Height	130 mm
• Depth	59.3 mm
Weight	
 Weight, approx. 	490 g

Ordering data	Order No.
IM 154-4 PN High Feature interface module	6ES7 154-4AB10-0AB0
For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFIsafe	
Accessories	
CM IM PN connection module M12, 7/8"	6ES7 194-4AJ00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	
CM IM PN connection module 2xRJ45	6ES7 194-4AF00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector	
CM IM PN 2xSCRJ FO connection module	6ES7 194-4AG00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector	
M12 sealing cap	3RX9 802-0AA00
For protection of unused M12 connections with ET 200pro	
IE M12 connecting cables	
Preassembled, with two M12 connectors, up to 85 m • 0.3 m long • 0.5 m long • 1.0 m long • 1.5 m long • 2.0 m long • 3.0 m long • 5.0 m long • 10 m long • 15 m long • 10 m long • 10 m long • 10 conditions with 90° or 180° cable outlet	6XV1 870-8AE30 6XV1 870-8AE50 6XV1 870-8AH10 6XV1 870-8AH15 6XV1 870-8AH20 6XV1 870-8AH30 6XV1 870-8AH50 6XV1 870-8AN50 6XV1 870-8AN15 see http:// support.automation.siemens.com/WW/view/en/26999294

	Order No.
7/8" sealing caps	6ES7 194-3JA00-0AA0
1 pack = 10 units	
7/8" connecting cable to power supply	
5-core, 5 x 1.5 mm², trailing type, preassembled with two 7/8" connectors, 5-pin, up to 50 m • 1.5 m long • 2.0 m long • 3.0 m long • 5.0 m long • 10 m long • 15 m long • Other special lengths with 90° or 180° cable outlet	6XV1 822-5BH15 6XV1 822-5BH20 6XV1 822-5BH30 6XV1 822-5BH50 6XV1 822-5BN10 6XV1 822-5BN15 see http:// support.automation.siemens. com/WW/view/en/26999294
Power line	6XV1 830-8AH10
5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m	
7/8" cable connector	
For ET 200eco, with axial cable outlet	
with male insert, 5 per packwith female insert, 5 per pack	6GK1 905-0FA00 6GK1 905-0FB00
Industrial Ethernet FastConnect installation cables	
IE FC TP Standard Cable GP 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 840-2AH10
IE FC TP Trailing Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 840-3AH10
IE FC TP Trailing Cable GP 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m I: Subject to export regulations AL: N	6XV1 870-2D

ET 200pro Interface modules IM 154-4 PN

Ordering data	Order No.		Order No.
Industrial Ethernet		General accessories	
FastConnect installation cables • IE TP Torsion Cable GP 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 870-2F	ET 200pro rack Narrow, for interface, electronics and power modules 500 mm	6ES7 194-4GA00-0AA0
IE FC TP Marine Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 840-4AH10	- 1000 mm - 2000 mm, can be cut to length • Compact, for interface, electronics and power modules	6ES7 194-4GA60-0AA0 6ES7 194-4GA20-0AA0
IE RJ45 Plug PRO RJ45 plug in IP65/67-rated design for on-site assembly, plastic housing, insulation/ displacement connection system, for SCALANCE X-200IRT PRO	6GK1901-1BB10-6AA0	 500 mm 1000 mm 2000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters 	6ES7 194-4GC70-0AA0 6ES7 194-4GC60-0AA0 6ES7 194-4GC20-0AA0
and ET200pro: 1 pack = 1 unit		- 500 mm - 1000 mm	6ES7 194-4GB00-0AA0 6ES7 194-4GB60-0AA0
IE SC RJ POF Plug PRO		 2000 mm, can be cut to length Wide, for I/O modules and motor 	6ES7 194-4GB20-0AA0
SC RJ plug for POF fibers in IP65/ 67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO and ET200pro 1 pack = 1 unit	6GK1900-0MB00-6AA0	• Wide, for I/O modules and motor starters - 500 mm - 1000 mm - 2000 mm	6ES7 194-4GD00-0AA0 6ES7 194-4GD10-0AA0 6ES7 194-4GD20-0AA0 6ES7 194-4HB00-0AA0
IE SC RJ PCF Plug PRO		12.5 A quick-response, for	020, 101, 11,200 0,210
SC RJ plug for PCF fibers in IP65/ 67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO	6GK1900-0NB00-6AA0	interface and power modules, 10 units per package unit SIMATIC Manual Collection J	6ES7 998-8XC01-8YE0
1 pack = 1 unit		Electronic manuals on DVD, multi- language:	
Power Plug PRO 5-pole power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200IRT and ET200 pro 1 pack = 1 unit	6GK1907-0AB10-6AA0	S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
IE panel feedthrough		SIMATIC Manual Collection - D	6ES7 998-8XC01-8YE2
Control cabinet feedthrough for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20) 1 pack = 5 units	6GK1 901-0DM20-2AA5	Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	3-2-1 333 3/132 . 3 1 <u>22</u>
Push-Pull cable connector	6GK1 907-0AB10-6AA0		
For 1L+/2L+, unassembled			
Cover caps for Push-Pull RJ45 female connectors	6ES7 194-4JD50-0AA0		
5 units per pack			
o unito per pack			

- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200pro Interface modules IM 154-6 PN IWLAN

Overview



Interface module for handling communication between ET 200pro and host PROFINET IO controllers over Industrial Wireless LAN (IWLAN) radio networks for 2.4 GHz or 5 GHz with data transfer rates up to 54 Mbit/s.

- Protection against illegal access, espionage, tapping and falsification through use of effective encryption mechanisms
- Fast exchange of devices through use of interchangeable medium MICRO MEMORY CARD

IM 154-6 PN IWLAN interface module	6ES7 154-6AB00-0AB0 6ES7 154-6AB50-0AB0
Supply voltage for electronic components 1L+ • Rated value • Valid range, lower limit • Valid range, upper limit • Short-circuit protection • Reverse polarity protection • Max. infeed current	24 V DC 20.4 V DC 28.8 V DC Yes; replaceable fuse Yes; against destruction 5 A
Load voltage 2L+ Rated value (DC) Lower limit of permissible range (DC) Upper limit of permissible range (DC) Short-circuit protection Reverse polarity protection Max. infeed current	24 V DC 20.4 V DC 28.8 V DC Yes, for potential group Yes; against destruction 8 A
Current consumption from supply voltage 1L+, typ.	335 mA
Power loss, typ.	8.5 W
Memory type	Micro Memory Card, is required
Address range/address volume • Outputs • Inputs	256 byte 256 byte
Reports PROFINET IO Industrial Wireless LAN	Yes Yes
PROFINET IO services	ARP, PING, SNMP
Industrial Wireless LAN • Transmission rate, max. • Standards for wireless communication	54 Mbit/s IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11h (not valid for 6ES7 154-6AB50-0AB0) IEEE 802.11e IEEE 802.11i

IM 154-6 PN IWLAN interface module	6ES7 154-6AB00-0AB0 6ES7 154-6AB50-0AB0
Radio frequency for WLAN in 2.4 GHz frequency band	2.4 2.4835 GHz
 Radio frequency for WLAN in 5 GHz frequency band 	5.15 5.825 GHz
Transmission method	Direct Sequence Spread Spectrum (DSSS)
	Complementary Code Keying (CCK)
	Orthogonal Frequency Division Multiplexing (OFDM)
Supported IWLAN services	Current approvals can be found in the Internet at
	http:// support.automation.siemens. com/WW/view/en/19812553
Connection for external antenna	
Parameters	
 Diagnostic interrupt 	Yes
 Maintenance alarm 	Yes
 Hardware interrupt 	Yes
 Swapping interrupt 	Yes
 Identifier-related diagnostic data 	Yes
 Module status 	Yes
 Channel-specific diagnostics 	Yes
Start-up if preset configuration is not equal to actual configuration	Yes
 Module replacement during operation 	Yes
Diagnostic indication (LED)	Yes
 Group fault (red) 	Yes
 Bus fault (red) 	Yes
 Maintenance information (yellow) 	Yes
 Monitoring 24 V power supply ON (green) 	Yes
 Load voltage monitoring 24 V DC (green) 	Yes
Connection to an Access Point R1 LINK (green)	Yes
Data exchange R1 RX/TX (yellow)	Yes
Connection to a PG/PC (green)	Yes
Data exchange with a PG/PC (yellow)	Yes

ET 200pro Interface modules IM 154-6 PN IWLAN

Technical specifications (continued)

IM 154-6 PN IWLAN interface module	6ES7 154-6AB00-0AB0 6ES7 154-6AB50-0AB0	IM 154-6 PN IWLAN interfact module
Insulation tested at Isolation Between the backplane bus and supply voltage 1L+ and 2L+ Between Ethernet and supply voltage 1L+ and 2L+ Between the supply voltage and electronic components	500 V DC Yes Yes Yes	Storage/transport temperature • Minimum • Maximum Degree of protection General information • Manufacturer's code (Vendo • Device ID
Operating temperature Minimum Maximum	-25 °C 55 °C	Dimensions • Width • Height • Depth Weight, approx.

IM 154-6 PN IWLAN interface module	6ES7 154-6AB00-0AB0 6ES7 154-6AB50-0AB0
Storage/transport temperature • Minimum • Maximum	-40 °C 70 °C
Degree of protection General information	IP65, IP66, IP67
Manufacturer's code (VendorID) Device ID	0x002A 0x0305
Dimensions • Width • Height • Depth Weight, approx.	135 mm 130 mm 60 mm 1085 q

Ordering data	Order No.
IM 154-6 PN HF IWLAN interface module	
For communication between ET 200pro and host controllers over Industrial Wireless LAN (IWLAN) radio networks; support of PROFIsafe	
With various national approvals; I refer to the current list of approvals	6ES7 154-6AB00-0AB0
With approval for USA	6ES7 154-6AB50-0AB0
Antennas with omnidirectional characteristic	
Mounting directly on IM154-6 PN HE IWI AN	
• ANT IM 154-6 IWLAN; 2 units	6ES7 194-4MA00-0AA0
For wall or pipe mounting • ANT 792-6MN; rod antenna N-Connect female 2.4 GHz; 1 unit	6GK5 792-6MN00-0AA6
 ANT793-6MN; rod antenna N-Connect female 5 GHz; 1 unit 	6GK5 793-6MN00-0AA6
For use with the RCoax antenna system	
ANT 792-4DN; RCoax N- Connect female 2.4 GHz; 1 unit	6GK5 792-4DN00-0AA6
ANT793-4MN; RCoax N- Connect female 5 GHz; 1 unit	6GK 5793-4MN00-0AA6
Antenna cables IWLAN RCoax; N-Connect / R-SMA	
1 m long	6XV1 875-5CH10
2 m long	6XV1 875-5CH20
5 m long	6XV1 875-5CH50
10 m long	6XV1 875-5CN10
IWLAN terminating resistor 50 Ohm for second R-SMA antenna socket, 3 units	6GK5 795-1TR10-0AA6

	Order No.
Accessories	
7/8" connecting cable to power supply	
5-core, 5 x 1.5 mm ² , trailing type, pre-assembled with two 7/8" connectors	
1.5 m long	6XV1 822-5BH15
2.0 m long	6XV1 822-5BH20
3.0 m long	6XV1 822-5BH30
5.0 m long	6XV1 822-5BH50
10 m long	6XV1 822-5BN10
15 m long	6XV1 822-5BN15
 Other special lengths with 90° or 180° cable outlet 	See http://support.automation.siemens.com/WW/view/en/26999294
Power line	6XV1 830-8AH10
5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m	
7/8" cable connector	6GK1 905-0FB00
For ET 200eco, with axial cable outlet; with socket insert, pack of 5	
Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m long	6XV1 870-3QE50
1 m long	6XV1 870-3QH10
2 m long	6XV1 870-3QH20
6 m long	6XV1 870-3QH60
10 m long	6XV1 870-3QN10

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro Interface modules IM 154-6 PN IWLAN

Ordering data Order No. Order No. (continued)

Ordering data Order No. Order	1101 (001111111111111111111111111111111
Crossed Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m long	6XV1 870-3RE50
1 m long	6XV1 870-3RH10
2 m long	6XV1 870-3RH20
6 m long	6XV1 870-3RH60
10 m long	6XV1 870-3RN10
IE FC RJ45 Plug 180	
180° cable outlet; for line components and CPs/CPUs with Industrial Ethernet interface 1 pack = 1 unit 1 pack = 10 units	6GK1 901-1BB10-2AA0 6GK1 901-1BB10-2AB0
IE FC RJ45 Plug 90	
90° cable outlet; e.g. for ET 200S • 1 pack = 1 unit • 1 pack = 10 units	6GK1 901-1BB20-2AA0 6GK1 901-1BB20-2AB0
General accessories	
Table	6ES7 194-4GA00-0AA0 6ES7 194-4GA60-0AA0 6ES7 194-4GA20-0AA0 6ES7 194-4GC70-0AA0 6ES7 194-4GC60-0AA0
 2000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters 500 mm 1000 mm 2000 mm, can be cut to length Wide, for I/O modules and motor starters 500 mm 1000 mm 2000 mm 	6ES7 194-4GC20-0AA0 6ES7 194-4GB00-0AA0 6ES7 194-4GB20-0AA0 6ES7 194-4GD00-0AA0 6ES7 194-4GD10-0AA0 6ES7 194-4GD10-0AA0

Spare fuse	6ES7 194-4HB00-0AA0
12.5 A quick-response, for interface and power modules, 10 units per package unit	
Labels	3RT1 900-1SB20
20 x 7 mm, pale turquoise, 340 units per pack	
SIMATIC Micro Memory Card	
• 64 KB	6ES7 953-8LF20-0AA0
• 128 KB • 512 KB	6ES7 953-8LG20-0AA0 6ES7 953-8LJ20-0AA0
SIMATIC Manual Collection	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multi- language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
SIMATIC Manual Collection - D Update service for 1 year	6ES7 998-8XC01-8YE2
Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

ET 200pro

Interface modules IM 154-8 PN/DP CPU

Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
- PROFINET IO controller to operate distributed I/Os on PROFINET
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integral Web server with the option of creating user-defined Web sites
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module to exchange preprocessed I/O data from ET 200pro with a higher-level master through PROFIBUS DP
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROFIsafe available

Micro Memory Card required for operation of CPU.

	6ES7 154-8AB01-0AB0
Product version	
associated programming package	STEP7 V 5.5 or higher
Supply voltages external protection for supply cables (recommendation)	MCB 24 V DC / 16A with trippingIO controller character- istic Type B and C (see ET 200pro manual)
Current consumption	
Current consumption (rated value)	350 mA; typical
Current consumption (in no-load operation), typ.	250 mA; Typical, current consumption for CPU in STOP state
Inrush current, typ.	2 A; typical
I ² t	0.25 A ² ·s;typical
Power losses	
Power loss, typ.	8.5 W; typical
Memory Work memory • integrated • expandable	384 Kibyte No
Load memory • pluggable (MMC) • pluggable (MMC), max.	Yes 8 Mbyte
Backup • present	Yes; ensured by MMC (maintenance-free)
• without battery	Yes; program and data
CPU-blocks DB	
Number, max.Size, max.	1 024; Number range: 1 to 16,000 64 Kibyte

	6ES7 154-8AB01-0AB0
FB	
Number, max.	1 024; Number range: 0 to 7,999
• Size, max.	64 Kibyte
FC	
 Number, max. 	1 024; Number range: 0 to 7,999
• Size, max.	64 Kibyte
OB	
• Size, max.	64 Kibyte
Nesting depth	
 per priority class 	16
 additional within an error OB 	4
CPU processing times	
for bit operations, min.	0.05 μs
for word operations, min.	0.09 µs
for fixed point arithmetic, min.	0.12 μs
for floating point arithmetic, min.	0.45 μs
Counters, timers and their	
retentivity	
S7 counter	050
NumberRetentivity	256
- adjusted	Yes
- lower limit	0
- upper limit	255
Counting range	
- adjusted	Yes
- lower limit	0
- upper limit	999

ET 200pro Interface modules IM 154-8 PN/DP CPU

Technical specifications (continued)	
	6ES7 154-8AB01-0AB0
IEC counter	
• present	Yes
• Type	SFB
S7 times	
• Number	256
 Retentivity 	
- adjusted	Yes
- lower limit	0
- upper limit	255
- preset	No retentivity
Time rangelower limit	10 ms
- upper limit	9 990 s
	3 330 3
IEC timer	Yes
presentType	SFB
• Number	Unlimited
	(limited only by RAM capacity)
Data areas and their retentivity	
Flag	
Number, max.	2 048 byte
 Retentivity available 	Yes; MB 0 to MB 2047
 Number of clock memories 	8
Data blocks	
 Number, max. 	1 024; Number range:
	1 to 16,000
Size, max.	64 Kibyte
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	yes
Local data	
per priority class, max.	32 768 byte; 2048 byte max. per
[block
Address area	
I/O address area	
• overall	2 048 byte
• Outputs	2 048 byte
of which, distributed	
- Inputs	2 048 byte
- Outputs	2 048 byte
Process image	
• Inputs, adjustable	2 048 byte
Outputs, adjustable	2 048 byte
• Inputs, preset	128 byte
• Outputs, peset	128 byte
Subprocess images	1. With DDOCINET IO the length
 Number of subprocess images, max. 	1; With PROFINET IO, the length of the user data is limited to
max.	1600 byte
Digital channels	
• Inputs	16 384
• Outputs	16 384
 Inputs, of which central 	128
Outputs, of which central	64
Analog channels	
• Inputs	1 024
Outputs	1 024
• Inputs, of which central	64
 Outputs, of which central 	64

	6ES7 154-8AB01-0AB0
Hardware configuration	
Racks, max.	1
Modules per rack, max.	16; expansion width max. 1m
Number of DP masters	
• integrated	1
Time	
Clock	Yes
Hardware clock (real-time clock)battery-backed and synchro-	Yes
nizable	
Deviation per day, max.	10 s; typ.: 2 s
Runtime meter	
NumberNumber/Number range	1
Range of values	0 to 2^31 hours
hange of values	(when using SFC 101)
Granularity	1 h
Retentive	Yes; must be restarted at each restart
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes; with DP slave only slave clock
to DP, slaveon Ethernet via NTP	Yes; as client
	res, as client
S7 message functions Number of login stations for	16; depending on the connec-
message functions, max.	tions configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status/control	V
Status/control variableVariables	Yes
• variables	Inputs, outputs, memory bits, DB times, counters
 Number of variables, max. 	30
 of which status variables, max. 	30
of which control variables, max.	14
Forcing • Forcing	Yes
Status block	Yes; up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	•
• present	Yes
Number of entries, max.	500; only the last 100 entries are retentive at power on/off
- adjusted	No
- preset	10

ET 200pro Interface modules IM 154-8 PN/DP CPU

Technical specifications (continued)	
	6ES7 154-8AB01-0AB0
Monitoring functions Status LEDs	Yes
Communication functions PG/OP communication	Yes
Routing	Yes
Global data communication • supported • Size of GD packets, max.	Yes 22 byte
S7 basic communication • supported	Yes
S7 communication • supported	Yes
Web server • supported • Number of HTTP clients • User-defined websites	Yes 5 Yes
Open IE communication • TCP/IP	Yes; Via integrated PROFINET
Number of connections, max. Data length, max.	interface and loadable FBs 8 32 768 byte; 1460 byte with connection type 01H; 32768 byte with connection type 11H
 Several passive connections per port, supported ISO-on-TCP (RFC1006) Number of connections, max. Data length, max. UDP Number of connections, max. Data length, max. 	Yes Yes 8 32 768 byte Yes 8 1 472 byte
Number of connections overall usable for PG communication usable for OP communication usable for S7 basic communication usable for routing	16 15 15 14 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as
DDOCINET ODA (-tttttt	PROFINET: 24 max.
PROFINET CBA (at set setpoint communication load) • Setpoint for the CPU communication load	50 %
• Number of remote interconnection	32
Number of functions,	30
master/slave Total of all Master/Slave connections	1 000
Data length of all incoming connections master/slave, max.	4 000 byte
Data length of all outgoing connections master/slave, max.	4 000 byte
Number of device-internal and PROFIBUS interconnections	500
Data length of device-internal und PROFIBUS interconnections, max.	4 000 byte
Data length per connection, max.	1 400 byte

	6ES7 154-8AB01-0AB0
Remote interconnections with	
acyclic transmission - Sampling frequency: Sampling time, min.	500 ms
Number of incoming intercon- nections	100
- Number of outgoing interconnections	100
- Data length of all incoming interconnections, max.	2 000 byte
- Data length of all outgoing interconnections, max.	2 000 byte
- Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	
- Transmission frequency: Transmission interval, min.	1 ms
Number of incoming interconnections	200
Number of outgoing intercon- nections	200
- Data length of all incoming interconnections, max.	2 000 byte
- Data length of all outgoing interconnections, max.	2 000 byte
- Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	
 Number of stations that can log on for HMI variables (PN OPC/ iMap) 	3; 2x PN OPC/1x iMap
- HMI variable updating	500 ms
 Number of HMI variables Data length of all HMI 	200 2 000 byte
variables, max.	2 000 Byte
PROFIBUS proxy functionality	Vac
supportedNumber of linked PROFIBUS	Yes 16
devices - Data length per connection,	240 byte; Slave-dependent
max.	240 byte, slave-dependent
1st interface Type of interface	Integrated RS 485 interface
Physics	RS 485/connection:
	2 x M12 b-coded
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	May only be used for external terminating resistor
Functionality	V
MPI DP master	Yes Yes
• DP slave	Yes
Point-to-point connection	No
MPI • Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	Yes
S7 basic communicationS7 communication	Yes Yes
- S7 communication, as client	No
- S7 communication, as server	Yes
Transmission rate, max.	12 Mbit/s

ET 200pro Interface modules IM 154-8 PN/DP CPU

Technical specifications (continued)	
	6ES7 154-8AB01-0AB0
DP master	
• Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	No
- S7 basic communication	Yes; I blocks only
- S7 communication	Yes
- S7 communication, as client	No
- S7 communication, as server	Yes; connection configured on
	one side only
- Equidistance mode support	Yes
- Isochronous mode	Yes; OB 61 - isochronous mode
	is possible either on DP or PROFINET IO
	(not simultaneously)
- SYNC/FREEZE	Yes
- Activation/deactivation of DP	Yes
slaves	1-1-
- Direct data exchange	Yes; As subscriber
(slave-to-slave communication)	
- DPV1	Yes
 Transmission rate, max. 	12 Mbit/s
 Number of DP slaves, max. 	124
Address area	
- Inputs, max.	2 048 byte
- Outputs, max.	2 048 byte
User data per DP slave	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
DP slave	
• Services	
- Routing	Yes; with active interface
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	No
- S7 communication, as server	Yes; connection configured on
5	one side only
 Direct data exchange (slave-to- slave communication) 	Yes
- DPV1	No
Transmission rate, max.	12 Mbit/s
Transfer memory	12 IVIDIUS
- Inputs	244 byte
- Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte
2nd interface	
Type of interface	PROFINET
Physics	Ethernet (2 x M12 d-coded; 1 x RJ45)
Isolated	Yes; Galvanic isolation for P3 is implemented in IM154-8, for P1 and P2 in CM
Integrated switch	Yes
Number of ports	3
automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
, lateorooming	100

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	6ES7 154-8AB01-0AB0
Media redundancy	
• supported	Yes
 Switchover time on line break, 	200 ms; PROFINET MRP
typically	
 Number of stations in the ring, max. 	50
Change of IP address at runtime, supported	Yes
Functionality	
• MPI	No
DP master	No
DP slave	No
PROFINET IO controller	Yes; also simultaneously with
	IO device functionality
PROFINET IO device	Yes; also simultaneously with IO controller functionality
PROFINET CBA	Yes
Open IE communication	Yes; Via TCP/IP, ISO on TCP,
·	UDP
Web server	Yes
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- Routing	Yes
- S7 communication	Yes; with loadable FBs, max.
	configurable connections: 14,
	max. number of instances: 32
- Isochronous mode	Yes; OB 61 - isochronous mode
	is possible either on DP or PROFINET IO (not simultane-
	ously)
- Open IE communication	Yes; Via TCP/IP, ISO on TCP,
	UDP
 Transmission rate, max. 	100 Mbit/s
 Number of connectable IO 	128
devices, max.	
Max. number of connectable IO	128
devices for RT	100
- of which in line, max.	128
 Number of IO devices with IRT and the option "high flexibility" 	128
of which in line, max.	61
Number of IO devices with IRT and	64
the option "high performance",	04
max.	
- of which in line, max.	64
 IRT, supported 	Yes
 Shared device, supported 	Yes
 Prioritized startup supported 	Yes
- Number of IO devices, max.	32
 Activation/deactivation of 	Yes
IO devices	
- Number of IO devices that can	8
be simultaneously activated/ deactivated, max.	
IO devices changing during	Yes
operation (partner ports),	103
supported	
- Max. number of IO devices per	8
tool	
Device replacement without swap	Yes
medium	050 - 500 4 3
Send clock times	250 μs, 500 μs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high
	flexibility" option)

ET 200pro Interface modules IM 154-8 PN/DP CPU

rechnical specifications (continued)	
	6ES7 154-8AB01-0AB0
Updating time	250 µs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details)
 Address area 	
- Inputs, max.	2 048 byte
- Outputs, max.	2 048 byte
User data per address area, max.	1.0041
- User data consistency, max.	1 024 byte
PROFINET IO device	
• Services	V
- PG/OP communication	Yes
- Routing - S7 routing	Yes Yes
- S7 routing - S7 communication	Yes; with loadable FBs, max.
	configurable connections: 14, max. number of instances: 32
- Isochronous mode	No
- Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP
- IRT, supported	Yes
- PROFlenergy, supported	Yes; with SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
- Shared device, supported	Yes
 Number of IO controllers with shared device, max. 	2
Transfer memory	4 440
- Inputs, max.	1 440 byte; per IO controller with shared device
- Outputs, max.	1 440 byte; per IO controller with shared device
Submodules	silaled device
- Number, max.	64
- User data per submodule, max.	1 024 byte
PROFINET CBA	·
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
 Open IE communication, supported 	Yes
Number of connections, max.	8
 Local port numbers used at the system end 	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes

	6ES7 154-8AB01-0AB0
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Isochronous mode Isochronous mode	Yes; via PROFIBUS DP or PROFINET interface
Programming	
Programming language	
• STEP 7	Yes; V5.5 or higher
• LAD	Yes
• FBD	Yes
• STL	Yes
• SCL	Yes
• CFC	Yes
• GRAPH	Yes
HiGraph®	Yes
Command set	see instruction list
Nesting levels	8
Know-how protectionUser program protection/	Yes
password protection	V M: 0711 1 D:
Block encryption	Yes; With S7 block Privacy
System functions (SFC)	See instruction list
System function blocks (SFB)	See instruction list
Galvanic isolation between backplane bus and electronics	No
between backplane bus and all other circuit components	Yes
between supply and all other circuits	Yes
Standards, approvals,	
certificates CE mark	Yes
CSA approval	No
C-TICK	Yes
cULus	Yes
FM approval	No
Dimensions and weight	
Dimensions	
• Width	135 mm
Height	130 mm
• Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weight	
 Weight, approx. 	720 g

Ordering data	Order No.
IM 154-8 PN/DP CPU interface module, V3.2	6ES7 154-8AB01-0AB0
PROFINET IO controller to operate distributed I/Os on PROFINET, with integrated PLC functionality	
Accessories	
MMC 64 KB ¹⁾	6ES7 953-8LF20-0AA0
For program backup	
MMC 128 KB ¹⁾	6ES7 953-8LG20-0AA0
For program backup	

	Order No.
MMC 512 KB ¹⁾	6ES7 953-8LJ20-0AA0
For program backup	
MMC 2 MB ¹⁾	6ES7 953-8LL20-0AA0
for program backup and/or firmware updates	
MMC 4 MB ¹⁾	6ES7 953-8LM20-0AA0
For program backup	
MMC 8 MB ¹⁾	6ES7 953-8LP20-0AA0
For program backup	

¹⁾ An MMC is essential for operating the CPU

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ET 200pro Interface modules IM 154-8 PN/DP CPU

Ordering data	Order No.		Order No.
Connection module	6ES7 194-4AN00-0AA0	IE Connecting Cable M12-180/ M12-180	
For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", to connect PROFINET and PROFIBUS DP		Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type	
SCALANCE X-200 Industrial Ethernet Switches		C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, length:	
With integral SNMP access,	6GK5 208-0HA00-2AA6	0.3 m	6XV1 870-8AE30
Web diagnostics, copper cable			
diagnostics and PROFINET diagnostics, for setting up linear,		0.5 m	6XV1 870-8AE50
star and ring structures SCALANCE X208PRO, in degree		1.0 m	6XV1 870-8AH10
of protection IP65, with eight 10/		1.5 m	6XV1 870-8AH15
100 Mbit/s M12 ports, incl. eleven		2.0 m	6XV1 870-8AH20
M12 dust caps		3.0 m	6XV1 870-8AH30
Industrial Ethernet FC RJ45 Plug 90		5.0 m	6XV1 870-8AH50
RJ45 plug connector for Industrial		10 m	6XV1 870-8AN10
Ethernet with a rugged metal		15 m	6XV1 870-8AN15
enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet		PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male insert)	
1 unit	6GK1 901-1BB20-2AA0	3.0 m	3RK1 902-2NB30
10 units	6GK1 901-1BB20-2AB0	5.0 m	3RK1 902-2NB50
Industrial Ethernet FC RJ45	0GK1 301-1BB20-2AB0	10 m	3RK1 902-2NC10
Plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts		PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male insert at one end, other end unconnected)	
for connecting Industrial Ethernet FC installation cables; with 180°		3.0 m	3RK1 902-2HB30 3RK1 902-2HB50
cable outlet			3RK1 902-2HC10
1 unit	6GK1 901-1BB10-2AA0	12.11	3NK1 902-2NC10
10 units	6GK1 901-1BB10-2AB0	IE FC M12 Plug PRO	
50 units	6GK1 901-1BB10-2AE0	PROFINET M12 plug connector, D-coded with fast connection	
Industrial Ethernet Fast		system, axial cable outlet	
Connect installation cables • Fast Connect standard cable	6XV1 840-2AH10	1 unit	6GK1 901-0DB20-6AA0
Fast Connect trailing cable	6XV1 840-3AH10	8 units	6GK1 901-0DB20-6AA8
Fast Connect marine cable Industrial Ethernet	6XV1 840-4AH10	PROFINET M12 plug connector, D-coded, angled	3RK1 902-2DA00
FastConnect installation cables		IE panel feedthrough	
• IE FC TP Trailing Cable GP 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 870-2D	Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units	6GK1 901-0DM20-2AA5
• IE TP Torsion Cable GP 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m	6XV1 870-2F		
		_	
Industrial Ethernet Fast Connect			

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ET 200pro Interface modules IM 154-8 PN/DP CPU

Ordering data	Order No.		Order No.
7/8" connecting cable to power		M12 sealing cap	3RX9 802-0AA00
supply 5-core, 5 x 1.5 mm ² , trailing type,		For protection of unused M12 connections with ET 200pro	
preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m		M12 sealing caps with female thread	6ES7 194-4JD60-0AA0
• 1.5 m long	6XV1 822-5BH15	5 units	
• 2.0 m long • 3.0 m long • 5.0 m long	6XV1 822-5BH20 6XV1 822-5BH30 6XV1 822-5BH50	PROFIBUS M12 connecting cable	
 10 m long 15 m long Other special lengths with 90° or 	6XV1 822-5BN10 6XV1 822-5BN15	Preassembled, with two 5-pole M12 connectors/sockets, up to 100 m; length: • 1.5 m	6XV1 830-3DH15
180° cable outlet	siehe http:// support.automation.siemens. com/WW/view/en/26999294	• 2.0 m • 3.0 m • 5.0 m	6XV1 830-3DH20 6XV1 830-3DH30 6XV1 830-3DH50
power cable, can be trailed, 5 x 1.5 mm ² , preassembled at both ends with 7/8" angled connectors		• 10 m • 15 m	6XV1 830-3DN10 6XV1 830-3DN15
(female insert at one end, male insert at the other end) • 3.0 m long F		Other special lengths with 90° or 180° cable outlet	See http://support.automation.siemens.c
 5.0 m long 10 m long Power cable, can be trailed, 	******	M12 bus termination connector for PROFIBUS, female insert	6GK1 905-0ED00
5 x 1.5 mm ² , preassembled at one end with 7/8" angled connector with female insert		M12 bus termination connector for PROFIBUS, male insert	6GK1 905-0EC00
(female insert at one end, other end unconnected)		M12 plug connector, axial outlet, with male insert	6GK1 905-0EA00
 3.0 m long 5.0 m long 10 m long 	3RK1 902-3GB50	PROFIBUS FC Standard Cable GP Standard type specially designed	6XV1 830-0EH10
Power line	6XV1 830-8AH10	for fast assembly, 2-core, shielded,	
5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m		Sold by the meter; Max. delivery unit 1000 m, Minimum order quantity 20 m	
7/8" cable connector		PROFIBUS FC Trailing Cable	6XV1 830-3EH10
For ET 200eco, with axial cable		2-core, shielded	
outlet • with male insert, 5 per pack • with female insert, 5 per pack	6GK1 905-0FA00 6GK1 905-0FB00	PROFIBUS FC Food Cable 2-core, shielded	6XV1 830-0GH10
 angled, with female insert, 1 unit F angled, with male insert, 1 unit F 		Sold by the meter; Max. delivery unit 1000 m, Minimum order quantity 20 m	
7/8" cover cap, 10 per pack	6ES7 194-3JA00-0AA0	PROFIBUS FC Robust Cable	6XV1 830-0JH10
Twisted Pair cables 4x2 with RJ45 connectors		2-core, shielded	
0.5 m long	6XV1 870-3QE50	Sold by the meter; Max. delivery unit 1000 m,	
1 m long	6XV1 870-3QH10	Minimum order quantity 20 m	
2 m long	6XV1 870-3QH20	PROFIBUS M12 cable	
	6XV1 870-3QH60	connector	
6 m long	0X V I 07 0-3 QI IOU	5-pole, B-coded, metal casing,	
6 m long	6XV1 870-3QN10		
3		1 pack = 5 units • Female insert	6GK1 905-0EB00
6 m long 10 m long Crossed Twisted Pair cables		1 pack = 5 units	6GK1 905-0EB00
6 m long 10 m long Crossed Twisted Pair cables 4x2 with RJ45 connectors 0.5 m long	6XV1 870-3QN10 6XV1 870-3RE50	1 pack = 5 units	6GK1 905-0EB00
6 m long 10 m long Crossed Twisted Pair cables 4x2 with RJ45 connectors 0.5 m long 1 m long	6XV1 870-3QN10 6XV1 870-3RE50 6XV1 870-3RH10	1 pack = 5 units	6GK1 905-0EB00
6 m long 10 m long Crossed Twisted Pair cables 4x2 with RJ45 connectors 0.5 m long	6XV1 870-3QN10 6XV1 870-3RE50	1 pack = 5 units	6GK1 905-0EB00

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ET 200pro

Interface modules IM 154-8 F PN/DP CPU

Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing

- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061, up to PLe according to ISO 13849-1:2006 and Cat. 4 according to EN 954-1
- For high-performance control solutions in ET 200pro
- Increase of the availability of systems and machines
- Integral Web server with the option of creating user-defined Web sites
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note

SIMATIC Micro Memory Card required for operation of CPU.

	6ES7 154-8FB01-0AB0
Product version	
associated programming package	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4
Supply voltages	
external protection for supply cables (recommendation)	MCB 24 V DC / 16 A with tripping characteristic Type B and C (see ET 200pro manual)
Current consumption	
Current consumption (rated value)	350 mA; typical
Current consumption (in no-load operation), typ.	250 mA; typical, current consumption for CPU in STOP state
Inrush current, typ.	2 A; typical
l²t	0.25 A ² ·s; typical
Power losses	
Power loss, typ.	8.5 W; typical
Memory	
Work memory	
• integrated	512 Kibyte
 expandable 	No
Load memory	
pluggable (MMC)	Yes
 pluggable (MMC), max. 	8 Mbyte
Backup	
• present	Yes; ensured by MMC (maintenance-free)
 without battery 	Yes; program and data
CPU-blocks	
DB	
Number, max.	1 024; Number range: 1 to 16,000
• Size, max.	64 Kibyte

	6ES7 154-8FB01-0AB0
FB	
Number, max.	1 024; number range: 0 to 7,999
• Size, max.	64 Kibyte
FC	
Number, max.	1 024; number range: 0 to 7,999
• Size, max.	64 Kibyte
OB	
• Size, max.	64 Kibyte
Nesting depth	
 per priority class 	16
additional within an error OB	4
CPU processing times	
for bit operations, min.	0.05 μs
for word operations, min.	0.09 µs
for fixed point arithmetic, min.	0.12 μs
for floating point arithmetic, min.	0.45 µs
Counters, timers and their	
retentivity S7 counter	
Number	256
Retentivity	250
- adjusted	Yes
- lower limit	0
- upper limit	255
 Counting range 	
- adjusted	Yes
- lower limit	0
- upper limit	999
IEC counter	
• present	Yes
• Type	SFB

ET 200pro Interface modules IM 154-8 F PN/DP CPU

	6ES7 154-8FB01-0AB0		
S7 times			
Number	256		
 Retentivity 			
- adjusted	Yes		
- lower limit	0		
- upper limit	255		
- preset	No retentivity		
Time range			
- lower limit	10 ms		
- upper limit	9 990 s		
IEC timer			
• present	Yes		
• Type	SFB		
 Number 	Unlimited		
	(limited only by RAM capacity)		
Data areas and their retentivity			
Flag	0.040 lasta		
Number, max. Detentivity available.	2 048 byte		
Retentivity availableNumber of clock memories	Yes; MB 0 to MB 2047		
	8		
Data blocks	1001 N		
Number, max.	1 024; Number range: 1 to 16,000		
Size, max.	64 Kibyte		
Retentivity adjustable Detentivity property	Yes; via non-retain property on DB		
Retentivity preset	yes		
Local data	00 700 1		
 per priority class, max. 	32 768 byte; 2048 byte max. per block		
Address area	Sicon		
I/O address area			
• overall	2 048 byte		
Outputs	2 048 byte		
• of which, distributed	2 0 10 5)10		
- Inputs	2 048 byte		
- Outputs	2 048 byte		
Process image			
Inputs, adjustable	2 048 byte		
Outputs, adjustable	2 048 byte		
Inputs, preset	128 byte		
Outputs, preset	128 byte		
- 			
Subprocess imagesNumber of subprocess images,	1; With PROFINET IO, the length		
max.	of the user data is limited to		
	1600 byte		
Digital channels			
• Inputs	16 384		
• Outputs	16 384		
 Inputs, of which central 	128		
 Outputs, of which central 	64		
Analog channels			
• Inputs	1 024		
• Outputs	1 024		
 Inputs, of which central 	64		
 Outputs, of which central 	64		

	CEC7.454.0ED04.04.D0
	6ES7 154-8FB01-0AB0
Hardware configuration	1
Racks, max.	
Modules per rack, max.	16; Expansion width max. 1 m
Number of DP masters • integrated	1
Time	<u>'</u>
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchro-	Yes
nizableDeviation per day, max.	10 s; typ.: 2 s
Runtime meter	10 3, typ 2 3
Number	1
Number/Number range	0
Range of values	0 to 2^31 hours
Granularity	(when using SFC 101) 1 h
retentive	Yes; must be restarted at each
	restart
Clock synchronization	
• supported	Yes
to MPI, masterto MPI, slave	Yes Yes
• to DP, master	Yes; with DP slave only slave clock
• to DP, slave	Yes
• on Ethernet via NTP	Yes; as client
S7 message functions	
Number of login stations for message functions, max.	16; depending on the connections configured for PG/OP and S7
message functions, max.	basic communication
Process diagnostic messages	Yes
Smultaneously active Alarm-S	300
blocks, max.	
Test commissioning functions	
Status/control Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB,
	times, counters
Number of variables, max.	30
 of which status variables, max. of which control variables, max. 	30 14
Forcing	17
• Forcing	Yes
Status block	Yes; up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	
• Present	Yes
• Number of entries, max.	500; only the last 100 entries are retentive at power on/off
- adjusted	No
- preset	10
Monitoring functions Status LEDs	Yes
Olalus LLDs	163

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Interface modules
IM 154-8 F PN/DP CPU

Communication functions PG/OP communication	6ES7 154-8FB01-0AB0
	Yes
Routing	Yes
Global data communication • supported • Size of GD packets, max.	Yes 22 byte
S7 basic communication • supported	Yes
S7 communication • supported	Yes
Web server • supported • Number of HTTP clients • User-defined websites	Yes 5 Yes
Open IE communication TCP/IP Number of connections, max. Data length, max. Several passive connections per port, supported ISO-on-TCP (RFC1006) Number of connections, max. Data length, max. UDP Number of connections, max. Data length, max. Number of connections overall usable for PG communication usable for OP communication usable for S7 basic communication usable for routing	Yes; Via integrated PROFINET interface and loadable FBs 8 32 768 byte; 1460 byte with connection type 01H; 32768 byte with connection type 11H Yes Yes 8 32 768 byte Yes 8 1 472 byte 16 15 15 14 X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave
DDOEINET CDA (at act actuaint	(active): max. 14; X2 as PROFINET: 24 max.
PROFINET CBA (at set setpoint communication load) • Setpoint for the CPU communication load	50 %
 Number of remote interconnection partners 	32
Number of functions, master/ slave	30
Total of all Master/Slave connections	1 000
Data length of all incoming connections master/slave, max. Data length of all outgoing.	4 000 byte
 Data length of all outgoing connections master/slave, max. Number of device-internal and 	4 000 byte 500
PROFIBUS interconnections • Data length of device-internal und PROFIBUS interconnections,	4 000 byte
max. • Data length per connection, max.	1 400 byte

	6ES7 154-8FB01-0AB0
Remote interconnections with	
acyclic transmission - Sampling frequency:	500 ms
Sampling time, min.	000 1110
 Number of incoming interconnections 	100
 Number of outgoing intercon- nections 	100
 Data length of all incoming interconnections, max. 	2 000 byte
Data length of all outgoing interconnections, max.	2 000 byte
Data length per connection, max.	1 400 byte
• Remote interconnections with	
cyclic transmission - Transmission frequency:	1 ms
Transmission interval, min. - Number of incoming intercon-	200
nections - Number of outgoing intercon-	200
nections - Data length of all incoming	2 000 byte
interconnections, max. - Data length of all outgoing	2 000 byte
interconnections, max. - Data length per connection,	450 byte
max. • HMI variables via PROFINET	
(acyclic) - Number of stations that can log on for HMI variables	3; 2x PN OPC/1x iMap
(PN OPC/iMap) - HMI variable updating	500 ms
Number of HMI variablesData length of all HMI variables,	200 2 000 byte
max. • PROFIBUS proxy functionality	
- supported	Yes
 Number of linked PROFIBUS devices 	16
 Data length per connection, max. 	240 byte; Slave-dependent
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485/connection: 2 x M12 b-coded
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	May only be used for external terminating resistor
Functionality	
• MPI	Yes
DP masterDP slave	Yes Yes
Point-to-point connection	No
MPI	
• Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	Yes
S7 basic communicationS7 communication	Yes Yes
- S7 communication, as client	No
- S7 communication, as server	Yes
• Transmission rate, max.	12 Mbit/s

ET 200pro Interface modules IM 154-8 F PN/DP CPU

Technical specifications (continued)		
	6ES7 154-8FB01-0AB0	
DP master		
• Services		
- PG/OP communication	Yes	
- Routing	Yes	
- Global data communication	No	
- S7 basic communication	Yes; I blocks only	
- S7 communication	Yes	
- S7 communication, as client	No	
- S7 communication, as server	Yes; connection configured on one side only	
- Equidistance mode support	Yes	
- Isochronous mode	Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)	
- SYNC/FREEZE	Yes	
 Activation/deactivation of DP slaves 	Yes	
- Direct data exchange (slave-to-slave communication)	Yes; as subscriber	
- DPV1	Yes	
Transmission rate, max.	12 Mbit/s	
Number of DP slaves, max.	124	
Address area	0.040 +-	
- Inputs, max.	2 048 byte	
- Outputs, max.	2 048 byte	
User data per DP slave	044 - +	
- Inputs, max.	244 byte	
- Outputs, max.	244 byte	
DP slave		
• Services		
- Routing	Yes; with active interface	
- Global data communication	No	
- S7 basic communication	No	
- S7 communication	Yes	
- S7 communication, as client	No	
- S7 communication, as server	Yes; connection configured on one side only Yes	
- Direct data exchange (slave-to-slave communication)	ies	
- DPV1	No	
Transmission rate, max.	12 Mbit/s	
Transfer memory		
- Inputs	244 byte	
- Outputs	244 byte	
Address area, max.	32	
• User data per address area, max.	32 byte	
2nd interface	·	
Type of interface	PROFINET	
Physics	Ethernet (2 x M12 d-coded;	
	1 x RJ45)	
Isolated	Yes; galvanic isolation for P3 is implemented in IM154-8, for P1 and P2 in CM	
Integrated switch	Yes	
Number of ports	3	
automatic detection of trans- mission speed	Yes; 10/100 Mbit/s	
Autonegotiation	Yes	
Autocrossing	Yes	

	6ES7 154-8FB01-0AB0
Media redundancy	
supported	Yes
Switchover time on line break,	200 ms; PROFINET MRP
typically	200 IIIS, I HOI INET WITH
Number of stations in the ring,	50
max.	
Change of IP address at runtime,	Yes
supported	
unctionality	
• MPI	No
DP master	No
DP slave	No
PROFINET IO controller	Yes; also simultaneously with
	IO device functionality
PROFINET IO device	Yes; also simultaneously with
DDOEINET OD A	IO controller functionality
PROFINET CBA	Yes
Open IE communication Web server	Yes; via TCP/IP, ISO on TCP, UDP
	Yes
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- Routing	Yes
- S7 communication	Yes; with loadable FBs, max.
	configurable connections: 14, max. number of instances: 32
- Isochronous mode	Yes; OB 61 - isochronous mode is
- Isocilionous mode	possible either on DP or
	PROFINET IO (not simultaneously)
- Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP
Transmission rate, max.	100 Mbit/s
Number of connectable IO	128
devices, max.	
Max. number of connectable IO	128
devices for RT	
- of which in line, max.	128
Number of IO devices with IRT	128
and the option "high flexibility"	04
- of which in line, max.	61
 Number of IO devices with IRT and the option "high perfor- 	64
mance", max.	
- of which in line, max.	64
IRT, supported	Yes
Prioritized startup supported	Yes
- Number of IO devices, max.	32
• Activation/deactivation of	Yes
IO devices	
- Number of IO devices that can	8
be simultaneously activated/	
deactivated, max.	
IO devices changing during	Yes
operation (partner ports),	
supported	0
- Max. number of IO devices per	8
tool	Yes
 Device replacement without swap medium 	162
Send clock times	250 us 500 us 1 ms: 2 ms 4 ms
- Gond Glock times	250 μs, 500 μs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high
	flexibility" option)

ET 200pro
Interface modules
IM 154-8 F PN/DP CPU

lechnical specifications (continued)			
	6ES7 154-8FB01-0AB0		
Updating time	250 µs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details)		
Address area Inputs may	2.049 byto		
Inputs, max.Outputs, max.	2 048 byte 2 048 byte		
 User data per address area, max. 			
- User data consistency, max.	1 024 byte		
PROFINET IO device			
 Services 			
- PG/OP communication	Yes		
- Routing	Yes		
- S7 routing	Yes		
- S7 communication - Isochronous mode	Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32		
- Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP		
- IRT, supported	Yes		
- PROFlenergy, supported	Yes; with SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device		
 Shared device, supported 	Yes		
 Number of IO controllers with shared device, max. 	2		
Transfer memory			
- Inputs, max.	1 440 byte; per IO controller with shared device		
- Outputs, max.	1 440 byte; per IO controller with shared device		
 Submodules 			
- Number, max.	64		
- User data per submodule, max.	1 024 byte		
PROFINET CBA			
 acyclic transmission 	Yes		
 cyclic transmission 	Yes		
Open IE communication			
 Open IE communication, supported 	Yes		
 Number of connections, max. 	8		
 Local port numbers used at the system end 	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535		
• Keep-alive function, supported	Yes		
Isochronous mode			
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface		

	6ES7 154-8FB01-0AB0
Programming	
Programming language	
• STEP 7	Yes; V5.5 or higher
• LAD	Yes
• FBD	Yes
• STL	Yes
• SCL • CFC	Yes Yes
• GRAPH	Yes
HiGraph®	Yes
Command set	see instruction list
Nesting levels	8
	0
Know-how protectionUser program protection/	Yes
password protection	165
Block encryption	Yes; with S7 block Privacy
System functions (SFC)	See instruction list
System function blocks (SFB)	See instruction list
Galvanic isolation	
between backplane bus and electronics	No
between backplane bus and all other circuit components	Yes
between supply and all other circuits	Yes
Standards, approvals, certifi-	
cates CE mark	Yes
CSA approval	No
C-TICK	Yes
cULus	Yes
FM approval	No
Dimensions and weight	110
Dimensions	
• Width	135 mm
Height	130 mm
• Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weight	
Weight, approx.	720 g

ET 200pro
Interface modules
IM 154-8 F PN/DP CPU

Ordering data	Order No.		Order No.
IM 154-8 F PN/DP CPU interface module, V3.2	6ES7 154-8FB01-0AB0	Industrial Ethernet FC RJ45 Plug 90	
Fail-safe PROFINET IO controller to operate distributed I/Os on PROFINET, with integrated PLC functionality		RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts	
Distributed Safety V5.4 programming tool		for connecting Industrial Ethernet FC installation cables; with 90° cable outlet	
Task: Software for configuring fail-safe application programs for		1 unit	6GK1 901-1BB20-2AA0
SIMATIC ŚŻ-300F, SŻ-400F,		10 units	6GK1 901-1BB20-2AB0
ET 200S Requirements: STEP 7 V5.3 SP3 and higher		Industrial Ethernet FC RJ45 Plug 180	
Floating license	6ES7 833-1FC02-0YA5	RJ45 plug connector for Industrial	
Software Update Service	6ES7 833-1FC00-0YX2	Ethernet with a rugged metal enclosure and integrated	
Distributed Safety Upgrade	6ES7 833-1FC02-0YE5	insulation displacement contacts for connecting Industrial Ethernet	
From V5.3 to V5.4; Floating license for 1 user	0207 000-11 002-0125	FC installation cables; with 180° cable outlet	
Accessories		1 unit	6GK1 901-1BB10-2AA0
MMC 64 KB ¹⁾	6ES7 953-8LF20-0AA0	10 units	6GK1 901-1BB10-2AB0
for program backup		50 units	6GK1 901-1BB10-2AE0
MMC 128 KB ¹⁾	6ES7 953-8LG20-0AA0	Industrial Ethernet Fast Connect installation cables	
for program backup		Fast Connect standard cable	6XV1 840-2AH10
MMC 512 KB ¹⁾	6ES7 953-8LJ20-0AA0	Fast Connect trailing cable	6XV1 840-3AH10
for program backup		Fast Connect marine cable	6XV1 840-4AH10
MMC 2 MB ¹⁾	6ES7 953-8LL20-0AA0	Industrial Ethernet FastConnect installation cables	
for program backup and/or firmware updates		• IE FC TP Trailing Cable GP 2 x 2;	6XV1 870-2D
MMC 4 MB ¹⁾	6ES7 953-8LM20-0AA0	Sold by the meter, max. order quantity 1000 m;	
for program backup		Minimum order quantity 20 m	
MMC 8 MB ¹⁾	6ES7 953-8LP20-0AA0	• IE TP Torsion Cable GP 2 x 2; Sold by the meter, max. order	6XV1 870-2F
for program backup		quantity 1000 m; Minimum order quantity 20 m	
Connection module	6ES7 194-4AN00-0AA0	Industrial Ethernet Fast	
For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", to connect PROFINET and PROFIBUS DP		Connect Stripping Tool	6GK1 901-1GA00
SCALANCE X-200 Industrial Ethernet Switches			
With integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbit/s M12 ports, incl. eleven M12 dust caps	6GK5 208-0HA00-2AA6		

¹⁾ An MMC is essential for operating the CPU

ET 200pro Interface modules IM 154-8 F PN/DP CPU

Ordering data	Order No.		Order No.
IE Connecting Cable M12-180/ M12-180		7/8" connecting cable to power supply	
Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, length:		5-core, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m • 1.5 m long	6XV1 822-5BH15
0.3 m	6XV1 870-8AE30	• 2.0 m long	6XV1 822-5BH20
0.5 m	6XV1 870-8AE50	• 3.0 m long	6XV1 822-5BH30
1.0 m	6XV1 870-8AH10	• 5.0 m long	6XV1 822-5BH50
1.5 m	6XV1 870-8AH15	10 m long15 m long	6XV1 822-5BN10 6XV1 822-5BN15
2.0 m	***************************************	Other special lengths with 90° or	See
	6XV1 870-8AH20	180° cable outlet	support.automation.siemens.
3.0 m	6XV1 870-8AH30		com/WW/view/en/26999294
5.0 m	6XV1 870-8AH50	Power cable, can be trailed, 5 x 1.5 mm ² , preassembled at	
10 m	6XV1 870-8AN10	both ends with 7/8" angled	
15 m	6XV1 870-8AN15	connectors (female insert at one	
PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male insert)		end, male insert at the other end) • 3.0 m long F • 5.0 m long F • 10 m long F	3RK1 902-3NB30 3RK1 902-3NB50 3RK1 902-3NC10
3.0 m F	3RK1 902-2NB30	 Power cable, can be trailed, 5 x 1.5 mm², preassembled at 	
5.0 m F	3RK1 902-2NB50	one end with 7/8" angled	
10 m	3RK1 902-2NC10	connector with female insert	
PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male insert at one end, other end unconnected)		(female insert at one end, other end unconnected) • 3.0 m long • 5.0 m long • 10 m long F	3RK1 902-3GB30 3RK1 902-3GB50 3RK1 902-3GC10
3.0 m F	3RK1 902-2HB30	Power line	6XV1 830-8AH10
5.0 m F	3RK1 902-2HB50	5-core, 5 x 1.5 mm ² , trailing type,	
10 m F	3RK1 902-2HC10	sold by the meter, minimum order quantity 20 m, maximum order	
IE FC M12 Plug PRO	3111(1 302-211010	quantity 1000 m	
-		7/8" cable connector	
PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet		For ET 200eco, with axial cable outlet	
1 unit	6GK1 901-0DB20-6AA0	with male insert, 5 per pack with famels insert, 5 per pack	6GK1 905-0FA00
8 units	6GK1 901-0DB20-6AA8	 with female insert, 5 per pack angled, with female insert, 1 unit F 	6GK1 905-0FB00 3RK1 902-3DA00
PROFINET M12 plug connector, D-coded, angled	3RK1 902-2DA00	• angled, with male insert, 1 unit F	3RK1 902-3BA00
IE panel feedthrough		7/8" cover cap, 10 per pack	6ES7 194-3JA00-0AA0
Cabinet feedthrough for converting from the M12	6GK1 901-0DM20-2AA5	Twisted Pair cables 4x2 with RJ45 connectors	
connection system (D-coded,		0.5 m long	6XV1 870-3QE50
IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units		1 m long	6XV1 870-3QH10
6,500 (ii 20), 1 paok – 5 dilits		2 m long	6XV1 870-3QH20
		6 m long	6XV1 870-3QH60
		10 m long	6XV1 870-3QN10
		F: Subject to export regulations AL: I	N and ECCN: EARGO

F: Subject to export regulations AL: N and ECCN: EAR99

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro
Interface modules
IM 154-8 F PN/DP CPU

Ordering data	Order No.		Order No.
Crossed Twisted Pair cables 4x2 with RJ45 connectors		PROFIBUS FC S tandard Cable GP	6XV1 830-0EH10
0.5 m long	6XV1 870-3RE50	Standard type specially designed	
1 m long	6XV1 870-3RH10	for fast assembly, 2-core, shielded.	
2 m long	6XV1 870-3RH20	Sold by the meter;	6XV1 830-3EH10
6 m long	6XV1 870-3RH60	Max. delivery unit 1000 m,	5AV 1 665 521115
10 m long	6XV1 870-3RN10	Minimum order quantity 20 m	
M12 sealing cap	3RX9 802-0AA00	PROFIBUS FC Trailing Cable	
For protection of unused M12		2-core, shielded	6XV1 830-0GH10
connections with ET 200pro		PROFIBUS FC Food Cable	
M12 sealing caps with female	6ES7 194-4JD60-0AA0	2-core, shielded	
thread 5 units		Sold by the meter; Max. delivery unit 1000 m,	6XV1 830-0JH10
PROFIBUS M12 connecting		Minimum order quantity 20 m	
cable		PROFIBUS FC Robust Cable	
Preassembled, with two 5-pole		2-core, shielded	
M12 connectors/sockets, up to 100 m; length:		Sold by the meter; Max. delivery unit 1000 m,	
• 1.5 m	6XV1 830-3DH15	Minimum order quantity 20 m	
• 2.0 m • 3.0 m	6XV1 830-3DH20 6XV1 830-3DH30	PROFIBUS M12 cable	
• 3.0 m • 5.0 m	6XV1 830-3DH30 6XV1 830-3DH50	connector	
• 10 m	6XV1 830-3DN10	5-pole, B-coded, metal casing,	6GK1 905-0EB00
• 15 m	6XV1 830-3DN15	1 pack = 5 units • Female insert	6GK1 905-0ED00
Other special lengths with 90° or 180° cable outlet	See http://support.automation.siemens.com/WW/view/en/26999294	Tonide insert	54K1 555 5255
M12 bus termination connector for PROFIBUS, female insert	6GK1 905-0ED00		
M12 bus termination connector for PROFIBUS, male insert	6GK1 905-0EC00		
M12 plug connector, axial outlet, with male insert	6GK1 905-0EA00		

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro I/O modules

Digital expansion modules

Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics

 - Standard modules with module-specific diagnostics
 High-feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8DI and 8DO module by selecting CM IO 4 x M12 or CM IO 8 x M12

	6ES7 141-4BF00-0AA0	6ES7 141-4BF00-0AB0	6ES7 141-4BH00-0AA0
Supply voltages			
Rated value			
• 24 V DC	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes; against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; against destruction; encoder power supply outputs applied with reversed polarity
Current consumption			
from backplane bus 3.3 V DC, max.	20 mA	40 mA	20 mA
from supply voltage 1L+, max.	20 mA	20 mA	30 mA
Power losses			
Power loss, typ.	2.5 W	2.5 W	3 W
Address area			
Occupied address area			
• Inputs	1 byte	1 byte	2 byte
FH technology			
Module for fail-safe applications	No	No	
Isochronous mode			
Isochronous mode	No	No	
Digital inputs			
Number of digital inputs	8	8	16
Number of simultaneously control- lable inputs			
 all mounting positions 			
- up to 55 °C, max.	8	8	16
Input characteristic curve acc. to IEC 1131, Type 1	Yes	No	Yes
Input characteristic curve acc. to IEC 1131, Type 2	No	Yes	
Input voltage			
Rated value, DC	24 V	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	11 to 30 V	11 to 30 V
Input current			
• for signal "1", typ.	7 mA	7 mA	4 mA

ET 200pro
I/O modules
Digital expansion modules

	6ES7 141-4BF00-0AA0	6ES7 141-4BF00-0AB0	6ES7 141-4BH00-0AA0
Input delay			
(for rated value of input voltage)			
• for standard inputs	Ne	Van	No
parameterizableat "0" to "1", min.	No 1.2 ms	Yes	No 1.2 ms
- at "0" to "1", max.	4.8 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms 20 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	0.5 ms; 0.5 ms/3 ms/15 ms/20 ms	0.7 ms
- at "1" to "0", max.	4.8 ms	20 ms	3 ms
Cable length			
Cable length, shielded, max.	30 m	30 m	30 m
Cable length unshielded, max.	30 m	30 m	30 m
Encoder supply			
Number of outputs	8	8	8
Output current			
● up to 55 °C, max.	1 A	1 A	1 A
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
 permissible quiescent current (2-wire BEROS), max. 	1.5 mA	1.5 mA	1.5 mA
Parameter			
Diagnostic alarm		yes	
Process alarm		for 6 channels	
Diagnostics: wire break		channel by channel	
Diagnostics: short circuit	Sensor supply to M; module by module	channel by channel	
Alarms/diagnostics/status			
Diagnostics			
Diagnostic functions	Yes	Yes; channel by channel,	Yes
Diagnostic information readable	Yes	parameterizable Yes	Yes
Wire break	les	Yes; monitoring, I < 0.3 mA	165
Short circuit	Yes; Sensor supply to M; module	Yes	Yes; sensor supply to M; module
	by module	100	by module
• Group error			Yes
diagnostic indication LED	V	V	V
• Group error SF (red)	Yes Yes; per channel	Yes	Yes
 Status indicator digital input (green) 	res, per channer	Yes; per channel	Yes; per channel
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
Galvanic isolation			
Galvanic isolation digital inputs			
 between the channels 	No	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes
Permissible potential difference			
between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Degree of protection			
IP65	Yes	Yes	
IP66	Yes	Yes	
IP67	Yes	Yes	Yes
Dimensions and weight			
Dimensions			
• Width	45 mm	45 mm	45 mm
• Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weight			
 Weight, approx. 	140 g	140 g	140 g

ET 200pro
I/O modules
Digital expansion modules

			6ES7 142-4BF00-0AA0
Supply voltages Load voltage 2L+			
Rated value (DC)	24 V	24 V	24 V
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
Current consumption			
rom load voltage 2L+ (without load), nax.	20 mA	40 mA	30 mA
rom backplane bus 3.3 V DC, max.	20 mA	40 mA	30 mA
Power losses			
Power loss, typ.	2 W	2.5 W	2 W
Address area			
Address space per module			
with packing	4 bit	4 bit	8 bit
without packing	1 byte	1 byte	1 byte
FH technology Module for fail-safe applications	No	No	No
Digital outputs			
Number of digital outputs	4	4	8
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Response threshold, typ.	3	3	0.7
imitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
_amp load, max.	10 W	10 W	5 W
Controlling a digital input	Yes	Yes	Yes; isolation between 1L+ and 2L+ is no longer provided, as 1N and 2M are jumpered
Output voltage			
for signal "1", min.	2L+ (-0.8 V)	2L+ (-0.8 V)	2L+ (-0.8 V)
Output current			
for signal "1" rated value	2 A	2 A	0.5 A
for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Parallel switching of 2 outputs			
for increased power	No	No	No
for redundant control of a load	Yes	Yes	Yes
Switching frequency			
with resistive load, max.	100 Hz	100 Hz	100 Hz
with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
on lamp load, max.	1 Hz	1 Hz	1 Hz
Aggregate current of outputs			
per group)	4.0	4.4	4.0
up to 55 °C, max.	4 A	4 A	4 A
Load resistance range			
lower limit	12 Ω	12 Ω	48 Ω
upper limit	4 kΩ	4 kΩ	4 kΩ
Cable length			
Cable length, shielded, max.	30 m	30 m	30 m
Cable length unshielded, max.	30 m	30 m	30 m

ET 200pro
I/O modules
Digital expansion modules

			6ES7 142-4BF00-0AA0
Parameter			
Diagnostics: wire break		channel by channel	
Diagnostics: short circuit		channel by channel	
Behavior on CPU/Master STOP		channel by channel	
Alarms/diagnostics/status information			
Substitute values connectable		Yes	
Alarms			
Diagnostic alarm		Yes	
Diagnostics			
Diagnostic functions	Yes	Yes	Yes
Diagnostic information readable	Yes	Yes	Yes
Wire break		Yes	
Short circuit	Yes; short-circuit of outputs to M; module by module	Yes	Yes; short-circuit of outputs to M; module by module
Diagnostic indication LED			
Group error SF (red)	Yes	Yes	Yes
 Status indicator digital output (green) 	Yes	Yes	Yes
 Channel error indicator F (red) 		Yes	
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
Galvanic isolation			
between backplane bus and all other circuit components		Yes	
between the channels and backplane bus		Yes	
Galvanic isolation digital outputs			
between the channels	No	No	No
 between the channels and the backplane bus 	Yes	Yes	Yes
Permissible potential difference			
between different circuits		75 V DC / 60 V AC	
Dimensions and weight Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
• Depth	35 mm	35 mm; without terminal module	35 mm
Weight		,	
Weight, approx.	140 g	140 g	140 g
3 : 11	~	5	

ET 200pro
I/O modules
Digital expansion modules

Technical specifications (conti	nued)
	6ES7 143-4BF00-0AA0
Supply voltages	
Rated value	
• 24 V DC	Yes
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Load voltage 2L+	
Rated value (DC)	24 V
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Current consumption	
from load voltage 1L+ (unswitched voltage)	20 mA
from load voltage 2L+, max.	20 mA
Power losses	
Power loss, typ.	3 W
Digital inputs	
Number of digital inputs	4
Number of simultaneously control-	
able inputsall mounting positions	
- Concurrently controllable	4; Up to 55 °C
inputs, up to 60 °C	1, op to 55°C
Input characteristic curve acc. to IEC 1131, Type 3	Yes
Input voltage	
Rated value, DC	24 V
• for signal "0"	-3 to +5 V
for signal "1"	11 to 30 V
Input current	
 for signal "0", max. (permissible quiescent current) 	1.5 mA
• for signal "1", typ.	7 mA
Input delay (for rated value of input	
voltage)	
for standard inputs	
- at "0" to "1", max.	4.8 ms
- at "1" to "0", max.	4.8 ms
Cable length	20 m
Cable length unshielded, max.	30 m
Digital outputs Number of digital outputs	8; 4 DO fixed, 4 DIO
Number of digital outputs	parameterizable
• in groups of	2
Short-circuit protection	Yes; per channel, electronic
Response threshold, typ.	0.7 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V

	6ES7 143-4BF00-0AA0
Switching capacity of the outputs • on lamp load, max.	5 W
Controlling a digital input	Yes
Output current	
• for signal "1" rated value	0.5 A
 for signal "0" residual current, max. 	0.5 mA
Parallel switching of 2 outputs	
for increased powerfor redundant control of a load	No Yes
Switching frequency	163
with resistive load, max.	100 Hz
with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Aggregate current of outputs (per group)	
• up to 55 °C, max.	2 A
Cable length Cable length unshielded, max.	30 m
_	30 111
Encoder supply Number of outputs	4
Output current, rated value	1 A
24 V encoder supply • Short-circuit protection	Yes
Alarms/diagnostics/status infor-	165
mation	
Status indicator	Yes; Green LED
Alarms	
Diagnostic alarm	Yes
Diagnostic alarm Diagnostics	
Diagnostic alarmDiagnosticsDiagnostic functions	Yes Yes Yes
Diagnostic alarm Diagnostics	Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit	Yes Yes; short-circuit of outputs to ground; module by module
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error	Yes Yes; short-circuit of outputs to ground; module by module
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with	Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other switching components Galvanic isolation digital inputs	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other switching components Galvanic isolation digital inputs between the channels Permissible potential difference	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes No
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes No 75 V DC/60 V AC
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other switching components Galvanic isolation digital inputs between the channels Permissible potential difference between different circuits Dimensions and weight Dimensions Width	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes No 75 V DC/60 V AC
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other switching components Galvanic isolation digital inputs between the channels Permissible potential difference between different circuits Dimensions and weight Dimensions	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes No 75 V DC/60 V AC
Diagnostic alarm Diagnostics Diagnostic functions Diagnostic functions Diagnostic information readable Short circuit Short circuit encoder supply Group error Isolation tested with 24 V DC circuits Galvanic isolation between the load voltages between load voltage and all other switching components Galvanic isolation digital inputs between the channels Permissible potential difference between different circuits Dimensions and weight Dimensions Width Height	Yes Yes Yes; short-circuit of outputs to ground; module by module Yes; per module Yes 500 V Yes Yes No 75 V DC/60 V AC

ET 200pro
I/O modules
Digital expansion modules

Ordering data	Order No.		Order No.
8 DI digital input module	6ES7 141-4BF00-0AA0	CM IO 8 x M12 connection module	6ES7 194-4CB00-0AA0
24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately		8 M12 sockets for connecting digital sensors or actuators to ET 200pro	
8 DI High Feature digital input module	6ES7 141-4BF00-0AB0	CM IO 8 x M12D connection module	6ES7 194-4CB50-0AA0
24 V DC, with channel-specific diagnostics, including bus module Connection module must be ordered separately		8 M12 sockets for connecting digital sensors or actuators to ET 200pro	
16 DI digital input module	6ES7 141-4BH00-0AA0	CM IO 8 x M8 connection module	6ES7 194-4EB00-0AA0
24 V DC, with module-specific diagnostics, including bus module. Connection module		8 sockets M8 for connection of digital sensors or actuators to ET 200pro	
6ES7 194-4CB50-0AA0 must be ordered separately		CM IO 2 x M12 connection module	6ES7 194-4FB00-0AA0
4 DO digital output module 24 V DC, 2 A, with module-	6ES7 142-4BD00-0AA0	2 M12 - pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	
specific diagnostics, including bus module. Connection module must be ordered separately		CM IO 1 x M23 connection module	6ES7 194-4FA00-0AA0
4 DO High Feature digital output module		1 socket M23; for use with: EM 8 DI, 24 V DC and 8 DO,	
24 V DC, 2 A, with channel- specific diagnostics, including	6ES7 142-4BD00-0AB0	24 V DC/0.5 A	
bus module. Connection module must be ordered separately		Module identification labels For color coding of the CM IOs in	6ES7 194-4HA00-0AA0
8 DO digital output module	6ES7 142-4BF00-0AA0	the colors of white, red, blue and green; pack with 100 units each	
24 V DC, 0.5 A, with module- specific diagnostics, including		M12 sealing cap	3RX9 802-0AA00
bus module. Connection module must be ordered separately		For protection of unused M12 connections with ET 200pro	
Digital input and output module 4 DIO / 4 DO	6ES7 143-4BF00-0AA0	Labels	3RT1 900-1SB20
24 V DC, 0.5 A, with module-		20 x 7, pale turquoise, 340 units per pack	
specific diagnostics, including bus module. Connection module		Y circular connector M12	6ES7 194-1KA01-0XA0
must be ordered separately		For double connection of sensors via a single cable, 5-pole; cannot	
Accessories CM IO 4 x M12 connection	6ES7 194-4CA00-0AA0	be used for F DI 4/8	
module	0E3/ 194-4CAUU-UAAU	Y cable M12	
4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro		For double connection of I/O by means of a single-cable on ET200, 5-pole	6ES7 194-6KA00-0XA0
CM IO 4 x M12 inverse connection module	6ES7 194-4CA50-0AA0	M8 sealing cap For IP 67 modules	3RK1 901-1PN00
4 sockets M12 for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 singly occupied, 2 x M12 doubly occupied		POLIF OF HIODULES	

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro
I/O modules
Analog expansion modules

Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostic functionality, limit values and substitute values

	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0	6ES7 144-4JF00-0AB0	6ES7 144-4PF00-0AB0
Supply voltages Load voltage L+				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
Current consumption from load voltage L+ (without load), max.				34 mA; typ.
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA; typically	20 mA; typically
Power losses Power loss, typ.	1.1 W	1.1 W	0.7 W	0.7 W
Address area Address space per module • Address space per module, max.	8 byte	8 byte	8 byte	8 byte
Analog inputs Number of analog inputs	4	4	4	4
Cable length, shielded, max.	30 m	30 m	30 m	30 m
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	267 ms	267 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes	
Input ranges • Voltage • Current	Yes No	Yes Yes	No No	Yes
ThermocoupleResistance thermometerResistance	No No No	No No No	No Yes Yes	Yes

ET 200pro
I/O modules
Analog expansion modules

- recinical specifications	<u> </u>			
	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0	6ES7 144-4JF00-0AB0	6ES7 144-4PF00-0AB0
Input ranges (rated values), voltages				
• 1 to 5 V	Yes			
• -10 V to +10 V	Yes			
 Input resistance (-10 V to +10 V) 	100 kΩ			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
 Input resistance (-80 mV to +80 mV) 				10 ΜΩ
Input ranges (rated values), currents				
• -20 to +20 mA		Yes		
 Input resistance (-20 to +20 mA) 		50 Ω		
• 4 to 20 mA		Yes		
 Input resistance (4 to 20 mA) 		50 Ω		
Input ranges (rated values), thermoelements				
• Type B				Yes
 Input resistance (Type B) 				10 ΜΩ
• Type E				Yes
 Input resistance (Type E) 				10 ΜΩ
• Type J				Yes
 Input resistance (type J) 				10 ΜΩ
• Type K				Yes
 Input resistance (Type K) 				10 MΩ
• Type L				Yes
• Input resistance (Type L)				10 ΜΩ
• Type N				Yes
Input resistance (Type N) The property of the state				10 MΩ
• Type R				Yes
Input resistance (Type R)Type S				10 MΩ Yes
Input resistance (Type S)				10 MΩ
• Type T				Yes
Input resistance (Type T)				10 MΩ
Input ranges (rated values),				
resistance thermometers • Cu 10			No	
• Ni 100			Yes	
Input resistance (Ni 100)			10 000 kΩ	
• Ni 1000			Yes	
Input resistance (Ni 1000)			10 000 kΩ	
• Ni 120			Yes	
• Input resistance (Ni 120)			10 000 kΩ	
• Ni 200			Yes	
• Input resistance (Ni 200)			10 000 kΩ	

ET 200pro
I/O modules
Analog expansion modules

Technical specifications (continued)				
	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0	6ES7 144-4JF00-0AB0	6ES7 144-4PF00-0AB0
Input ranges (rated values), resistance thermometers Ni 500 Input resistance (Ni 500) Pt 100 Input resistance (Pt 100) Pt 1000 Input resistance (Pt 1000) Pt 200 Input resistance (Pt 200) Pt 500 Input resistance (Pt 500)			Yes 10 000 kΩ	
0 to 150 Ohm Input resistance (0 to 150 Ohm) 0 to 300 Ohm Input resistance (0 to 300 Ohm) 0 to 600 Ohm Input resistance (0 to 600 Ohm) 0 to 3000 Ohm) 0 to 3000 Ohm Input resistance (0 to 3000 Ohm)			Yes 10 000 k Ω	
Voltage input • permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
Current input • permissible input current for current input (destruction limit), max.		40 mA		
Characteristic linearization • parameterizable • for resistance thermometer			Yes Ptxxx, Nixxx	
Temperature compensation internal temperature compensation external temperature compensation with compensations socket				Yes Yes
Analog value creation Measurement principle	integrating	integrating	integrating	integrating
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max.	15 bit; at +/- 10 V, at +/- 5 V; 14 bit at 0 to 10 V, at 1 to 5 V	15 bit; at +/20 mA; 14 bit at 0 to 20 mA, 4 to 20 mA	15 bit; at 150, 300, 600 und 3000 Ohm; otherwise 15 bit + sign	15 bit; + sign
 Integration time, ms Interference voltage suppression for interference frequency f1 in Hz 	20 / 16,667 50/60 Hz	20 / 16,667 50/60 Hz	20 / 16,667 50/60 Hz	2.5/16.67/20/100 ms 10/50/60/400 Hz
 Conversion time (per channel) 	67 ms	67 ms	20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	4.7/19/22/102 ms

ET 200pro
I/O modules
Analog expansion modules

	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0	6ES7 144-4JF00-0AB0	6ES7 144-4PF00-0AB0
Smoothing of measured				
values • parameterizable	Yes	Yes	Yes	Yes
Step: None	Yes; 1 x cycle time	Yes; 1 x cycle time	Yes; 1 x cycle time	Yes; 1 x cycle time
Step: Low	Yes; 4 x cycle time	Yes; 4 x cycle time	Yes; 4 x cycle time	Yes; 4 x cycle time
Step: Medium	Yes; 16 x cycle time	Yes; 16 x cycle time	Yes; 16 x cycle time	Yes; 16 x cycle time
Step: High	Yes; 64 x cycle time	Yes; 64 x cycle time	Yes; 64 x cycle time	Yes; 64 x cycle time
Encoder supply	<u> </u>			
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Encoder				
Connection of signal encoders				
for current measurement		Yes		
as 2-wire transducer		Vaa		
ofor current measurement as 4-wire transducer		Yes		
• for resistance measurement with 2-conductor connection			Yes; line resistances are also measured	
for resistance measurement			Yes	
with 3-conductor connection				
for resistance measurement			Yes	
with 4-conductor connection				
Errors/accuracies				
inearity error (relative to nput area)	+/- 0.01 %	+/- 0.01 %	+/- 0.05 %	
Temperature error (relative to input area)	+/- 0.002 %/K	+/- 0.002 %/K	+/- 0.002 %/K	Positive temperature
Crosstalk between the inputs,	-50 dB	-50 dB	-50 dB	-90 dB; max.
min.				
Repeat accuracy in settled status at 25 °C relative to input area)	+/- 0.025 %	+/- 0.025 %	+/- 0.015 %	
Operational limit in overall				
emperature range	. / 0.15.0/			Desitive temperature
Voltage, relative to input area	+/- 0.15 %			Positive temperature
Current, relative to input		+/- 0.15 %		
area		.,		
Resistance-type			+/- 0.175 %	
thermometer, relative to input area				
Basic error limit (operational				
imit at 25 °C)				
Voltage, relative to input	+/- 0.1 %			
area		./ 0.1 %		
Current, relative to input area		+/- 0.1 %		
Resistance-type			+/- 0.125 %	
thermometer, relative to				
input area				
nterference voltage suppression for f = n x				
fl +/- 1%), fl = interference				
requency				
Series mode interference	50 dB	50 dB	50 dB	42 dB
(peak value of interference				
< rated value of input range), min.				
common mode voltage	70 dB; Interference	70 dB; Interference	70 dB; Interference	85 dB; Interference
(USS < 2.5 V) , min.	voltage < 5 V	voltage < 5 V	voltage < 5 V	voltage < 10 V
Parameter Diagnostics: wire break			1	

ET 200pro
I/O modules
Analog expansion modules

Technical specifications (continued)				
	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0	6ES7 144-4JF00-0AB0	6ES7 144-4PF00-0AB0
Measurement type/range			R4L / R3L / R2L/ TR4L / TR3L / TR2L	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type N (NiCr-Si-NiSi)/ TC-EL Typ E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC-EL Type L (Fe-CuNi)
Interference frequency suppression			50/60 Hz	10/50/60/400 Hz
Group diagnostics			1	Yes
Overflow/underflow			1	Yes
Comparison point				None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.
Unit			Degrees C / Degrees F	°C/°F/K
Alarms/diagnostics/status information Alarms • Diagnostic alarm • Limit value alarm • Process alarm	Yes; parameterizable Yes; (limit value alarm), can be parameterized for channel 0	Yes; parameterizable Yes Yes; (limit value alarm), can be parameterized for channel 0	Yes; parameterizable	Yes; parameterizable
Diagnostics • Diagnostics • Wire break • Short circuit • Group error • Overflow/underflow	Yes; at 1 to 5 V Yes; at 1 to 5 V	Yes Yes; at 4 to 20 mA Yes; at 4 to 20 mA Yes	Yes Yes Yes	No Yes
Diagnostic indication LED • Group error SF (red)	Yes	Yes	Yes	Yes
Isolation Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
Galvanic isolation Galvanic isolation analog inputs • between the channels • between the channels and the backplane bus • between the channels and the load voltage L+	No Yes	No Yes	No Yes	No Yes Yes
Permissible potential difference between the inputs (UCM)			5 Vpp AC	20 Vpp AC
between inputs and MANA (UCM)	5 Vpp AC	5 Vpp AC		-3 1881.0
between MANA and M internally (UISO)	500 V DC	500 V DC	500 V DC	
Dimensions and weight Dimensions • Width • Height • Depth Weight	45 mm 130 mm 35 mm	45 mm 130 mm 35 mm	45 mm 130 mm 35 mm	45 mm 130 mm 35 mm
 Weight, approx. 	150 g	150 g	150 g	150 g

ET 200pro
I/O modules
Analog expansion modules

	6ES7 145-4FF00-0AB0	6ES7 145-4GF00-0AB0
Supply voltages		
_oad voltage L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Current consumption from backplane bus 3.3 V DC, max.	10 mA	10 mA
Address area		
Address space per module		
Address space per module, max.	8 byte	8 byte
Analog outputs		
Number of analog outputs	4	4
Cable length, shielded, max.	30 m	30 m
/oltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to chassis
/oltage output, short-circuit current, max	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
Output ranges, voltage		
• 0 to 10 V	Yes	
1 to 5 V	Yes	
-10 to +10 V	Yes	
Output ranges, current		
0 to 20 mA		Yes
-20 to +20 mA		Yes
• 4 to 20 mA		Yes
Connection of actuators	V	
for voltage output 2-conductor connection	Yes	
for voltage output 4-conductor connection for current output 2-conductor connection	Yes	Yes
for current output 4-conductor connection		Yes
·		165
Load impedance (in rated range of output) with voltage outputs, min.	1 000 Ω	
with voltage outputs, min. with voltage outputs, capacitive load, max.	1 μF	
with current outputs, max.	, b.,	600 Ω
with current outputs, inductive load, max.		1 mH
Destruction limits against externally applied		
oltages and currents		
Voltages at the outputs towards MANA	16 V; permanent	
· Current, max.		100 mA
Analog value creation		
ntegrations and conversion time/ resolution per channel		
Resolution with overrange (bit including sign),	15 bit; at -10 to +10 V; 14 bit at 1 to 5 V;	15 bit; at +/- 20 mA; 14 bit at 0 to 20 mA;
max.	15 bit at 0 to 10 V	15 bit at 4 to 20 mA
Conversion time (per channel)	0.7 ms	0.7 ms
Settling time		
for resistive load	0.1 ms	0.1 ms
for capacitive load for inductive load	6 ms	1 mg
TOT ITTUUCTIVE TOAC		1 ms

ET 200pro
I/O modules
Analog expansion modules

	6ES7 145-4FF00-0AB0	6ES7 145-4GF00-0AB0
Errors/accuracies		
Output ripple (based on output area, bandwidth 0 to 50 kHz)	+/- 0.02 %	+/- 0.02 %
Linearity error (relative to output area)	+/- 0.1 %	+/- 0.1 %
Temperature error (relative to output area)	+/- 0.01 %	+/- 0.01 %
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0.05 %	+/- 0.05 %
Operational limit in overall temperature range • Voltage, relative to output area • Current, relative to output area	+/- 0.2 %	+/- 0.2 %
Basic error limit (operational limit at 25 °C) • Voltage, relative to output area • Current, relative to output area	+/- 0.15 %	+/- 0.15 %
Parameter		
Output type/range	1	1
Diagnosis: wire break		1
Diagnosis: short circuit	Outputs; sensor supply to M	Encoder supply to M
Group diagnostics	1	1
Behavior on CPU/Master STOP	1	1
Alarms/diagnostics/status information		
Substitute values connectable	Yes	Yes
Alarms		
Diagnostic alarm	Yes; parameterizable	Yes; parameterizable
Process alarm	No	No
Diagnostics		Yes
Diagnostic functionsDiagnostic information readable	Yes	res
Wire break	No	Yes; per channel, not in zero range
Short circuit	Yes; per channel, not in zero range	,, , , , , , , , , , , , , , , , , , ,
 Short circuit encoder supply 	Yes; per module	Yes; per module
Diagnostic indication LED		
• Group error SF (red)	Yes	Yes
Galvanic isolation		
Galvanic isolation analog outputs		
between the channels	No	No
• between the channels and the backplane bus	Yes	Yes
Dimensions and weight		
Dimensions	AE mm	4E mm
WidthHeight	45 mm 130 mm	45 mm 130 mm
Depth	35 mm	35 mm
Weight		
Weight, approx.	150 g	150 g
÷ .,	-	•

ET 200pro
I/O modules
Analog expansion modules

Ordering data	Order No.		Order No.
1AI U analog input module	6ES7 144-4FF00-0AB0	4AO I analog output module	6ES7 145-4GF00-0AB0
High Feature, ±10 V; ±5 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately		High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	
AAI I analog input module	6ES7 144-4GF00-0AB0	Accessories	
High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-		CM IO 4 x M12 connection module	6ES7 194-4CA00-0AA0
specific diagnostics, including bus module. Connection module must be ordered separately		4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	
AAI RTD analog input module	6ES7 144-4JF00-0AB0	M12 compensation connectors	6ES7 194-4AB00-0AA0
High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500		with integral PT100 for reference point compensation when connecting thermocouples	
and 1000; channel-discrete		Module identification labels	6ES7 194-4HA00-0AA0
diagnostics, incl. bus module. Connection module must be ordered separately		For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	
Analog input module 4AI TC	6ES7 144-4PF00-0AB0	M12 sealing cap	3RX9 802-0AA00
High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement: ±80 mV; channel diagnostics, including bus module. Connection module must be ordered separately		For protection of unused M12 connections with ET 200pro	CITA UZ-VANU
AAO U analog output module	6ES7 145-4FF00-0AB0		
High Feature, ±10 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately			

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ET 200pro I/O modules

I/O modules <u>Fai</u>l-safe digital expansion modules

Overview



Fail-safe digital inputs/outputs with degree of protection IP65/66/67 for application on the machine level without control cabinet

Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

Fail-safe digital outputs

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A

All modules are certified up to Cat. 4 (EN954-1) and up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with IM 151-7 F CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

Technical specifications

	6ES7 148-4FA00-0AB0	6ES7 148-4FC00-0AB0
Supply voltages		
Rated value		
 permissible range, lower limit (DC) 	20.4 V	20.4 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V
Digital inputs		
Number of digital inputs	16	8
Dimensions and weight		
Dimensions		
• Width	90 mm	90 mm
Height	130 mm	130 mm
• Depth	65 mm	65 mm

Ordering data	Order No.	
Fail-safe digital input module 8/16 F-DI PROFIsafe	6ES7 148-4FA00-0AB0	
24 V DC, including bus module Connection module must be ordered separately		F F
Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A	6ES7 148-4FC00-0AB0	- (
24 V DC, including bus module Connection module must be ordered separately		(
Fail-safe electronic module F-Switch PROFIsafe	6ES7 148-4FS00-0AB0	8
Three fail-safe PP-switching outputs for safe switching of the		i
rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to cat. 4 (EN 954)/SIL3		
(IEC 61508)		
		Ī
		F

	Order No.
Accessories	
Connection module	6ES7 194-4DA00-0AA0
For the fail-safe electronic module F-switch PROFIsafe	
Connection module	6ES7 194-4DC00-0AA0
For the fail-safe electronic module 4/8 F-DI/4 F DO, 24 V DC/2 A	
Connection module	6ES7 194-4DD00-0AA0
For the fail-safe electronic module 8/16 F-DI, 24 V DC/2 A	
PROFIBUS DP interface module IM154-2	6ES7 154-2AA01-0AB0
Including termination module	
PROFINET interface module IM154-4 PN	6ES7 154-4AB10-0AB0
Including termination module	
M12 sealing cap	3RX9 802-0AA00
For protection of unused M12 connections with ET 200pro	

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ET 200pro
I/O modules
PM-E power module

Overview



• PM-E 24 V DC power module

Technical specifications

	6ES7 148-4CA00-0AA0
Power supply	
Input voltage	
 Rated value, 24 V DC 	Yes
Current carrying capacity	
Current carrying capacity, max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Supply voltages	
Load voltage 2L+	
Short-circuit protection	Yes; via an exchangeable fuse in the power module
Reverse polarity protection	Yes; against destruction
Parameter	
Missing load voltage	Potential group of the power module
Alarms/diagnostics/status infor-	
mation	
Diagnostics	
Diagnostic functions	Yes
Diagnostic information readableMissing load voltage	Yes Yes
	163
Diagnostic indication LED	Van
• Group error SF (red)	Yes Yes
 Load voltage monitoring DC 24 V (green) 	165
Isolation	
Isolation checked with	500 V DC
Degree of protection	
IP65	Yes
IP66	Yes
IP67	Yes
Dimensions and weight	
Dimensions	
• Width	15 mm
• Height	81 mm
• Depth	52 mm
Weight	
 Weight, approx. 	35 g

ET 200pro
I/O modules
PM-E power module

Ordering data	Order No.	<u> </u>	Order No.
PM-E 24 V DC power module For backfeed and group formation	6ES7 148-4CA00-0AA0	PROFIBUS ECOFAST hybrid cable, GP	
of the 24 V DC load supply for		Trailing-type cable with 4 x copper	
electronic modules within an		cores and 2 x copper cores,	
ET 200pro station.		shielded, with UL approval	
Accessories		Unassembled	
CM PM-E ECOFAST connecting	6ES7 194-4BA00-0AA0	• 50 m	6XV1 860-4PN50
module		• 100 m	6XV1 860-4PT10
For backfeed of 24 V load voltage,		Preassembled	
1 ECOFAST Cu connection		with ECOFAST male and female connector	
CM PM-E direct connecting	6ES7 194-4BC00-0AA0	• 1.5 m	6XV1 860-3PH15
module		• 3 m	6XV1 860-3PH30
For backfeed of 24 V load voltage,		• 5 m	6XV1 860-3PH50
up to 2 M20 screwed cable		• 10 m	6XV1 860-3PN10
glands		• 15 m	6XV1 860-3PN15
CM PM-E 7/8" connecting	6ES7 194-4BD00-0AA0	• 20 m	6XV1 860-3PN20
module		• 25 m	6XV1 860-3PN25
For backfeed of 24 V load voltage,		• 30 m	6XV1 860-3PN30
1 x 7/8"		• 35 m	6XV1 860-3PN35
CM PM-E PP connection module	6ES7 194-4BE00-0AA0	• 40 m	6XV1 860-3PN40
For supplying 24-V load voltage,		• 45 m	6XV1 860-3PN45
2 x push-pull, with spare fuse		• 50 m	6XV1 860-3PN50
Spare fuse	6ES7 194-4HB00-0AA0	ECOFAST cable connector,	6GK1 905-0CB00
12.5 A guick-response, for		for user assembly	
interface and power modules,		Female connector; ordering unit	
10 items per package item		5 units	
PROFIBUS ECOFAST hybrid cable, copper		PROFIBUS ECOFAST hybrid plug, angled	6GK1 905-0CD00
Trailing-type cable (PUR casing)		With 2 x shielded copper cores	
with two shielded copper cables		and 4 x 1.5 mm2 copper cores;	
for PROFIBUS DP and four copper cores of 1.5 mm ² in cross-section		5 units; with assembly instructions;	
		female insert	
<u>Unassembled</u>	CVV4 020 74NF0	Push-Pull cable connector	6GK1 907-0AB10-6AA0
• 50 m • 100 m	6XV1 830-7AN50 6XV1 830-7AT10	For 1L+/ 2L+, unassembled	
	6AV1 630-7A110	Cover caps for Push-Pull female	6ES7 194-4JA50-0AA0
Preassembled with ECOFAST male and female		connectors	
connector, fixed length		5 units	
• 1.5 m	6XV1 830-7BH15	Accessories for CM PM-E direct	
• 3 m	6XV1 830-7BH30		6VV/1 020 0ALI40
• 5 m	6XV1 830-7BH50	Power line	6XV1 830-8AH10
• 10 m	6XV1 830-7BN10	5-core, 5 x 1.5 mm ² , trailing type,	
● 15 m	6XV1 830-7BN15	sold by the meter, minimum order quantity 20 m, maximum order	
• 20 m	6XV1 830-7BN20	quantity 1000 m	
● 25 m	6XV1 830-7BN25	Accessories for CM PM-E 7/8"	
• 30 m	6XV1 830-7BN30		
● 35 m	6XV1 830-7BN35	7/8" connecting cable to power	
• 40 m	6XV1 830-7BN40	supply	
● 45 m	6XV1 830-7BN45	5-core, 5 x 1.5 mm ² , trailing type,	
• 50 m	6XV1 830-7BN50	pre-assembled with two 7/8" connectors, 5-pin	
		• 1.5 m long	6XV1 822-5BH15
		• 2.0 m long	6XV1 822-5BH20
		• 3.0 m long	6XV1 822-5BH30
		• 5.0 m long	6XV1 822-5BH50
		• 10 m long	6XV1 822-5BN10
		• 15 m long	6XV1 822-5BN15
		7/8" cable connector	022 351110
		With axial cable outlet • with female insert, 5 per pack	6GK1 905-0FB00

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ET 200pro
I/O modules
PM-O power module output

Overview



• PM-O 2x 24 V DC power module

Technical specifications

	6ES7 148-4CA60-0AA0
Power supply	
Current carrying capacity	
Current carrying capacity, max.	Output current 2 A for 1L+ and 6 A for 2L+
Supply voltages	
Supply voltage from power module	
• Rated value (DC)	24 V
Load voltage 2L+	
 Short-circuit protection 	Yes
 Reverse polarity protection 	Yes; against destruction
Parameter	
Remark	Diagnosis short circuit
	implemented after M for 1L+
Alarms/diagnostics/status infor-	
mation	
Diagnostics	
 Diagnostic functions 	Yes
 Diagnostic information readable 	Yes
• Fuse blown	No; Indirect diagnosis (short circuit after M for 1L+), since electronic fuse
 Missing load voltage 	No

	6ES7 148-4CA60-0AA0
Diagnostic indication LED Rated load voltage PWR (green) Group error SF (red) Load voltage monitoring 24 V DC (green)	No Yes No; signalled in IM or in PM
Isolation	500 V DC
Isolation checked with	500 V DC
Galvanic isolation primary/secondary	No
Degree of protection	Yes
IP66	Yes
IP67	Yes
Dimensions and weight Dimensions • Width • Height • Depth	45 mm 130 mm 35 mm
Weight • Weight, approx.	150 g

Ordering data

Order No.

For drawing the 24 V load voltage
2L+ and electronic/encoder
supply voltage 1L+ within an

PM-O 2 x 24 V DC power module

ET 200pro station.

6ES7 148-4CA60-0AA0	

Accessories	
CM PM-O PP connection module	6ES7 194-4BH00-0AA0
For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	
Push-Pull cable connector	6GK1 907-0AB10-6AA0
For 1L+/ 2L+, unassembled	
Cover caps for Push-Pull female connectors	6ES7 194-4JA50-0AA0
5 units	

Order No.

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ET 200pro I/O modules

I/O modules
ET 200pro pneumatic interface

Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using the ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

Technical specifications

	6ES7 148-4EA00-0AA0	6ES7 148-4EB00-0AA0
Supply voltages		
Load voltage 2L+		
 Rated value (DC) 	24 V	24 V
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Current consumption		
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power losses		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
without packing	2 byte	2 byte
Digital outputs		
Number of digital outputs	16	16
Output current		
• for signal "1" rated value	12 mA	16 mA
Switching frequency		
 with inductive load, max. 	25 Hz	20 Hz
Aggregate current of outputs (per group)		
• up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves
Load resistance range		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
Parameter		
Remark	Diagnostic load voltage 2L+	Diagnostic load voltage 2L+
Behavior on CPU/Master STOP	no	
Alarms/diagnostics/status information		
Alarms		
Diagnostic alarm	Yes	Yes
Diagnostics		
Diagnostic functions	Yes	Yes
Diagnostic information readable	Yes	Yes
Diagnostic indication LED		
• Group error SF (red)	Yes	Yes
 Status indicator digital output (green) 	Yes	Yes

ET 200pro

I/O modules
ET 200pro pneumatic interface

Technical specifications (continued)

	6ES7 148-4EA00-0AA0	6ES7 148-4EB00-0AA0
Isolation		
Isolation checked with	500 V DC	500 V DC
tested with		
 Load voltage L+ against backplane bus 	500 V DC	500 V DC
Galvanic isolation		
between backplane bus and all other circuit components	Yes	Yes
between the channels and backplane bus	Yes	Yes
Galvanic isolation digital outputs		
• between the channels and the backplane bus	Yes	Yes
Permissible potential difference		
between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions and weight		
Dimensions		
• Width	90 mm	120 mm
Height	130 mm	152 mm
• Depth	47 mm	47 mm

Ordering data	Order No.		Order No.
EM 148-P pneumatic interface		FESTO CPV10 valve terminal	To be purchased by FESTO
DO 16 x P/CPV 10 for direct accomodation of FESTO valve terminal CPV 10 16 DO x P	6ES7 148-4EA00-0AA0	FESTO CPV 14 valve terminal	To be purchased by FESTO FESTO AG & Co Ruiterstr. 82
DO 16 x P/CPV 14 for direct accomodation of FESTO valve terminal CPV 14 16 DO x P	6ES7 148-4EB00-0AA0		D-73732 Esslingen More addresses in the Internet at: www.festo.de

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ET 200pro
I/O modules
SIMATIC RF170C

Overview



The SIMATIC RF170C is a communication module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers (SLGs) of all RFID systems as well as the MV400 code-reading systems can be operated on the SIMATIC RF170C.

Thanks to its high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows them to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Technical specifications

Communication module	SIMATIC RF170C
Ambient temperature • During operation • During storage	-25 55 °C -40 +70 °C 20 K/h
Relative humidity	5 max. 100%
Atmospheric pressure	795 1 080 hPa
Resistance to shock	as for ET 200pro
Vibration	as for ET 200pro
Supply voltage Rated value Permissible range	24 V DC 20.4 28.8 V DC
Current consumption • Without reader • With 2 readers	typ. 130 mA Max. 1 000 mA
Enclosure • Degree of protection • Enclosure material	IP67 Thermoplastic (fiberglass reinforced)
Housing color	IP Basic 714
Dimensions W x H x D (mm) SIMATIC RF170C without connection block SIMATIC RF170C with connection block	90 x 130 x 35 90 x 130 x 60
Weight • Without connection block • With connection block	Approx. 270 g Approx. 770 g
Serial reader interface (gross transmission rate) MOBY U/D, RF200 / RF300 / RF600	19 200, 57 600, 115 200 bit/s
Connectors	2 x connector plug M12, 8-pin
Cable length to reader • Standard length • Optional preassembled cables • Self-assembled cables	2 m 5 m, 10 m, 20 m, 50 m Reader-dependent, up to 1 000 m
Supply voltage to reader	24 V
Max. current; 2 readers connected	0.4 A per reader
Max. current; 1 readers connected	0.8 A per reader

ET 200pro
I/O modules
SIMATIC RF170C

Ordering data	Order No.		Order No.
SIMATIC RF170C communication module	6GT2 002-0HD00	M12 Reader cable SIMATIC RF200 / RF300	6GT2 891-4JH20
For connecting to the distributed I/O system ET 200pro		pre-assembled, between ASM 456, RF170C, RF180C, RF182C and reader, material PUR, plug	
Accessories		angled at reader, 2 m	
Connection block for SIMATIC RF170C	6GT2 002-1HD00	M12 sealing caps for unused reader connections	3RX9 802-0AA00
For connecting 2 readers via an M12 connector		10 units minimum order quantity, price per 100 units DVD "RFID Systems Software & J GGT2 Documentation"	
Reader cable for MOBY U PUR material, CMG approved, suitable for cable carriers			6GT2 080-2AA20
2 m	6GT2 091-4FH20		
5 m	6GT2 091-4FH50		
Reader cable for MOBY D PUR material, CMG approved, suitable for cable carriers, 2 m	6GT2 691-4FH20		
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400 Or extension cable MOBY U/D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector			
2 m	6GT2 891-4FH20		
5 m	6GT2 891-4FH50		
10 m	6GT2 891-4FN10		
20 m	6GT2 891-4FN20		
50 m	6GT2 891-4FN50		

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ET 200pro

SIMATIC ET200pro PS

Overview



SIMATIC ET200pro PS, the power supply unit with degree of protection IP67, is used as electronic/encoder and load voltage supply for the new I/O device. With signaling contact for "24 V OK" and "Overtemperature" as well as a second connector for looping through the input voltage.

Technical specifications

Order No.	6ES7 148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Input	
Input	3-phase AC
Voltage range	340 550 V
Note	320 340 V for max. 1 min
Wide-range input	Yes
Overvoltage resistance	Implemented internally with varistors
Mains buffering at lout rated, min.	15 ms
Mains buffering	at $V_{in} = 400 \text{ V}$
Rated line frequency 1 2	50 Hz 60 Hz
Rated line range	45 66 Hz
Input current • at nominal level of the input voltage 400 V nominal value	0.5 A
Switch-on current limiting (+25 °C), max.	40 A
Duration of current limiting at 25 °C • typical • maximum	
Inrush current A ² s	3.5 A ^{2.} s
Built-in incoming fuse	internal, 4 A
Protection in the mains power input (IEC 898)	Required: Circuit breaker 2.2 3.2 A 3RV1021-1DA10 or 3RV1721-1DD10 (UL 489)
Output	
Output	controlled, isolated DC voltage
Rated voltage	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.5 %
Static load balancing, approx.	0.5 %

Order No.	6ES7 148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Residual ripple peak-peak, max.	200 mV
Residual ripple peak-peak, typ.	
Spikes peak-peak, max. (bandwidth: 20 MHz) • max.	250 mV
Product feature output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
Signaling	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for Vout in range 21.3 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
On/off behavior	Overshoot of Vout < 2 %
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value lout rated	8 A
Current range	0 A
Current range up to +55 °C	8 A
delivered active power typ.	192 W
short-term overload current at short- circuit during run-up typical	50 A
Duration of overloading ability for excess current on short-circuiting during the start-up	100 ms
Short-term overload current at short-circuit during operation typical	50 A
Duration of overloading ability for excess current on short-circuiting during the operational phase	100 ms
Parallel switching for enhanced performance	No

ET 200pro

SIMATIC ET200pro PS

Order No.	6ES7 148-4PC00-0HA0			
Product	SIMATIC ET200pro PS			
Power supply, type	24 V/8 A			
Efficiency				
Efficiency at Vout rated, lout rated, approx.	88 %			
Power loss at Vout rated, lout rated, approx.	25 W			
Closed-loop control				
Dynamic mains compensation (Vin rated ±15 %), max.	0.5 %			
Dynamic load smoothing (lout: 50/100/50 %), Uout ± typ.	1 %			
Setting time maximum	2 ms			
Protection and monitoring				
Output overvoltage protection	< 33 V			
Current limitation, typ.	9.4 A			
Characteristic feature of the output short-circuit protected	Yes			
Short-circuit protection	Electronic shutdown, automatic restart			
Enduring short circuit current Effective level				
• maximum	10 A			
Overload/short-circuit indicator	-			
Safety	\ <u></u>			
Primary/secondary isolation	Yes			
Potential separation	Protective extra low output voltage Vout according to EN 60950-1 and EN 50178			
Protection class	Class I			
stray current maximum typical	3.5 mA 0.4 mA			
CE mark	Yes			
UL/CSA approval	No			
UL/cUL (CSA) approval	in preparation			
FM approval	No			
CB approval	Yes			
Marine approval	-			
Degree of protection (EN 60529)	IP67, enclosure type 4 indoor			

Order No.	6ES7 148-4PC00-0HA0			
Product	SIMATIC ET200pro PS			
Power supply, type	24 V/8 A			
EMC				
Emitted interference	EN 55022 Class A			
Supply harmonics limitation	-			
Noise immunity	EN 61000-6-2			
Operating data				
Ambient temparature • in operation	-25 +55 °C			
Note	with natural convection			
Ambient temparature • on transport Ambient temparature	-40 +70 °C			
• in storage	-40 +70 °C			
Humidity class according to EN 60721	Climate class 3K3, no condensation			
Mechanics				
Connection technology	screw-type terminals			
Connections • Supply input	L1, L2, L3, PE: Plug connector HAN Q4/2			
• Output	L+, M: 2 x 1.5 mm ² each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm ²)			
Auxiliary	Alarm signals: M12 plug-in connector 5-pin			
Width of the housing	310 mm			
Height of the housing	135 mm			
Depth of the housing	90 mm			
Weight, approx.	2.8 kg			
Product feature of the housing housing for side-by-side mounting	No			
Type of fixing				
wall-mountingcap rail mounting	Yes No			
Type of attachment S7-300 rail mounting	No			
Installation	Can be mounted onto ET200pro mounting rail			
Electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm²)) (Output: 3RK1911-2BF10 (4 mm²))			

ET 200pro

SIMATIC ET200pro PS

Ordering data	Order No.		Order No.
SIMATIC ET 200pro PS	6ES7 148-4PC00-0HA0	Accessories	
Stabilized power supply in the		Power connection plug	
design of the distributed I/O system, permitting the loop- through of energy to further modules; with degree of protection IP67;		For connecting to the distributed I/O system • For X1 (6 mm ²) • For X2 (6 mm ²)	3RK1 911-2BE30 3RK1 911-2BF10
input: 400-480 V 3 AC Output: 24 V DC/8 A		Sealing cap	
•		For 9-pole power sockets • X2 (1 unit) • X2 (10 units)	3RK1 902-0CJ0 F 3RK1 902-0CK00

F: Subject to export regulations AL: N and ECCN: EAR99 I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200pro

ET 200pro FC frequency converter

Overview





ET 200pro FC Standard frequency converter and converter with integral safety functions

- · Two versions with and without integral safety functions
- 1.1 kW output (1.5 kW at max. 45 °C ambient temperature)
- Sensorless vector control, frequency control or torque control
- Integral brake control 180 V DC
- · Regenerative feedback
- Power is looped through using jumpers with 25 A per segment
- Easy parameterization over the bus
- Extensive diagnostics

Technical specifications

ET 200pro frequency converter with integral safety functions Selection features

Integral safety functions	
according to Category 3 of	
EN 954-1 and according to SIL 2	
of IEC 61508	

- Safe Torque Off (STO)

- Safely Limited Speed (SLS)¹⁾
 Safe Stop 1 (SS1)¹⁾
 Activation of the integral safety

0.120 0.1000	functions through Safety Local Isolator Module F-RSM or via F-Switch PROFIsafe		
Electrical data			
Line voltage	380 V to 480 V 3 AC +10 % / -10 %		
Output (at 0 °C to 55 °C ambient temperature)	1.1 kW		
Rated input current (at 0 °C to 55 °C ambient temperature)	2.0 A		
Rated output current	3.5 A		
(at 0 °C to 55 °C ambient temperature)			
Output (at 0 °C to 45 °C ambient temperature)	1.5 kW		
Rated input current (at 0 °C to 45 °C ambient temperature)	2.5 A		
Rated output current (at 0 °C to 45 °C ambient temperature)	3.9 A		
Line frequency	47 Hz to 63 Hz		
Overload capability	Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s		
Output frequency	0 Hz to 650 Hz		
Pulse frequency	4 kHz (standard), 2 kHz to 16 kHz (in 2 kHz steps)		
SCCR (Short Circuit Current Rating) ²⁾	10 kA		
Skipped frequency range	1, programmable		
Converter efficiency	≥96 %		
Interfaces	Connection to PROFIBUS (PROFINET available soon) over the ET 200pro backplane bus Optical interface with USS protocol for optical RS232 connecting cable Slot for an optional memory card (MMC) for uploading or downloading parameter settings PTC/KTY84 interface for motor temperature monitoring		

- 1) The safety functions "Safely Limited Speed" and "Safe Stop 1" are certified for asynchronous motors without encoders - these safety functions are not permitted for pull-through loads as in the case of lifting gear and winders.
- ²⁾ Valid for industrial control cabinet installation according to NEC Article 409 / UL 508A

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ET 200pro

ET 200pro FC frequency converter

Technical specifications (continued)

ET 200pro frequency converter	with integral safety functions			
Functions				
Open-loop/closed-loop control procedure	 W/f control – linear (M~n) with/ without flux current control (FCC), quadratic (M~n²) or parameter- izable Vector closed-loop control without encoder Closed-loop torque control 			
Operating functions	Jogging mode, free function blocks (FFB), positioning deceleration ramp, automatic restart following interruption due to power failure, bumpless connection of converter to rotating motor			
Braking functions	 Regenerative braking operation without brake chopper and pulse resistor Contol of an electromagnetic holding brake 180 V DC 			
Protective functions	Undervoltage, overvoltage, ground faults, short circuits, stall prevention, thermal motor protection (${}^{\mu}$ t, or sensor), converter overtemperature, motor blocking protection			
Connectable motors	Low-voltage asynchronous motors Motor cable lengths: max. 15 m (shielded)			

Mechanical data			
Degree of protection	IP65		
Operating temperature	0 °C to +55 °C		
	Increased output at 0 °C to +45 °C		
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)		
Mounting dimensions (W x H x D) in mm (including terminal module)	155 x 230 x 213		
Weight	4.0 kg		
Standards			
Compliance with standards	UL, cUL, CE, low voltage directive 2006/95/EG, EMC directive 89/336/ EEC		

Derating data

Pulsfrequenz

Ambient temperature °C	Rated output current in A at a pulse frequency of							
	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0 55 (1.1 kW)	3.5	3.5	2.8	2.2	1.6	1.1	0.5	-
0 45 (1.5 kW)	3.9	3.9	3.9	3.9	3.4	3.0	2.6	2.2

Ordering data Order No.



ET 200pro FC frequency converter with integral safety functions

380 V – 480 V 3 AC +10/-10 % 47 Hz – 63 Hz

Overload:

150 % 60 s 200 % 3 s

Output: 1.1 kW (0 ° ... 55 °C) 1.5 kW (0 ° ... 45 °C)

E 6SL3 235-0TE21-1SB0

E: Subject to export regulations AL: 91999 and ECCN: EAR99

ET 200pro

ET 200pro FC frequency converter

Ordering data Order No.



ET 200pro FC Standard frequency converter 380 V – 480 V 3 AC +10/-10 % 47 Hz – 63 Hz

150 %, 60s 200 % 3s

Output: 1.1 kW (0 ° ... 55 °C) 1.5 kW (0 ° ... 45 °C)

E 6SL3 235-0TE21-1RB0

Backplane bus module to hold the frequency converter

6SL3 260-2TA00-0AA0

E: Subject to export regulations AL: 91999 and ECCN: EAR99

Accessories:

Accessories	Order No.		Order No.
Connector set		Power jumper plug	3RK1 922-2BQ00
for energy supply, HAN Q4/22		for 400 V power transmission to following 400 V modules	
2.5mm ²	3RK1 911-2BE50		6SL3 555-0PA00-2AA0
4.0 mm ²	3RK1 911-2BE10	for communication with a PC	00E0 000-01 A00-2AA0
6.0 mm ²	3RK1 911-2BE30	(2.5 m long)	
Motor cables		RS232 interface cable	3RK1 922-2BP00
Motor cables prefabricated at one end	(HTG: supplied from the Harting Company) (ZKT: supplied from the KnorrTec Company)	for parameterizing the converter with the STARTER tool via a direct point-to-point connection	
For motors with brake and temperature sensor with	are raterities demparty)		6SL3 255-0AA00-4HA0
HAN Q8 connector, shielded		For use with SINAMICS G120.	OGLO ZOO-VAAOU-4NAU
Cross-section 1 mm ² • Length 1.5 m • Length 3 m • Length 5 m	ZKT: 70018601000150 ZKT: 70018601000300 ZKT: 70018601000500	SINAMICS G110D, SINAMICS G120D, SIMATIC ET 200S FC or SIMATIC ET 200pro FC	
• Length 10 m	ZKT: 70018601001000	Included in the scope of	
Cross-section 1.5 mm ²		delivery: • IOP	
• Length 1.5 m	HTG: 61 88 201 0288	 Handheld housing 	
• Length 3 m	HTG: 61 88 201 0289	 Rechargeable batteries (4 × AA) 	
• Lengthe 5 m	HTG: 61 88 201 0290	• Charging unit (international)	
• Length 10 m	HTG: 61 88 201 0299	RS232 connecting cable	
	Further selected accessories are available from Siemens Solution Partners. Select "Distributed Field Installation System" as	(3 m long, can only be used for SINAMICS G120 and SIMATIC ET 200S FC) • USB cable (1 m long)	
	technology in the "Solution	Memory card (MMC)	6SL3 254-0AM00-0AA0
	Partner Finder". www.siemens.com/automation/ partnerfinder	for parameter settings of the ET 200S FC and ET 200pro FC If required, the complete parameter settings of the	
Frequency converter	6ES7 194-1AB01-0XA0	frequency converter can be	
connector for motor cable, shielded, HAN Q8		saved on a memory card (MMC). When servicing, the plant is immediately ready for use again after replacing the frequency converter and inserting the memory card.	

E: Subject to export regulations AL: 91999 and ECCN: EAR99

ET 200pro

ET 200pro motor starter General data

Overview



ET 200pro motor starter: Isolator module, Standard starter and High-Feature starter mounted on a wide module rack

Motor starters

- Only two versions up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Overload can be acknowledged by remote reset
- · Current unbalance monitoring
- Stall protection
- · Emergency start function in the event of overload
- Current value transmission by bus
- Current limit monitoring
- Direct-on-line or reversing starters
- Power bus can be plugged in using the new HAN Q4/2
- Plug-in connectors
- Conductor cross-sections up to 6 x 4 mm²
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High-Feature versions (with 4 DI onBoard)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated smooth-starter function
- Supplied with 400 V AC brake contact as an option.

Isolator modules

The isolator module with switch disconnector function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

Safety local isolator module

With the Safety local modules

- · Safety local isolator module and
- 400 V disconnecting module

it is possible to achieve safety category 4/SIL 3 with an appropriate connection.

Safety Solution PROFIsafe

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

it is likewise possible to achieve safety category 4/SIL 3 with an appropriate connection.

Motor Starter ES software

The Motor Starter ES software is used the for parameterization, monitoring, diagnostics and testing of motor starters. See page 9/180.

Application

With the ET 200pro motor starters, any AC loads can be protected and switched. They are an integral part of ET 200pro and have the high degree of protection IP65. This makes them ideal for operation in modular, distributed peripherals without control cabinets or control enclosures.

The ET 200pro motor starters are available both with mechanical as well as electronic contacts

The ET 200pro electromechanical starters are offered as direct (DSe/DSe) and reversing starters (RSe/RSe) in the High-Feature version with the following equipment:

- 4 digital inputs
- Device versions with or without control for externally fed brakes with 400 V AC
- With expanded parameterization capabilities.

The ET 200pro electronic starters are offered as direct (DSe/DSe) and reversing starters (RSe/RSe) in the High-Feature version with the following equipment:

- · 4 digital inputs
- With soft-start and smooth ramp-down function
- With the deactivated smooth start function as an electronic starter for applications with a high level of switching frequency
- Device versions with or without control for externally fed brakes with 400 V AC
- With expanded parameterization capabilities.

As the result of the protection concept with solid-state overload evaluation and the use of SIRIUS controls size S00, additional advantages are realized on the standard and High-Feature motor starters - advantages which soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier by the fine modular structure.
 When using the ET 200pro motor starters, the list of parts per load feeder is reduced to two main units: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are optimized in addition by the low level of variance (2 units up to 5.5 kW).

The ordering option for motor starters with a 400 V AC brake output provides the possibility of controlling motors with 400 V AC brakes. With four locally acting inputs available on the High-Feature motor starter it is possible to realize autonomous special functions which work independently of the bus and the higher level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.

SIMATIC ET 200 distributed I/O ET 200pro

ET 200pro motor starter General data

Overview (continued)

When using the optional isolator module with switch disconnector and group fusing function for the ET 200pro, the 400 V supply of the motor starters can be switched on and off directly in the field, i.e. locally.

The Motor Starter ES software is available for the parameteriza-

tion and diagnostics.
See Chapter 12 "Planning, Configuration and Visualization with SIRIUS".

Technical specifications

		Standard motor starters	High-Feature motor starters	
		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Device functions				
Parameterizable rated operational current		Yes		
Parameterizable current limit values		No	Yes, 2 limit values	
Parameterizable response in case of current limit violation		No	Yes	
Zero current monitoring		Yes		
Parameterizable response in case of zero current violation		Yes		
Parameterizable current unbalance limit		No, fixed limit value $(30 \% \times I_e)$	Yes, 30 % 60 % x i	le e
Parameterizable response in case of unbalance limit violation		Yes		
Motor blocking monitoring		No	Yes	
Parameterizable blocking current limit		No	Yes, 150 % 1000 %	$\% \times I_{\Theta}$
Parameterizable blocking time limit	S	No	Yes, 1 5	
Current value transmission		Yes		
Group warning diagnostics		No	Yes, parameterizable)
Group diagnostics		Yes, parameterizable		
Emergency start		Yes		
Digital inputs Parameterizable input signal Parameterizable input level Parameterizable input signal delay Parameterizable input signal extension Parameterizable input control actions	ms ms	No No No No No	Yes, 4 inputs Yes, latching/ non-lat Yes, NC contacts/NC Yes, 10 80 Yes, 0 200 Yes, 12 different actic	contacts
400 V brake output		Yes, ordering option	roo, 12 amoroni aon	51.10
Parameterizable brake enabling delay	S	Yes, -2.5 2.5		
Parameterizable holding time of the brake during stopping	S	Yes, 0 25		
Parameterizable start-up type		No		Yes
Parameterizable ramp-down time		No		Yes
Parameterizable starting voltage		No		Yes
Parameterizable stopping voltage		No		Yes
Local device interface		Yes		
Firmware update		Yes, by trained personn	nel	
Thermal motor model		Yes		
Parameterizable trip class		No, CLASS 10 fixed	Yes, CLASS 5, 10, 15	5, 20
Parameterizable response in case of overload of thermal motor model		No	Yes, 3 possible states	*
Advance warning limit for motor heating	%	No	Yes, parameterizable	0 95
Advance warning limit time-related trip reserve	S	No	Yes, parameterizable	
Parameterizable recovery time	min	No	Yes, 1 30	
Parameterizable protection against voltage failure		No, permanently integrated	Yes	
Reversing start function		Yes, ordering option		
Parameterizable interlock time for reversing starters		No, 150 ms fixed	Yes, 0 60s	
Integrated logbook functions		Yes, 3 device logbooks		
Integrated statistics data memory		Yes		
Parameterizable response in case of CPU / master stop		Yes		
Device indications Group fault Switching state		SF LED (red) STATE LED (red, yellow	, green)	

- Device statusDigital inputs

DEVICE LED (red, yellow, green)
No IN 1 ... IN 4, LED

ET 200pro ET 200pro motor starter General data

Technical specifications (continued)

		Standard motor starters	High-Feature motor starters	
		Mechanical switching without inputs	Mechanical switching with inputs	Electronic switching with inputs and soft starter function
Technology designation ⁴⁾		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Mechanics and environment				
Motor starters that can be connected to ET 200pro or modules with width of 110 mm		max. 8		
Mounting dimensions (W x H x D) • Direct-on-line starter and reversing starter	mm	110 x 230 x 150		110 x 230 x 160
Permissible ambient temperature • During operation • During storage	°C °C	-25 +55, from +40 with -40 +70	n derating	
Permissible mounting positions		Vertical, horizontal		
Vibration resistance acc. to IEC 60068, Part 2-6		2 g		
Shock resistance acc. to IEC 60068 Part 2-27		Half-sine 15 g/11 ms		
Degree of protection		IP65		
Pollution degree		3, IEC 60664 (IEC 61131	1)	
Electrical specifications				
Power consumption at 24 V DC • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA mA	Approx. 40 Approx. 200		
Rated operational current for power bus I_e	Α	25		
 Rated operational voltage U_e Approval according to EN 60947-1, Appendix N Approval according to CSA and UL 	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)		Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
Approval VDE 0106, Part 101 CSA and UL approval	V V	Up to 400 Up to 600		Up to 480 Up to 480
Conductor cross-sections • Incoming energy supply	mm ²	Max. 6 x 4		
Touch protection		Finger-safe		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated insulation voltage U _i	V	400		
Rated operational current for starters I _e				
• AC-1/2/3 at 40 °C - At 400 V - At 500 V	A A	0.15 2.0/1.5 12.0 0.15 2.0/1.5 9.0		0.15 2.0/1.5 12.0 ¹⁾
• AC-4 at 40 °C - At 400 V	А	0.15 2.0/1.5 4.0		
Rated short-circuit breaking capacity	kA	100 at 400 V		
Type of coordination acc. to IEC 60947-4-1		1		
Power of induction motors at 400 V	kW	Max. 5.5		Max. 5.5/4 ²⁾
Utilization categories		AC-1, AC-2, AC-3, AC-4		AC-53a ³⁾ (max. 9 A with deactivated soft start function up to CLASS 10)
Protective separation between main and auxiliary circuits	V	400, Acc. to EN 60947-1, App	pendix N	
Endurance of contactor • Mechanical • Electrical		30 million operating cycl Up to 10 million operatin the current loading (see	g cycles; dependent on	=
Reliable switching frequency		Dependent on the currer period (see Manual)	nt loading, motor starting	time and relative ON
Operating times at 0.85 1.1 x U _e • Closing delay • Opening delay	ms ms	11 50 5 45		

1) Caution!

With deactivated soft starter control function the permissible rated operational current is reduced to 9 A up to CLASS 10.

DS ... direct-on-line starter
 RS ... reversing starter
 DSS . direct-on-line soft starters
 RSS . reversing starter
 e electronic motor protection

te full motor protection (thermal + electronic) s electronic switching with semiconductor

 $^{^{2)}\,}$ With parameterization as electronic starter max. 4 kW.

^{3) 8-}hour operation.

ET 200pro

Standard motor starters **High Feature motor starters**

Ordering data

Version Order No.

Standard motor starters, mechanical Motor protection: thermal model



DSe direct-on-line starters1)

- · Without brake output
- With brake output 400 V AC

RSe reversing starters¹⁾

- Without brake output
- With brake output 400 V AC

3RK1 304-5□S40-4AA0 3RK1 304-5□S40-4AA3

3RK1 304-5□S40-5AA0 3RK1 304-5□S40-5AA3

DSe Standard

High-Feature motor starters, mechanical Motor protection: thermal model



RSe High-Feature

DSe direct-on-line starters¹⁾

• Without brake output and with 4 inputs • With brake output 400 V AC and 4 inputs

RSe reversing starters¹⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1 304-5 S40-2AA0 3RK1 304-5 S40-2AA3

3RK1 304-5□S40-3AA0 3RK1 304-5□S40-3AA3

Setting range

Rated operational current

- 0.15 ... 2.0 A 1.5 ... 12.0 A

High-Feature motor starters, <u>electronic</u>

Full motor protection, comprising thermal motor protection and thermistor motor protec-



sRSSte High-Feature

sDSSte/sDSte direct-on-line starters 1)2)

- Without brake output and with 4 inputs
 With brake output 400 V AC and 4 inputs

3RK1 304-5□S70-2AA0 3RK1 304-5□S70-2AA3

sRSSte/sRSte reversing starters¹⁾²⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1 304-5□S70-3AA0 3RK1 304-5□S70-3AA3

Setting range Rated operational current

- 0.15 ... 2.0 A 1.5 ... 12.0 A

- 1) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for motor starters ET 200pro").
- $^{2)}$ Delivery time class A for setting range rated operational current 0.15 ... 2.0 A
- 3) The solid-state motor starters can be used not only as solid-state motors starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and smooth ramp-down. The changeover from motor starter to soft starter takes place through reparameterization in HW Config.

- Depending on the setting, this results in the following current ranges:
 Parameterization as solid-state starter: 0.15 ... 2 A and 1.5 ... 9 A (4 kW)
 Parameterization as soft starter: 0.15 ... 2 A and 1.5 ... 12 A (5.5 kW).

ET 200pro

ET 200pro isolator module

Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnector function is used for safe disconnection of the 400 V operational voltage in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The isolator module is available in addition in a safety version (see Safety local isolator module, page 9/315):

- The following properties apply to the isolator module:

 Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free construction thanks to high degree of protection IP65.

Technical Specifications

		Isolator modules
General data		
Mounting dimensions (W x H x D) • Direct-on-line starter and reversing starter	mm	110 x 230 x 170
Permissible ambient temperature • During operation • During storage	°C	-25 +55 -40 +70
Permissible mounting positions		Any
Vibration resistance acc. to IEC 60068 Part 2-6		2 <i>g</i>
Shock resistance acc. to IEC 60068 Part 2-27		Half-sine 15 g/11 ms
Power consumption From auxiliary circuit L+/M (U1) From auxiliary circuit A1/A2 (U2)	mA	Approx. 20
Rated operational current for power bus $I_{\rm e}$	А	25
Rated operational voltage $U_{\rm e}$	V	400
Approvals according to DIN VDE 0106, Part 101 CSA and UL	V V	Up to 500 Up to 600
Conductor cross-sections • Incoming energy supply	mm ²	Max. 6 x 4

	Isolator modules
	IP65
	Finger-safe
	3, IEC 60664 (IEC 61131)
, kV	6
V	400
Α Δ	25 25
kA	50 at 400 V
	2
V	400, to VDE 0106 Part 101
	Yes, parameterizable
	SF LED (red)
	V A A kA

Ordering data

Version Order No.

ET 200pro isolator modules, mechanical

Isolator modules¹⁾

Rated operational current 25 A

3RK1 304-0HS00-6AA0



3RK1 304-0HS00-6AA0

¹⁾ Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories formotor" starters ET 200pro").

ET 200pro

ET 200pro safety motor starter Solutions local/PROFIsafe – safety module

Overview



ET 200pro motor starter: Safety local isolator module, disconnecting module, Standard starter and High-Feature starter mounted on a wide module rack

Safety local isolator module

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for:

- Connection of a 1 or 2-channel EMERGENCY-STOP circuit up to Category 3-4/SIL 3 (protective door or EMERGENCY-STOP pushbuttons) and parameterizable start behavior
- Control of the 400 V disconnecting module by means of a safety rail signal

400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to Category 3-4/SIL 3. For operation in a Safety Solution local application it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

F-Switch

Fail-safe digital inputs/outputs in degree of protection IP65/66/67 for near-machine, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- · Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

 3 fail-safe PP-switching outputs for safe switching of the backplane bus bars

The F-Switch is certified up to Category 4 (EN 954-1) and up to SIL 3 (IEC 61508) and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Application

Safety local isolator module

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK28 41 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY-STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using 2 slide switches located under the left M12 opening.

In the event of an EMERGENCY-STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely isolates the 400 V circuit up to Category 4/SIL 3.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to Category 4/SIL 3 according to EN ISO 13849-1 / IEC 61508 1-4.

400 V disconnecting module

The 400 V disconnecting module can be used for local safety applications in combination with the Safety local isolator module, and for PROFIsafe safety applications in combination with the F-Switch.

It contains 2 contactors connected in series for the safety-oriented disconnection of the main circuit.

The auxiliary circuit supply of the device is implemented via a safety busbar in the backplane module.

The 400 V disconnecting module can be used in combination with the Safety local isolator module or with the F-Switch for safety applications up to Cat. 4/SIL 3 according to EN ISO 13849-1/IEC 61508 1-4.

F-Switch

The F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane bus bars. In combination with the 400 V disconnecting module it can be used in PROFIsafe applications for the fail-safe disconnection of ET 200pro motor starters up to Category 4/SIL 3.

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ET 200pro
ET 200pro safety motor starter
Solutions local/PROFIsafe – safety module

Technical specifications

		Safety local isolator module	400 V disconnecting module
General data			
Mounting dimensions (W x H x D) in mm • Direct-on-line starter and reversing starter	mm	110 x 230 x 170	110 x 230 x 150
Permissible ambient temperature • During operation • During storage	°C °C	-25 +55 -40 +70	
Permissible mounting positions		Any	
Vibration resistance acc. to IEC 60068, Part 2-6		2 g	
Shock resistance acc. to IEC 60068 Part 2-27		Half-sine 15 g/11 ms	
Power consumption • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA	Approx. 20	
Rated operational current for power bus I _e	Α	25	
Rated operational voltage U _e	V	400 (50/60 Hz)	
Approval to DIN VDE 0106 Part 101	V	Up to 500	
CSA and UL approval	V	Up to 600	
Conductor cross-sections Incoming energy supply	mm ²	Max. 6 x 4	
Degree of protection		IP65	
Touch protection		Finger-safe	
Pollution degree		3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage $U_{\rm imp}$	kV	6	
Rated insulation voltage U_i	V	400	
Rated operational current for starter I _e			
• AC-1/2/3 at 40 °C - At 400 V - At 500 V	A A	16 16	25 25
Rated short-circuit breaking capacity	kA	50 at 400 V	
Type of coordination acc. to IEC 60947-4-1		2	
Protective separation between main and auxiliary circuits	V	400, acc. to VDE 0106 Part 101	
Operating times at 0.85 1.1 x U _e • Closing delay • Opening delay	ms ms		25 100 7 10
Device functions • Group diagnostics		Yes, parameterizable	
Device indications • Group fault		SF LED (red)	

ET 200pro
ET 200pro safety motor starter
Solutions local/PROFIsafe – safety module

Ordering data

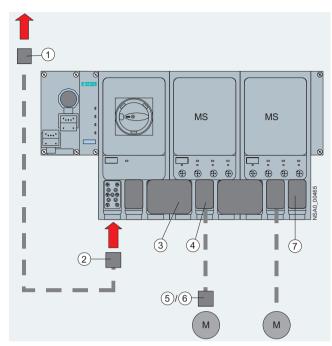
Ordering data		
	Version	Order No.
Safety modules ET 200pro		
	Safety local isolator modules ¹⁾²⁾ Rated operational current 16 A	3RK1 304-0HS00-7AA0
3RK1 304-0HS00-7AA0	0)4)	
3RK1 304-0HS00-8AA0	400 V disconnecting modules ³⁾⁴⁾ Rated operational current 25 A	3RK1 304-0HS00-8AA0
The life	F-Switch PROFIsafe	
	24 V DC, including bus module Connection module to be ordered separately	6ES7 148-4FS00-0AB0
R		
6ES7 148-1FS00-0AB0	Connection modules for F-Switch	
		6ES7 194-4DA00-0AA0
	·	

- 1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.
- 2) Only in combination with the special backplane bus module for the Safety local isolator module (see "Accessories for motor starters ET 200pro").
- 3) The 400 V disconnecting module only functions when used together with the Safety local isolator module or with the F-Switch.
- 4) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for motor starters ET 200pro").
- I: Subject to export regulations AL: N and ECCN: EAR99H

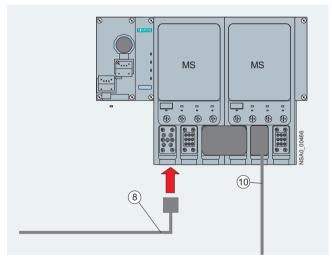
ET 200pro

Accessories for ET 200pro motor starters

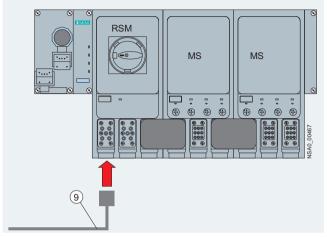
Overview



Basic design of an motor starter ET 200pro



Infeed on the motor starter ET 200pro



Infeed on the RSM isolator module

Legend:

- ① Power feeder plug (see page 9/319)
- ② Power connection plug (see page 9/319)
- 3 Power jumper plug (see page 9/319)
- Motor connection plug (see page 9/319)
- (5) Motor plug (see page 9/319)
- (6) Motor plug with EMC suppressor circuit (see page 9/319)
- Power loop-through plug (see page 9/319)
- (8) Power connection cable (see page 9/319)
- n Motor cable (see page 9/320)

ET 200pro

Accessories for ET 200pro motor starters

	_	_
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Olu	emu	ı uata

ordering data		
	Version	Order No.
ET 200pro accessories		
	Power feeder plugs Connector set for energy supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. gland 5 male contacts 2.5 mm² 5 male contacts 4 mm² 5 male contacts 6 mm²	3RK1 911-2BS60 3RK1 911-2BS20 3RK1 911-2BS40
	(2) Power connection plugs Connector set for energy supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder,female insert for HAN Q4/2, incl. gland 5 female contacts 2.5 mm² 5 female contacts 4 mm² 5 female contacts 6 mm²	3RK1 911-2BE50 3RK1 911-2BE10 3RK1 911-2BE30
	③ Power jumper plugs	3RK1 922-2BQ00
		F 3RK1 902-0CE00 F 3RK1 902-0CC00
	 Motor plugs Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, incl. gland 7 female contacts 1.5 mm² 7 female contacts 2.5 mm² 	3RK1 911-2BM21 3RK1 911-2BM22
	Motor plugs with EMC suppressor circuit Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, incl. star jumper, incl. gland 7 female contacts 1.5 mm ² 7 female contacts 2.5 mm ²	3RK1 911-2BL21 3RK1 911-2BL22
	Power loop-through plugs Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, pin insert for HAN Q4/2, incl. gland 4 male contacts 2.5 mm² 4 male contacts 4 mm²	3RK1 911-2BF50 3RK1 911-2BF10
	Power connection cables, assembled at one end Power connection cable for ET 200pro motor starters, ECOFAST, open at one end, for HAN Q4/2, angled, insert turned at isolator module end, 4 x 4 mm² Length 1.5 m Length 5.0 m	3RK1 911-0DB13 3RK1 911-0DB33
	 Power connection cables for isolator modules, assembled at one end Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angled, insert turned at isolator module end, 4 x 4 mm² Length 1.5 m Length 5.0 m 	3RK1 911-0DF13 3RK1 911-0DF33

F: Subject to export regulations AL: N and ECCN: EAR99

ET 200pro

Accessories for ET 200pro motor starters

Version	Order No.
Motor cables, assembled at one end	
Open at one end, HAN Q8, angled, length 5 m	
 Motor cable for motor without brake, for ET 200pro, ET 200X, AS-i Compact, 4 x 1.5 mm² 	3RK1 911-0EB31
 Motor cable for motor with brake, for ET 200pro, 6 x 1.5mm² 	3RK1 911-0ED31

Solution Partner

Automation

SIEMENS

More connection technology products can be found at our "Siemens Solution Partners" www.siemens.com/automation/partnerfinder under "Distributed Field Installation System" technology"

Version	Order No.

Module racks, wide ¹⁾ • Length 500 mm	6ES7 194-4GB00-0AA0
• Length 1000 mm	6ES7 194-4GB60-0AA0
• Length 2000 mm	6ES7 194-4GB20-0AA0
Module racks, wide, compact ¹⁾ • Length 500 mm	6ES7 194-4GD00-0AA0
Length 500 mm Length 1000 mm	6ES7 194-4GD10-0AA0
• Length 2000 mm	6ES7 194-4GD20-0AA0
Backplane bus modules 110 mm ²⁾	3RK1 922-2BA00
Backplane bus modules for Safety local isolator modules	3RK1 922-2BA01
RS 232 interface cables	3RK1 922-2BP00
Hand-held devices for ET 200pro motor starter, (also for ET 200S High-Feature and ECOFAST), for local operation. A serial interface cable must be ordered separately.	3RK1 922-3BA00
Sealing caps (for power supply) (1 pack contains 10 units)	3RK1 902-0CJ00
Dismantling tools for HAN Q4/2	3RK1 902-0AB00
Crimping tools for pins/sockets 4 mm ² and 6 mm ²	3RK1 902-0CW00
Crimping tools for male contacts and sockets up to 4.0 mm ² (HAN Q8/0)	3RK1 902-0CT00
Dismantling tools for male contacts and sockets (HAN Q8/0)	3RK1 902-0AJ00
M12 sealing caps For sealing unused input and output sockets (one set contains ten sealing caps)	3RX9 802-0AA00

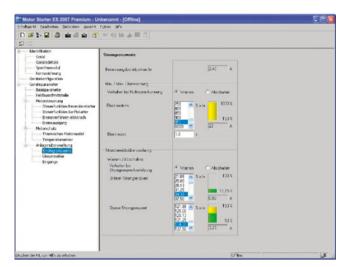


²⁾ The backplane bus module is a prerequisite for operation of the motor starter ET 200pro and the optional module.

3RK1 922-3BA00

ET 200pro ET 200pro software Motor starter ES

Overview



Motor starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor starter ES is used for start-up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200pro, SIMATIC ET 200S, ECOFAST and SIRIUS M200D product families.

Note:

For further information see page 9/180.

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SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

Overview



- Compact block I/O for processing digital, analog and IO-Link signals for connection to the PROFINET bus system
- Cabinet-free design with degree of protection IP65/66/67 with M12 connections
- Very rugged and resistant metal enclosure and encapsulated

- Compact module in two types of enclosures:
- 30 mm x 200 mm x 37 mm (W x H x D, long and narrow enclosure), with 4 x M12 for digital signals
- 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure), with 8 x M12 for digital signals and IO-Link
- 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure) with 4 x M12 or 8 x M12 for analog signals
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbit/s
- LLDP proximity detection without PG and Fast Startup (boot up within approx 0.5 seconds)
- Supply and load voltage connection: 2 x M12
- Module variance:
 - 8 DI 16 DI
- 8 DO (2 A) 8 DO (1.3 A) 8 DO (0.5 A)
- 16 DO (1.3 A)
- 8 DI/DO (1.3 A)
- 8 AI (U, I, TC, RTD)
- 4 AO (Ú, Í)
- 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics

Technical specifications

	6ES7 141-6BF00-0AB0	6ES7 141-6BG00-0AB0	6ES7 141-6BH00-0AB0
General information			
Vendor identification (VendorID)	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H
• 24 V DC	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
 permissible range, upper limit (DC) 	28.8 V	28.8 V	28.8 V
 reverse polarity protection 	Yes	Yes	Yes
Current consumption, typ.	100 mA	100 mA	100 mA
Encoder supply			
Number of outputs	4	8	8
Output current, rated value	100 mA; per output	100 mA; per output	100 mA; per output
24 V encoder supply			
Short-circuit protection	Yes	Yes	Yes
Power losses			
Power loss, typ.	5.5 W	4.5 W	6.5 W
Digital inputs			
Number of digital inputs	8	8	16
• in groups of	2	1	2
Number of simultaneously control- lable inputs			
all mounting positions			
 Concurrently controllable inputs, up to 60 °C 	8	8	16
Input characteristic curve acc. to IEC 1131, Type 3	Yes	Yes	Yes
Input voltage			
Rated value, DC	24 V	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V	-3 to +5 V
• for signal "1"	11 to 30 V	11 to 30 V	11 to 30 V

ET 200eco PN

ET 200eco PN

	6ES7 141-6BF00-0AB0	6ES7 141-6BG00-0AB0	6ES7 141-6BH00-0AB0
nput current			
for signal "0", max.	1.5 mA	1.5 mA	1.5 mA
(permissible quiescent current)			
for signal "1", typ.	7 mA	7 mA	7 mA
nput delay			
for rated value of input voltage)			
for standard inputs - at "0" to "1", max.	Typ. 3 ms	Typ. 3 ms	Typ. 3 ms
- at 0 to 1, max.	Typ. 3 ms	Typ. 3 ms	Typ. 3 ms
·	190. 5 1113	1yp. 5 ms	тур. 5 тіб
Cable length Cable length unshielded, max.	30 m	30 m	30 m
nterfaces	30 111	30 111	30 111
ransmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
·			
Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Number of PROFINET interfaces	2 Yes	2 Yes	2 Yes
Autocrossing Automatic detection of	Yes	Yes	Yes
transmission speed	168	168	ies
Integrated switch	Yes	Yes	Yes
PROFINET IO device			
- IRT with the option	Yes	Yes	Yes
"high flexibility" supported			
- Prioritized startup supported	Yes	Yes	Yes
Protocols			
PROFINET IO	Yes	Yes	Yes
Protocols (Ethernet)			
SNMP	Yes	Yes	Yes
DCP	Yes	Yes	Yes
LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• arp	Yes	Yes	Yes
Alarms/diagnostics/status			
nformation Status indicator	Yes; green LED	Yes; green LED	Yes; green LED
	res, green LLD	res, green LLD	res, green LLD
Alarms	Voc	Voc	Voc
Diagnostic alarm	Yes	Yes	Yes
Diagnosetics	V	V	V
Diagnostic functions	Yes	Yes	Yes
Diagnostic information readable	Yes	Yes	Yes
Monitoring the supply voltage to the electronics	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED
Wire break in signal transmitter cable	Yes	Yes	Yes
Short circuit encoder supply	Yes; per channel group	Yes; per channel group	Yes; per channel group
Group error	Yes; red/yellow "SF/MT" LED	Yes; red/yellow "SF/MT" LED	Yes; red/yellow "SF/MT" LED
alvanic isolation	· ·		
etween the load voltages	Yes	Yes	Yes
petween load voltage and all other witching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
		.00	.00
Salvanic isolation digital inputs between the channels	No	No	No
Permissible potential difference			
petween different circuits	75 V DC/60 V AC	75 V DC/60 V AC	75 V DC/60 V AC

SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

	6ES7 141-6BF00-0AB0	6ES7 141-6BG00-0AB0	6ES7 141-6BH00-0AB0
Isolation			
tested with			
 24 V DC circuits 	500 V	500 V	500 V
Interface	1 500 V; according to IEEE 802.3	1 500 V; according to IEEE 802.3	1 500 V; according to IEEE 802.3
IP65	Yes	Yes	Yes
IP66	Yes	Yes	Yes
IP67	Yes	Yes	Yes
Connection method			
M12	Yes	Yes	Yes
Dimensions and weight			
Dimensions			
• Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
• Depth	49 mm	49 mm	49 mm
Weight			
Weight	550 g	910 g	910 g

ET 200eco PN

ET 200eco PN

	6ES7 142-6BF50- 0AB0	6ES7 142-6BF00- 0AB0	6ES7 142-6BG00- 0AB0	6ES7 142-6BR00- 0AB0	6ES7 142-6BH00- 0AB0
General information Vendor identification (VendorID)	002AH	002AH	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H	0306H	0306H
Load voltage 1L+ • Rated value (DC) • Permissible range, lower limit (DC)	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V
Permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Load voltage 2L+					
 Rated value (DC) Permissible range, lower limit (DC) 	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V	24 V 20.4 V
Permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
from load voltage 1L+ (unswitched voltage)	100 mA	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
Power losses Power loss, typ.	3 W	5.5 W	5.5 W	5 W	5.5 W
Digital outputs Number of digital outputs	8	8	8	8	16
• in groups of	8	4	4	4	8
Short-circuit protection • Response threshold, typ.	Yes; electronic 0.7 A	Yes; electronic 1.8 A	Yes; electronic 1.8 A	Yes; electronic 2.8 A	Yes; electronic 1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47
Switching capacity of the outputs					
 on lamp load, max. 	5 W	5 W	5 W	10 W	5 W
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Output current • for signal "1" rated value	0.5 A	1.3 A; maximum	1.3 A; maximum	2 A	1.3 A; maximum
• for signal "0" residual current, max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Parallel switching of 2 outputs					
 for increased power for redundant control of a load 	No Yes	No Yes	No Yes	No Yes	No Yes
Switching frequencywith resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz	1 Hz
Aggregate current of outputs (per group) • up to 55 °C, max.	4.0	3.9 A	201	20 4	20 /
up to 60 °C, max. Cable length Cable length	4 A 30 m	2.6 A 30 m	3.9 A 30 m	3.9 A 30 m	3.9 A 30 m

SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

	6ES7 142-6BF50- 0AB0	6ES7 142-6BF00- 0AB0	6ES7 142-6BG00- 0AB0	6ES7 142-6BR00- 0AB0	6ES7 142-6BH00- 0AB0
Interfaces Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Transmission rate, max. Number of PROFINET interfaces	100 Mbit/s 2				
AutocrossingAutomatic detection of transmission speed	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Integrated switchPROFINET IO device	Yes	Yes	Yes	Yes	Yes
 IRT with the option "high flexibility" supported 	Yes	Yes	Yes	Yes	Yes
 Prioritized startup supported 	Yes	Yes	Yes	Yes	Yes
Protocols PROFINET IO	Yes	Yes	Yes	Yes	Yes
Protocols (Ethernet) SNMP DCP LLDP ping arp	Yes Yes Yes Yes	Yes Yes Yes Yes	Yes Yes Yes Yes	Yes Yes Yes Yes	Yes Yes Yes Yes
Alarms/diagnostics/ status information					
Status indicator	Yes; green LED				
Alarms • Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics Diagnostic functions Diagnostic information readable	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
 Monitoring the supply voltage to the electronics 	Yes; green "ON" LED				
Wire break in actuator cable	Yes	Yes	Yes	Yes	Yes
Short circuit Group error	Yes Yes; red/yellow "SF/ MT" LED				
Galvanic isolation between the load voltages	Yes	Yes	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No	No	No
between Ethernet and electronics	Yes	Yes	Yes	Yes	Yes
Galvanic isolation digital outputs					
between the channels	No	No	No	No	No
Permissible potential difference between different circuits	75 V DC/60 V AC				

ET 200eco PN

ET 200eco PN

	6ES7 142-6BF50- 0AB0	6ES7 142-6BF00- 0AB0	6ES7 142-6BG00- 0AB0	6ES7 142-6BR00- 0AB0	6ES7 142-6BH00- 0AB0
Isolation tested with					
 24 V DC circuits 	500 V				
• Interface	1 500 V; according to IEEE 802.3				
IP65	Yes	Yes	Yes	Yes	Yes
IP66	Yes	Yes	Yes	Yes	Yes
IP67	Yes	Yes	Yes	Yes	Yes
Connection method					
M12	Yes	Yes	Yes	Yes	Yes
Dimensions and weight					
Dimensions					
 Width 	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
• Depth	49 mm				
Weight					
Weight	550 g	550 g	910 g	910 g	910 g

	6ES7 147-6BG00-0AB0
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
• 24 V DC	Yes
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Load voltage 2L+	
Rated value (DC)	24 V
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	8
Output current, rated value	100 mA; Per output
24 V encoder supply	
Short-circuit protection	Yes

	6ES7 147-6BG00-0AB0
Power losses	
Power loss, typ.	6.5 W
Digital inputs	
Number of digital inputs	8
• in groups of	4
Number of simultaneously control- lable inputs	
 all mounting positions 	
 Concurrently controllable inputs, up to 60 °C 	8
Input characteristic curve acc. to IEC 1131, Type 3	Yes
Input voltage	
 Rated value, DC 	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
 for signal "0", max. (permissible quiescent current) 	1.5 mA
• for signal "1", typ.	7 mA
Input delay (for rated value of input voltage)	
for standard inputs	T 0
- at "0" to "1", max.	Typ. 3 ms
- at "1" to "0", max.	Typ. 3 ms
Cable length	
 Cable length unshielded, max. 	30 m

SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

reclinical specifications (contin	naca)
	6ES7 147-6BG00-0AB0
Digital outputs Number of digital outputs • in groups of	8 4
Short-circuit protection • Response threshold, typ.	Yes; Electronic 1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Switching capacity of the outputs on lamp load, max.	5 W
Controlling a digital input	Yes
Output current • for signal "1" rated value • for signal "0" residual current, max.	1.3 A; maximum 1.5 mA
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No Yes
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz 1 Hz
Aggregate current of outputs (per group) • up to 60 °C, max.	3.9 A
Cable length Cable length unshielded, max.	30 m
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max. Number of PROFINET interfaces	100 Mbit/s 2
Autocrossing	Yes
Automatic detection of trans-	Yes
mission speed Integrated switch PROFINET IO device	Yes
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup supported	Yes
PROFINET IO	Yes
Protocols (Ethernet) • SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• arp	Yes

	6ES7 147-6BG00-0AB0
Alarms/diagnostics/status infor-	
mation Status indicator	Yes; Green LED
Alarms	,
Diagnostic alarm	Yes
Diagnostics	
Diagnostic functions	Yes
Diagnostic information readable	Yes
 Monitoring the supply voltage to the electronics 	Yes; Green "ON" LED
 Wire break in actuator cable 	Yes
Wire break in signal transmitter	Yes
cableShort circuit	Yes
Short circuit encoder supply	Yes
Group error	Yes; Red/yellow "SF/MT" LED
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation digital inputs	
between the channels	No
Galvanic isolation digital outputs	
between the channels	No
Permissible potential difference between different circuits	75 V DC / 60 V AC
Isolation	75 V DC / 60 V AC
tested with	
• 24 V DC circuits	500 V
Interface	1 500 V; According to
	IEEE 802.3
IP65	Yes
IP66	Yes
IP67	Yes
Connection method	V
M12	Yes
Dimensions and weight Dimensions	
Width	60 mm
Height	175 mm
• Depth	49 mm
Weight	
Weight	910 g

ET 200eco PN

ET 200eco PN

Technical specifications (cont	inued)
	6ES7 144-6KD00-0AB0
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
• 24 V DC	Yes
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Current consumption, typ.	110 mA
Encoder supply	
Number of outputs	4
24 V encoder supply	
 Short-circuit protection 	Yes; electronic at 1.4 A
 Output current, max. 	1 A
Power losses	
Power loss, typ.	2.8 W
Analog inputs	
Number of analog inputs	8
Number of analog inputs for voltage/current measurement	4
Number of analog inputs for resistance/temperature measurement	4
Cable length, shielded, max.	30 m
Permissible input voltage for voltage input (destruction limit), max.	28.8 V permanent, 35 V for max. 500 ms
Input ranges (rated values),	
voltages	
• 0 to +10 V	Yes
• 1 to 5 V	Yes
• -10 V to +10 V • -80 mV to +80 mV	Yes Yes
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Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• -20 to +20 mA	Yes
• 4 to 20 mA	Yes
Input ranges (rated values),	
thermoelements	v
• Type E	Yes
• Type J	Yes
• Type K	Yes Yes
• Type N	res
Input ranges (rated values), resistance thermometers	
• Ni 100	Yes
• Ni 1000	Yes
• Ni 120	Yes
• Ni 200	Yes
• Ni 500	Yes
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values),	
resistors • 0 to 150 Ohm	Yes
• 0 to 300 Ohm	Yes
• 0 to 600 Ohm	Yes
• 0 to 3000 Ohm	Yes

	CEC7 144 CKD00 04 D0
	6ES7 144-6KD00-0AB0
 Temperature compensation Temperature compensation parameterizable 	Yes
Internal temperature compen-	Yes
 External temperature compensation with compensations socket 	Yes
Analog value creation Analog value display	SIMATIC S7 format
Measurement principle	Integrating
Integrations and conversion time/ resolution per channel Resolution (incl. overrange) Integration time, parameterizable Integration time, ms Interference voltage suppression for interference frequency f1	15 bit + sign Yes 2/16.67/20/100 ms 500/50/60/10 Hz
in Hz • Conversion time (per channel)	4/19/22/102 ms
Smoothing of measured values • parameterizable • Step: None • Step: Low • Step: Medium • Step: High	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time
Encoder Number of connectable encoders, max.	8
Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer	Yes Yes
 for current measurement as 4-wire transducer 	Yes
• for resistance measurement with 2-conductor connection	Yes
• for resistance measurement with 3-conductor connection	Yes
 for resistance measurement with 4-conductor connection 	Yes
Errors/accuracies Linearity error (relative to input area)	+/- 0.01 %
Temperature error (relative to input area)	U: 0.0035%/°C; I:0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.008 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency Series mode interference (peak	46 dB
value of interference < rated value of input range), min. Common mode interference, min.	70 dB

SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

	6ES7 144-6KD00-0AB0
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
• Number of PROFINET interfaces	2
 Autocrossing 	Yes
 Automatic detection of trans- mission speed 	Yes
Integrated switchPROFINET IO device	Yes
 IRT with the option "high flexi- bility" supported 	Yes
- Prioritized startup supported	Yes
Protocols	
PROFINET IO	Yes
Protocols (Ethernet)	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• arp	Yes
Alarms/diagnostics/status infor-	
mation Alarms	
Diagnostic alarm	Yes
	103
Diagnostics	Yes
Diagnostic functions Diagnostic information readable	Yes
Diagnostic information readable Manitoring the appropriate sectors	100
 Monitoring the supply voltage to the electronics 	Yes; Green "ON" LED
Short circuit encoder supply	Yes; Per module
• Group error	Yes; Red/yellow "SF/MT" LED
Overflow/underflow	Yes

	6ES7 144-6KD00-0AB0
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation analog inputs • between the channels	No
Permissible potential difference between inputs and MANA (UCM)	10 Vpp AC
Isolation tested with • 24 V DC circuits • Interface	500 V 1 500 V; According to IEEE 802.3
IP65	Yes
IP66	Yes
IP67	Yes
Connection method M12	Yes
Dimensions and weight Dimensions • Width • Height • Depth Weight • Weight	60 mm 175 mm 49 mm
	555 9

	6ES7 145-6HD00-0AB0
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
• 24 V DC	Yes
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Current consumption, typ.	280 mA
Encoder supply	
Number of outputs	4
24 V encoder supply	
Short-circuit protection	Yes; Electronic at 1.4 A
Output current, max.	1 A
Power losses	
Power loss, typ.	5.5 W
Analog outputs	
Number of analog outputs	4
Cable length, shielded, max.	30 m
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA

	6ES7 145-6HD00-0AB0
Current output, no-load voltage, max.	20 V
Output ranges, voltage • 0 to 10 V • 1 to 5 V	Yes Yes
• -10 to +10 V	Yes
Output ranges, current • 0 to 20 mA • -20 to +20 mA • 4 to 20 mA	Yes Yes Yes
Connection of actuators • for voltage output 2-conductor connection • for current output 2-conductor connection	Yes Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max.	1 kΩ 1 μF 600 Ω 1 mH
Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA	28.8 V permanent, 35 V for max. 500 ms

ET 200eco PN

ET 200eco PN

Technical specifications (continued)	
	6ES7 145-6HD00-0AB0
Analog value creation Analog value display	SIMATIC S7 format
Measurement principle	Resistor network
Integrations and conversion time/ resolution per channel • Resolution (incl. overrange) • Conversion time (per channel)	15 bit + sign 1 ms
Settling time • for resistive load • for capacitive load • for inductive load	2 ms 1.8 ms 2 ms
Errors/accuracies Output ripple (based on output area, bandwidth 0 to 50 kHz)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output area)	+/- 0.02 %
Temperature error (relative to output area)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0.008 %
Interfaces Transmission procedure	100BASE-TX
Transmission rate, max. Number of PROFINET interfaces Autocrossing Automatic detection of transmission speed Integrated switch PROFINET IO device IRT with the option "high flexibility" supported Prioritized startup supported	100 Mbit/s 2 Yes Yes Yes Yes Yes
Protocols PROFINET IO	Yes
Protocols (Ethernet) SNMP DCP LLDP ping arp	Yes Yes Yes Yes

	6ES7 145-6HD00-0AB0
Alarms/diagnostics/status infor-	
mation Status indicator	Yes
Substitute values connectable	Yes
Alarms	
Diagnostic alarm	Yes
Diagnostics Diagnostic functions Diagnostic information readable Monitoring the supply voltage to the electronics Wire break Short circuit Group error	Yes Yes; Green "ON" LED Yes; Channel-by-channel with current output Yes; Channel-by-channel with voltage output Yes; Red/yellow "SF/MT" LED
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation analog outputs • between the channels	No
Permissible potential difference between M internally and the outputs	10 Vpp AC
IP65	Yes
IP66	Yes
IP67	Yes
Connection method M12	Yes
Dimensions and weight Dimensions • Width • Height • Depth Weight • Weight	60 mm 175 mm 49 mm

SIMATIC ET 200 distributed I/O ET 200eco PN

ET 200eco PN

lecnnical specifications (conti	inued)
	6ES7 148-6JA00-0AB0
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
• 24 V DC	Yes
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Load voltage 2L+	
Rated value (DC)	24 V
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply Number of outputs	6
Output current, rated value	200 mA; 100 mA per output to X5-X6
24 V encoder supply	
Short-circuit protection	Yes
Power losses	
Power loss, typ.	8 W
Digital inputs	
Number of digital inputs	8
Number of simultaneously control- lable inputs	
all mounting positions	_
 Concurrently controllable inputs, up to 60 °C 	8
Input characteristic curve acc. to IEC 1131, Type 3	Yes
Input voltage	
 Rated value, DC 	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for signal "0", max.	1.5 mA
(permissible quiescent current)for signal "1", typ.	7 mA
	/ III/\text{\tin}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\\\ \text{\tex{\tin}\tint{\text{\text{\text{\text{\text{\text{\text{\text{\texi\text{\texi}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\tint{\text{\tin}\tint{\text{\tin\tiny}\tint{\text{\text{\texi}\text{\text{\ti}\tint{\text{\texi}\tint{\text{\texi}\tint{\text{\tin\tiint{\titil\tint{\text{\tin\tiint{\tinit{\tint}\tint{\tii}\tiint{\tii}\ti
Input delay (for rated value of input voltage)	
• for standard inputs	
- at "0" to "1", max.	Typ. 3 ms
at 1 ta 0 maay	Typ. 3 ms
at "1" to "0", max.	3 ·
Cable length	71
	30 m

	6ES7 148-6JA00-0AB0
Digital outputs Number of digital outputs	4
Short-circuit protection • Response threshold, typ.	Yes; Electronic 1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Switching capacity of the outputs • on lamp load, max.	5 W
Controlling a digital input	Yes
Output current • for signal "1" rated value • for signal "0" residual current, max.	1.3 A; maximum 1.5 mA
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No Yes
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz 1 Hz
Aggregate current of outputs (per group) • up to 60 °C, max.	3.9 A
Cable length Cable length unshielded, max.	30 m
Interfaces Transmission procedure	100BASE-TX
Transmission rate, max. Number of PROFINET interfaces Autocrossing Automatic detection of transmission speed Integrated switch PROFINET IO device IRT with the option "high flexibility" supported	100 Mbit/s 2 Yes Yes Yes Yes
Protocols PROFINET IO	Yes
Protocols (Ethernet) • SNMP • DCP • LLDP • ping • arp	Yes Yes Yes Yes

ET 200eco PN

ET 200eco PN

	6ES7 148-6JA00-0AB0
Alarms/diagnostics/status information	
Status indicator	Yes; Green LED
Alarms	
Diagnostic alarm	Yes
Diagnostics	
Diagnostic functions	Yes
Diagnostic information readable	Yes
 Monitoring the supply voltage to the electronics 	Yes; Green "ON" LED
 Wire break in actuator cable 	Yes
 Wire break in signal transmitter cable 	Yes
Short circuit	Yes
 Short circuit encoder supply 	Yes
Group error	Yes; Red/yellow "SF/MT" LED
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation digital inputs • between the channels	No
Galvanic isolation digital outputs • between the channels	No

	6ES7 148-6JA00-0AB0
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Isolation	
tested with	
 24 V DC circuits 	500 V
Interface	1 500 V; According to IEEE 802.3
IP65	Yes
IP66	Yes
IP67	Yes
Connection method	
M12	Yes
Dimensions and weight	
Dimensions	
Width	60 mm
• Height	175 mm
• Depth	49 mm
Weight	
• Weight	910 g

ET 200eco PN

ET 200eco PN

6AA0 6AA8
6AA3
5AA0
0XA0

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200eco PN IO-Link master

ET 200eco PN IO-Link master

Overview



The IO-Link master module ET200eco PN is part of the compact block I/O range ET 200eco PN. It is characterized by:

- Compact block I/O for processing digital and IO-Link signals for connection to the PROFINET bus system
- Cabinet-free installation to the IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal housing and casting
- Compact module in housing size 60 mm x 175 mm x 37 mm (W x H x D, short and wide) with 8 x M12 for digital signals and IO-Link
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- 100 Mbit/s data transmission rate
- LLDP neighbor detection without the need for a programming device
- Supply and load voltage connection: 2 x M12
- Channel-specific diagnostics

Technical specifications

	6ES7 148-6JA00-0AB0
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
• 24 V DC	Yes
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
 Reverse polarity protection 	Yes
Load voltage 2L+	
 Rated value (DC) 	24 V
 Permissible range, lower limit (DC) 	20.4 V
 Permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	6
Output current, rated value	200 mA; 100 mA per output to X5-X6
24 V encoder supply	
Short-circuit protection	Yes
Power losses	
Power loss, typ.	8 W

	6ES7 148-6JA00-0AB0
Digital inputs Number of digital inputs	8
Number of simultaneously controllable inputs • all mounting positions - Concurrently controllable inputs, up to 60 °C	8
Input characteristic curve acc. to IEC 1131, Type 3	Yes
Input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V -3 to +5 V 11 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", typ.	1.5 mA 7 mA
Input delay (for rated value of input voltage) • for standard inputs - at "0" to "1", max. - at "1" to "0", max.	Typ. 3 ms Typ. 3 ms
Cable length unshielded, max.	30 m

SIMATIC ET 200 distributed I/O ET 200eco PN IO-Link master

ET 200eco PN IO-Link master

Technical specifications (continued)		
	6ES7 148-6JA00-0AB0	
Digital outputs Number of digital outputs	4	
Short-circuit protection • Response threshold, typ.	Yes; electronic 1.8 A	
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	
Switching capacity of the outputs • on lamp load, max.	5 W	
Controlling a digital input	Yes	
Output current • for signal "1" rated value • for signal "0" residual current, max.	1.3 A; maximum 1.5 mA	
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No Yes	
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz 1 Hz	
Aggregate current of outputs (per group) • up to 60 °C, max.	3.9 A	
Cable length Cable length unshielded, max.	30 m	
Interfaces Transmission procedure	100BASE-TX	
Transmission rate, max. • Number of PROFINET interfaces	100 Mbit/s 2	
 Autocrossing Automatic detection of transmission speed 	Yes Yes	
Integrated switchPROFINET IO Device	Yes	
- IRT with the option "high flexibility" supported	Yes	
Protocols PROFINET IO	Yes	
Protocols (Ethernet)		
• SNMP	Yes	
• DCP	Yes	
• LLDP	Yes	
• ping • arp	Yes Yes	

	6ES7 148-6JA00-0AB0
Alarms/diagnostics/status infor-	
mation Status indicator	Yes; green LED
Alarms	, 9 222
Diagnostic alarm	Yes
Diagnostics	
Diagnostic functions	Yes
Diagnostic information readable	Yes
 Monitoring the supply voltage to the electronics 	Yes; green "ON" LED
 Wire break in actuator cable 	Yes
Wire break in signal transmitter	Yes
cable Short circuit	Yes
Short circuit encoder supply	Yes
• Group error	Yes; red/yellow "SF/MT" LED
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation digital inputs	
between the channels	No
Galvanic isolation digital outputs	
between the channels	No
Permissible potential difference between different circuits	7F V DC / C0 V AC
	75 V DC / 60 V AC
Isolation tested with	
• 24 V DC circuits	500 V
• Interface	1 500 V; according to IEEE
	802.3
IP65	Yes
IP66	Yes
IP67	Yes
Connection method	
M12	Yes
Dimensions and weight	
Dimensions • Width	60 mm
	60 mm 175 mm
HeightDepth	49 mm
Weight	
Weight	910 g
S	ŭ

SIMATIC ET 200 distributed I/O ET 200eco PN IO-Link master

ET 200eco PN IO-Link master

Ordering data	Order No.		Order No.
IO-Link Master ET 200eco PN		M12 plug-in power cables	
 4 IO-L + 8 DE + 4 DA DC 24 V/ 1.3 A; 8 X M12, IP67 degree of protection 	6ES7 148-6JA00-0AB0	Pre-assembled plug-in power cables, fitted at each end with M12 socket and plug	
Accessories		4 x 0.75 mm ² , in various lengths:	
 Voltage divider PD 24 V DC; 1 X 7/8", 4 X M12 	6ES7 148-6CB00-0AA0	0.3 m	6XV1 801-5DE30
• Terminal block for ET 200eco	6ES7 194-6CA00-0AA0	0.5 m	6XV1 801-5DE50
PN, 10 A insulation-piercingSpare fuses for terminal block,	CEC7 104 CUROO 04 40	1.0 m	6XV1 801-5DH10
Spare ruses for terminal block, 10 units	6ES7 194-6HB00-0AA0	1.5 m	6XV1 801-5DH15
Mounting rail 0.5 m	6ES7 194-6GA00-0AA0	2.0 m	6XV1 801-5DH20
 Shaped screw for mounting rail, 50 units 	6ES7 194-6MA00-0AA0	3.0 m	6XV1 801-5DH30
 Sealing cap M12 for IP67 	3RK1 901-1KA00	5.0 m	6XV1 801-5DH50
modules, 10 units	2DT1 000 1CD12	10.0 m	6XV1 801-5DN10
 Labels 10 x 7 mm, pale turquoise, 	3RT1 900-1SB10	15.0 m	6XV1 801-5DN15
816 units per pack		M12 coupler plug	
PROFINET M12 cable connector, for user assembly		Pre-assembled	
IE FC M12 connector PRO, for		 For connecting actuators or sensors, 4-pole 	3RX8 000-0CD40
user assembly		For connecting actuators or	3RX8 000-0CD55
1 unit 8 units	6GK1 901-0DB20-6AA0 6GK1 901-0DB20-6AA8	sensors, 5-pole	
	6GK1 901-0DB20-6AA6	M12 angular coupler plug	
PROFINET M12 connecting cables		For user assembly; for connecting actuators or sensors, 5-pole	3RX8 000-0CE55
Preassembled connecting cables with 2 M12 connectors		M12 Y cable	
(D-coded), in various lengths:		For double connection of I/O by means of a single-cable on	6ES7 194-6KA00-0XA0
0.3 m	6XV1 870-8AE30	ET200, 5-pole	
0.5 m	6XV1 870-8AE50	M12 connecting cables (PUR	
1.0 m	6XV1 870-8AH10	casing)	
1.5 m	6XV1 870-8AH15	Preassembled plug-in cables for connecting digital sensors and	
2.0 m	6XV1 870-8AH20	actuators	
3.0 m	6XV1 870-8AH30	Fitted at each end with M12	
5.0 m	6XV1 870-8AH50	socket and plug 3 x 0.34 mm ² , in various lengths:	
10.0 m	6XV1 870-8AN10	0.6 m	3RX8 000-0GF32-1AA6
15.0 m	6XV1 870-8AN15	1.0 m	3RX8 000-0GF32-1AB0
M12 connector for 24 V DC load power supply		1.5 m	3RX8 000-0GF32-1AB5
Socket for 24 V DC incoming	6GK1 907-0DC10-6AA3	Fitted at each end with M12 socket and plug 4 x 0.34 mm ² ,	
supply; 4-pole A-coded, 3 units		in various lengths:	
Cable connector for loop-through	6GK1 907-0DB10-6AA3	0.6 m	3RX8 000-0GF42-1AA6
of 24 V DC;		1.0 m	3RX8 000-0GF42-1AB0
4-pole A-coded, 3 units		1.5 m	3RX8 000-0GF42-1AB5

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200eco

ET 200eco

Overview



- · Compact, cost-effective I/O devices for processing digital
- Design without control cabinet with degree of protection IP65/67 with flexible and fast connections
- Comprises a basic module and various connection blocks for application-specific implementation options:
 - ECOFAST: 2 x RS 485 hybrid fieldbus connection with

 - identification plug for setting the PROFIBUS address
 M12: 2 x M12 and 2 x 7/8" with 2 rotary coding switches for assigning the PROFIBUS address
- Connection block contains T-functionality for bus and power supply so that during commissioning and service, the modules can be disconnected from and reconnected to the PROFIBUS without interruption
- Module variance: 8DI, 16DI, 8DI/8DO (1.3 A), 8DI/8DO (2.0 A), 8DO (2.0 A), 16DO (0.5 A)
- Transmission rates up to 12 Mbit/s
- Fail-safe DI modules 4/8 F-DI with safety-related signal processing according to PROFIsafe

Technical specifications

	6ES7 141-3BF00-0XA0	6ES7 141-3BH00-0XA0	6ES7 148-3FA00-0XB0
Supply voltages			
Supply voltage of electronics 1L+			
 Rated value (DC) 	24 V	24 V	24 V
 Reverse polarity protection 	Yes	Yes	No
Current consumption			
from supply voltage 1L+, max.	70 mA; typically	70 mA; typically	100 mA
Power losses			
Power loss, typ.	2.4 W	3.6 W	3 W
FH technology			
Module for fail-safe applications			Yes
Protocols			
PROFIBUS DP protocol	Yes	Yes	Yes
PROFIBUS DP			
Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 /	12 Mbit/s; 9.6 / 19.2 / 45.45 /	12 Mbit/s
	93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	
<u></u>	0 / 12 IVIDIQS	0 / 12 WDIVS	
Digital inputs Number of digital inputs	0	10	O. O single abancal
Number of digital inputs	8	16	8; 8 single channel, 4 two-channel
Number of simultaneously control-	8; all mounting positions up to	16; all mounting positions up to	8; 8 single channel,
lable inputs	55 °C	55 °C	4 two-channel
Input characteristic curve acc. to	Yes	Yes	Yes
IEC 1131, Type 1			
Input voltage			
 Rated value, DC 	24 V	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V	-30 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V	15 to 30 V
Input current			
• for signal "1", typ.	7 mA	7 mA	3.7 mA
Input delay (for rated value of input			
voltage)			
• for standard inputs			
- at "0" to "1", max.	3 ms; typ.	3 ms; typ.	
- at "1" to "0", max.	3 ms; typically	3 ms; typically	
Cable length	0.0		
 Cable length unshielded, max. 	30 m	30 m	30 m

ET 200eco

ET 200eco

	6ES7 141-3BF00-0XA0	6ES7 141-3BH00-0XA0	6ES7 148-3FA00-0XB0
Encoder supply			
Number of outputs	8	8	2
Output voltage	24 V DC	24 V DC	min. L+ (-1.5 V)
Output current, rated value	1 A; aggregate current up to 55 °C	1 A; aggregate current up to 55 °C	300 mA
Short-circuit protection	Yes; electronic	Yes; electronic	Yes
Encoder Connectable encoders • 2-wire BEROS - permissible quiescent current	Yes 1.5 mA	Yes 1.5 mA	No
(2-wire BEROS), max.	1.5 11// (1.0 11//	
Alarms/diagnostics/status information			
Status indicator	Yes	Yes	
Alarms	NI	NI-	
• Alarms	No	No	
Diagnostics • Diagnostics	Yes; diagnostic information readable	Yes; diagnostic information readable	
Diagnostic indication LED Group error SF (red) Status indicator digital input (green) Channel error indicator F (red)	Yes Yes No	Yes Yes No	Yes Yes No
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V AC for 1 min.
Galvanic isolation between PROFIBUS DP and all other circuit components	Yes	Yes	Yes
Galvanic isolation digital inputs • between the channels	No	No	No
Permissible potential difference between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Standards, approvals, certificates Highest safety class achievable in safety mode			
acc. to EN 954acc. to IEC 61508			Cat. 3 (single-channel), Cat. 4 (two-channel) SIL 2 (single-channel), SIL 3 (two-channel)
General information			
Vendor identification (VendorID)	80DBh	80DAh	
Dimensions and weight			
Dimensions	00	00	00
• Width	60 mm	60 mm	60 mm
HeightDepth	210 mm 28 mm	210 mm 28 mm	210 mm 28 mm
	20 111111	20 111111	20 111111
Weight • Weight, approx.	210 g	210 g	220 g

ET 200eco

ET 200eco

	6ES7 142-3BF00-0XA0	6ES7 142-3BH00-0XA0
Supply voltages		
Supply voltage of electronics 1L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 2L+ • Rated value (DC)	24 V	24.1/
Reverse polarity protection	Yes	24 V Yes
Current consumption	103	100
from load voltage 2L+ (without load), max.	60 mA; typically	80 mA; typically
from supply voltage 1L+, max.	70 mA; typically	70 mA; typically
Power losses	7.51 5	- 70k 3
Power loss, typ.	4 W	4 W
Protocols		
PROFIBUS DP protocol	Yes	Yes
PROFIBUS DP		
Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s
Digital outputs		
Number of digital outputs	8	16
Short-circuit protection	Yes; electronic	Yes; electronic
• Response threshold, typ.	4 A per channel	1.4 A (per channel)
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-47 V)
Lamp load, max.	10 W	5 W
Controlling a digital input	Yes	Yes
Output voltage		
• for signal "1", min.	2L+ (-0.8 V)	2L+ (-0.8 V)
Output current		
• for signal "1" rated value	2 A	0.5 A
 for signal "1" permissible range for 0 to 55 °C, min. 	5 mA	5 mA
• for signal "1" permissible range for 0 to 55 °C,	2.4 A	1 A
max.		
for signal "0" residual current, max.	0.5 mA	0.1 mA
Parallel switching of 2 outputs	No	Nie
for increased powerfor redundant control of a load	No Yes	No Yes
Switching frequency	103	100
with resistive load, max.	100 Hz	100 Hz
with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC13	0.5 Hz; to IEC 947-5-1, DC13
• on lamp load, max.	1 Hz	1 Hz
Aggregate current of outputs (per group)		
• up to 55 °C, max.	4 A; 4 A each for sockets X1, X3, X5, X7 and	4 A; Please note the current carrying capacity
	4 A each for sockets X2, X4, X6, X8; note the current carrying capacity of the cable	of the cable!
Load resistance range		
• lower limit	12 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
Cable length		
Cable length unshielded, max.	30 m	30 m
Alarms/diagnostics/status information		
Status indicator	Yes	Yes
Alarms		
Alarms	No	No
Diagnostics	Very discount of the second	Van die eer akte informatie
Diagnostics	Yes; diagnostic information readable	Yes; diagnostic information readable

SIMATIC ET 200 distributed I/O ET 200eco

ET 200eco

	6ES7 142-3BF00-0XA0	6ES7 142-3BH00-0XA0
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
 Status indicator digital output (green) 	Yes	Yes
 Channel error indicator F (red) 	No	No
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation		
between PROFIBUS DP and all other circuit	Yes	Yes
components		
Galvanic isolation digital outputs		
 between the channels 	No	No
Permissible potential difference		
between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC
General information		
Vendor identification (VendorID)	80DDh	80FBh
Dimensions and weight		
Dimensions		
• Width	60 mm	60 mm
• Height	210 mm	210 mm
• Depth	28 mm	28 mm
Weight		
 Weight, approx. 	210 g	210 g

	6ES7 143-3BH00-0XA0	6ES7 143-3BH10-0XA0
Supply voltages		
Supply voltage of electronics 1L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	No	Yes
Load voltage 2L+		
Rated value (DC)	24 V	24 V
Reverse polarity protection	No	Yes
Current consumption from load voltage 2L+ (without load), max.	60 mA; typically	60 mAs typically
	7 31 3	60 mA; typically
from supply voltage 1L+, max.	70 mA; typically	70 mA; typically
Power losses		
Power loss, typ.	5 W	5 W
Protocols		
PROFIBUS DP protocol	Yes	Yes
PROFIBUS DP		
Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s
Digital inputs		
Number of digital inputs	8	8
Number of simultaneously controllable inputs	8; all mounting positions up to 55 °C	8; all mounting positions up to 55 °C
Input characteristic curve acc. to IEC 1131, Type 1	Yes	Yes
Input voltage		
Rated value, DC	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Input delay (for rated value of input voltage) • for standard inputs		
- at "0" to "1", max.	3 ms; typ.	3 ms; typ.
- at "1" to "0", max.	3 ms; typically	3 ms; typically

ET 200eco

ET 200eco

	6ES7 143-3BH00-0XA0	6ES7 143-3BH10-0XA0
Digital outputs		
Number of digital outputs	8	8
Short-circuit protection	Yes; electronic	Yes; electronic
Response threshold, typ.	4 A per channel	4 A per channel
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-44 V)
Lamp load, max.	10 W	10 W
Controlling a digital input	Yes	Yes
Output voltage		
• for signal "1", min.	2L+ (-0.8 V)	2L+ (-1.2 V)
Output current		
• for signal "1" rated value	2 A	1.3 A
 for signal "1" permissible range for 0 to 55 °C, min. 	5 mA	5 mA
• for signal "1" permissible range for 0 to 55 °C,	2.4 A	1.8 A
max.		
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Parallel switching of 2 outputs	Ne	Ne
for increased powerfor redundant control of a load	No Yes	No Yes
	165	165
Switching frequency • with resistive load, max.	100 Hz	100 Hz
with resistive load, max. with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC13	0.5 Hz; to IEC 947-5-1, DC13
• on lamp load, max.	1 Hz	1 Hz
Aggregate current of outputs (per group)		
• up to 55 °C, max.	4 A; 4 A each for sockets X1, X3, X5, X7 and	5.2 A; please note the current carrying
	4 A each for sockets X2, X4, X6, X8; note the	capacity of the cable!
	current carrying capacity of the cable	
Load resistance range	12.0	12.0
lower limit upper limit	12 Ω 4 k Ω	12 Ω 4 kΩ
Cable length	7 1/22	T 1/22
Cable length unshielded, max.	30 m	30 m
Encoder supply		
Number of outputs	8	8
Output voltage	24 V DC	
Output current, rated value	0.75 A; up to 55°C max. 0.75 A	1 A; up to 55°C max. 1 A (summation current)
Calpat carroni, rated value	(summation current)	77, ap to so a max 77 (cammais. camenty
Short-circuit protection	Yes; electronic	Yes; electronic
Encoder		
Connectable encoders		
• 2-wire BEROS	Yes	Yes
- permissible quiescent current (2-wire BEROS),	1.5 mA	1.5 mA
max. Alarms/diagnostics/status information		
Status indicator	Yes	Yes
Alarms		100
• Alarms	No	No
Diagnostics		
• Diagnostics	Yes; diagnostic information readable	Yes; diagnostic information readable
Diagnostics indication LED		ŭ
• Group error SF (red)	Yes	Yes
Status indicator digital output (green)	Yes	Yes
 Status indicator digital input (green) 	Yes	Yes
 Channel error indicator F (red) 	No	No

ET 200eco

ET 200eco

	6ES7 143-3BH00-0XA0	6ES7 143-3BH10-0XA0
Isolation		
Isolation checked with	500 V DC	500 V DC
Galvanic isolation between PROFIBUS DP and all other circuit components	Yes	Yes
Galvanic isolation digital inputs • between the channels	No	No
Galvanic isolation digital outputs • between the channels	No	No
Permissible potential difference between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC
General information Vendor identification (VendorID)	80DCh	80FCh
Dimensions and weight Dimensions		
• Width	60 mm	60 mm
HeightDepth	210 mm 28 mm	210 mm 28 mm
Weight • Weight, approx.	210 g	210 g

	6ES7 194-3AA00-0AA0	6ES7 194-3AA00-0BA0
Power losses		
Power loss, typ.	2 W; The power loss depends on the curr that you loop through via the connection be	
Dimensions and weight		
Dimensions		
Width	79 mm	79 mm
Height	60 mm	60 mm
• Depth	30 mm	29 mm
Weight		
 Weight, approx. 	313 g	392 g

ET 200eco

ET 200eco

Ordering data	Order No.		Order No.
BM 141 ET 200eco basic modules		Accessories for M12 connection block, 7/8"	
8 DI 24 V DC 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately	6ES7 141-3BF00-0XA0	PROFIBUS M12 cable connector 1 pack = 5 units	
 16 DI 24 V DC 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 	6ES7 141-3BH00-0XA0	Male insert Female insert PROFIBUS M12 connecting	6GK1 905-0EA00 6GK1 905-0EB00
BM 142 ET 200eco basic module		cable for PROFIBUS DP,	
8 DO 24 V DC/1.2 A 8 x M12, individual assignment, IP65/67 connection block 6ES7194-	6ES7 142-3BF00-0XA0	1 pack = 5 units • Male insert PROFIBUS M12 connecting	6GK1 905-0EC00
3AA00-0.A0 to be ordered separately • 16 DO 24 V DC/0.5 A 8 x M12, double assignment, IP65/67; connection block 6ES7 194-3AA00-0.A0 to be ordered separately	6ES7 142-3BH00-0XA0	cable Pre-assembled 2-wire (inverse coded) with M12 connectors (straight) in various lengths: • 0.3 m • 0.5 m	6XV1 830-3DE30 6XV1 830-3DE50
BM 143 ET 200eco basic modules		• 1.0 m • 1.5 m	6XV1 830-3DH10 6XV1 830-3DH15
• 8 DI/8 DO, 2 A 8 x M12, IP65/67 connection block 6ES7194-3AA00-0.A0 to be	6ES7 143-3BH00-0XA0	• 2.0 m • 3.0 m • 5.0 m	6XV1 830-3DH20 6XV1 830-3DH30 6XV1 830-3DH50
ordered separately • 8 DI/8 DO, 1.3 A 8 x M12, double assignment, IP65/67 connection block 6ES7 194-3AA00-0.A0 to be ordered separately	6ES7 143-3BH10-0XA0	 10.0 m 15.0 m Other special lengths with 90° or 180° cable outlet 	6XV1 830-3DN10 6XV1 830-3DN15 see http://
BM 148 ET 200eco basic modules			support.automation.siemens. com/WW/view/en/26999294
4/8 F-DI, 8 x M12, connection block 6ES7194-3AA00-0.A0 to be ordered separately	6ES7 148-3FA00-0XB0	7/8" connector 1 pack = 5 units • Male contact insert, straight	6GK1 905-0FA00
ECOFAST connection block	6ES7 194-3AA00-0AA0	Male contact insert, angled F	3RK1 902-3BA00
for ET 200eco, 2 x ECOFAST connection RS485 identification connector for PROFIBUS DP,		 Female contact insert, straight Female contact insert, angled F 7/8" covering caps 	6GK1 905-0FB00 3RK1 902-3DA00 6ES7 194-3JA00-0AA0
address setting		1 pack = 10 units	0E37 194-30A00-0AA0
M12 connection block, 7/8"	6ES7 194-3AA00-0BA0	SIMATIC NET energy cable	
for ET 200eco, 2 x M12 and 2 x 7/8" 2 rotary coding switch for PROFIBUS DP, address setting		5-wire energy cable, stranded 5 x 1.5 mm ² , trailing-type • Sold by the meter, minimum	6XV1 830-8AH10
Accessories for ECOFAST connection block		order quantity = 20 m	
PROFIBUS ECOFAST hybrid plug		7/8" connecting cable to power supply	
Female contact insert, straight Female contact insert, engled	6GK1 905-0CB00	Pre-assembled 5-wire cable with 7/8" connectors (straight) in	
Female contact insert, angledMale contact insert, straight	6GK1 905-0CD00 6GK1 905-0CA00	various lengths: • 0.3 m	6XV1 822-5BE30
Male contact insert, angled	6GK1 905-0CC00	• 0.5 m	6XV1 822-5BE50
PROFIBUS ECOFAST terminating plug		• 1.0 m • 1.5 m	6XV1 822-5BH10 6XV1 822-5BH15
ECOFAST terminating resistor for PROFIBUS DP		• 2.0 m	6XV1 822-5BH20
• 1 pack = 1 unit	6GK1 905-0DA10	• 3.0 m • 5.0 m	6XV1 822-5BH30 6XV1 822-5BH50
• 1 pack = 5 units PROFIBUS ECOFAST	6GK1 905-0DA00 See ECOFAST bus cables	• 10.0 m	6XV1 822-5BN10
Hybrid cable – Cu	occ Looi Aot bus cables	• 15.0 m	6XV1 822-5BN15
		5 0 1 · · · · · · · · · · · · · · · · · ·	150011 51500

F: Subject to export regulations AL: N and ECCN: EAR99

I: Subject to export regulations AL: N and ECCN: EAR99H

ET 200eco

ET 200eco

Ordering data	Order No.		Order No.
7/8" connecting cable to power supply		"Distributed Safety" V5.4 F programming tool	6ES7 833-1FC02-0YA5
Pre-assembled 5-wire cable with 7/8" connectors (straight) in various lengths: • 3.0 m F • 5.0 m F	3RK1 902-3NB30 3RK1 902-3NB50	Floating License for 1 user, with documentation, 3 languages (German, English, French), on CD, runs on STEP 7 V5.3 SP3 or higher	
• 10.0 m	3RK1 902-3NC10	"Distributed Safety"	6ES7 833-1FC02-0YE5
• Other special lengths with 90° or	see	F programming tool	
180° cable outlet	http://support.automation.siemens.	Upgrade from V5.x to V5.4	
	com/WW/view/en/26999294	"Distributed Safety" F programming tool	6ES7 833-1FC00-0YX2
Other accessories		Software Update Service for	
Identification plug	6ES7 194-1KB00-0XA0	1 year, with automatic extension;	
for setting of the PROFIBUS node address		latest software version required S7 Manual Collection J	6ES7 998-8XC01-8YE0
M12 Y circular connector	6ES7 194-1KA01-0XA0	Electronic manuals on DVD,	
For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8		multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7,	
M12 Y cable	6ES7 194-6KA00-0XA0	Engineering Tools, Runtime Software, SIMATIC DP	
For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8		(Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Commu- nication)	
M12 coupler plug	3RK1 902-4BA00-5AA0	S7 Manual Collection update D	6ES7 998-8XC01-8YE2
for connecting actuators or sensors, 5-pole		service for 1 year Scope of delivery: Current DVD	0137 990-08001-0112
M12 covering caps	3RX9 802-0AA00	"S7 Manual Collection" and the	
for sealing of unused I/O sockets		three subsequent updates	
Labels	3RT1 900-1SB20		
Module description "Distributed I/O device ET 200eco" excluding F-DI			
• paper version, German	6ES7 198-8GA00-8AA0		
paper version, English	6ES7 198-8GA00-8BA0		
 paper version, French 	6ES7 198-8GA00-8CA0		

- D: Subject to export regulations AL: N and ECCN: 5D992
- F: Subject to export regulations AL: N and ECCN: EAR99
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC ET 200 distributed I/O ET 200R

ET 200R

Overview



- Distributed I/O to the degree of protection IP65
- Die-cast aluminum housing
- Integrated repeater
- Parameterizable inputs/ outputs: 8 DI/8 DO up to 16 DI
- Terminal strip at rear for connecting up analog signals for welding transformers
- Connection through hybrid line to 17-pin M23 connector

Technical specifications

	6ES7 143-2BH00-0AB0	6ES7 143-2BH50-0AB0
Supply voltages		
Rated value		
• 24 V DC	Yes; -15 / +20 %	Yes; -15 / +20 %
 Permissible range, lower limit (DC) 	20.4 V	20.4 V
Permissible range, upper limit (DC)	28.8 V	28.8 V
Reverse polarity protection	Yes; also electronic protection	Yes; also electronic protection
Connection method		
Bus cables	Bus and voltage: X01/X02: 2x M23 (17-pin)	Bus and voltage: X01/X02: 2x M23 (17-pin)
Inputs/outputs	8x 5-pin M12x1 circular connector	8x 5-pin M12x1 circular connector
Protocols		
PROFIBUS DP protocol	Yes; ramp-up time at 12 Mbit/s: approx. 80 ms	Yes
PROFIBUS DP		
Cable length, max.	30 m; per line, shielded	30 m; per line, shielded
Digital inputs		
Number of digital inputs	8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters	8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters
Input characteristic curve acc. to IEC 1131, Type 2	Yes	Yes
Input voltage		
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	15 to 30 V	15 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Input delay (for rated value of input voltage) • for standard inputs		
- at "0" to "1", max.	3 ms; typ.	3 ms; typ.
Cable length		
Cable length unshielded, max.	10 m; for signal lines	10 m; for signal lines

SIMATIC ET 200 distributed I/O ET 200R

ET 200R

	6ES7 143-2BH00-0AB0	6ES7 143-2BH50-0AB0
Digital outputs		
Number of digital outputs	8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters	8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters
Short-circuit protection	Yes; electronic	Yes; electronic
Output current • for signal "1" permissible range for 0 to 55 °C, max.	0.5 A	0.5 A
Switching frequency with resistive load, max.	100 Hz	100 Hz
Aggregate current of outputs (per group) • up to 55 °C, max.	2 A	2 A
Cable length Cable length unshielded, max.	10 m	10 m
Encoder supply Number of outputs	8	8
Output current, rated value	0.5 A; 8 channels each	0.5 A; 8 channels each
Encoder Connectable encoders • 2-wire BEROS	Yes	Yes
Alarms/diagnostics/status information		
Diagnostics Diagnostic functions Short circuit	Yes; diagnostic frames Yes; (digital outputs) per group; X0 to X1 or X2 to X3	Yes; diagnostic frames Yes; (digital outputs) per group; X0 to X1 or X2 to X3
Short circuit encoder supplyMissing load voltage	Yes; per group X0 to X3 or X4 to X7 Yes	Yes; per group X0 to X3 or X4 to X7 Yes
Diagnostic indication LED Description Bus fault BF (red) Rated load voltage PWR (green) Group error SF (red) Status indicator digital output (green) Status indicator digital input (green) Monitoring 24 V voltage supply ON (green)	Channel 01, Channel 02 Yes Yes; 24 V DC (load voltage) US2 Yes Yes Yes Yes Yes Yes; (logic circuits/encoder voltage) US1	Channel 01, Channel 02 Yes Yes; 24 V DC (load voltage) US2 Yes Yes Yes Yes Yes Yes; (logic circuits/encoder voltage) US1
Environmental requirements	, (- 0	, (- 3
Operating temperature • max.	55 °C	55 °C
Degree of protection IP65	Yes	Yes
Standards, approvals, certificates CE mark	Yes	Yes
CSA approval	Yes; ES 02 or higher	Yes
UL approval	Yes; ES 02 or higher	Yes
General information Housing	Die-cast aluminum	Die-cast aluminum
Dimensions and weight		
Dimensions • Width • Height • Depth • Length	54 mm 55 mm; 64 mm incl. overall plug height 150 mm 150 mm	54 mm 55 mm; 64 mm incl. overall plug height 150 mm 150 mm
Weight • Weight, approx.	780 g	780 g

ET 200R

ET 200R

Ordering data	Order No.		Order No.
ET 200R handling module IP65	6ES7 143-2BH00-0AB0	S7 Manual Collection	6ES7 998-8XC01-8YE0
Metal casing 8 DI + 8 DI/DO, configurable; 24 V DC, 5-pole, 8 x M12, 2 x M23 (DP, PS, analog)		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300,	
ET 200R welding module IP65	6ES7 143-2BH50-0AB0	C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime	
Metal casing 8 DI + 8 DI/DO, configurable; 24 V DC, 5-pole, 8 x M12, 2 x M23 (DP, PS, analog)		Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Commu-	
Accessories		nication)	
Cables ELOCAB	Order from: ELOCAB Sonderkabel Obere Lerch 34	S7 Manual Collection update D service for 1 year	6ES7 998-8XC01-8YE2
	D-91166 Georgensmünd Tel.: (+49 91 72) 69 80-0 Fax: (+49 91 72) 20 29	Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	
M23 Connector Interconnectron	Order from: Hypertac GmbH Auwiesenstr. 5, Postfach 14 65 D-94454 Deggendorf		

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- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Distributed I/O SIMATIC ET 200

PROFIBUS components

Power Rail Booster

Overview



- The device for low-cost PROFIBUS DP transfer over contact conductors and slip rings to degree of protection IP20
- Permissible baud rates from 9600 bit/s to 500 kbit/s, self-optimizing
- Permissible busbar length: From 25 m at 500 kbit/s to 1200 m at 9600 bit/s
- Configuring with PRB Checker software
- Up to 125 nodes per segment
- Transparent for data communication:
 The power rail booster does not reserve DP addresses
- Easy to install due to connection without terminating resistor and filter element
- Diagnostics LED for power supply, bus activity and group errors
- Isolated electronic changeover contact for external group error display or diagnostic alarm
- Uninterruptible communication beyond segment limits using the "PRB segment controller"

Technical specifications

Degree of protection	IP20
Dimensions (W x H x D, with connector) in mm	90 x 132 x 75
Supply voltage	24 V DC
Power consumption	max. 20 W
Data transmission rate, max.	500 kbit/s, self-adjusting
Cable length (depends on baud rate), max.	1200 m
Shock-hazard protected voltage	Yes, to EN 61131-2
Stations per PRB segment, max.	125
Operation without terminating resistance	Yes
Operation without filter	Yes
Wiring options: Line / star	Yes / Yes

Ordering data Order No.

Power Rail Booster	6ES7 972-4AA02-0XA0
Signal amplifier for PROFIBUS DP transmission over contact cables, max. 500 kbit/s	
PRB segment controller	6ES7 972-4AA50-0XA0
Automatic change-over switch	

Automatic change-over switch between PRB segments

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PROFIBUS components

Diagnostic repeater for PROFIBUS DP

Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- DP standard PROFIBUS slave (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbit/s to 12 Mbit/s
- Connection through FastConnect using the insulation displacement method

Technical specifications

	6ES7 972-0AB01-0XA0
Supply voltages	
Rated value	
• 24 V DC	Yes
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Connection method	
Bus cables	FastConnect insulation displacement, 10 clamping cycles possible
Power supply	Terminal block
PROFIBUS DP	
Transmission rate, max.	12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s
Environmental requirements	
Operating temperature	
• Min.	0 °C
• Max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• Max.	70 °C
Relative humidity	
Operation, max.	95 %; at 25 °C
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
• Width	80 mm
Height	125 mm
• Depth	67.5 mm
Weight	
 Weight, approx. 	300 g

SIMATIC ET 200 distributed I/O PROFIBUS components

Diagnostic repeater for PROFIBUS DP

Ordering data	Order No.		Order No.
RS 485 diagnostic repeater	6ES7 972-0AB01-0XA0	PROFIBUS FastConnect Stripping Tool	6GK1 905-6AA00
For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostic functions for monitoring the bus cables		Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
Accessories		PROFIBUS FC Standard Cable	6XV1 830-0EH10
RS 485 bus connector with 90° cable outlet With screw terminals Max. transfer rate 12 Mbit/s		Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum	
Without PG interface	6ES7 972-0BA12-0XA0	order quantity 20 m	
With PG interface	6ES7 972-0BB12-0XA0	S7 Manual Collection	6ES7 998-8XC01-8YE0
PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet With insulation displacement terminals, max. data transfer rate 12 Mbit/s		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7- 400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial	
Without PG interface 1 unit	6ES7 972-0BA52-0XA0	Communication) S7 Manual Collection update D	6ES7 998-8XC01-8YE2
• 100 units	6ES7 972-0BA52-0XB0	service for 1 year	OLOT OSC OXCOT CTLL
With PG interface 1 unit 100 units	6ES7 972-0BB52-0XA0 6ES7 972-0BB52-0XB0	Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	
RS 485 bus connector with angled cable outlet (35°)		Manual for PROFIBUS networks 1)	
With screw terminals, max. transfer rate 12 Mbit/s • Without PG interface	6ES7 972-0BA42-0XA0	Network architecture, configu- ration, network components, installation	
With PG interface	6ES7 972-0BB42-0XA0	German	6GK1 970-5CA20-0AA0
PROFIBUS FastConnect RS 485		BT 200 Hardware Tester	6ES7 181-0AA01-0AA0
bus connector with angular cable outlet (35°) With insulation displacement terminals, max. transfer rate		with point-to-point cable for station testing, with test connector for withing test, without charging	
12 Mbit/s		unit, with operating instructions in German/English/French	
Without PG interfaceWith PG interface	6ES7 972-0BA60-0XA0 6ES7 972-0BB60-0XA0	Connecting cable for PROFIBUS	6ES7 901-4BD00-0XA0
		12 Mbit/s, for PG connection to PROFIBUS DP, preassembled with 2 x 9-pin sub D connector, 3.0 m	

¹⁾ Further language variants and manuals can be found for the respective products at: www.siemens.com/automation/csi/net

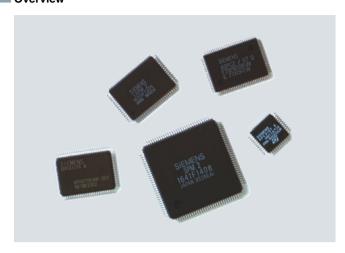
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PROFIBUS components

PROFIBUS DP ASICs

Overview



- Easy connection of field devices to PROFIBUS
- Integrated low power management
- Different ASICs for the different functional requirements and application areas

Technical specifications

	LSPM 2	SPC 3	SPC 3LV	DPC 31
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	simple slave application	intelligent slave application	intelligent slave application	intelligent slave application
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s
Bus access	in ASIC	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	yes	yes	yes	yes
Microprocessor required	no	yes	yes	integrated
Scope of firmware	not required	6 to 24 KB	6 to 24 KB	approx. 38 KB
Message buffer	-	1.5 KB	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	<0.5 W	0.2 W
Permissible ambient temperature	-40 °C +75 °C	-40 °C +85 °C	-40 °C +85 °C	-40 °C +85 °C
Housing	MQFP, 80-pin	PQFP, 44-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm ²	2 cm ²	2 cm ²	4 cm ²
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	5/160/800/1000/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

	SPC 4-2	ASPC 2	SIM 1-2	FOCSI
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA	-
Application range	Intelligent slave application	Master application	Medium Attachment	Medium Management Unit
Transmission rate, max.	12 Mbit/s	12 Mbit/s	31.25 kbit/s	12 Mbit/s
Bus access	in ASIC	in ASIC	-	-
Automatic determination of transmission rate	yes	yes	-	-
Microprocessor required	yes	yes	-	-

SIMATIC ET 200 distributed I/O PROFIBUS components

PROFIBUS DP ASICs

Technical specifications (continued)

	SPC 4-2	ASPC 2	SIM 1-2	FOCSI
Scope of firmware	3 30 KB	80 KB	not required	not required
Message buffer	3 KB	1 MB (external)	-	-
Voltage supply	5 V DC, 3.3 V	5 V DC	via bus	3.3 V DC
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W	0.75 W
Permissible ambient temperature	-40 °C +85 °C	-40 °C +85 °C	-40 °C +85 °C	-40 °C +85 °C
Housing	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin	TQFP, 44-pin
Frame size	2 cm ²	4 cm ²	36 mm ²	2 cm ²
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000	40

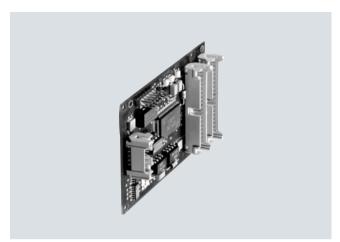
Ordering data	Order No.		Order No.
ASIC ASPC 2		ASIC DPC 31 STEP B	
For constructing master interfaces (quantity discount) • 6 units (lead-free) • 66 units (lead-free) • 660 units (lead-free) • 4620 units (lead-free)	0_000 0/2.00 0/2.0	For constructing intelligent DP slave interfaces (quantity discounts) • 6 units (lead-free) • 60 units (lead-free) • 300 units (lead-free) • 5100 units (lead-free)	6ES7 195-0BE02-0XA0 6ES7 195-0BE12-0XA0 6ES7 195-0BE22-0XA0 6ES7 195-0BE32-0XA0
ASIC LSPM 2		ASIC DPC 31 STEP C1	
For constructing simple slave interfaces (quantity discount) • 6 units (lead-free) • 66 units (lead-free) • 330 units (lead-free) • 4950 units (lead-free)	6ES7 195-0BA02-0XA0 6ES7 195-0BA12-0XA0 6ES7 195-0BA22-0XA0 6ES7 195-0BA32-0XA0	For constructing intelligent DP slave interfaces (quantity discounts) • 6 units (lead-free) • 66 units (lead-free) • 660 units (lead-free)	6ES7 195-0BF02-0XA0 6ES7 195-0BF12-0XA0 6ES7 195-0BF22-0XA0
ASIC SPC 3		• 4620 units (lead-free)	6ES7 195-0BF32-0XA0
For constructing intelligent DP slave interfaces (quantity discounts) • 6 units (lead-free) • 96 units (lead-free) • 960 units (lead-free) • 4800 units (lead-free) • 750 units (lead-free) I	6ES7 195-0BD04-0XA0 6ES7 195-0BD14-0XA0 6ES7 195-0BD24-0XA0 6ES7 195-0BD34-0XA0 6ES7 195-0BD44-0XA0	ASIC SPC 4-2 For constructing intelligent DP slave interfaces (quantity discounts) • 5 units for laboratory development (lead-free) • 160 units (lead-free, 1 tray)	6GK1 588-3AA00 6GK1 588-3AA15
ASIC SPC 3LV	0201 100 022 11 00010	ASIC SIM 1-2	
For constructing intelligent DP slave interfaces (quantity discounts) • 5 units (lead-free) • 160 units (lead-free) • 800 units (lead-free)	6ES7 195-0BG00-0XA0 6ES7 195-0BG10-0XA0 6ES7 195-0BG20-0XA0	For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbit/s • 60 units (in tube) • 1000 units (tape & reel) Accessories	6GK1 588-3BB02 6GK1 588-3BB21
4800 units (lead-free)1000 units (lead-free) T&R	6ES7 195-0BG30-0XA0 6ES7 195-0BG40-0XA0	Firmware for Siemens ASIC SPC 3	
ASIC FOCSI Fiber Optic Controller from Siemens for conditioning signals for the optical PROFIBUS • 40 units (lead-free)	6ES7 195-0EA20-0XA0	DP firmware DPV1 firmware DPV1 firmware DPV1 firmware upgrade Firmware for Siemens ASIC DPC 31	6ES7 195-2BA00-0XA0 6ES7 195-2BA01-0XA0 6ES7 195-2BA02-0XA0
10 3.11.0 (1000 1100)		 DPV1 firmware 	6ES7 195-2BB00-0XA0

I: Subject to export regulations AL: N and ECCN: EAR99H

PROFIBUS components

Connections/interfaces

Overview



 PC slave board IM 182-1 for the connection of AT-compatible PCs as DP slaves

Technical specifications

	.=
	6ES7 182-0AA01-0XA0
Supply voltages	
Rated value	
• 5 V DC	Yes
Current consumption	
Current consumption, typ.	250 mA
Protocols	
PROFIBUS DP protocol	Yes
PROFIBUS DP	
Transmission rate, max.	12 Mbit/s
Hardware components/ modules/ ASIC	
ASIC	SPC 3
Scope of firmware	4 to 24 KB (incl. test program)
Programming devices	
Microprocessor type	Processor of the PG/PC
Environmental requirements	
Operating temperature	
• Min.	0 °C
• Max.	60 °C
General information	
Application area	Slave applications
Dimensions	
PCB size, width	168 mm
PCB size, height	105 mm

Ordering data	Order No.
SIMATIC S5/S7 IM 182-1 PC slave board	6ES7 182-0AA01-0XA0
For PROFIBUS DP, max. 12 Mbit/s	
Accessories	
Windows NT driver for IM 180 and IM 182	6ES7 195-2AC00-0XA0
Firmware for Siemens ASIC SPC 3 and IM 182-1	
DP firmware	6ES7 195-2BA00-0XA0
 DPV1 firmware 	6ES7 195-2BA01-0XA0
 DPV1 firmware upgrade 	6ES7 195-2BA02-0XA0

I: Subject to export regulations AL: N and ECCN: EAR99H

PROFIBUS components

Development kits

Overview

Development kit

Using the development kits, PROFIBUS hardware and software applications can be developed and tested using the PROFIBUS ASICs DPC31.

The comprehensive, perfectly interacting hardware and software components considerably reduce the development costs for a PROFIBUS device.

The kits provide a fully functional hardware development environment which development engineers can build on with their special requirements for hardware and software. The kit documentation is supplied on CD in English and German.

The kits make our PROFIBUS know-how accessible to other users. The development team is available to provide advice to new users even with their own developments - this consultancy service is also a component part of the development kit.

Following completion of a development, devices can be certified by our experts in the PROFIBUS interface centers – we can help new users here, too.

PROFIBUS DP/PA development kit

The kit facilitates set up of PROFIBUS slaves with a variety of PROFIBUS standards:

- PROFIBUS DP-V1 (RS485)
- PROFIBUS PA (IEC 1158) and
- · PROFIBUS based on fiber-optic cables.

The development environment shows applications implemented using PROFIBUS-ASICs DPC 31.

Hardware included:

- DPC 31 development board; for developing/testing proprietary applications
- CP 5613; serves as master interface for the PC (PCI card)
- Optical bus terminal; for conversion of copper cables to FOCs
- Pre-assembled PROFIBUS cables

Software included:

- Testing and simulation software under WinNT for use on the PC in connection with the CP 5613 master module
- · Sample program for the DPC 31 board
- DPC 31 DPV1 original firmware, including developer license
- Parameterization software for CP 5613 "COM PROFIBUS" for DP operation

When developing PROFIBUS PA applications, order a PROFIBUS DP/PA coupler (6ES7 157-0AC80-0XA0) separately. The DP/PA coupler converts the PROFIBUS DP physical specifications into those of PROFIBUS PA physical. This module is not included in the development kit!

PROFIsafe starter kit V3.4

The PROFIsafe starter kit V3.4 is compatible with version 2.4 of the PROFIsafe profile, as specified in IEC 61784-3-3. It meets a series of user requirements such as multi-instance capability and variable process data length at runtime.

Along with all of the PI specifications required for development, the PROFIsafe starter kit contains the source files for the PROFIsafe driver software (PSD) and a comprehensive implementation manual in English and German. In addition, it includes various CRC calculation tools and tools for creating GSD files with security-related parameters.

Examples of adaptation of the PSD (PROFIsafe Driver) to current PROFIBUS and PROFINET stack interfaces provide assistance for adaptations that may be necessary. Special "slow motion monitors" allow the PROFIsafe protocol processes to be monitored in slow motion. A new feature is support for the iPar server and the TCI interface.

Example applications are provided on the CD-ROM for both PROFIBUS and PROFINET. The hardware components supplied in the development kits offer the user access to the PROFIsafe world, step-by-step.

The PROFIsafe starter kit consists of the following components:

- Current PROFIsafe specifications with current PROFIsafe certificate
- PROFIsafe driver software (as core component of the development package)
- Example GSD file for STEP7 (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Example project for S7-319F (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- GSD tools (e.g. GSD editor and CRC calculation tool)
- iPar server software and instructions (FB24)
- · Tool calling interface example and instructions
- · F programming guidelines
- Layer stacks (V1SL and PN IO)
- Example firmware (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Project for development environment example (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Slow motion monitor (for PROFIBUS: PG-PC and CP5613, for PROFINET: PG-CP1616)
- Comprehensive documentation

Ordering data	Order No.
DP/PA development kit	6ES7 195-3BA10-0YA0
For PROFIBUS ASIC DPC 31 and SIM1, English/German	
PROFIsafe starter kit V3.4	6ES7 195-3BF02-0YA0

- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIPLUS PROFIBUS components

SIPLUS diagnostic repeater for PROFIBUS

Overview



- RS-485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbit/s to 12 Mbit/s
- · Connection via Fast Connect IDC

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS diagnostic repeater for PROFIBUS DP		
Order No.	6AG1 972-0AB01-4XA0	
Order No. based on	6ES7 972-0AB01-0AA0	
Ambient temperature range	0 °C to +60 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % condensation permitted	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX 1) 2)	
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temperature range	1080795 hPa (-1000 +2000 m)	
specified)	See ambient temperature range	
	795658 hPa	
	(+2000 +3500 m) Derating 10 K	
	658540 hPa	
	(+3500 +5000m)	
	Derating 20K	

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ <4.8 ppm; H $_2$ S <9.9 ppm; CI <0.2 ppm; HCI <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O $_3$ <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO $_2$ <17.8 ppm; H $_2$ S <49.7 ppm; CI <1.0 ppm; HCI <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O $_3$ <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

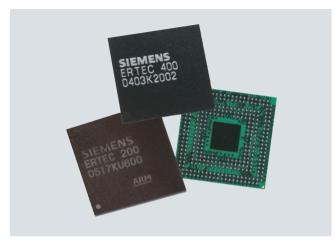
Ordering data		Order No.
SIPLUS RS 485 diagnostic repeater	Н	6AG1 972-0AB01-4XA0
(medial exposure)		
to connect up to 2 segments to PROFIBUS DP, with on-line diagnostic functions to monitor the bus lines		
Accessories		See SIMATIC RS 485 diagnostic repeater, page 9/351

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

PROFINET components

Enhanced real-time Ethernet controller ERTEC

Overview



With the Industrial Ethernet ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller), devices and systems can be connected to PROFINET without great effort. The high-performance Ethernet controllers with 32-bit microprocessor as well as integral real-time switch for Real Time Ethernet have been specially developed for industrial use.

These Ethernet controllers handle all the data transmission for PROFINET IO in real time (RT) and isochronous real time (IRT) and thus offload the application processor. Thanks to the integral 2-port switch (ERTEC 200) or 4-port switch (ERTEC 400), there are no costs for external switches. Flexible topologies such as star, tree and linear topologies can be implemented without any other external network components.

- ERTEC 200
 - with an integral 2-port switch for developing simple or modular PROFINET field devices. It also contains integral PHYs for linking the Ethernet controllers to the physical communication network.
- ERTEC 400
 with 4 integral ports and one integral PCI interface for developing controllers and network components.

The DK-ERTEC 200 PN IO and DK-ERTEC 400 PN IO Development Kits enable the uncomplicated development of PROFINET field devices thanks to fast and simple integration of the PROFINET IO functionalities based on the ERTEC. The ERTEC 200 PN IO Starter Kit is especially suitable for low-cost introduction to PROFINET field device development.

Technical specifications

	ERTEC 400	ERTEC 200
Transmission rate	10/100 Mbit/s	10/100 Mbit/s
Interfaces • Ethernet / PHY interface	4 x PHY interface	2 x Ethernet interface (PHY integrated) or alternatively 2 x PHY interface (for connection of optical PHYs)
	Half/full duplex	Half/full duplex
	Broadcast filter	Broadcast filter
	IEEE 802.1 p Traffic Management	• IEEE 802.1 p Traffic Management
	IEEE 802.1 q VLAN Tagging and Identification	IEEE 802.1 q VLAN Tagging and Identification
- In connection with the corresponding PHY types:	• IEEE 1588 Support for copper and fiber-optic cables; autosensing; autocrossover	• IEEE 1588 Support for copper and fiber-optic cables (PHY for copper integrated); autosensing; autocrossover
Local Bus Unit (LBU)PCI interface	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width 32 bit. 33/66 MHz	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width
	Host functionality	_
	2 PCI interrupt outputs INTA_N and SERR_N	-
	Power Management V1.1	_
	• 3.3 V (5 V tolerance)	_
	PCI master/target interface	-
External memory interface (EMIF)	PCI Core compatible PCI spec. 2.2	-
- SDRAM controller - SRAM controller	128 MB/16 bit or 256 MB/32 bit 4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)	64 MB/16 bit or 128 MB/32 bit 4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)
Chip-select supportIO interfaces	yes 32 parameterizable I/O (GPIO); multifunctional outputs	yes 45 parameterizable I/O (GPIO) multifunctional outputs

PROFINET components

Enhanced real-time Ethernet controller ERTEC

Technical specifications (continued)		
	ERTEC 400	ERTEC 200
Function units		
Real-time Ethernet switch	Integral 4-port Fast Ethernet/Real-Time Ethernet switch; 10/100 Mbit Ethernet full duplex	Integral 2-port Fast Ethernet/Real-Time Ethernet switch; 10/100 Mbit Ethernet full duplex
 Communication RAM (SRAM on chip for message frame buffering) 	192 KB	64 KB
 Intelligent switching and PROFINET IRT prioritization/timing 	yes	yes
 Integral ARM946 processor 	32-bit ARM system	32-bit ARM system
- Adjustable operating frequency	50/100/150 MHz	50/100/150 MHz
- Data cache	4 KB	4 KB
Instruction cacheD-TCM	8 KB 4 KB	8 KB 4 KB
- Memory Protection Unit (MPU)	yes	yes
- Trace functionality	Debug capability due to embedded ICE (JTAG)	Debug capability due to embedded ICE (JTAG)
Interrupt controllerProcessor I/O	For 16xIRQ/ 8xFIQ 2 UART similar to the standard UART 16C550	For 16xIRQ/ 8xFIQ 1 UART similar to the standard UART 16C550
- SPI master interface	yes	yes
- Timer 32 bit down-counter	2	3
- F timer 32 bit down-counter	yes	yes
- Watchdog functions	2	3
- External interrupt inputs	yes	yes
 Internal bus structure 	32 bit (multi-layer AHB) with 50 MHz clock	32 bit (multi-layer AHB) with 50 MHz clock
	frequency;	frequency;
	multi-layer architecture with parallel access structure of several multimasters to multislave	multi-layer architecture with parallel access structure of several multimasters to multislave
SRAM-integral work memory on AHB	en detaile et eeveral manimaetere te manerave	
- Size	8 KB	
- Program/data memory	ARM 946	_
- Multiport RAM	For ARM946, IRT and PCI	_
Clock cycle generation	Internal through PLL for ARM 946ES, AHB, APB and IRT	Internal through PLL for ARM 946ES, AHB, APB and IRT
Boot ROM	With opcode for software download from different download sources	With opcode for software download from different download sources
Test functions	Boundary scan	Boundary scan
Supply voltage		
Core (VDD Core)	1.5 V +/- 10 %	1.5 V +/- 10 %
• I/Os (VDD IO)	3.3 V +/- 10 %	3.3 V +/- 10 %
Current input		
• IDD core	Typ. 270 mA	Typ. 535 mA
• IDD IO	Typ. 150 mA	Typ. 175 mA
Power loss		
• PDD core	Typ. 0.4 W	Typ. 0.8 W
• PDD IO	Typ. 0.5 W	Typ. 0.57 W
Perm. ambient conditions		
Operating temperature	-40 °C to +85 °C	-40 °C to +85 °C
Transport/storage temperature	-40 °C to +85 °C	-40 °C to +85 °C
Relative humidity	Max. 95 % at +25 °C	Max. 95 % at +25 °C
Constructional design		
Housing	Plastic FBGA 304 Pin	Plastic FBGA 304 Pin
Pinning Ball Pitch	0.8 mm	0.8 mm
Dimensions (W x H x D) in mm - ERTEC	19 x 1 x 19	19 x 1 x 19
Supported communication protocols		
General Ethernet protocols	In accordance with the respective software implementation that uses the ERTEC	In accordance with the respective software implementation that uses the ERTEC
	as Ethernet controller	as Ethernet controller
PROFINET in combination with a PROFINET	Real-Time communication (RT);	Real-Time communication (RT);
Software Stack	Isochronous Real-Time communication (IRT)	Isochronous Real-Time communication (IRT)

SIMATIC ET 200 distributed I/O PROFINET components

Enhanced real-time Ethernet controller ERTEC

Ordering data	Order No.		Order No.
ERTEC 400 (lead-free)		ERTEC 200 (lead-free)	
ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 RISC and PCI interface (V2.2), data preparation for real-time and isochrone real-time for PROFINET IO		ASIC ERTEC 200 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 2-port switch, ARM 946 processor and integrated PHYs real-time for PROFINET IO • 70 units (individual tray) • 350 units (drypack, 5 trays)	6GK1 182-0BB01-0AA1 6GK1 182-0BB01-0AA2
70 units (individual tray),350 units (drypack, 5 trays),	6GK1 184-0BB01-0AA1 6GK1 184-0BB01-0AA2	DK-ERTEC 200 PN IO Development kit	6GK1 953-0BA00
DK-ERTEC 400 PN IO Development kit	6GK1 953-0CA00	ERTEC 200 PN IO Starter kit	6ES7 195-3BD00-0YA0

D: Subject to export regulations AL: N and ECCN: 5D992

PROFINET components

Development kit for ERTEC

Overview



With the help of the development kits for the Enhanced Real-Time Ethernet Controller ERTEC, compact or modular PROFINET IO field devices can be developed in a short time and without great effort.

The DK-ERTEC 200 PN IO and DK-ERTEC 400 PN IO development kits enable comprehensive implementation of the PROFINET IO functionality. The low-cost starter kit is suitable as an introduction to PROFINET technology and can later be upgraded to a full DK-ERTEC 200 PN IO.

New: Since Version 3.2, the innovative functions Shared Device, MRP and PROFlenergy have been included in the development packages and can be integrated into PROFINET IO field devices at no additional expense.

Ordering data	Order No.
ERTEC development kits	
DK-ERTEC 200 PN IO Development kit	6GK1 953-0BA00
DK-ERTEC 400 PN IO Development kit	6GK1 953-0CA00
ERTEC 200 PN IO Starter Kit	6ES7 195-3BD00-0YA0
PROFIsafe starter kit V3.4	6ES7 195-3BF02-0YA0
ERTEC ASICs	
ERTEC 200	
ASIC ERTEC 200 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 2-port switch, ARM 946 processor and integrated PHYs real-time for PROFINET IO • 70 units (individual trays), • 350 units (drypack, 5 trays),	6GK1 182-0BB01-0AA1 6GK1 182-0BB01-0AA2
ERTEC 400	
ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 RISC and PCI (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO • 70 units (individual trays), • 350 units (drypack, 5 trays),	6GK1 184-0BB01-0AA1 6GK1 184-0BB01-0AA2
Accessories	
PROFINET IO product line license for one product line	6ES7 195-3BC10-0YA0

D: Subject to export regulations AL: N and ECCN: 5D992 J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC ET 200 distributed I/O PROFINET components

Development kit for Standard Ethernet Controllers

Overview



With the help of the development kit for Standard Ethernet Controllers, PROFINET IO devices can be developed on the basis of a Standard Ethernet Controller.

Ordering data	Order No.
Development kit for Standard J Ethernet Controller	6ES7 195-3BC00-0YA0
for Ethernet processor	
Accessories	
PROFINET IO product line license for one product line	6ES7 195-3BC10-0YA0

J: Subject to export regulations AL: N and ECCN: EAR99S

Network components for PROFIBUS

RS 485 repeater for PROFIBUS

Overview



- Automatic data transmission rate search
- Data transmission rate of 45.45 Kbit/s possible
- 24 V DC voltage display
- · Display bus activity segment 1 and 2
- Isolation of segment 1 and 2 possible by switch
- Isolation of the right segment part when terminating resistor is inserted
- Decoupling of segment 1 and segment 2 in the event of static interference.

Designed for Industry

- To increase the number of stations and the expansion
- Galvanic isolation of segments
- Startup assistance
 - switch for disconnecting segments
 - display of bus activity
 - isolation of segment with incorrectly inserted terminating resistor

Please also have a look at the diagnostic repeater which in addition to the normal repeater functionality also has comprehensive diagnostic functions for physical line diagnostics. It is described on page 9/350.

Technical specifications

	6ES7 972-0AA01-0XA0
Supply voltages	
Rated value	
• 24 V DC	Yes
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Current consumption	
Current consumption, max.	200 mA; (200 mA without loads at PG/OP socket; 230 mA load at PG/OP socket (5 V/90 mA); 300 mA load at PG/OP socket (24 V/90 mA))
Connection method	
Bus cables	2 terminal blocks
Power supply	Terminal block
PROFIBUS DP	
Transmission rate, max.	12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s
Environmental requirements	
Operating temperature	
• Min.	0 °C
• Max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• Max.	70 °C
Relative humidity	
Operation, max.	95 %; at 25 °C
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
• Width	45 mm
Height	128 mm
Depth	67 mm
Weight	
 Weight, approx. 	350 g

Ordering data

Order No.

RS 485 Repeater for PROFIBUS

Data transmission rate up to 12 Mbit/s 24 V DC, housing to IP20

6ES7 972-0AA02-0XA0

Network components for PROFIBUS

Active RS 485 terminating element

Overview



- Terminates bus segments at data transmission rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of bus stations.

Designed for Industry

Terminal-independent bus termination through onboard power supply

Technical specifications

	6ES7 972-0DA00-0AA0
Supply voltages	
Rated value	
• 24 V DC	Yes
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Current consumption	
Current consumption, typ.	30 mA
Connection method	
Bus cables	Screw terminal block
Power supply	Screw terminal block
PROFIBUS DP	
Transmission rate, max.	12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s
Environmental requirements	
Operating temperature	
• Min.	0 °C
• max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Relative humidity	
 Operation, max. 	95 %; at +25 °C
Degree of protection	
IP20	Yes
Dimensions and weight	
Dimensions	
• Width	60 mm
Height	70 mm
• Depth	43 mm
Weight	
 Weight, approx. 	95 g

Ordering data

Order No.

Active RS 485 terminating element for PROFIBUS

For terminating bus segments for data transmission rates of 9.6 kbit/s to 12 Mbit/s

6ES7 972-0DA00-0AA0

SIPLUS network components for PROFIBUS

SIPLUS RS 485 repeater

Overview



- · Automatically detects transmission rate
- 45.45 kbit/s transmission rate is possible
- 24 V DC voltage display
- Bus activity segment 1 and 2 display
- The separation of segment 1 and segment 2 on switch is possible
- · Separation of the right segment with an inserted terminator
- Decoupling of segment 1 and segment 2 with static interference

Designed for Industry

- To increase the number of participants and the extension
- Segment electric isolation
- · Commissioning support
- Segment separation switch
- Bus activity display
- Segment separation with an incorrectly inserted terminator

Please also note in this context the diagnostic repeater that provides extensive diagnostic functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/350.

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 972-0AA01- 4XA0	6AG1 972-0AA01- 7XA0
Order No. based on	6ES7 972-0AA01- 0XA0	6ES7 972-0AA01- 0XA0
Ambient temperature range	0 °C to +60 °C	-25 °C to +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	5 100 % condensation permitted	
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)	
Chemically active substances	Conformity with EN 3C4 incl. salt mist a severity level G1; G	nd ISA-S71 04
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust ²⁾	
Air pressure (depending on the highest positive temper- ature range specified)	1080795 hPa (-10 See ambient tempe 795658 hPa (+200 Derating 10 K 658540 hPa (+350 Derating 20K	rature range 00 +3500 m)

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ <4.8 ppm; H $_2$ S <9.9 ppm; CI <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O $_3$ <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO $_2$ <17.8 ppm; H $_2$ S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O $_3$ <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data	Order No.
SIPLUS RS 485 repeater for PROFIBUS	
(medial exposure)	
Transfer rate up to max. 12 Mbit/s, L 24 V DC, housing IP20	6AG1 972-0AA01-4XA0
Additionally with extended ambient temperature range -25 °C +70 °C	6AG1 972-0AA01-7XA0

L: Subject to export regulations AL: 91999 and ECCN: N

SIPLUS network components for PROFIBUS

SIPLUS DP active RS485 terminating element

Overview



- Used to complete bus segments at rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of the bus participants.

Designed for Industry

End-device independent bus termination due to own power supply

Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Order No.	6AG1 972-0DA00-2AA0
Order No. based on	6ES7 972-0DA00-0AA0
Ambient temperature range	-25 °C to +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	5 100 % condensation permitted
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA –S71.04 severity level G1; G2; G3; GX ^{1) 2)}
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust 2)
Air pressure (depending on the highest positive temperature range specified)	1080795 hPa (-1000 +2000 m) See ambient temperature range 795658 hPa (+2000 +3500 m) Derating 10 K 658540 hPa (+3500 +5000m) Derating 20K

- $^{1)}$ ISA-S71.04 severity level GX: Long-term load: SO $_2$ <4.8 ppm; H $_2$ S <9.9 ppm; CI <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O $_3$ <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO $_2$ <17.8 ppm; H $_2$ S <49.7 ppm; CI <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O $_3$ <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

www.siemens.com/siplus-extreme

Ordering data

Order No.

SIPLUS DP active RS 485 termi- L nating element for PROFIBUS

(extended temperature range and medial exposure)

to complete bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s 6AG1 972-0DA00-2AA0

L: Subject to export regulations AL: 91999 and ECCN: N

9

SIMATIC ET 200 distributed I/O

Network transitions

PN/PN coupler

Overview



- Data exchange of max. 256-byte input data and 256-byte output data between two PROFINET networks
- Maximum of 16 input/output ranges for the exchange of data
- Electrical isolation between the two PROFINET IO subnets
- Redundant power supply
- Supported Ethernet services
 - ping
 - arp
 - network diagnostics (SNMP/MIB-2)
- Diagnostic interrupts
- ReturnOf Submodule interrupts

Ordering data	Order No.
PN/PN coupler	6ES7158-3AD01-0XA0
for connecting two PROFINET networks	
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
 with push-in terminals 	6ES7 193-4JB00-0AA0
 with screw-type terminals 	6ES7 193-4JB50-0AA0

Network transitions

DP/DP coupler

Overview



- Interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler.

Technical specifications

DP/DP transceiver		
PROFIBUS transmission rate	max. 12 Mbit/s	
Interfaces • PROFIBUS DP	9-pin Sub-D connector	
Supply voltage	24 V DC	
Current consumption typ.	150 mA	
Mounting	Upright (DIP switches above)	
Perm. ambient conditions • Operating temperature		
 horizontal mounting all other mounting positions Transport/storage temperature Relative humidity 	0°C +60°C 0°C +40°C -40 °C +70 °C 10-95 % at +25 °C	
Design • Dimensions (W x H x D) in mm • Weight	40 x 127 x 117 approx. 250 g	
Degree of protection	IP20	

Ordering data	Order No.
DP/DP coupler	6ES7 158-0AD01-0XA0

The manual is available on the Internet free of charge.

10

SIMATIC control systems



10/2	T400 technology module
10/2	T400 technology module
10/4	SRT400 technology box
10/5	Standard software packages: Axial winders with T400 - SPW420
10/5	Standard software packages: Angular-locked synchronism control with T400 - SPA440
10/5	Standard software packages: Cross cutters with T400 - SPS450
40/0	
10/6	SIMATIC TDC multi processor control
10/6	SIMATIC TDC multi processor control system
10/6 10/6	
	system
10/6	system UR5213 rack
10/6 10/7	system UR5213 rack CPU551 processor module
10/6 10/7 10/8	system UR5213 rack CPU551 processor module MC5xx program memory module
10/6 10/7 10/8 10/8	system UR5213 rack CPU551 processor module MC5xx program memory module CP50M1 communication module
10/6 10/7 10/8 10/8 10/9	system UR5213 rack CPU551 processor module MC5xx program memory module CP50M1 communication module CP51M1 communication module
10/6 10/7 10/8 10/8 10/9 10/9	system UR5213 rack CPU551 processor module MC5xx program memory module CP50M1 communication module CP51M1 communication module CP53M0 communications module

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

SIMATIC control systems T400 technology module

T400 technology module

Overview



The T400 technology module (Drive Based) implements technological tasks direct in the drive:

- The T400 technology module is plugged into the SIMOVERT MASTERDRIVES frequency converter or in the SIMOREG DC-Master converter
- The T400 can also be used as stand-alone solution for other drives in combination with the SRT400 technology box

Technical specifications T400 technology module

<u> </u>	
Processor	32-bit RISC with FPU
Program memory (PC card)	2 MB Flash
Loading the program code	Via serial interface from PC (no plug-in memory module required)
Work memory (program/data)	4 MB DRAM
Cache (program/data)	4 KB each
Permanent modification memory	32 KB NOVRAM
Data backup in the event of a power failure	NOVRAM for 30 configurable (real) values
Sampling time, strictly cyclic, for a	closed control loop
Shortest	0.1 ms
Typical	0.8 1.6 ms
Typical computing times (REAL) MUL, multiplier PIC, PI controller RGE, ramp generator	5.5 μs 14.3 μs 29.5 μs
Networking	Point-to-point USS PROFIBUS slave, optionally with CBP2
Power supply/typ. current consumption	+5 V ±5%/1.1 A +15 V ±4%/140 mA + max. 100 mA encoder current -15 V ±3%/140 mA
Galvanic isolation of inputs/outputs	No
Operating state indicators	3 LEDs
Space requirements	1 slot
Dimensions (W x H x D) in mm	14 x 267 x 140
Weight	0.3 kg
Analog outputs	
Number	2
Output range	±10 V
Short-circuit protection	Yes

T400 technology module	
Short-circuit current	±10 mA
Resolution	12 bit (4.88 mV)
Accuracy, absolute	± 3 bit
Linearity error	< 1 bit
Voltage rise time	4.2 V/μs
Delay time	3.5 µs
Analog inputs	
Number	2 differential inputs, 3 unipolar inputs
Input range	±10 V
Measuring principle	Sampling
Conversion time	12 µs
Input resistance	20 kΩ
Input filter	3 dB corner frequency: 25 kHz
Resolution	12 bit (4.88 mV)
Absolute precision	± 3 bit
Linearity error	< 1 bit
Digital outputs	
Number	2 + max. 4 (bidirectional)
External power supply Rated value Permitted range Current consumption	24 V DC 15 33 V DC 20 mA + output currents
Output voltage • for "0" signal • for "1" signal	max. 0.1 V External power supply - 0.3 V
Output current	max. 50 mA/output
Overload protection	Yes (limited to 220 mA)
Switching frequency • Resistive load	5 kHz
max. switching delay (0 24 V)	70 µs

SIMATIC control systems T400 technology module

T400 technology module

Technical specifications (continued)

T400 technology module	
Digital inputs and reference came	s:
Number	8 + max. 4 (bidirectional) + max. 2 (reference cams)
Input voltage • Rated voltage • with 0 signal • with 1 signal	24 V DC -1 +6 V or open input +13 +33 V
Input current • with 0 signal • with 1 signal	0 mA Typ. 3 mA, max. 5 mA
Delay time	150 µs
Incremental encoder 1	
Connection of sensor signals	Converter module (CUx) or T400/terminals 81-83
Signal voltage for connection to T400 (HTL, unipolar) • for "0" signal • for "1" signal	< 5 V > 8 V
Signal voltage for connection to converter	As converter (see there); 5 V encoder also possible
Input current	8 mA (max.)
Max. pulse frequency	400 kHz (depending on cable length)
Input filter	Can be configured on function block (NAV)
Incremental encoder 2	
Connection of sensor signals	T400/terminals 62-64, 86-88
Signal voltages (rated value)	5 V (TTL) or 15 V (HTL), unipolar or bipolar

T400 technology module	
Signal voltage for RS 422, bipolar: • for "0" signal	< -0.2 V
• for "1" signal	> 0.2 V
Signal voltage for TTL, unipolar (untyp.): • for "0" signal • for "1" signal	< 0.8 V > 2.3 V
Signal voltage at 15 V (HTL, bipolar): • for "0" signal • for "1" signal	- 30 4 V 8 30 V
Signal voltage at 15 V (HTL, unipolar): • for "0" signal • for "1" signal	< 4 V > 8 V
Input current	2 mA (max.)
Max. pulse frequency	1.5 MHz (depending on cable length)
Input filter	Can be configured on function block (NAV)
Absolute encoder	
Number	Max. 2
Connectable encoders	Single turn or multiturn encoder with SSI (synchronous-serial) or EnDat interface
Signal voltage	5 V to RS 422
Data transmission rate	100 kHz to 2 MHz
Data representation	Dual code, gray code, gray excess code

Ordering data	Order No.
T400 technology module	6DD1 606-0AD1
(incl. T400 short description)	
SC400 commissioning cable	6DD1 684-0GF0
for PC - connection to T400	
LBA local bus adapter	6SE7 090-0XX84-4HA0
for MASTERDRIVES and SIMOREG DC Master	

	Order No.
ADB adapter module	6SE7 090-0XX84-0KA0
CBP2 communication module	6SE7 090-0XX84-0FF5
for PROFIBUS DP and USS	
CBC communication module	6SE7 090-0XX84-0FG0
for CAN	

I: Subject to export regulations AL: N and ECCN: EAR99H

SIMATIC control systems T400 technology module

SRT400 technology box

Overview



Compact rack for technology-oriented open-loop and closed-loop control tasks, e.g. for highly dynamic control of two to four drives.

The SRT400 is comparable to the electronics box of SIMOVERT MASTERDRIVES.

The following can be plugged into the SRT400 technology box:

- Up to two T400 technology modules, or
- one T400 and one MASTERDRIVES communication module (e.g. CBx, ADB subrack module for CBP2 (PROFIBUS DP) and CBC submodules).

Technical specifications

•	
Input	
Input voltage • Nominal value • Permissible range	115 V/230 V AC ± 15 %
Line supply frequency Nominal value Permissible range	50/60 Hz ± 2.5 Hz
Line supply failure buffering	10 ms
Input current (nominal value) • At 120 V AC • At 230 V AC	190 mA 140 mA to 320 mA (when the 24 V DC output is loaded)
Output	
Output voltages +5 V +15 V -15 V +24 V	5.05 to 5.15 V 14.25 to 15.75 V -14.25 to -15.75 V 20 to 30 V
Output currents +5 V +15 V -15 V +24 V	3.0 A 0.5 A 0.5 A 0.6 A
Short-circuit protection	Yes
Electrical isolation	Yes
Power drain for two T400 and max. 24V load	43 W at 115 V 54 W at 230 V
Power loss, typical (without modules)	7 W at 115 V 16 W at 230 V
Dimensions (W x H x D) in mm	90 x 291 x 175
Weight	2 kg

Ordering Data	Order No.
SRT400 technological box	6DD1 682-0CG0
Compact rack with power supply, 115/230 V AC, 2 free slots	

SIMATIC control systems

T400 technology module

Standard software packages: Axial winders with T400 - SPW420

Overview

This standard software package SPW420 is suitable for use in the following drive units:

- MASTERDRIVES VC/MC
- SIMOREG DC master

Ordering data	Order No.
Axial winders with T400 - SPW420	6DD1 842-0AA1
Standard software package with documentation German/English	
Axial winder software	6DD1 843-0AA0
on CD, German and English, executable under Win 95/98/ME, NT, 2000, in connection to STEP 7	

Standard software packages: Angular-locked synchr. control with T400 - SPA440

Overview

The standard software package SPA440 is suitable for use in the following drive units:

- MASTERDRIVES MC/SC/VC
- SIMOREG DC master

Ordering data	Order No.
Angular-locked synchronism control with T400 - SPA440	6DD1 842-0AB1
Standard software package with documentation German/English	
Angular-locked synchronism control software	6DD1 843-0AB0
on CD, German and English, executable under Win 95/98/ME, NT, 2000, in connection to STEP 7	

Standard software packages: Cross cutters with T400 - SPS450

Overview

The SPS450 standard software package is suitable for use in the following drive units:

- MASTERDRIVES MC/SC/VC
- SIMOREG DC master

Ordering data

Cross cutters with T400 - SPS450

Standard software package with short description and documentation CD

Order No.

6DD1 842-0AD1

UR5213 rack

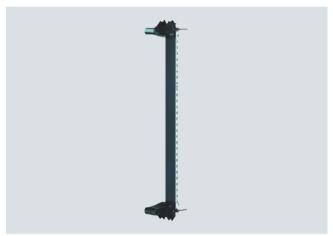
Overview



The UR5213 rack is the basis for SIMATIC TDC. System power supply and system fans are integrated. A high-performance 64-bit backplane bus supports high-speed data exchange between the inserted modules.

SR51 slot cover

The slot cover SR51 is used for covering any slots that are not used in the rack. It is required to ensure the EMC properties and ventilation of the system.



SR51 slot cover

Input voltage range	85 V - 264 V AC, 47 - 63 Hz 198 V - 253 V DC
Mains buffering	Min. 20 ms
Dimensions (W x H x D) in mm	482.6 x 354.9 x 343

Technical specifications

Operating temperature range

Storage temperature range

Backup battery

Dimensions (w x H x D) in min	482.6 X 354.9 X 343
Weight	Approx. 20 kg
Degree of protection	IP20
Rated input current	At 120 V AC: 4.45 A At 230 V AC: 2.3 A At 220 V DC: 2.38 A
Max. inrush current	<40 A
Output voltages	+3.3 V 44 A + 5 V 36 A + 12 V 4.6 A - 12 V 4 A

0 °C to +60 °C

-40 °C to +70 °C

6ES7 971-0BA00

Ordering data	Order No.
UR5213 rack, spare-part compatible successor of 6DD1 682-0CH0	6DD1 682-0CH2
Accessories	
SR51 slot cover	6DD1 682-0DA1
for covering any slots that are not used in the rack	
Spare parts	

CPU551 processor module

Overview



High-performance CPU module for open and closed-loop control and arithmetic tasks.

Technical specifications

CPU551		
Required space / width	1 slot	
Weight	0.6 kg	
Display	5x7 LED	
Local service interface	Serial RS232 interface	
Sampling intervals	from 100 µs	
SDRAM	128 MB	
Synchronous cache	8 MB	
Clock frequency	500 MHz	
CPU	64 bit RISC CPU with floating point unit	
SRAM	512 KB, battery buffered	
Power supply		
Voltage / Power supply (at 250°C)	+3.3 V, 2.0 A typical +5 V, 1.5 A typical +12 V, 0.04 A typical -12 V, 0.04 A typical	
Buffer battery	3.0 V, 3 µA typical	
Power loss, typical	15 W	
Digital inputs		
Number	8 inputs, 4 with alarm capability	
Galvanic isolation	Only through optional interface modules	
Input voltage Rated voltage For 0-signal For 1-signal	24 V -1 V +6 V +13.5 V +33 V	
Input power • At 0-signal • At 1-signal Delay time	0 mA 3 mA 100 µs	
Real-time clock, resolution	0.1 ms	

Ordering data	Order No.
CPU551 processor module	6DD1 600-0BA2
Accessories	
MC500 memory module	6DD1 610-0AH4
4 Mbyte	
MC510 memory module	6DD1 610-0AH6
8 Mbyte	
MC521 memory module	6DD1 610-0AH3
2 Mbyte	
SB10 interface module	6DD1 681-0AE2
for connecting 8 digital I/O to FM 458-1 DP	
SB60 interface module	6DD1 681-0AF4
for connecting 8 digital I/O to FM 458-1 DP, input voltage 115/230 V AC/DC	
SB61 interface module	6DD1 681-0EB3
for connecting 8 digital I/O to FM 458-1 DP, input voltage 24/48 V DC	
SU12 interface module	6DD1 681-0AJ1
for connecting 10 signals to FM 458-1 DP	
SC66 interface cable	6DD1 684-0GG0
between the CPU551 and the SB10, SB60, SB61 or SU12 interface module, 2 m long	
SC67 service cable	6DD1 684-0GH0
between CPU551 and PG/PC, 7 m long	

I: Subject to export regulations AL: N and ECCN: EAR99H

MC5xx program memory module

Overview

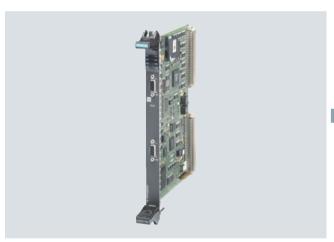
Program memory module for the program designed with CFC.

Ordering data	Order No.
MC500 memory module (4 MByte)	6DD1 610-0AH4
MC510 memory module (8 MByte)	6DD1 610-0AH6
MC521 memory module (2 MByte)	6DD1 610-0AH3

I: Subject to export regulations AL: N and ECCN: EAR99H

CP50M1 communication module

Overview



The CP50M1 communication module provides two PROFIBUS DP/MPI interfaces and an 8 MB interprocessor memory for inter-CPU communication. The interfaces can be used as PROFIBUS DP master, slave, as master and slave simultaneously or as MPI node.

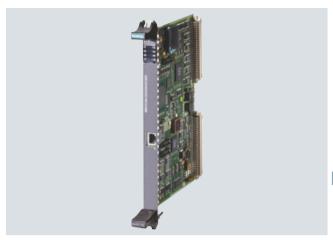
Technical specifications

Power supply		
Voltage / Power supply	+5 V, 1.0 A typical	
Power loss, typical	5 W	
Required space / width	1 slot	
Weight	0.34 kg	

Ordering data Order No. 6DD1 661-0AD1 CP50M1 communication module with 8 MB interprocessor memory, with up to 1 MPI interface and up to 2 PROFIBUS DP interfaces

CP51M1 communication module

Overview



The CP51M1 communication module is an Industrial Ethernet connection for the SIMATIC TDC automation system.

Technical specifications¹⁾

Required space / width	1 slot
Connection for Industrial Ethernet	RJ45
Protocols	TCP/IP and/or UDP
Message frame lengths	also larger than 2 KB
Modes of transfer	Refresh, Handshake, Multiple and Select
Autosensing	for 10 Mbit or 100 Mbit network
Default router	adjustable

¹⁾ Up-to-date technical specifications can be taken from the user documentation provided at the start of delivery

Ordering data	Order No.
CP51M1 communication module	6DD1 661-0AE1

CP53M0 communications module

Overview



The CP53M0 communication module allows coupling of a SIMATIC TDC system to a SIMADYN D system for fast data exchange, e.g. when expanding existing SIMADYN D systems.

Technical specifications

CP53M0 communications module	
Memory	
Communication memory	SRAM, 128 KB
Communications buffer	SDRAM, 8 MB
FOC interface	
Number	2 (master mode) 1 (slave mode)
Data transfer rate	96 Mbit/s
Coding	5B/6B
Voltage, currents	
Voltages / currents	+5 V / 0.3 A 3.3 V / 0.5 A
Power loss	
Power loss, typical	3.1 W
Dimensions	
Number of slots required in rack	1
Dimensions W x H x D (in mm)	20 x 233 x 160
Weight	0.6 kg

Ordering data Order No. CP53M0 communications 6DD1 660-0BJ0 module For connection of a SIMATIC TDC system to a SIMADYN D system or to two additional SIMATIC TDC

SM500 I/O module

Overview



The SM500 I/O module provides analog and digital inputs/outputs as well as incremental and absolute value encoder connections.

Technical specifications

Power supply	
Voltage/current supply (at 25°C)	+5 V typ. 1.0 A +3.3 V typ. 0.05 A +12 V typ. 0.3 A -12 V typ. 0.3 A
Typical power loss	12.5 W
Space requirement/width	1 slot
Weight	0.7 kg
Analog outputs	
Number	8
Version	Output with associated ground
Electrical isolation	No
Output voltage range	-10 V to +10 V
Output current	± 10 mA
Resolution	12 bit
Typ. conversion time per channel	4 μs
Accuracy Max. differential linearity error	±1 LSB (monotony maintained)
Max. gain error	±- 0.3 %
Max. offset error	±- 24 LSB
Slewrate	Approx. 3.5 V/µs
Voltage output Short-circuit protection to ground	Yes
Short-circuit current	Appr. 100 mA
Analog inputs	
Number	8
Version	Differential inputs
Electrical isolation	No
Input voltage range	-10 V to +10V
Resolution	12 bit
Max. conversion time per channel	Approx. 20 µs

Power supply	
Accuracy	
Max. differential linearity error	± 1 LSB (no missing code)
Max. gain error Max. affect arror	± 0.3 %
Max. offset error	± 5 LSB
Input resistance	20 kOhm
Input filter	34 kHz
Incorrect polarity protection	Yes, as differential inputs are used
Integrating analog inputs (V/Hz)	
Number	4
Version	Differential inputs
Electrical isolation	No
Input voltage range	-10 V to +10 V
Resolution	Dependent on the integration time, e.g.15 bit for a 4 ms integration time
Max. integration time per channel	Can be configured
Accuracy • Max. differential linearity error	0.05 %
Max. gain error Max. effect error	1 %
Max. offset error	± 2 LSB (software calibration)
Input resistance	470 kOhm
Input filter	2 kHz
Incorrect polarity protection	Yes, as differential inputs are used
Digital outputs	
Number	16
Electrical isolation	Only by using the optional interface modules
External power supply	
voltage • Rated value	24 V
Permissible range	20 to 30
Briefly	35 V, for max. 0,5 s
 Max. current consumption (without load) 	40 mA
Output voltage range	
• For a 0-signal, max.	3 V
• For a 1-signal, min.	Ext. power supply voltage 2.5 V
Output current	
• For a 0-signal, min.	- 20 μA
• For a 1-signal	50. 4
Rated valuePermissible range, max.	50 mA 100 mA
Delay time	100 µs
Max. switching frequency of	6 kHz
the outputs for an ohmic load	
Short-circuit protection to Ground	Yes
• Ext. power supply	No
Max. short-circuit current	250 mA
Summed current of the outputs (to 60 °C)	16 x 50 mA
Limiting of inductive switch-off voltages	External power supply voltage + 1 V
Digital inputs	
Number	16, non-floating
Electrical isolation	Only by using the optional interface
	modules

SM500 I/O module

Technical specifications (continued)

recillical specifications	(continued)
Power supply	
Input voltage Rated voltage For a 0 – signal For a 1 – signal	24 V -1 V to +6 V +13.5 V to +33 V
Input current • For a 0 – signal • For a 1 – signal	0 mA 3 mA
Delay time	0.1 ms
Incremental encoder	
Number of encoders	4
Types which can be connected	Incremental encoder with tracks offset through 90° degrees
Version	Differential inputs, can be changed-over between 15 V (HTL) and 5 V (TTL) encoder signals
Track signals	Track A, B with or without zero pulse N
Min. phase difference of the track signals	200 ns
Max. pulse frequency (track frequency)	1 MHz
Input voltage • 15 V encoder	
Rated valueFor a 0-signalFor a 1-signal5 V encoder	- 30 V to + 30 V - 30 V to + 4 V + 8 V to +30 V
- Rated value - For a 0-signal - For a 1-signal	- 7 V to + 7 V - 7 V to - 0,7 V +1.5 V to + 7 V
Input current • For 15 V - encoder (typ.,abs.) • For 5 V - encoder (typ.,abs.)	5,0 mA 1.5 mA
Monitoring output	Not avaible
Monitoring input	Specification, the same as for digital inputs

Power supply	
Interrupt reset output Short-circuit protection to ground	Yes
- Ext. power supply - Max. short-circuit current	No 20 mA
Interrupt input • Input voltage (permissible range)	0 V to 5 V
 0-signal, max. 1-signal, min. Input current	< 0,5 V > 2.0 V
- 0-signal - 1-signal	- 2.8 mA 1.6 mA
Power supply voltage for encoders	
Number	1
Electrical isolation	No
Typ. output voltage	13.5 V
Max. output current	150 mA, short-circuit proof to ground, short-circuit current, approx. 250 mA
Absolute value encoder inputs	
Number	4
Version	Differential inputs, RS 485 signal level
Signal voltage	5 V, RS485 level
Types which can be connected	Single or multi-turn Encoder
Protocols	SSI, EnDat
Data formats	Gray, binary
Data direction Uni-directional Bi-directional	SSI EnDat
Data bits	SSI: 13+Parity, 25+Parity EnDat: variable
Max. pulse frequency	2 MHz, dependant on the cable length
Input voltage • Permissible range	RS 485 signal level

Ordering data	Order No.
SM500 I/O module	6DD1 640-0AH0
SB10 interface module	6DD1 681-0AE2
for connecting 8 digital I/O to FM 458-1 DP	
SB60 interface module	6DD1 681-0AF4
for connecting 8 digital I/O to FM 458-1 DP, input voltage 115/230 V AC/DC	
SB61 interface module	6DD1 681-0EB3
for connecting 8 digital I/O to FM 458-1 DP, input voltage 24/48 V DC	
SB70 interface module	6DD1 681-0AG2
8 digital outputs with relay	
SB71 interface module	6DD1 681-0DH1
8 digital outputs with transistors, 24/48 V DC	

	Order No.
SU12 interface module	6DD1 681-0AJ1
for connecting 10 signals to FM 458-1 DP	
SU13 interface module	6DD1 681-0GK0
with screw-plug-in terminal	
SC62 interface module	6DD1 684-0GC0
between rack SM500 or EXM 438-1 and max. 5 SB10, SB60, SB70, SB 61, SB71 and/or SU12 interface modules, 2 m long	
SC63 interface module	6DD1 684-0GD0
between rack SM500 or EXM 438-1 and SU13 interface module, 2 m long	

GlobalDataMemory

Overview



GlobalDataMemory

Data can be exchanged between all of the CPU modules in the system, over all of the networked subracks, using the memory in the GlobalDataMemory (GDM).

Up to 44 subracks can be coupled in synchronism through the central memory. This means that a maximum of 836 CPU modules can be used.

Technical specifications

CP52M0	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 0.4 A +3.3 V typ. 0.7 A +12 V typ. 0.01 A -12 V typ. 0.01 A
Power loss, typical	4.5 W
Space requirement / width	1 slot
Weight	0.6 kg
Digital outputs	
Number	16
Electrical isolation	No
External power supply voltage • Rated value • Permissible range • Briefly • Max. current drain (without load) Output voltage range	24 V 20 to 30 35 V, for max. 0.5 s 40 mA
For a 0-signal, max. For a 1-signal min	3 V External power supply -2.5 V

CP52M0	
Output current For a 0-signal, min. For a 1-signal Nominal value Permissible range, max.	-20 μA 50 mA 100 mA
Delay time	100 μs
Max. switching frequency of the outputs for an ohmic load	6 kHz
Short-circuit protection with respect to • Ground • Ext. power supply	Yes No
Max. short-circuit current	250 mA
Summed current of the outputs (up to 60 °C)	16 x 50 mA
Limiting, of inductive switch-off voltages	External power supply voltage + 1 V

CP52IO	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 3 A +3.3 V typ. 0.8 A
Power loss, typical	18 W
Space requirement / width	1 slot
Weight	0.6 kg

CP52A0	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 1.5 A +3,3 V typ. 0.4 A
Power loss, typical	9 W
Space requirement / width	1 slot
Weight	0.6 kg

Order No.
6DD1 660-0BF0
6DD1 660-0BG0
6DD1 660-0BH0

Accessories for SIMATIC TDC

Overview SB60 interface module



Interface module for connecting 8 digital inputs with 120 V DC/AC to 24 V DC conversion.

Overview SC66 interface cable



Interface cable for the SIMATIC TDC CPU551 processor module and the SB10, SB60, SB61 and SU12 interface modules

Overview SB70 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 120 V DC/AC on the plant side using relays.

Overview SC67 service cable



Service cable for the SIMATIC TDC CPU551 module and a local configuration / service PC.

Accessories for SIMATIC TDC

Technical specifications		
SB60 interface module		
Number of digital inputs for Input voltage	8 120 V DC/AC	
Insulating voltage	Safe isolation assured between inputs and outputs	
	 Galvanic isolation assured between input circuits 	
	• 1125 V AC test voltage	
Connectable conductor cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	
Weight	0.31 kg	
SB70 interface module		
Number of digital outputs • Output voltage, max.	8 120 V DC/AC	
Relay switching current • at 120 V AC • at 120 V DC	2 A 0.2 A	
Galvanic isolation	via relay	
Insulating voltage	Safe isolation assured between inputs and outputs	
	 Galvanic isolation assured between input circuits 	
	• 1125 V AC test voltage	
Connectable conductor cross-section	1.5 mm ²	
Dimensions (W x H x D) in mm	45 x 130 x 156	

Ordering data	Order No.
SB60 interface module	6DD1 681-0AF4
8 digital inputs, 120 V AC	
SB70 interface module	6DD1 681-0AG2
8 digital outputs with relay	
SC66 interface cable	6DD1 684-0GG0
between the CPU551 and the SB10, SB60, SB61 or SU12 interface module, 2 m long	
SC67 service cable	6DD1 684-0GH0
between CPU551 and PG/PC, 7 m long	

Note:

For more information about SC62, SC63, SC64 interface cables and SB10, SB61, SB71, SU12 and SU13 interface modules see chapter 6, page 6/136

11

Software for SIMATIC controller



11/2	Introduction
11/3	Controller software inside TIA Portal
11/3	STEP 7 Professional/Basic V11
11/5	STEP 7 programming software
11/5	STEP 7
11/8	STEP 7 Professional
11/10	STEP 7 Lite
11/11	STEP 7 Micro/WIN
11/12	STEP 7 Micro/WIN commands library
11/13	S7-SCL S7-GRAPH
11/15 11/17	S7-PLCSIM
1 1/ 17	
11/18	Options for programming and design
11/18	CFC
11/20	Distributed safety software
11/21	S7 F/FH systems
11/22	S7 F systems
11/23	SIMATIC Safety Matrix
11/24	Software redundancy
11/25	SIMATIC iMap
11/27	DOCPRO
11/28	Options for diagnostics and
11/28	service S7-PDIAG
11/29	TeleService
11/32	PRODAVE
11/33	
11/00	Options for engineering and drive technology
11/33	Standard PID control
11/35	Modular PID control
11/38	PID Self-Tuner
11/39	Fuzzy Control
11/41	NeuroSystems
11/43	S7-Technology
11/44	Easy Motion Control
11/46	D7-SYS
11/47	Drive ES engineering software

11/48	Software for joint tasks in the documentation sector
11/48	Technical product data for CAx applications
11/49	Software for joint tasks in the maintenance sector
11/49	SIMATIC Maintenance Station
11/51	SIMATIC PDM process device manager
11/54	Software for joint tasks in the administration sector
11/54 11/54	
	administration sector
11/54	administration sector Version cross manager
11/54 11/55	administration sector Version cross manager Version Trail
11/54 11/55 11/56	administration sector Version cross manager Version Trail ADDM data management

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

Software for SIMATIC controller

Introduction

Software for SIMATIC controller

Overview



- System of seamlessly interconnected software tools for SIMATIC S7 and SIMATIC WinAC
- With user-friendly functions for all phases of an automation
- Comprising:
 - Controller software in the TIA Portal STEP 7 programming software

 - Options for programming and design
 Options for diagnostics and service
 - Options for technology and drive systems

For brochures serving as selection guides for SIMATIC products refer to:

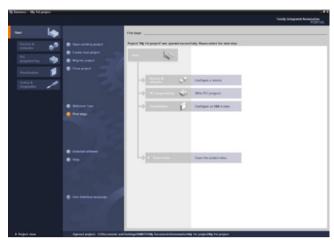
www.siemens.com/simatic/printmaterial

Software for SIMATIC controller

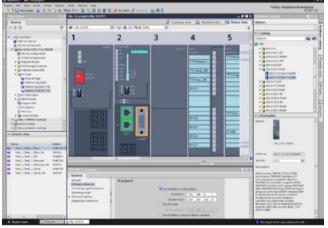
Controller software inside TIA Portal

STEP 7 Professional/Basic V11

Overview



STEP 7 V11 (TIA Portal), portal view



STEP 7 V11 (TIA Portal), device view: configuring and parameterizing in photographically realistic representation

Intuitive, efficient and future-oriented - the new engineering software for programming the S7 controllers

SIMATIC STEP 7 Professional V11 is the easy-to-use, integrated engineering system for the current S7-1200, S7-300, S7-400 SIMATIC controllers and WinAC.

SIMATIC STEP 7 Basic V11 is the successor to STEP 7 Basic V10.5 and supports the additional functions of the firmware 2.0 of the S7-1200 controller.

STEP 7 V11 is based on the new central engineering framework Totally Integrated Automation Portal (TIA Portal), which offers the user a uniform, efficient and intuitive solution to all automation tasks. TIA Portal forms the integrated working environment for IA and DT engineering software.

WinCC Basic for configuration of Basic Panels is included in the scope of delivery.

Software for SIMATIC controller Controller software inside TIA Portal

STEP 7 Professional/Basic V11

Technical specifications

	STEP 7 Professional / Basi	c V11 (TIA Portal)		
Type of license	Single License (Basic) / Floa	Single License (Basic) / Floating License (Professional)		
Software class	А	A		
Current version	V11	V11		
Target system	SIMATIC S7-1200, S7-300, S	SIMATIC S7-1200, S7-300, S7-400, WinAC		
Operating system	Windows XP Professional SF Microsoft Windows 7 Home Microsoft Windows 7 Profess Microsoft Windows 7 Enterp Microsoft Windows 7 Ultimat	Microsoft Windows XP Home SP3 (STEP 7 Basic only) Windows XP Professional SP3 (32 bit) Microsoft Windows 7 Home Premium (STEP 7 Basic only) Microsoft Windows 7 Professional (32 bit) Microsoft Windows 7 Enterprise (32 bit) Microsoft Windows 7 Ultimate (32 bit) Microsoft Server 2008 Std. SP2 (32 bit) Microsoft Server 2008 Std. SP2 (32 bit)		
Minimum PG/PC hardware	Processor: Pentium 4, 1.7 GHz or comparable	RAM: 1 GB	Graphics: 1024x768	
Recommended PG/PC hardware	Processor: Core Duo, 2 GHz or comparable	RAM: 2 GB	Graphics: 1280x1024	
Note	Includes the IEC programmi	Includes the IEC programming languages SCL, LAD, FBD, STL, GRAPH		

Compatibility with other SIMATIC products

STEP 7 Professional / Basic V11 (incl. WinCC Basic V11) can be installed on a PC in parallel with other versions of STEP 7 (V5.4/V5.5), STEP 7 Micro/WIN, WinCC flexible (from 2008) and WinCC (V7.0 SP2).

	STEP 7 Professional V11, Software Update Service, 1 year; requires current software version	6ES7 822-1AA00-0YL5
	STEP 7 Professional V11, Software Update Service Compact, 1 year; requires current software version	6ES7 822-1AA00-0YM5
	STEP 7 Professional Software Update Service; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software version	6ES7 810-5CC04-0YE2
	STEP 7 Professional Software Update Service Compact; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software version	6ES7 810-5CC00-0YM2
6ES7 822-1 A A01-0VA 5	STEP 7 Basic V11, single license	6ES7 822-0AA01-0YA0
0E37 022-1AA01-01A3	STEP 7 Basic V11, trial license	6ES7 822-0AA01-0YA7
6ES7 822-1AA01-0YA7	Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license	6ES7 822-0AA01-0YE0
6ES7 822-TAAUT-UXES	STEP 7 Basic, Software Update D Service, 1 year; requires current software version	6ES7 822-0AA00-0YL0
6ES7 822-1AA01-0XC5	STEP 7 Basic, Software Update D Service Compact, 1 year; requires current software version	6ES7 822-0AA00-0YM0
6ES7 822-1AA01-0YC5		
	6ES7 822-1AA01-0XE5 6ES7 822-1AA01-0XC5	requires current software version STEP 7 Professional V11, Software Update Service Compact, 1 year; requires current software version STEP 7 Professional Software Update Service; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software version STEP 7 Professional Software Update Service Compact; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software version STEP 7 Basic V11, single license STEP 7 Basic V11, trial license Upgrade STEP 7 Basic V10.5 to STEP 7 Basic V11, single license STEP 7 Basic V11, single license

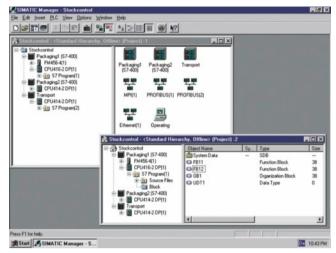
D: Subject to export regulations AL: N and ECCN: 5D992

Software for SIMATIC controller

STEP 7 programming software

STEP 7

Overview



- STEP 7 basic software: The standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.
- Makes use of the full performance capabilities of the systems
- User-friendly functions for all phases of an automation project:
- Configuring and parameterizing the hardware
- Definition of communication
- Programming
- Testing, commissioning and service
- Documentation, archiving
- Operating, diagnostic functions

Components for connecting a PC to MPI and PROFIBUS

The components described below are used to connect programming devices and PCs (incl. notebooks) to PROFIBUS and to the multipoint SIMATIC S7 MPI interface in conjunction with STEP 7.

PC adapter USB

- To connect a PC to the SIMATIC S7 programmable controller via the USB port
- Connectable to USB 1.1 and 2.0 ports
- Applicable for SIMATIC S7-200, S7-300, S7-400 and C7
- Supports routing
- Automatic transmission rates and profile search
- Noticeably improved performance (up to three times faster than the PC adapter via RS 232)
- Including subsequently updatable firmware (e.g. for function expansions or troubleshooting)
- Applicable in Windows 2000, Windows XP Home and Windows XP Professional
- Scope of delivery:
 - PC adapter USB
 - CD "SIMATIC Software PC Adapter USB" including software and documentation
 - USB cable, 5 m
 - MPI cable, 0.3 m

CP 5512

- For PGs/ PCs/notebooks with PCMCIA slot
- PCMCIA slot Type II (32 bit cardbus)
- Incl. adapter with 9-pin sub-D socket for connection to PROFIBUS

CP 5611/CP 5611-MPI

- For PGs/PCs with PCI slot
- Short PCI card (32 bit)
- CP 5611-MPI including MPI cable

Components for connecting the PC to Industrial Ethernet

The PC modules described below are used to connect programming devices and AT-compatible PCs/notebooks to Industrial Ethernet in conjunction with STEP 7 and SOFTNET-PG (as of V6.0).

CP 1512

- For PGs/ PCs/notebooks with PCMCIA slot
- PCMCIA slot Type II (32 bit cardbus); 10/100 Mbit/s
- Incl. adapter with RJ45 socket for connection to Industrial Ethernet

CP 1612

- For PGs/PCs with PCI slot
- Short PCI card (32 bit); 10/100 Mbit/s
- Incl. RJ45 socket for connection to Industrial Ethernet

Please refer to the respective product catalog for technical information regarding product versions and supported operating systems.

You will find more information about the online connection of PCs and SIMATIC S7/C7 controllers under "SIMATIC NET Communication Systems".

Software for SIMATIC controller STEP 7 programming software

STEP 7

Technical specifications

	STEP 7
Type of license	Floating license
Software class	A
Current version	V 5.5
Target system	SIMATIC S7-300 SIMATIC S7-400
Operating system	Windows XP Professional
	Windows 7 Professional, Windows 7 Ultimate
Main memory expansion in PG / PC, min.	Depends on Microsoft Windows operating system used. Recommendation: 1 to 2 GB
Hard drive requirement in PG / PC	Depending on scope of installation, 650 to 900 MB
Size of user program in the CPU	approx. factor 1.5 compared with STEP 5 with AWL (STL - instruction list), KOP (LAD - ladder diagram), FUP (FBD - function block diagram)
Comment	-

CEC7 070 0CD00 0VA0
6ES7 972-0CB20-0XA0
Yes
163
100 mA
max. 2.5 W
Yes; 6 kV, contact discharge (acc. to IEC 61000-4-2); 8 kV, air discharge (to IEC 61000-4-2)
Yes; 2 kV (to IEC 61000-4-4, Burst)
Yes; 1 kV (acc. to IEC 61000-4-4; burst; length < 3 m); 2 kV (acc. to IEC 61000-4-4; burst; length > 3 m)
Yes; 1 kV (to IEC 61000-4-5; surge symm.); 2 kV (acc. to IEC 61000-4-5; surge asymm.)
Yes; 10 V/m, 80 to 1000 MHz (acc. to IEC 61000-4-3); 10 V/m, 900 MHz, 1.89 GHz, 50% ED (acc. to IEC 61000-4-3)

PC adapter USB	6ES7 972-0CB20-0XA0	
Immunity against conducted interference induced by high-frequency fields Interference immunity against high frequency current feed acc. to IEC 61000-4-6	Yes; 10 V, 9 kHz to 80 MHz (acc. to IEC 61000-4-6)	
Immunity to magnetic field interference Interference immunity to magnetic fields at 50 Hz	30 A/m; acc. to IEC 61000-4-8	
Emission of radio interference acc. to EN 55 022 • Interference emission acc. to EN 55022, class B	Yes	
Environmental requirements Operating temperature • Min. • Max. • Permissible temperature change Storage/transport temper-	5 °C 40 °C 10 °C/h; Operation: 10 K/h; storage/ transport: 20 K/h	
Min. Max.	-20 °C 60 °C	
Relative humidity Operation, min. Operation, max. Storage/transport, min. Storage/transport, max.	5 % 80 %; at 25 °C (no condensation) 5 % 95 %; at 25 °C (no condensation)	
Vibrations • Operation, checked according to IEC 60068-2-6 • Transport, checked according to IEC 60068-2-6	Yes; 10 to 58 Hz: amplitude 0.075 mm; 58 to 500 Hz: acceleration 9.8 m/s ² Yes; (packed) 5 to 9 Hz, amplitude 3.5 mm; 9 to 500 Hz, acceleration 9.8 m/s ²	
Shock test • Shock test	Tested to IEC 60068-2-2; Operation: 950 m/s ² (10 g), 30 ms, 100 Shocks; Transport (packaged): 250 m/s ² (25 g), 6 ms, 1000 shocks	
Dimensions and weight		
Dimensions Width Height Depth	105 mm 58 mm 26 mm	
Weight • Weight, approx.	100 g	

Software for SIMATIC controller STEP 7 programming software

STEP 7

Ordering data	Oudou No		Order No.
STEP 7 Version 5.5	Order No.	STEP 7 reference manuals	Order NO.
Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirements:		Consisting of STL, LAD and FBD manuals as well as a reference manual for standard and system functions for SIMATIC S7-300/400	
Windows XP Prof., Windows 7 Professional / Ultimate		German	6ES7 810-4CA10-8AW1
Type of delivery: German, English, French,		English	6ES7 810-4CA10-8BW1
Spanish, Italian; incl. license key		French	6ES7 810-4CA10-8CW1
on USB stick, with electronic documentation		Spanish Italian	6ES7 810-4CA10-8DW1 6ES7 810-4CA10-8EW1
Floating license on DVD	6ES7 810-4CC10-0YA5	SIMATIC manual collection J	
Rental license for 50 hours	6ES7 810-4CC10-0YA6		0E37 990-0AC01-01E0
Software Update Service on DVD (requires current software version)	6ES7 810-4BC01-0YX2	Electronic manuals on DVD, multilingual: LOGOI, SIMADYN, SIMATIC bus components, SIMATIC C7,	
Upgrade Floating License 3.x/4.x/5.x to V5.4; on DVD	6ES7 810-4CC10-0YE5	SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,	
Trial License STEP 7 V5.4; on DVD, runs for 14 days	6ES7 810-4CC10-0YA7	SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC,	
STEP 7 Version 5.4 Japanese		SIMATIC S7, SIMATIC Software, SIMATIC TDC	
Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC		SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
Requirements: Windows XP Professional Japanese		Current "Manual Collection" DVD and the three subsequent updates	
Type of delivery: English, Japanese; incl. license key on USB stick, with electronic		EPROM programming device, USB prommer	6ES7 792-0AA00-0XA0
documentation Floating License Japanese on DVD	6ES7 810-4CC08-0JA5	For programming SIMATIC memory cards and EPROM modules	
Upgrade Floating License	6ES7 810-4CC08-0JE5	MPI cable	6ES7 901-0BF00-0AA0
Japanese 3.x/4.x/5.x to V5.4; on DVD		For linking SIMATIC S7 and PG through MPI (5 m)	
STEP 7 Version 5.5, Chinese Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC		Components for connecting a PC to MPI and PROFIBUS For PCs with a free PCI slot:	
Requirements:		CP 5611	6GK1 561-1AA01
Windows XP Professional Chinese Type of delivery:		CP 5611 MPI	
English, Chinese; incl. license key on USB stick, with electronic documentation		incl. MPI cable (5 m)	
Floating License Chinese on DVD	6ES7 810-4CC10-0KA5	For PCs with a free PCMCIA slot:	
Upgrade Floating License	6ES7 810-4CC10-0KE5	CP 5512	6GK1 551-2AA00
Chinese 3.x/4.x/5.x to V5.5; on DVD	0207 010 40010 0K20	For Windows XP Professional	
Documentation package STEP 7 basic information		For PCs without a free PCl slot: PC adapter USB	6ES7 972-0CB20-0XA0
Comprising Getting Started, hardware configuration manual, programming manual, migration		For connecting a PC to S7-300/-400/C7 through a USB interface; with USB cable (5 m)	
manual	0007 040 40440 041110	Components for connecting the	
German	6ES7 810-4CA10-8AW0	PC to Industrial Ethernet For PCs with a free PCl slot:	
English	6ES7 810-4CA10-8BW0		
French Spanish	6ES7 810-4CA10-8CW0 6ES7 810-4CA10-8DW0	• For PCs with a free PCMCIA slot:	
		SOFTNET-PG Edition 2006	6GK1 704-1PW64-3AA0

- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Software for SIMATIC controller

STEP 7 programming software

STEP 7 Professional

Overview



STEP 7 Professional supports all IEC languages.

In addition to the languages recognized by STEP 7

- LAD
- FBD
- |L

the following are also available:

- "Sequential Function Chart"
- "Structured Text".

An offline simulation of programs created with these languages is included. STEP 7 Professional thus replaces the combination of the individual packages STEP 7, S7-GRAPH, S7-SCL and S7-PI CSIM

A POWERPACK is offered to customers who use STEP 7 already and wish to change. A valid STEP 7 license is required for purchasing the POWERPACK. A separate update service is available for STEP 7 Professional.

Technical specifications

	STEP 7 Professional	
Type of license	Floating license	
Software class	A	
Current version	Edition 2010	
Target system	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7	
Operating system	Windows XP Professional	
	Windows 7 Professional, Windows 7 Ultimate	
Main memory expansion in PG / PC, min.	Depends on Microsoft Windows operating system used. Recommendation: 1 to 2 GB	
Hard drive requirement in PG / PC	Depending on scope of installation, 700 to 1000 MB	
Size of user program in the CPU	approx. factor 1.5 compared with STEP 5 with AWL (STL - instruction list), KOP (LAD - ladder diagram), FUP (FBD - function block diagram)	
Comment	Includes all 5 IEC programming languages KOP (LAD - ladder diagram), FUP (FBD - function block diagram), AWL (STL - instruction list), SCL (structured control language), GRAPH and the PLC simulation software S7-PLCSIM	

Ordering data Order No. STEP 7 Professional 2010

SIMATIC S7-300/400,
SIMATIC S7-300/400,
SIMATIC C7, SIMATIC WinAC
Requirements:
Windows XP Prof., Windows 7
Professional / Ultimate
Type of delivery:
German, English, French,
Spanish, Italian; license key on
USB stick, with electronic
documentation

Floating license on DVD
Rental license for 50 hours

6ES7 810-5CC11-0YA5

6ES7 810-5CC11-0YA6

6ES7 810-5CC04-0YE2

6ES7 810-5CC00-0YM2

6ES7 810-5CC11-0YE5

6ES7 810-5CC11-0YC5

6ES7 810-5CC11-0YA7

STEP 7 Professional Software Update Service; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software yersion

STEP 7 Professional Software Update Service Compact; 1 year; for STEP 7 Professional and STEP 7 Professional inside TIA Portal, requires current software version

Upgrade of Floating License to Edition 2010; on DVD Powerpack Floating License for upgrading from STEP 7 to

STEP 7 Professional

Trial License STEP 7 Professional

on DVD, runs for 14 days Documentation package STEP 7 basic information Comprising Getting Started,

2010;

hardware configuration manual, programming manual, migration manual

German

English

French

Spanish

Gess 810-4CA10-8BW0

6ES7 810-4CA10-8EW0

6ES7 810-4CA10-8DW0

6ES7 810-4CA10-8DW0

6ES7 810-4CA10-8EW0

STEP 7 reference manuals Comprising STL, LAD and FBD manuals as well as a reference

 manual for standard and system functions for SIMATIC S7-300/400

 German
 6ES7 810-4CA10-8AW1

 English
 6ES7 810-4CA10-8BW1

 French
 6ES7 810-4CA10-8CW1

 Spanish
 6ES7 810-4CA10-8DW1

 Italian
 6ES7 810-4CA10-8EW1

Software for SIMATIC controller STEP 7 programming software

STEP 7 Professional

Ordering data	Order No.		Order No.
SIMATIC manual collection J Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O,	6ES7 998-8XC01-8YE0	Components for connecting a PC to MPI and PROFIBUS For PCs with a free PCI slot: CP 5611	6GK1 561-1AA01
SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,		CP 5611 MPI Incl. MPI cable (5 m)	6GK1 561-1AM01
SIMATIC PC Based Automation,		For PCs with a free	
SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software,		PCMCIA slot:	
SIMATIC TDC		CP 5512	6GK1 551-2AA00
SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2	For Windows XP Professional	
Current "Manual Collection" DVD		For PCs without a free PCI slot:	
and the three subsequent updates		PC adapter USB	6ES7 972-0CB20-0XA0
EPROM programming device, USB prommer	6ES7 792-0AA00-0XA0	For connecting a PC to S7-300/-400/C7 through a USB interface; with USB cable (5 m)	
For programming SIMATIC memory cards and EPROM modules		Components for connecting the PC to Industrial Ethernet For PCs with a free PCI slot:	
MPI cable	6ES7 901-0BF00-0AA0	Lover 2 Ethernet eards	
For linking SIMATIC S7 and PG through MPI (5 m)		Layer 2 Ethernet cardsFor PCs with a free PCMCIA slot:	
		SOFTNET-PG Edition 2006	6GK1 704-1PW64-3AA0

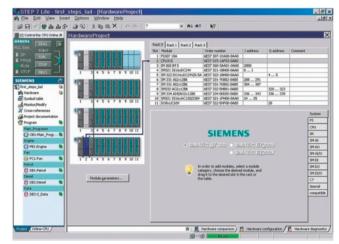
- D: Subject to export regulations AL: N and ECCN: 5D992
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Software for SIMATIC controller

STEP 7 programming software

STEP 7 Lite

Overview



- Programming software for creating stand-alone systems with SIMATIC S7-300, SIMATIC C7, ET 200S and ET 200X
- Operation is simple and intuitive
- Projects created with STEP 7/STEP 7 Professional can still be

STEP 7 Lite is exclusively available for free downloading. Further information is available in the Internet under:

http://support.automation.siemens.com/WW/view/com/

Technical specifications

<u> </u>	
	STEP 7 Lite
Type of license	Floating license
Software class	A
Current version	V 3.0
Target system	SIMATIC S7-300 SIMATIC C7
Operating system	Windows XP Home
	Windows 2000 Professional
	Windows XP Professional
Main memory expansion in PG / PC, min.	Depends on Microsoft Windows operating system used. Recommendation: 128 MB
Hard drive requirement in PG / PC	Depending on scope of installation, 90 to 250 MB
Size of user program in the CPU	approx. factor 1.5 compared with STEP 5 with AWL (STL - instruction list), KOP (LAD - ladder diagram), FUP (FBD - function block diagram)
Comment	For stand-alone applications with centralized I/O.

Ordering data	Order No.
STEP 7 Lite V3.0	
Target system: SIMATIC S7-300, SIMATIC C7, ET 200S, ET 200X Requirements: Windows 2000 Prof./XP Home/ XP Prof. Type of delivery: German, English, French, Spanish, Italian; incl. 3.5" authorization diskette Downloading free-of-charge from the Internet at: http://	
support.automation.siemens.com /WW/view/com/22764848	
SIMATIC manual collection	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates	
EPROM programming device, USB prommer	6ES7 792-0AA00-0XA0
For programming SIMATIC memory cards and EPROM modules	
MPI cable	6ES7 901-0BF00-0AA0
For linking SIMATIC S7 and PG through MPI (5 m)	
With Engineering Software for use with STEP 7 Lite	
S7-PLCSIM	see page 11/17
TeleService	see page 11/29
Components for connecting a PC to MPI and PROFIBUS For PCs with a free PCl slot:	
CP 5611	6GK1 561-1AA01
CP 5611 MPI	
incl. MPI cable (5 m)	
For PCs with a free PCMCIA slot:	
CP 5512	6GK1 551-2AA00
for Windows XP Professional	
For PCs without a free PCI slot:	
PC adapter USB	6ES7 972-0CB20-0XA0
	0L3/ 3/2-00D20-0/A0

D: Subject to export regulations AL: N and ECCN: 5D992

For connecting a PC to S7-300/-400/C7 through a

USB interface; with USB cable (5 m)

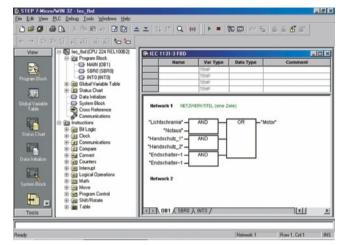
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

SIMATIC Industrial software

Software for SIMATIC controller

STEP 7 Micro/WIN

Overview



- The simple, easy to learn programming software under Windows 2000/XP for the SIMATIC S7-200
- A large number of wizards support the programming even of difficult automation tasks
- · For fast startup and timesaving programming
- With large scope of functions
- Based on standard Windows software (user interface similar to standard applications, such as Microsoft Word, Outlook)
- With 3 standard editors STL, LAD and CSF; you can switch between these editors at any time
- Generation, exporting and importing of user-specific libraries (including standard commands and user-defined subroutines)
- Documentation CD with manuals, software tools and example programs as support

Technical specifications

Standard tool	STEP 7 Micro/WIN
Type of license	Single license
Software class	A
Current version	V 4.0
Target system	SIMATIC S7-200
Operating system	Windows 2000 Windows XP
Main memory expansion in PG / PC, min.	32 MB
Hard drive requirement in PG / PC	50 MB
Size of user program in the CPU	Approx. factor 1.0 compared with STEP 5 for STL, LAD

Ordering Data	Order No.
STEP 7 Micro/WIN V4 programming software	
Target system: All CPUs of the SIMATIC S7-200 Requirements: Windows 2000/XP on PG or PC Type of delivery: German, English, French, Spanish, Italian, Chinese; with online documen- tation	
Single license J	6ES7 810-2CC03-0YX0
Upgrade Single License ¹⁾ J	6ES7 810-2CC03-0YX3
To be ordered separately:	
Intelligent RS 232/PPI multi-master cable	6ES7 901-3CB30-0XA0
For connecting devices with an RS 232 interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network	
Intelligent USB/PPI multi-master cable	6ES7 901-3DB30-0XA0
For connecting devices with an USB interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network	
System manual for S7-22x CPUs	
German	6ES7 298-8FA24-8AH0
English	6ES7 298-8FA24-8BH0
French	6ES7 298-8FA24-8CH0
Spanish	6ES7 298-8FA24-8DH0
Italian	6ES7 298-8FA24-8EH0
Chinese Components for connecting a	6ES7 298-8FA24-8FH0
PC to MPI and PROFIBUS For PCs with a free PCl slot:	
CP 5611	6GK1 561-1AA01
CP 5611 MPI	6GK1 561-1AM01
incl. MPI cable (5 m)	
For PCs with a free PCMCIA slot:	
CP 5512	6GK1 551-2AA00
for Windows XP Professional	
For PCs without a free PCI slot:	
PC adapter USB	6ES7 972-0CB20-0XA0
For connecting a PC to S7-300/ S7-400/C7 through a USB interface; with USB cable (5 m)	

- Upgrade for all previous STEP 7-Micro/WIN and STEP 7-Micro/DOS versions
- I: Subject to export regulations AL: N and ECCN: EAR99H
- J: Subject to export regulations AL: N and ECCN: EAR99S

Software for SIMATIC controller

STEP 7 programming software

STEP 7 Micro/WIN commands library

Overview

- Additional instruction libraries for STEP 7 Micro/WIN V3.2:
 USS protocol library

 - Modbus protocol library

Ordering data	Order No.
STEP 7 Micro/Win commands library V1.1	6ES7 830-2BC00-0YX0
Protocol libraries for USS and Modbus protocols; can be used with STEP 7-Micro/Win32 V3.2; including documentation, on CD-ROM	

Selection guide STEP 7

Overview

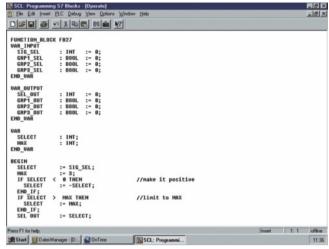
	STEP 7 Lite	STEP 7	STEP 7 Professional
Configuration			
Target systems	S7-300/C7	S7-300/S7-400/C7/WinAC	
Modules	Digital, analog I/O, IFM only central	Digital, analog I/O, IFM, FM, CP ce	ntral and distributed (DP)
Network/communication	No	Time-based, cyclic data transmissi MPI, PROFIBUS or Industrial Ether	on between automation components; net
Distributed I/Os	No	Yes	
Message configuration (HMI display)	No	Yes	
Read from/write on MMC	Yes, only in CPU	Yes, in CPU and directly on PG/PC (updating of AS operating system possible)	
Export/import	Program, symbols	Program, symbols, HW configuration	on
Documentation function	Included	Included; option DOCPRO for standardized documentation of the S7 project	
Multilingual project documentation	Yes	Yes	
Multi-user engineering	No	Yes	
Programming			
Languages	LAD/FBD/IL	LAD/FBD/IL and IL source	Like STEP 7 plus S7-GRAPH (sequencer)/ S7-SCL (textual high-language)
Structured/symbolic programming	Yes/yes	Yes/yes	
Checking/establishing program consistently	Yes/yes	Yes/yes	
Standard/user libraries	Yes/no	Yes/yes	
Online functions			
Online access	MPI	MPI, PROFIBUS, option: Industrial	Ethernet
Test functions	Monitoring, control, forcing	Monitoring, control, forcing, single	step (debugging)
Offline/online comparison functions	Program, HW configuration	Program	
Diagnostics	System diagnostics	System diagnostics, signaling of system faults, integrated process fau diagnostics with S7-GRAPH	
Option packages			
Optional programming languages	None	S7-GRAPH, S7-SCL, S7-HiGraph, CFC	S7-HiGraph, CFC
Options for simulation, documentation, diagnostics and remote maintenance	S7-PLCSIM, S7-Teleservice	S7-PLCSIM, S7-DOCPRO, TeleService, S7-PDiag	DOCPRO, TeleService, S7-PDiag (S7-PLCSIM included in scope of delivery)

Software for SIMATIC controller

STEP 7 programming software

S7-SCL

Overview



- PASCAL-type high-level language
- Optimized for programming programmable controllers
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 314 and CPU 312C or higher), S7-400, C7 and WinAC



Technical specifications

Technical specifications		
Engineering Tool	S7-SCL	
Current version	V5.3	
Software class	A	
Application areas		
Can be used for	Text-based high-level language programming of simple and complex calculations, CASE, loop, jump, and comparison functions	
Marketing message	Programming of algorithms and calculations made easy!	
Advantages	Clear and easy-to-read programs Functional, module-based programming CASE instruction replaces a large number of jump and comparison functions Easily understood by PLC programmers, as the programming philosophy of LAD/FBD/STL is retained Easy switchover to PLC programmers Exchangeability (porting) of subroutines in accordance with IEC 61131-3 Less time required for engineering compared to LAD/FBD/STL: Up to 20% for simple programs; at least 50% for demanding program structures	
Sectors	Labeling machines Chemical plants (e.g. oxygen extraction, evaluation of measured values) Rubber and plastics machines Woodworking machines Storage and logistics systems Paper and printing machinery Punching and cutting machines Water industry Coilers	
Target systems		
Can be used in	S7-300 (CPU 313 or higher and CPU 312C or higher recom- mended) S7-400 C7 (C7-626 or higher recom- mended) WinAC	
System requirements		
Operating system	Windows 2000 Professional Windows XP Professional	
Required hard drive memory in the PG/PC	8 MB	
Required software	STEP 7 V5.3	

Software for SIMATIC controller STEP 7 programming software

S7-SCL

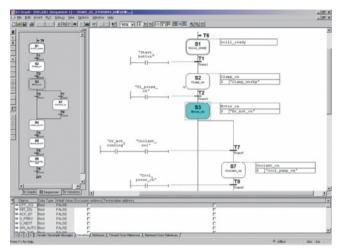
Technical specifications (cont	inued)	Ordering data	Order No.
Engineering Tool	S7-SCL	SIMATIC S7 SCL, Version 5.3	
Properties		Task:	
Monitoring tags	Yes	High-level language programming	
Controlling tags	Yes	Target system:	
Single-step processing	Yes	SIMATIC S7-300 (CPU 314 and higher), SIMATIC S7-400,	
Integration in CFC	Yes	SIMATÍC C7, SIMATIC WinAC Requirements:	
Program runtimes		STEP 7 V5.3 and higher	
with S7-300 (typical)	Similar to LAD/FBD/STL	Type of delivery: on CD; German, English, French,	
with S7-400 (typical)	Similar to LAD/FBD/STL	Spanish, Italian; incl. authori-	
Diagnostics		zation diskette, with electronic documentation	
Integration of diagnostic data in ProAgent	-	Floating License	6ES7 811-1CC05-0YA5
Integration of diagnostic data in ProTool/Pro	+	Software Update Service (requires current software version)	6ES7 811-1CA01-0YX2
Integration of diagnostic data in WinCC	-	Upgrade floating to V5.3	6ES7 811-1CC05-0YE5
Supported standards		SIMATIC manual collection	6ES7 998-8XC01-8YE0
IEC 61131-3	PLCopen certification • Base level ST available • Conformity and reusability level ST (available soon)	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O,	
Status of PLCopen activities	Test profile for conformity and reusability level ST available	SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation,	
Available versions/licenses		SIMATIC PCS 7, SIMATIC PG/PC,	
Floating license	CD-ROM with Tool	SIMATIC S7, SIMATIC Software, SIMATIC TDC	
	Electronic manual Getting Started guide Examples Authorization diskette	SIMATIC manual collection update service for 1 year Current "Manual Collection" DVD and the three subsequent	6ES7 998-8XC01-8YE2
	Certificate of License	updates	
	Product information		
Upgrade (floating license)	CD-ROM with Tool Electronic manual Getting Started guide Examples		
	Authorization diskette		
	Certificate of License		
0 (Product information		
Software Update Service (SUS)			
Also a component part of	V		
STEP 7 Professional	Yes		
S7 Trainer Package	Yes		
PCS 7	Yes		
D7-SYS	-		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

STEP 7 programming software

S7-GRAPH

Overview



- For configuring and programming sequential processes using sequencers
- Standardized representation to EN 1131-3
- Clearly comprehensible program thanks to structuring of the process into separate steps
- With extensive diagnostic functions, integrated into the SIMATIC diagnostics concept
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 315 and CPU 312C or higher), S7-400, C7 and WinAC



Engineering Tool	S7-GRAPH
Current version	V5.3
Software class	A
Application areas	
Can be used for	Graphical programming of sequential controllers and sequencers
Marketing message	Fast, elegant way to program sequential processes easily and transparently!
Advantages	Can be used to optimum effect even during the design phase Less configuration effort thanks to graphical structuring and programming Quick and easy familiarization Precise fault localization thanks to integrated diagnostics in combination with ProAgent for ProTool/Pro and WinCC Less time required for engineering compared to LAD/FBD/STL: approx. 40 to 70%
Sectors	Automotive industry (e.g. body-in-white, final assembly) Electrical equipment manufacture Rubber and plastics machines Pick-and-place machines Woodworking machines Metalworking machines Paper and printing machinery Testing machines Rolling mills Coilers Leisure and entertainment facilities
Target systems	
Can be used in	S7-300 (CPU 314 or higher and CPU 312C or higher recom- mended) S7-400 C7 (C7-626 or higher recom- mended) WinAC
System requirements	
Operating system	Windows 2000 Professional Windows XP Professional
Required hard drive memory in the PG/PC	15 MB
Required software	STEP 7 V5.3

Software for SIMATIC controller STEP 7 programming software

S7-GRAPH

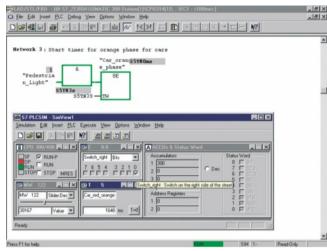
Technical specifications (con	tinued)	Ordering data	Order No.
Engineering Tool	S7-GRAPH	SIMATIC S7 GRAPH, Version 5.3	
Properties		Task:	
Monitoring tags	Yes	Configuration and programming of sequences	
Controlling tags	Yes	Target system:	
Single-step processing	Yes	SIMATIC S7-300, SIMATIC S7-400,	
Integration in CFC	-	SIMATIC C7, SIMATIC WinAC	
Program runtimes		Requirements: STEP 7 V5.3 and higher	
with S7-300 (typical)	3 ms per block + 1 ms per active step	Type of delivery: on CD; German, English, French, Spanish, Italian; incl. authori-	
with S7-400 (typical)	0.4 ms per block + 0.06 ms per active step	zation diskette, with electronic documentation	
Diagnostics		Floating License	6ES7 811-0CC06-0YA5
Integration of diagnostic data in ProAgent	Yes	Software Update Service (requires current software version)	6ES7 811-0CA01-0YX2
Integration of diagnostic data in ProTool/Pro	Via ProAgent	Floating license upgrade to V5.3	6ES7 811-0CC06-0YE5
Integration of diagnostic data in	Via ProAgent	SIMATIC manual collection	6ES7 998-8XC01-8YE0
WinCC		 Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, 	
Supported standards	Di 0	SIMATIC bus components,	
IEC 61131-3	PLCopen certification • Base Level SFC available	SIMATIC C7, SIMATIC distributed I/O,	
Status of PLCopen activities	+	SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,	
Available versions/licenses		SIMATIC PC Based Automation,	
Floating license	CD-ROM with Tool Electronic manual	SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
	Getting Started guide Examples	SIMATIC manual collection update service for 1 year	6ES7 998-8XC01-8YE2
	Authorization diskette	Current "Manual Collection" DVD	
	Certificate of License	and the three subsequent updates	
	Product information	αρααιοσ	
Upgrade (floating license)	CD-ROM with Tool		
	Electronic manual Getting Started guide Examples		
	Authorization diskette		
	Certificate of License		
	Product information		
Software Update Service (SUS)			
Also a component part of			
STEP 7 Professional	Yes		
S7 Trainer Package	Yes		
PCS 7	-		
D7-SYS			

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

STEP 7 programming software

S7-PLCSIM

Overview



- For functional testing of the generated SIMATIC S7 user blocks on the PG/PC, independent of the availability of the target hardware
- To transfer detection and elimination of program faults to an early phase of program development
- Permits accelerated, cost-reduced initial commissioning, and an increase in program quality
- Can be used for LAD, FBD, STL, S7-GRAPH, S7-HiGraph, S7-SCL, CFC, S7-PDIAG, WinCC (local installation)

Technical specifications

Engineering Tool	S7-PLCSIM
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows 2000 Professional Windows XP Professional
Required software packages	STEP 7 V5.4 SP1 or higher
Disk space required in PG/PC	5 MB

Ordering data Order No.

S7-PLCSIM, Version 5.4

Task:

Function testing of SIMATIC S7 application blocks on PG/PC

SIMATIC S7-300,

SIMATIC S7-400, SIMATIC C7

From STEP 7 V5. 4 incl. SP1, SP2

Type of delivery:

on CD; English, German, French, Spanish, Italian; license key on USB stick, with electronic documentation

Floating License

Software Update Service (requires current software version)

Floating license upgrade to V5.4

SIMATIC manual collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC 67, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7 841-0CC05-0YA5 6ES7 841-0CA01-0YX2

6ES7 841-0CC05-0YE5

6ES7 998-8XC01-8YE0

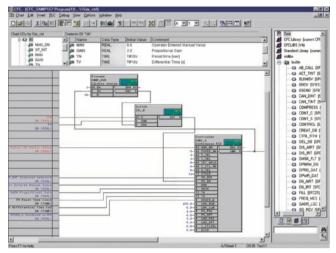
6ES7 998-8XC01-8YE2

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Options for programming and design

CFC

Overview



- For creating automation programs by drawing a function chart
- With extensive libraries of prefabricated function blocks to which function blocks created by the user can be added
- Reduced costs and fewer mistakes by simply interconnecting read-to-use function blocks
- Optimized integration in the world of automation, for example, through guaranteed compatibility with all STEP 7 tools
- Can be used for SIMATIC S7-300 (recommended for CPU 316 or CPU 314C or higher), SIMATIC S7-400, SIMATIC WinAC and D7-SYS

Engineering Tool	CFC
Current version	V7.1
Software class	A
Application areas	
Can be used for	Graphical creation, intercon- nection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	Can be used to optimum effect even during the design phase Reduced configuration effort thanks to graphical interconnection High degree of reusability of diagrams that have already been created Quick and easy familiarization Quick and easy familiarization Guick and transparent interconnection of ready-made functions Technological creation of the program as a whole Clear representation of control loop structures Short commissioning time High plant availability Less time required for engineering compared to LAD/FBD/STL: up to 50%
Sectors	Automotive industry (e.g. thermostats, tire production processes) Chemicals Power engineering and supply Rubber and plastics machines Metalworking machines Food and beverage machines Petrochemicals Rolling mills Water industry Coilers
Target systems	
Can be used in	S7-300 S7-400 F/H systems WinAC
System requirements	
Operating system	Windows 2000 Professional SP4, Windows Server 2003 R2 SP2, Windows XP Professional SP3, Windows Vista SP2 32 bit, Windows 7 32 bit
Required hard drive memory in the PG/PC	approx. 60 MB
Required software	STEP 7 V5.3 or higher

Software for SIMATIC controller Options for programming and design

CFC

Technical specifications (con	tinued)	Ordering data	Order No.
Engineering Tool	CFC	SIMATIC CFC, Version 7.1	
Properties		Task:	
Monitoring tags	Yes	Graphic configuring and programming of automation	
Controlling tags	Yes	applications in the form of	
Single-step processing	-	technology-oriented diagrams Target system:	
Integration in CFC	Yes	SIMATIĆ S7-300/400, SIMATIĆ WinAC, D7-SYS	
Program runtimes		Requirements:	
with S7-300 (typical)	Depending on the interconnected blocks	STEP 7 V5.3 and higher Type of delivery: Engineering software and	
with S7-400 (typical)	Depending on the intercon- nected blocks	electronic documentation on CD- ROM, License Key on USB stick, — Certificate of License	
Diagnostics		Floating License	6ES7 658-1EX17-2YA5
Integration of diagnostic data in ProAgent	-	Floating license upgrade from V7.0 to V7.1	6ES7 658-1EX17-2YE5
Integration of diagnostic data in ProTool/Pro	-	Software Update Service (requires current software	6ES7 658-1EX00-2YL8
Integration of diagnostic data in WinCC	-	version)	
Supported standards		SIMATIC manual collection	6ES7 998-8XC01-8YE0
IEC 61131-3	based on the IEC standard	Electronic manuals on DVD,	
Status of PLCopen activities	-	multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
Available versions/licenses		SIMATIC C7, SIMATIC distributed I/O,	
Floating license (S7-HiGraph) or single license (CFC)	CD-ROM with Tool Electronic manual Getting Started guide Examples License Key Disk	SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC SIMATIC manual collection D	6ES7 998-8XC01-8YE2
	Terms and Conditions	update service for 1 year	
Floating license (S7-HiGraph) or single license (CFC)	Certificate of License CD-ROM with Tool Electronic manual Getting Started guide Examples License Key Disk Emergency Key Disk Certificate of License Terms and Conditions Product information	Current "Manual Collection" DVD and the three subsequent updates	
Software Update Service (SUS)			
Also a component part of			
STEP 7 Professional	-		
S7 Trainer Package	-		
PCS 7	Yes		
D7-SYS	Yes		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Options for programming and design

Distributed safety software

Overview

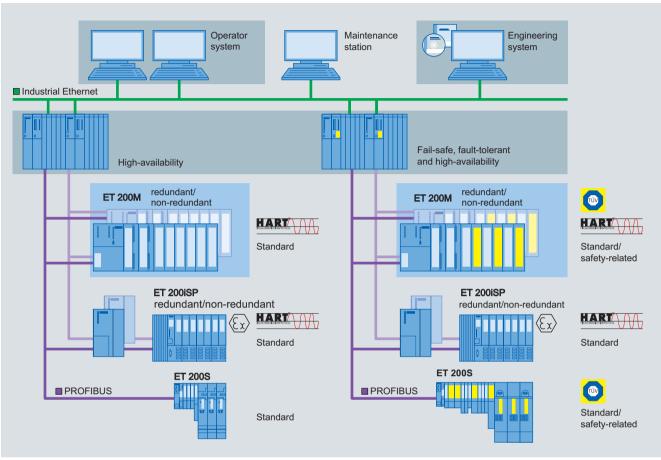
- For creating safety-oriented automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by making simple connections between function blocks
- With preconfigured function block library
- User-defined blocks can be created
- Optimum embedding in the automation world due to guaranteed integration with STEP 7 tools
- Scope of supply:
 - Distributed Safety editor
 - Code generator
 - Debugger
 - Libraries of standard blocks

Order No.
6ES7 833-1FC02-0YA5
6ES7 833-1FC00-0YX2
6ES7 833-1FC02-0YE5
9AL3 100-1AD54

Options for programming and design

S7 F/FH systems Introduction

Overview



Common engineering system for basic process control system and safety instrumented system

The process industry frequently features complex technological sequences with high safety demands, and faults and failures in the process automation could have fatal consequences for personnel, machines, plants and the environment. Therefore, process safety is of particular significance. The safety technology used must reliably detect errors in the process and also its own internal errors, and automatically set the plant/application to a safe state if an error is detected.

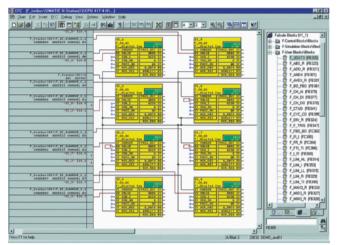
S7 F/FH Systems is the comprehensive range of products and services from Siemens for safe, fault-tolerant applications in the process industry. This is characterized by:

- · Safe communication via PROFIBUS with PROFIsafe
- Safe communication also via PROFIBUS PA with PROFIsafe
- ET 200 distributed I/O systems with safety-related I/O modules
- User-friendly process visualization, including safety-relevant fault messages, via the optional operator system
- Engineering system with S7 F Systems software package and SIMATIC Safety Matrix

- AS 412F/FH, AS 414F/FH and AS 417F/FH safety-related automation systems: The safety-related automation systems of the S7 F/FH-System are based on the hardware of the CPU 412H, CPU 414H or CPU 417H automation systems that are extended with the S7 F Systems software package to include safety functions. All F/FH systems listed are TÜV-certified and comply with the safety requirements up to SIL 3 according to IEC 61508. There are two design versions:
 - Single-channel (with one CPU, safety-related)
 - High-availability (with redundant CPÚs, safety-related and fault-tolerant)

Options for programming and design S7 F/FH systems S7 F systems

Overview



The S7 F Systems engineering tool integrated in the SIMATIC Manager can be used to configure an S7 F/FH System. With this

- parameterize CPU and F-signal modules
- create safety-related applications in the CFC.

Predefined, TÜV-approved blocks are available for this purpose. The safety-related blocks save the user having to perform redundant programming for detecting and reacting to errors.

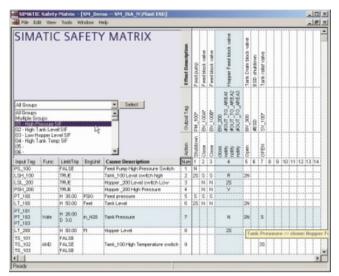
Ordering data	Order No.
S7 F systems RT license	6ES7 833-1CC00-6YX0
For processing safety-related application programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	
S7 F systems V6.1	6ES7 833-1CC02-0YA5
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, floating license for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2 2 languages (German, English) Type of delivery:	
Certificate of license as well as software and electronic documentation on CD	
S7 F systems upgrade from V5.x/V6.0 to V6.1	6ES7 833-1CC02-0YE5
2 languages (German, English), floating license for 1 user	
Type of delivery: Certificate of license as well as software and electronic documentation on CD	

In the case of an S7 F Systems Upgrade from V5.x to V6.1, the type of S7 F Systems license changes from single license to floating license.

Options for programming and design

S7 F/FH systems SIMATIC Safety Matrix

Overview



The SIMATIC Safety Matrix which can be used in addition to the CFC is an innovative safety lifecycle tool from Siemens that can be used not only for user-friendly configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause & effect matrix, is ideally suited to processes where defined statuses require specific safety reactions.

The SIMATIC Safety Matrix not only means that programming of the safety logic is significantly simpler and more convenient, but also much faster than in the conventional manner. During the risk analysis of a plant, the configuration engineer can assign exactly defined reactions (effects) to events (causes) which may occur during a process.

Ordering data

Order No.

SIMATIC Safety Matrix Tool V6.2

Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment

Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels

1 language (English), executes with Windows XP Professional,

Type of supply: Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD

Floating License for 1 installation J Floating License upgrade from J V5.x/V6.x to V6.2

6ES7 833-1SM02-0YA5 6ES7 833-1SM02-0YE5

6ES7 833-1SM42-0YA5

SIMATIC Safety Matrix Editor V6.2

Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment

1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation

Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD

SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7

Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operating levels Bilingual (English/German), runs on Windows 2000 Professional or Windows XP Professional, Windows 2003 Server Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD Floating License for 1 installation

Floating License upgrade from V6.x to V6.2

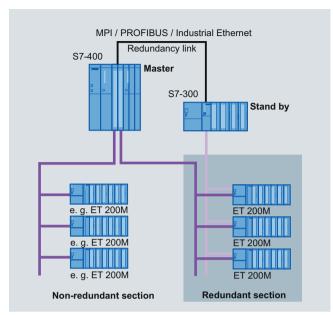
6ES7 833-1SM62-0YA5 6ES7 833-1SM62-0YE5

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for programming and design

Software redundancy

Overview



- Software package for assembling fault-tolerant control systems based on software
- Designed for control systems with single-channel distributed I/O
- For use in applications with low demands on changeover speed, such as the control of hydroelectric power plants, cooling circuits, traffic flows, level control, measured data acquisition
- Inexpensive thanks to the use of standard S7-300 and S7-400 components
- I/O linking with PROFIBUS DP in redundant configuration
- Optional control via WinCC operator station

Technical specifications

Hardware requirements	
CPU	S7-300: CPU 313C-2 DP, 314C-2 DP, 315-2 DP, 316-2 DP, 318-2 DP S7-400: all CPUs
Redundancy link of the CPUs	MPI, PROFIBUS, Industrial Ethernet; existing connections can also be used.
Suitable modules for ET 200M	IM 153-2; all DI/O, AI/O for ET 200M; FM 350-1 counter module CP 341
Software requirements	
Configuring/programming	STEP 7 V4.0
Communication configuration for redundant PROFIBUS DP	NCM S7 for PROFIBUS

Ordering data Order No. Program package software redundancy V1.2 Configuring a redundant control. Target system: SIMATIC S7-300, S7-400 Requirements: STEP 7 V5.2, NCM S7 for PROFIBUS incl. electronic documentation (English, German, French, Spanish, Italian), 4 application examples and faceplate for WinCC on CD-ROM Single license (for 2 CPUs) 6ES7 862-0AC01-0YA0 Single license, without software 6ES7 862-0AC01-0YA1 and documentation SIMATIC manual collection 6ES7 998-8XC01-8YE0 Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC SIMATIC manual collection 6ES7 998-8XC01-8YE2

D: Subject to export regulations AL: N and ECCN: 5D992

update service for 1 year

and the three subsequent

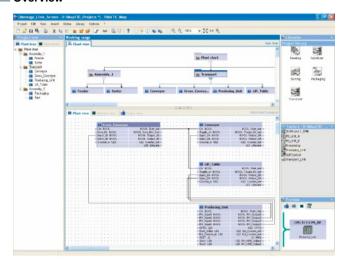
Current "Manual Collection" DVD

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for programming and design

SIMATIC iMap

Overview



- Component-based software tool for configuring the communication in distributed automation solutions
- For easy graphical configuration of the communication between subsystems and machine-to-machine communication in the production line
- Based on the PROFINET standard
- Open for PROFINET devices from various manufacturers on Industrial Ethernet
- Runs under Windows 2000, Windows XP Professional and Windows 2003 Server

Engineering tool	SIMATIC iMap
Current version	V3.0
Software class	Α
Applications	
Keyword	SIMATIC iMap is an engineering tool for configuring communication between automation and field devices in distributed automation solutions.
Marketing message	"Time and cost savings in modular machine and plant construction with Component based Automation." "Modularization and machine-tomachine communication along the production line."
Advantages	Open component-based engineering tool to the PROFINET standard. Simple communication between intelligent automation and field devices on PROFIBUS DP and on Ethernet. Graphical configuration of communication on PROFIBUS DP and on Ethernet Extremely high reusability of software components (technology modules) Graphical structuring of the plant using "chart-in-chart" function Convenient navigation through the project tree Easy creation and structuring of technology libraries PROFIBUS and Ethernet in the overview of the network view Fast start-up thanks to downloading and testing directly on Ethernet (also of PROFIBUS slaves)

Engineering tool	SIMATIC iMap
Advantages (continued)	Online display of values of the technology modules on the interfaces and in the variable table Diagnostics of communication in the diagnostics window
Sectors	Automotive industry (especially in assembly, conveyor systems and in the paint shop) More complex food and packaging machines Conveyor systems based on PROFIBUS DP Production lines with several interlinked machines
Target systems	SIMATIC S7 CPU 31x-2 PN/DP and SIMATIC S7 CPU 319-3 PN/DP (with integrated PROFINET interface. This can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only) SIMATIC WinAC PN (can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only) SIMATIC NET IE/PB Link (can be used as a proxy function for the devices of a complete PROFIBUS segment) SIMATIC NET (CP 343-1 Advanced (for connecting SIMATIC S7-300 to Ethernet), CP443-1 Advanced (for connecting SIMATIC S7-400 to Ethernet)

Software for SIMATIC controller Options for programming and design

SIMATIC iMap

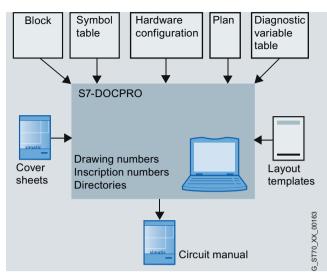
Technical specifications (conti	nued)	Ordering data	Order No.
Engineering tool	SIMATIC iMap	SIMATIC iMap V3.0	
Target systems (continued)	Distributed I/O stations with separate CPU (all intelligent field devices on PROFIBUS such as SIMATIC CPU 313C-2DP, CPU 314C-2DP, CPU 315-2DP, CPU 316-2DP, ET 200 IM 151 CPU, ET 200S BM 147 CPU), PROFINET CBA OPC Server (for access from PC applications to data in PROFINET devices) Devices on Industrial Ethernet based on the PROFINET CBA standard SIMATIC OPS (within the components) SIMATIC ProTool/Pro, WinCC or any other visualization system with OPC client function	Target system: CPU 31x-2 PN/DP, CPU 319-3 PN/DP, SIMATIC WinAC PN, SIMATIC NET IE/PB Link, SIMATIC NET CP 343-1, SIMATIC NET CP 343-1 Advanced, SIMATIC NET CP 443-1 Advanced, distributed I/O devices with own CPU, PROFINET CBA OPC server, devices on the Industrial Ethernet based on the PROFINET CBA standard, SIMATIC OPs, SIMATIC ProTool/Pro Requirements: Windows 2000 Prof. with Service Pack 4 or higher or Windows XP Prof. with Service Pack 1 or higher or Windows 2003 Server	
System requirements		with Service Pack 1 or higher; on PG or PC with Pentium processor,	
Operating system	Windows 2000 Prof. Service Pack 4 and higher or Windows XP Prof. Service Pack 1 and higher or Windows 2003 Server Service Pack 1 and higher; PC administration rights are required for installation	min. 1 GHz; STEP 7 V5.3 or higher with Service Pack 3, PN OPC Server V6.3 or higher Type of delivery: German, English, with electronic documentation Floating License D	6ES7 820-0CC04-0YA5
PG/PC hardware	Pentium processor, 1 GHz or	Software Update Service D	
Recommended expansion of main	higher RAM: 512 MB or more	(requires current software version)	0L37 020-00001-0172
memory in PG/PC ·		Upgrade to V3.0, floating license D	6ES7 820-0CC04-0YE5
Hard disk space required in PG/PC	Approx. 200 MB		
Software required	 STEP 7 V5.3 Service Pack 3 or higher PN OPC server V6.3 or higher The following software must be installed before iMap (included in the iMap package): MS Internet Explorer V6.0 Service Pack 1 and higher Adobe Acrobat Reader V5.0 		
Type of delivery			
Languages	English, German, French, Italian and Spanish		
Single License (SL)	Yes		
Upgrade License (UL)	Yes, from V2.0 to V3.0		
Paper manuals	Electronically on CD		
Authorization/licenses			
Authorization	Yes		
Single License (SL)	Yes		
	Yes		
Upgrade License (UL) Software Update Service	Yes Yes		

D: Subject to export regulations AL: N and ECCN: 5D992

Options for programming and design

DOCPRO

Overview



- For creating and managing plant documentation
- Permits structuring of project data, the preparation in the form of wiring manuals, and the printout in a unified print image.
- For use in SIMATIC S7-300, S7-400 and C7

Technical specifications

Engineering Tool	DOCPRO
Type of license	Floating license
Software class	А
Current version	V5.4
Target system (recommended)	SIMATIC S7-300/400 SIMATIC C7
Operating system	Windows 2000 Professional Windows XP Professional Windows Vista Business/Ultimate
Required software packages	STEP 7 V5.4 or higher under Windows Vista V5.4 SP3 or higher
Disk space required in PG/PC	5 MB

Ordering data Order No.

DOCPRO, Version 5.4 Creation of circuit manuals for plant documentation management SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 from STEP 7 V5.4 on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation 6ES7 803-0CC03-0YA5 Floating License Software Update Service 6ES7 803-0CA01-0YX2 (requires current software version) Floating license upgrade to V5.4 6ES7 803-0CC03-0YE5

SIMATIC manual collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC ST, SIMATIC Software, SIMATIC TDC

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7 998-8XC01-8YE0

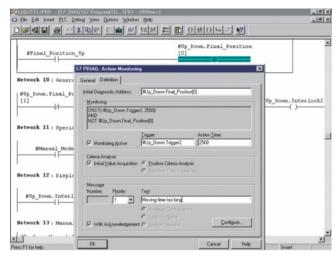
6ES7 998-8XC01-8YE2

D: Subject to export regulations AL: N and ECCN: 5D992 J: Subject to export regulations AL: N and ECCN: EAR99S

Options for diagnostics and service

S7-PDIAG

Overview



- For configuration of process diagnostics with SIMATIC S7
- Increases the availability of machines and production plants and supports with fault analysis and elimination on site
- For use on the SIMATIC S7-300, S7-400

Technical specifications

Engineering tool	S7-PDIAG
Type of license	Floating license
Software class	Α
Current version	V5.3
Target system (recommended)	SIMATIC S7-300 (CPU 314 or higher) SIMATIC S7-400
Operating system	Windows 2000 Professional Windows XP Professional
Required software packages	STEP 7 V5.3 SP3 or higher
Disk space required in PG/PC	6 MB

S7-PDIAG, Version 5.3	
Task: Configuring of process diagnostics for LAD/FBD/STL Target system: SIMATIC S7-300 (CPU 314 and higher); SIMATIC S7-400 Requirements: STEP 7 V5.3 SP3 and higher Type of delivery: on CD; German, English, French, Spanish, Italian; incl. authori- zation diskette, with electronic documentation	
Et al. 11	

Order No.

Floating License 6ES7 840-0CC04-0YA5
Software Update Service (requires current software version) 6ES7 840-0CA01-0YX2

Upgrade to V5.3

Ordering data

6ES7 840-0CC04-0YE5 6ES7 998-8XC01-8YE0

SIMATIC manual collection Electronic manuals on DVD,

multilingual: LOGOI, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

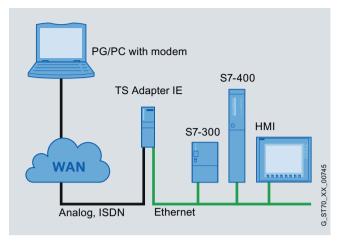
D 6ES7 998-8XC01-8YE2

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

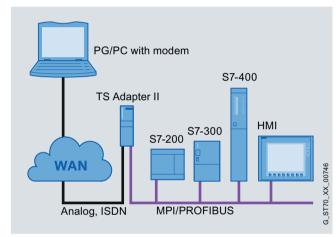
Options for diagnostics and service

TeleService

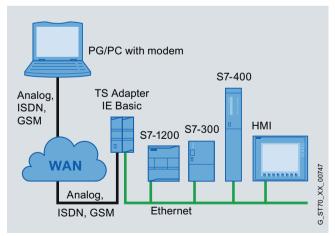
Overview



Teleservice with TS Adapter IE



Teleservice with TS Adapter II



Teleservice with TS Adapter IE Basic

- For performing remote maintenance over the telephone network: A PG/PC with an Engineering Tool installed, e.g. STEP 7, can access automation components (e.g. S7 CPUs) over the telephone network that are connected to the appropriate adapters over Industrial Ethernet or PROFIBUS.
- Comprising the TeleService software and different adapters:
- TS Adapter II for connection to PPI, MPI or PROFIBUS DP
- TS Adapter IE or TS adapter IE Basic for connection to Industrial Ethernet
- Additional functions with TS Adapter II:
 - Establishing a connection from/to remote plants, e.g. for calling up process data from an automation system (PG-to-AS remote coupling).
 - Exchanging data between plants (AS-to-AS remote coupling): Exchange of process data between two SIMATIC automation systems.
 - Sending a text message: Sending a text message from a SIMATIC automation system via a GSM wireless modem.
- Additional functions with TS Adapter IE:
 - Remote operation of HMI devices: Access to the HMI device via an Internet browser installed on the adapter
 - Sending e-mails: Establishing a modem link to a dial-up server (e.g. to an Internet service provider): A SIMATIC CPU can send e-mails over an e-mail server that can be accessed in this manner.
 - Standard routing: A modem link can be established to an Internet service provider for accessing data on the Internet.

Software for SIMATIC controller Options for diagnostics and service

TeleService

Engineering tool	DOCPRO
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300/400 SIMATIC C7
Operating system	Windows 2000 Professional Windows XP Professional Windows Vista Business/Ultimate
Required software packages	STEP 7 V5.4 or higher under Windows Vista V5.4 SP3 or higher
Disk space required in PG/PC	5 MB

TS adapter II	
Dimensions (W x H x D) in mm	125 x 110 x 40
Weight, approx.	250 g
Interfaces • to S7/C7 • to the PC • to an external modem • to the analog telephone network • to the ISDN telephone network	RS 485 (up to 12 Mbit/s) USB 1.1 (12 Mbit/s) RS 232 (up to 115 kbaud) RJ12 RJ45
Supply voltage, external or via MPI interface	24 V DC
Current consumption	60 mA (typ.) / 120 mA (max.)
Switch-on current, max.	0.7 A; 8 μs
Degree of protection	IP20
Temperature • Operation • Storage/transport	±0 °C to +60 °C -40 °C to +70 °C

TS adapter IE	
Dimensions (W x H x D) in mm	125 x 110 x 40
Weight, approx.	approx. 370 g
Interfaces Ethernet to an external modem to the analog telephone network to the ISDN telephone network	RJ45 (10/100 Mbit/s) RS 232 (up to 115 kbaud) RJ12 RJ45
Supply voltage, external or via MPI interface	24 V DC
Current consumption of the TSA-IE ISDN	typ. 170 mA / max. 230 mA
Current consumption of the modem TSA IE	typ. 180 mA / max. 240 mA
Switch-on current, max.	0.7 A; 8 μs
Degree of protection	IP20
Temperature • Operation • Storage/transport	±0 °C to +60 °C -40 °C to +70 °C

30 x 100 x 75
100 g
RJ45 (10/100 MBit/s) Proprietary (can only be used for TS modules
24 V DC
typ. 50 mA, max. 80 mA typ. 50 mA, max. 80 mA typ. 40 mA, max. 60 mA typ. 100 mA, max. 180 mA 240 mA
IP20
± 0 °C to +60 °C (horizontal mounting) ± 0 °C to +40 °C (vertical mounting) 40 °C to +70 °C

TS module modem		
Dimensions (W x H x D) in mm, approx.	30 x 100 x 75	
Weight, approx.	98 g	
ITU transmission standards	• V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.34x, K56flex, V.90, V.92	
Additional features	Error correction and data compressing a/b interface Hayes (AT) command set All data formats Dialing multifrequency (MFV), impulse (IWV)	

TS module ISDN		
Dimensions (W x H x D) in mm	30 x 100 x 75	
Weight, approx.	92 g	
Protocols D-channel protocols B-channel protocols	DSS1 (Euro-ISDN), 1TR6 V.110 (9600 bit/s, 19200 bit/s, 38400 bit/s) V.120 (64 Kbit/s) X.75 (64 Kbit/s)	
Additional features	Multiple Subscriber Numbers (MSN) AT command interpreter	

Software for SIMATIC controller Options for diagnostics and service

TeleService

Technical specifications (continued)

TS module RS232	
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	100 g
Operating mode	Full duplex, asynchronous
Signals	TXD, RXD, DSR, CTS, RTS, DTR, DCD
Data transmission rate	2 400 115 200 bit/s
Frame	8 data bits (LSB first), no parity bit, 1 stop bit
Control	according to RS232 standard
Plug-in	D sub 9-pin, male

TS module GSM	
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	118 g
Transmission rate • GPRS Multislot Class 10	
- up to 2 uplinks	13.4 Kbit/s 27 Kbit/s upload gross
- up to 4 downlinks	40 Kbit/s 54 Kbit/s download gross
Interfaces	
SIM interface	3 V/1.8 V
Antenna connection	1 x SMA antenna socket (50 Ohm)
Frequency ranges	Quad band: 850, 900, 1800, 1900 MHz
Transmitted output power	2 W at 850 MHz, 900 MHz 1 W at 1800 MHz, 1900 MHz

Order No.

Ordering data		Order No.
TeleService, Version 6.1		
Task: Remote maintenance by means of wired or radio network Target system: SIMATIC S7-200, SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 Requirements: TS Adapter (STEP 7 not required) Type of delivery: on CD, German, English, French, Spanish, Italian; with electronic documentation		
Floating License	J	6ES7 842-0CE00-0YE0
Floating License Upgrade (from each previous version)	J	6ES7 842-0CE00-0YE4
Software Update Service (requires current software version)		6ES7 842-0CA01-0YX2
TS adapter II modem		6ES7 972-0CB35-0XA0
With MPI connection and RS 232; 9-pin, male		
TS adapter II ISDN		6ES7 972-0CC35-0XA0
With MPI connection and RS 232; 9-pin, male		
TS adapter IE modem		6ES7 972-0EM00-0XA0
With Ethernet connection RJ45 (10/100 Mbit/s) and RS 232; 9-pin, male		
TS adapter IE ISDN		6ES7 972-0ED00-0XA0
With Ethernet connection RJ45 (10/100 Mbit/s) and RS 232; 9-pin, male		

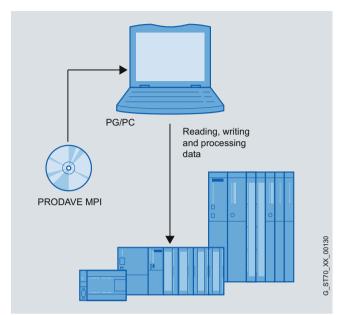
USB cable		6ES7 901-0AE00-0XA0
for parameterizing the TS adapter II, it can also be used for programming the connected devices. 5 m long		OLOT SUITOREOU-OVAC
TS adapter IE Basic	ı	6ES7 972-0EB00-0XA0
Basic unit		
TS module modem	ı	6ES7 972-0MM00-0XA0
TS module ISDN	ı	6ES7 972-0MD00-0XA0
TS module RS232	I	6ES7 972-0MS00-0XA0
TS module GSM	I	6GK7 972-0MG00-0XA0
S7 mounting rail adapter		6ES7 972-0SE00-7AA0
For mounting on TS adapter IE Basic on S7-300 mounting rail, width 60 mm		
SIMATIC manual collection	J	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC ST, SIMATIC ST		
SIMATIC manual collection update service for 1 year	D	6ES7 998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates		

D: Subject to export regulations AL: N and ECCN: 5D992 I: Subject to export regulations AL: N and ECCN: EAR99H J: Subject to export regulations AL: N and ECCN: EAR99S

Options for diagnostics and service

PRODAVE

Overview



- The toolbox for exchange of process data between SIMATIC S7, SIMATIC C7 and a PG/PC
- For autonomous handling of data traffic over MPI/PPI, PROFIBUS and Industrial Ethernet

Technical specifications

Runtime software	
Parameterization software	PRODAVE
Type of license	Simple license, copy license
Software class	A
Current version	V6.1
Target system	SIMATIC S7-200 SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows 2000 Prof./XP, Vista 32 Ultimate
Required software packages	-
Main memory configuration in target system	8 MB on PG/PC
Disk space required in PG/PC	2 MB
Standard FBs	
Required libraries	-

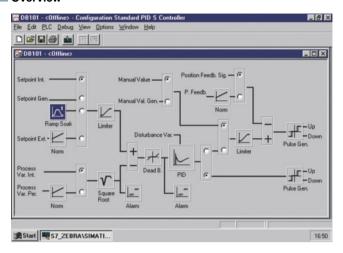
Ordering data		Order No.
PRODAVE MPI/IE V6.1 for Windows 95/98/ME/NT 4.0/ 2000 Prof./XP Prof.		
Task: Data link between PG/PC and SIMATIC S7/C7 via MPI (S7-200 via PPI) or Industrial Ethernet Requirements:		
Windows 2000 Prof./XP Prof./ Vista 32 Ultimate; CP 5611, integrated MPI or PC adapter Type of delivery: CD incl. electr. documentation (German, English)		
Single license	J	6ES7 807-4BA02-0YA0
Copy license, without software and documentation	J	6ES7 807-4BA02-0YA1
PRODAVE MPI Mini V6.0 for Windows 95/98/ME/NT 4.0/ 2000 Prof./XP Prof.		
Task: Data link between PG/PC and SIMATIC S7/C7 over MPI (S7-200 over PPI); with reduced functional scope)		
Requirements: Windows 95/98/ME/NT 4.0/ 2000 Prof./XP Prof.; CP 5611, integrated MPI or PC adapter Type of delivery: CD incl. electr. documentation		
(German, English)		
Single license	J	6ES7 807-3BA01-0YA0
Copy license, without software and documentation	J	6ES7 807-3BA01-0YA1
SIMATIC manual collection	J	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7,		
SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		
SIMATIC manual collection update service for 1 year	D	6ES7 998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

Standard PID control

Overview



- For integrating continuous PID controllers, pulse controllers and step controllers in the application program
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Parameterization software	Standard PID co	ontrol					
Type of license	Single license	Single license					
Software class	Α	A					
Current version	V 5.2						
Target system	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7	(CPU 313 or high	er)				
Required software packages	STEP 7 V5.3 SP2	2 or higher					
Main memory configuration in PG/PC	16 MB						
Disk space required in PG/PC	1.85 MB						
Standard function blocks	PID_CP (FB 1)		PID_ES (FB 2)		LP_SCHED (FC 1)		
Storage space requirements FB length in the memory DB length in the memory	Load memory 8956 byte 1168 byte	Work memory 7796 byte 510 byte	Load memory 9104 byte 1124 byte	Work memory 7982 byte 484 byte	Load memory 1064 byte 184 byte ²⁾	Work memory 976 byte 100 byte ²⁾	
Runtimes • In S7-300 ¹⁾ • In S7-400 ¹⁾	0.18 - 4.4 ms 0.13 - 0.35 ms		0.2 - 5.1 ms 0.16 - 0.35 ms		0.03 - 0.3 ms 0.03 - 0.08 ms		
Required libraries	Standard PID co	ntrol FBs					
Licensing forms	Simple license a 1 runtime license	nd 1 runtime licen	Se;				
Software class	А						
Current version	V 5.2						
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7						
Required software packages	STEP 7 V5.3 SP2	STEP 7 V5.3 SP2 or higher					
Main memory configuration in PG/PC	16 MB						
Disk space required in PG/PC	1.85 MB						

¹⁾ Depending on the CPU

²⁾ With 5 control loops

Software for SIMATIC controller Options for engineering and drive technology

Standard PID control

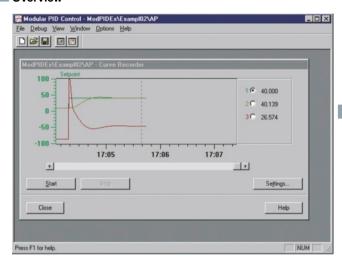
Ordering data	Order No.		Order No.
Standard PID control parameterization tool, V5.2		SIMATIC manual collection J	6ES7 998-8XC01-8YE0
Task: Parameterization tool for standard closed-loop controls Requirements: STEP 7, V5.3 SP2 or higher Type of delivery: With electronic manual/Getting Started English, German; incl. authorization diskette		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC ST, SIMATIC Software, SIMATIC TDC	
Floating license	6ES7 830-2AA22-0YX0		2525 222 27224 2752
Software Update Service (requires current software	6ES7 830-2AA00-0YX2	SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
version)		Current "Manual Collection" DVD	
Upgrade License from V5.x to V5.2	6ES7 830-2AA22-0YX4	and the three subsequent updates	
Standard function blocks for standard PID control, V5.2			
Task: Standard FBs for standard closed-loop controls Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400 Type of delivery: With electronic manual/Getting Started English, German			
Single license	6ES7 860-2AA21-0YX0		
Single license without software and documentation	6ES7 860-2AA21-0YX1		

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

Modular PID control

Overview



- For creating complex closed-loop control structures
- Preferred for implementation in closed-loop control equipment in mid-range and high-end applications and in process engineering
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Parameterization software	Modular PID control
Type of license	Single license
Software class	A
Current version	V 5.1
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7
Required software packages	STEP 7 V5.3 SP2 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB
Processor, at least	486
Windows swap area, approx.	20 MB (max. possible)

Standard function blocks	A_DEAD_B		CRP_IN		CPR_OUT	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
 FB length in the memory 	898 byte	692 byte	182 byte	70 byte	206 byte	96 byte
 DB length in the memory 	186 byte	44 byte	122 byte	20 byte	114 byte	14 byte
Runtimes in S7-300	0.13 to 0.17 ms		0.06 ms		0.18 to 0.22 ms	
Runtimes in S7-400	0.01 to 0.03 ms		0.01 to 0.02 m		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	DEAD_T		DEAD_BAND		DIF	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
 FB length in the memory 	532 byte	394 byte	232 byte	120 byte	410 byte	268 byte
 DB length in the memory 	142 byte	22 byte	114 byte	16 byte	158 byte	30 byte
Runtimes in S7-300	0.26 to 0.33 ms		0.16 to 0.21 ms		0.55 to 0.71 ms	
Runtimes in S7-400	0.02 to 0.06 m		0.01 to 0.03 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	ERR_MON		INTEG		LAG1ST	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
 FB length in the memory 	558 byte	360 byte	488 byte	314 byte	534 byte	368 byte
 DB length in the memory 	206 byte	52 byte	168 byte	36 byte	156 byte	30 byte
Runtimes in S7-300	0.27 to 0.35 ms		0.40 to 0.51 ms		0.52 to 0.67 ms	
Runtimes in S7-400	0.01 to 0.05 ms		0.02 to 0.07 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Software for SIMATIC controller Options for engineering and drive technology

Modular PID control

Technical specifications (continued)

Technical specific	cations (continued)					
Standard function blocks	LAG2ND		LIMALARM		LIMITER		
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory	
FB length in the memory	690 byte	516 byte	390 byte	240 byte	262 byte	140 byte	
DB length in the memory	190 byte	46 byte	152 byte	28 byte	124 byte	20 byte	
Runtimes in S7-300	0.88 to 1.14 ms		0.47 to 0.61 ms		0.14 to 0.17 ms		
Runtimes in S7-400	0.04 to 0.16 ms		0.02 to 0.07 ms		0.03 to 0.01 ms		
Target system	SIMATIC S7-300 (C S7-400, WinAC	PU 313 and higher),	SIMATIC S7-300 (C S7-400, WinAC	CPU 313 and higher),	SIMATIC S7-300 (C S7-400, WinAC	PU 313 and higher),	
Standard function blocks	LMNGEN_C		LMNGEN_S		NONLIN		
Storage space	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory	
FB length in the memory	1576 byte	1280 byte	2578 byte	2152 byte	826 byte	672 byte	
DB length in the memory	276 byte	80 byte	360 byte	110 byte	138 byte	18 byte	
Runtimes in S7-300	0.32 to 0.41 ms		1.16 to 1.47 ms		0.32 to 0.41 ms		
Runtimes in S7-400	0.02 to 0.06 ms		0.06 to 0.18 ms		0.02 to 0.07 ms		
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (C S7-400, WinAC	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	NORM		OVERRIDE		PARA_CTL		
Storage space	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory	
FB length in the memory	234 byte	122 byte	362 byte	214 byte	406 byte	232 byte	
DB length in the memory	130 byte	24 byte	146 byte	28 byte	234 byte	82 byte	
Runtimes in S7-300	0.33 to 0.43 ms		0.15 to 0.18 ms		0.12 to 0.15 ms		
Runtimes in S7-400	0.02 to 0.07 ms		0.01 to 0.04 ms		0.01 to 0.03 ms		
Target system	SIMATIC S7-300 (C S7-400, WinAC	PU 313 and higher),	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		
Standard function blocks	PID		PULSEGEN		RMP_SOAK		
Storage space	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory	
FB length in the memory	1560 byte	1242 byte	1110 byte	872 byte	1706 byte	1500 byte	
DB length in the memory	340 byte	98 byte	190 byte	34 byte	212 byte	62 byte	
Runtimes in S7-300	1.15 to 1.46 ms		0.17 to 0.20 ms		0.16 to 0.20 ms		
Runtimes in S7-400	0.06 to 0.18 ms		0.01 to 0.05 ms		0.01 to 0.04 ms		
Target system	SIMATIC S7-300 (C S7-400, WinAC	PU 313 and higher),	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (C S7-400, WinAC	PU 313 and higher),	
Standard function blocks	ROC_LIM		SCALE		SP_GEN		
Storage space	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory	
FB length in the memory	1242 byte	980 byte	136 byte	32 byte	658 byte	484 byte	
DB length in the memory	222 byte	50 byte	114 byte	16 byte	164 byte	40 byte	
Runtimes in S7-300	0.53 to 0.68 ms		0.10 to 0.13 ms		0.27 to 0.35 ms		
Runtimes in S7-400	0.02 to 0.09 ms		0.01 to 0.02 ms		0.02 to 0.06 ms		
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		

Software for SIMATIC controller Options for engineering and drive technology

Modular PID control

Technical specifications (continued)

Standard function blocks	SPLT_RAN		SWITCH		LP_SCHED	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
 FB length in the memory 	304 byte	180 byte	238 byte	116 byte	1104 byte	972 byte ¹⁾
DB length in the memory	138 byte	28 byte	118 byte	18 byte	234 byte	64 byte ¹⁾
Runtimes in S7-300	0.09 to 0.11 ms		0.07 to 0.09 ms		0.28 to 0.34 ms	
Runtimes in S7-400	0.01 to 0.02 ms		0.01 to 0.03 ms		0.03 to 0.08 ms	
Target system	SIMATIC S7-300 (C S7-400, WinAC	CPU 313 and higher),	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

¹⁾ With 5 control loops

Standard FBs in general	
Required libraries	Modular PID control FBs
Licensing forms	Simple license and 1 runtime license; 1 runtime license
Software class	A

Current version	V 5.1
Required software packages	STEP 7 V5.3 SP2 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB

Order No.

Ordering data	Order No.
Modular PID control commis- sioning tool, V5.1 for SIMATIC S7 and WinAC	
Task: Start-up tool for modular PID controllers Requirements: STEP 7, V5.3 SP2 or higher Type of delivery: With electronic manual, English, German; incl. authorization diskette	
Floating license	6ES7 830-1AA11-0YX0
Software Update Service (requires current software version)	6ES7 830-1AA00-0YX2
Upgrade License from V5.0 to V5.1	6ES7 830-1AA11-0YX4
Standard function blocks for modular PID control, V5.1	
Task: Standard FBs for modular PID controllers Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC Type of delivery: English, German; with electronic manual	
Single license	6ES7 860-1AA10-0YX0
Single license, without software and documentation	6ES7 860-1AA10-0YX1

SIMATIC manual collection	J	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		
SIMATIC manual collection update service for 1 year	D	6ES7 998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates		

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

PID Self-Tuner

Overview

- PID Self-Tuner: For expanding existing PID controllers to create self-tuning PI or PID controllers
- Optimization of PI or PID controllers with 3-step action (HEATING - OFF - COOLING)
- Convenient online initial setting and online adaptation during
- Ideally applicable to temperature controllers, but also suitable for level and flow controllers
- Can be used with SIMATIC S7-300 (CPU 313 or higher), SIMATIC S7-400 and WinAC; in combination with PID control (integrated in STEP 7), standard PID control, modular PID control, FM 355, FM 455 as well as with any PID algorithm

Technical specifications

Parameterization software	PID Self-Tuner					
Type of license	-					
Software class	i +					
Current version	-					
Target system	-					
Operating system	-					
Required software packages	-					
Main memory configuration in PG/PC	-					
Disk space required in PG/PC	-	-				
Standard FBs	-					
PID Self-Tuner	TUN_EC		TUN_ES			
Storage space requirements • FB length in the memory • DB length in the memory	Load memory approx. 6542 byte 644 byte	Work memory approx. 5956 byte 294 byte	Load memory 6332 byte 638 byte	Work memory 5714 byte 288 byte		
Runtimes • In S7-300 • In S7-400	1.0 ms to 1.5 ms ¹⁾ 0.06 ms to 0.19 ms ¹⁾					
Required libraries	PID Self-Tuner FBs V5.	PID Self-Tuner FBs V5.0				
Licensing forms	-					
Software class	А					
Current version	V5.0					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7-620					
Required software packages	STEP 7 V3.2 or higher					
Main memory configuration in PG/PC	-					
Disk space required in PG/PC	-					
1) - " - "						

¹⁾ Depending on the CPU selected

Ordering data Order No. Order No.

PID Self-Tuner V5.1

Online optimization for PID controller SIMATIC S7-300 (CPU 313 or higher), \$7-400, WinAC Standard function blocks, electronic manual and Getting Started (German/English);

and documentation

Single license Single license, without software 6ES7 860-4AA01-0YX0 6ES7 860-4AA01-0YX1

SIMATIC manual collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC bus components, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC Electronic manuals on DVD,

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent

6ES7 998-8XC01-8YE2

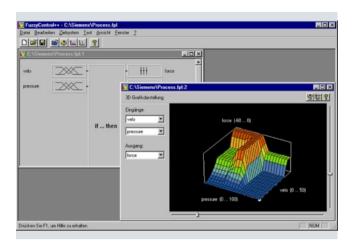
6ES7 998-8XC01-8YE0

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

Fuzzy Control

Overview



- For creating Fuzzy systems for SIMATIC S7 and SIMATIC WinCC
- For use at all levels of automation from the standalone controller through to plant optimization
- Can be combined with classical PID controllers to utilize the advantages of both systems for optimized closed-loop control

Technical data for configuration tool		
Parameterization software	Fuzzy Control++	
Type of license	Single license	
Software class		
Current version		
Target system	SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400	

Technical data for configuration tool		
Processor	PC or PG with 80486 processor (or higher)	
Main memory, min.	16 MB work memory (RAM)	
Hard disk, min.	5 MB free memory on the hard disk	
Operating system	Windows 95 or Windows NT 4.0	

	FUZZY_4K (FB 30)	FUZZY_20K (FB 31)	FUZZY WinCC
Target system	SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400	SIMATIC S7-400	SIMATIC WinCC
Communication PC/PG-S7	MPI bus, SOFTNET S7 for PROFIBUS	MPI bus, SOFTNET S7 for PROFIBUS	Not required
Runtimes	Depending on the number of rules, inputs and outputs: 13 up to 180 ms (S7-300), 1.8 up to 22 ms (S7-400)	Depending on the number of rules, inputs and outputs: 1.8 up to 150 ms (S7-400)	Not measurable
Memory requirements FB DB	1524 byte 4228 byte	1524 byte 20612 byte	Not measurable
Number of inputs	8 with max. 7 association functions each	8 with max. 7 association functions each	8 with max. 7 association functions each
Number of outputs	4 with max. 9 association functions each	4 with max. 9 association functions each	4 with max. 9 association functions each
Number of rules, max.	200	2000	2000
Required libraries	Fuzzy Control++ FBs		
Licensing forms	Single license		
Software class	A		
Current version	V 4.0		
Operating system	Windows 95/NT		
Required software packages			
Main memory configuration in PG/PC	16 MB on PG/PC		
Disk space required in PG/PC	5 MB		

Software for SIMATIC controller Options for engineering and drive technology

Fuzzy Control

Ordering Data	Order No.		Order No.
Fuzzy Control++ configuration tool		SIMATIC manual collection J Electronic manuals on DVD,	6ES7 998-8XC01-8YE0
Function blocks for S7-300/400 CPU 314 and higher incl. SmartObject for SIMATIC WinCC, manual; single license		multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI,	
Basic license	2XV9 450-1WC10-0AA1	SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation,	
Copy license	2XV9450-1WC11-4XA0	SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
		SIMATIC manual collection Dupdate service for 1 year	6ES7 998-8XC01-8YE2
		Current "Manual Collection" DVD and the three subsequent updates	

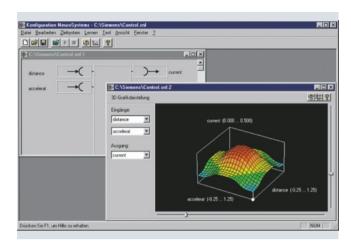
D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

NeuroSystems

Overview



- For creating and teaching of neuronal networks
- For use with problems whose structure and solution are only partially known
- Applications:
 - Data-based optimization
- Identification of characteristics or processes
- Filtering of data
- Data evaluation and interpretation
- Non-linear single and multiple-variable closed-loop control
- Pattern recognition and diagnostics

Technical data for configuration tool		
Parameterization software	Neuro systems	
Type of license	Single license	
Software class		
Current version		
Target system	SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400	

Technical data for configuration tool		
Processor	PC or PG with 80486 processor (or higher)	
Main memory, min.	16 MB work memory (RAM)	
Hard disk, min.	5 MB free memory on the hard disk	
Operating system	Windows 95 or Windows NT 4.0	

	NEURO_4K (FB 100)	NEURO_20K (FB 101)	NEURO_WinCC
Target system	SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400	SIMATIC S7-400	SIMATIC WinCC
Communication PC/PG-S7	MPI bus, SOFTNET S7 for PROFIBUS	MPI bus, SOFTNET S7 for PROFIBUS	Not required
Runtimes	Depending on the number of inputs, outputs and neurons: 6.5 up to 270 ms (S7-300) 3.3 up to 140 ms (S7-400)	Depending on the number of inputs, outputs and neurons: 3.3 up to 260 ms (S7-400)	Not measurable
Memory requirements FB DB	2246 byte 4278 byte	2210 byte 20612 byte	Not measurable
Number of inputs, max.	4	100	10
Number of outputs, max.	4	10	10
Line supply types	MLP, RBF, neuro-fuzzy	MLP, RBF, neuro-fuzzy	MLP, RBF, neuro-fuzzy
Required libraries	Neuro systems FBs		
Licensing forms	Single license		
Software class			
Current version			
Operating system	Windows 95/NT		
Required software packages			
Main memory configuration in PG/PC	16 MB on PG/PC		
Disk space required in PG/PC	5 MB		

Software for SIMATIC controller Options for engineering and drive technology

NeuroSystems

Ordering data	Order No.		Order No.
NeuroSystems configuration tool Function blocks for S7-300/400 CPU 314 and higher incl. SmartObject for SIMATIC single license Basic license	J 2XV9 450-1WC15-0AA0	Electronic manuals on DVD, multilingual: LOGOI, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET,	Order No. 6ES7 998-8XC01-8YE0
Copy license	J 2XV9 450-1WC16-4XA0	SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC SIMATIC manual collection	6ES7 998-8XC01-8YE2
		update service for 1 year	0E37 330-0X001-01E2
		Current "Manual Collection" DVD and the three subsequent updates	

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

S7-Technology

Overview

- Option package for creating motion control tasks for CPU 31xT-2 DP and CPU 317TF-2 DP
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Programming in the standard SIMATIC programming languages LAD, FBD and STL
- Additional Engineering Tools such as S7-SCL or S7-GRAPH can be used

Ordering data Order No.

S7-Technology V4.2

Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT-2 DP and the SIMATIC S7 CPU 317TF-2 DP

STEP 7 V5.4 SP5 or higher

Type of delivery: on DVD; incl. documentation for CPU 31xT-2 DP, CPU 317TF-2 DP (included on DVD)

Floating license

Upgrade to V4.2

6ES7 864-1CC42-0YA5 6ES7 864-1CC42-0YE5

Options for engineering and drive technology

Easy Motion Control

Overview

- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard drive with alterable speed, such as, for example, frequency inverter, servo drive
- For incremental and absolute encoders

Technical specifications

Supported hardware:

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- C7.
- WinAC.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.

- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE sensor with PROFIBUS DP.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U.
- SM 332.
- SM 432.
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

• MM4

Storage space requirements

Required main storage in byte			
Block	Required main storage per block	Additional main storage required per instance	
MC_Init	1086	-	
MC_MoveAbsolute	3924	112	
MC_MoveRelative	2982	110	
MC_MoveJog	3110	110	
MC_Home	2886	104	
MC_StopMotion	1114	70	
MC_Control	1756	58	
MC_Simulation	410	64	
MC_GearIn	3476	128	
Input driver	1416 2654	76 128	
Output driver	384 1242	52 68	
Axis data block	-	294	

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Options for engineering and drive technology

Easy Motion Control

Technical specifications (continued)

Runtime load

Typical runtimes of the blocks in	μs			
Block	CPU 416-2 DP 6ES7 416-2XK02-0AB0	CPU 314C 6ES7 314-6CF00-0AB0	CPU 315-2 DP 6ES7 315-2AF03-0AB0	WinLC RTX 3.1 on AMD, 1333 MHz
MC_Init	53	967	2203	21
MC_MoveAbsolute 1)	67	908	2138	18
MC_MoveRelative 1)	67	911	2143	18
MC_MoveJog 1)	48	605	1387	15
MC_Home 1)	49	592	1332	15
MC_StopMotion 1)	23	309	696	8
MC_Control	27	343	819	11
MC_Simulation	23	259	584	6
MC_GearIn	66	931	2130	21
Input driver	50	662	1323	44
Output driver	20	223	413	31

The highlighted travel blocks require more runtime once at the start of a trip. More information can be found in the manual.

Ordering data

Order No.

Easy Motion Control V2.1

Task:

Controlled positioning with standard drives with variable speed

Requirements: STEP 7 V5.3 SP2 Type of delivery: incl. documentation (German, English),

Single license

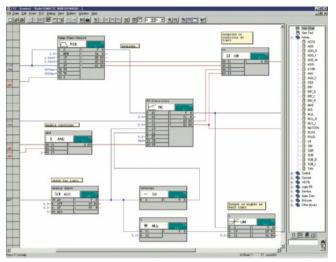
Single license, without software and documentation

6ES7 864-0AC01-0YX0 6ES7 864-0AF01-0YX0

Options for engineering and drive technology

D7-SYS

Overview



- Add-on for STEP 7/CFC/SFC for configuration of control and automation tasks with T400, FM 458, SIMADYN D or SIMATIC TDC
- Contains function blocks for every application
- Scope of delivery: Software packages D7-SYS, CFC, SFC,
- Optional: D7-FB-Gen, function block generator for the creation of customized function blocks

Ordering data Order No.

SIMATIC D7-SYS V7.1

Function block library for configuring closed-loop control and automation tasks

SIMATIC S7-400/FM 458/ SIMATIC TDC/T400/SIMADYN

Windows 2000/XP

on CD, German, English, with electronic documentation

Floating license

Upgrade License V5.x and higher

Software Update Service

SIMATIC D7 FB Gen V2.1

Function block generator **SIMATIC** manual collection

Electronic manuals on DVD multilingual: LOGO!, SIMADYN,

multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

SIMATIC manual collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7 998-8XC01-8YE2

6ES7 852-0CC02-0YA5

6ES7 852-0CC02-0YE5

6ES7 852-0CC01-0YL5

6ES7 998-8XC01-8YE0

6DD1 805-5DA0

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

Options for engineering and drive technology

Drive ES engineering software

Overview

SIMATIC Programs Configuration / Commissioning Drive ES PCS 7 Drive ES Basic Drive ES SIMATIC

Drive ES is the engineering system used to integrate Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively in terms of communication, configuration and data management.

It is based on the user interface of the STEP 7 Manager, the essential element when it comes to engineering.

Various software packages are available for selection.

- Drive ES Basic For entry into the world of Totally Integrated Automation and the capability of routing beyond network boundaries and the use of the SIMATIC teleservice.
- Drive ES SIMATIC to simply parameterize the STEP 7 communication program instead of programming.
- Drive ES PCS 7 integrates drives with PROFIBUS interface into the SIMATIC PCS 7 process control system.

Ordering data

Order No.

Drive ES Basic V5.5 SPx *)

Configuration software for the integration of drives into Totally Integrated Automation

Requirements: STEP 7, V5.3 and higher, SP3

Type of delivery: on CD-ROM Ger., Eng., Fr., Sp., It. with electronic documentation

- · Floating license, 1 user
- Floating license (copy license), 60 users
- Update service for single-user license
- Update service for copy license,
- Upgrade from V5.x to V5.5 SPx *)

6SW1 700-5JA00-5AA0 6SW1 700-5JA00-5AA1

6SW1 700-0JA00-0AB2

6SW1 700-0JA00-1AB2

6SW1 700-5JA00-5AA4

Ordering data

Order No.

Drive ES SIMATIC V5.5 SPx *)

Function block library for SIMATIC for the parameterization of communication with the drives

Requirements: STEP 7, V5.3 and higher, SP3

Type of delivery: on CD-ROM Ger., Eng., Fr., Sp., It. with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data
- Upgrade from V5.x to V5.5 SPx *)

6SW1 700-5JC00-5AA0

6SW1 700-5JC00-1AC0

6SW1 700-5JC00-5AA4

Drive ES PCS 7 V6.1 SPx *)

Block library for PCS 7 for the integration of drives

Requirements: PCS 7, V6.1 and higher

Type of delivery: on CD-ROM Ger., Eng., Fr., Sp., It.

- with electronic documentation • Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user

6SW1 700-6JD00-1AA0

6SW1 700-5JD00-1AC0

6SW1 700-0JD00-0AB2

Drive ES PCS 7 V7.0 SPx *)

Block library for PCS 7 for the integration of drives

Requirements: PCS 7, V7.0 and

Type of delivery: on CD-ROM Ger., Eng., Fr., Sp., It. with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user
- license Upgrade from V5.x to V7.0 SPx *)

6SW1 700-7JD00-0AA0

6SW1 700-5JD00-1AC0

6SW1 700-0JD00-0AB2

6SW1 700-7JD00-0AA4

Drive ES PCS 7 V7.1 SPx *)

Block library for PCS 7 for the integration of drives

Requirements: PCS 7, V7.1 and higher

Type of delivery: on CD-ROM Ger., Eng., Fr., Sp., It. with electronic documentation

- Single-user license incl. 1x runtime license
- Runtime license (without data
- Update service for single-user license
- Upgrade from V6.x to V7.1 SPx *)

6SW1 700-7JD00-1AA0

6SW1 700-5JD00-1AC0

6SW1 700-0JD00-0AB2

6SW1 700-7JD00-1AA4

Further information is available on the Internet under:

www.siemens.com/drivesolutions

^{*)} Orders are always automatically supplied with the latest SP.

Software for joint tasks in the documentation sector

Technical product data for CAx applications

Overview

The DVD "Technical Product Data for CAx Applications – Industrial Automation System" contains technical product data for approx. 1,400 products from the following product families:

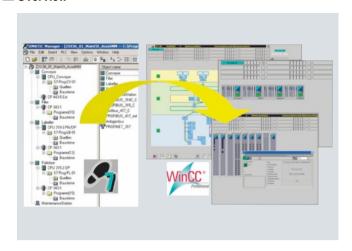
- S7-300 / S7-400
- C7
- Bus components
- ET 200M / S / iS / iSP / X / eco / ecoPN / pro / L
- Communication / Networks

Ordering data	Order No.
Technical product data for CAx applications	
Task: Product data for use in CAD/CAE applications	
One Off License	6ES7 991-0CD01-0YX0

Software for joint tasks in the maintenance sector

SIMATIC Maintenance Station

Overview



System-integrated plant asset management system

- Automatic generation of a maintenance view in WinCC from the STEP 7 hardware configuration
- Plant-wide visualization of all automation components from the management level to the field level in ready linked, hierarchically arranged WinCC displays
- Mapping of central and distributed SIMATIC S7 components, PROFIBUS and PROFINET networks as well as associated bus nodes
- Ethernet network components and industrial PCs can be integrated through SIMATIC NET SNMP OPC Server
- Display of device status with group status generation in overview and detail displays
- The device statuses "Maintenance required" and "Maintenance request" are supported for status-based maintenance
- Provision of uniform faceplates showing detailed information for all components displayed
- Display of the device identification data (electronic rating plate)
- Integrated display of the status of the request

Technical specifications

Hardware requirements

System	Clock frequency	Main memory	Free hard disk space
Engineering station	2.8 GHz	1 GB	15 GB
Maintenance Station Stand-alone / WinCC-Station "Single-user Workstation"	2.8 GHz	1 GB	15 GB
Maintenance Station Server / WinCC Server	2.8 GHz	1 GB	15 GB
Maintenance Station Client / WinCC Client	2.8 GHz	512 MB	3 GB

Software requirements

System	Operating system
Engineering station "ES"	Windows XP Professional SP2 Windows Server 2003 SP1
Maintenance Station Stand-alone / WinCC-Station "Single-user Workstation"	Windows XP Professional SP2 Windows Server 2003 SP1
ES with Maintenance Station Stand-alone	Windows XP Professional SP2 Windows Server 2003 SP1
Maintenance Station Server / WinCC Server	Windows Server 2003 SP1
Maintenance Station Client / WinCC Client	Windows XP Professional SP2 Windows Server 2003 SP1

Software for joint tasks in the maintenance sector

SIMATIC Maintenance Station

Technical specifications (continued)

Requirements for the integration of devices

Туре	Integration	Comment
SIMATIC S7 controllers / I/O		
• S7-300 ¹⁾	Yes	
• S7-400	Yes	
• WinAC	Yes	
Distributed devices		
• ET 200	Yes	PROFIBUS DP and PROFINET IO according to STEP 7 hardware catalog
 PROFIBUS standard slaves 	Yes	Integration using a GSD file
 PROFINET standard devices 	Yes	Integration using a GSD file
Network components		
Ethernet network components	Yes	SIMATIC NET SNMP OPC Server and MIB also required
PROFINET network components	Yes	
PROFIBUS diagnostic repeater	Yes	
Personal computer		
PC/Industrial PC	Yes	SIMATIC NET SNMP OPC Server also required
Drives		
Drives with PROFIBUS connection	Yes	For integrating devices designed to the PROFIDRIVE profile, Drive ES SIMATIC (V5.4 SP1 or higher) is required
Drives with PROFINET connection	Yes	For integrating devices designed to the PROFIDRIVE profile, Drive ES SIMATIC (V5.4 SP1 or higher) is required
Accessory devices		
Devices not configured in STEP 7 Hardware Config	Yes	Integrated via function block (asset proxy)

¹⁾ With S7-300, PROFIBUS/PROFINET systems are supported if they are connected to the internal CPU interfaces

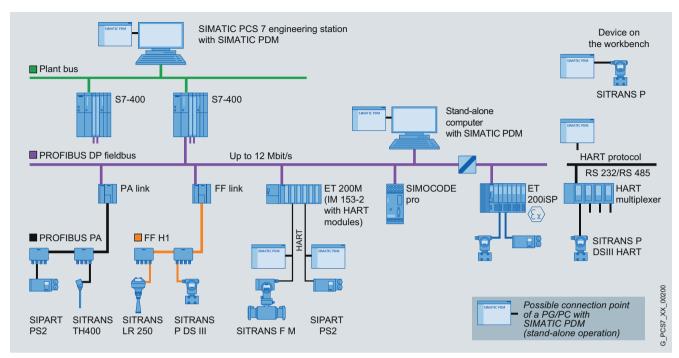
Ordering data	Order No.		Order No.	
SIMATIC Maintenance Station 2007		SIMATIC Maintenance Station 2009		
Software for implementation of a plant-oriented asset management system		Can be used with STEP 7 V5.4 or higher and WinCC V7 Basic package D	6ES7 840-0WD01-0YA0	
Can be used with STEP 7 V5.4 or higher and WinCC V6.2		with engineering software (Floating License) and Runtime License for 100 devices		
 Basic package with engineering software (Floating License) and Runtime License for 100 devices 	6ES7 840-0WD00-0YA0	Powerpack 100 Runtime License for 100 additional devices	6ES7 840-0WD11-0YD0	
Powerpack 100 Runtime License for 100 additional devices	6ES7 840-0WD10-0YD0	Powerpack 500 Runtime License for 500 additional devices	6ES7 840-0WD21-0YD0	
Powerpack 500 Runtime License for 500 additional devices	6ES7 840-0WD20-0YD0	Powerpack 1000 Runtime License for 1000 additional devices	6ES7 840-0WD31-0YD0	
Powerpack 1000	6ES7 840-0WD30-0YD0	Basic demo package 2009	6ES7 840-0WD01-0YA7	
Runtime License for 1000 additional devices		Upgrade from D SIMATIC Maintenance Station	6ES7 840-0WD01-0YE0	
Basic demo package 2007 []	6ES7 840-0WD00-0YA7	2007 to SIMATIC Maintenance Station 2009		

D: Subject to export regulations AL: N and ECCN: 5D992

Software for joint tasks in the maintenance sector

SIMATIC PDM process device manager

Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendorindependent tool for the configuration, parameterization, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

Using *one* software, SIMATIC PDM enables the processing of more than 2000 devices from Siemens and over 200 vendors worldwide on *one* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open device manager available in the world. Devices which previously were not supported can be easily integrated in SIMATIC PDM at any time by importing their device descriptions (EDD). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform presentation and operation of devices
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Graded user privileges including password protection

When used in SIMATIC PCS 7, SIMATIC PDM is integrated in the asset management of the process control system. You can change directly to the SIMATIC PDM views from the diagnostics faceplates in the Maintenance Station.

The Process Device Manager provides more detailed information for all devices described by means of an Electronic Device Description (EDD), e.g.:

- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Information on changes (audit trail report)
- · Parameter information

Software for joint tasks in the maintenance sector

SIMATIC PDM process device manager

Technical specifications

	SIMATIC PDM V6.0	SIMATIC PDM V7.0
Hardware	 PG/PC/notebook with processor corre- sponding to operating system requirements 	PG/PC/notebook with processor corresponding to operating system requirements
Operating systems (alternative)	 Microsoft Windows 2000 Professional SP3/SP4 Microsoft Windows XP Professional SP2/SP3 Microsoft Windows Server 2003 SP2 (only for operation on a SIMATIC PCS 7 Engineering Station) 	 Microsoft Windows XP Professional SP3 with Internet Explorer 7 Microsoft Windows Server 2003 SP2/R2 with Internet Explorer 7
Integration in STEP 7 / PCS 7	 STEP 7 V5.2 + SP1 STEP 7 V5.3 + SP3 STEP 7 V5.4 + SP3/SP4/SP5 SIMATIC PCS 7 V6.1 + SP2/SP3/SP4 SIMATIC PCS 7 V7.0 + SP1/SP2/SP3 SIMATIC PCS 7 V7.1/V7.1 + SP1/SP2 	• SIMATIC PCS 7 V7.1 + SP2

Ordering data Order No. Order No.

Selection and ordering data for TIA applications

0	
Product packages	
Minimum configuration	
SIMATIC PDM Single Point V6.0 for operation and parameter-ization of one field device; communication via PROFIBUS DP/PA or HART modem, including 1 TAG	6ES7 658-3HX06-0YA5
cannot be expanded with respect to functions or with TAG option/ PowerPack	
6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user	
Type of delivery: License key disk, certificate of license including terms and conditions; software SIMATIC PDM V6.0 and device library on CD/DVD	
Basic configuration for individual product packages	
Product package for operation and parameterization of field devices and components, communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS) and Modbus, including 4 TAGs	
6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP professional	
Type of delivery: License key disk, certificate of license including terms and conditions; software SIMATIC PDM V6.0 and device library on CD/DVD	
Floating license for 1 userRental license for 50 hours	6ES7 658-3AX06-0YA5 6ES7 658-3AX06-0YA6

Application-specific configurations	
SIMATIC PDM Service V6.0 Product package for stand-alone users for servicing, with • SIMATIC PDM Basic V6.0 • 128 TAGs	6ES7 658-3JX06-0YA5
6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user	
Type of delivery: License key disk, certificate of license including terms and conditions; software SIMATIC PDM V6.0 and device library on CD/DVD	
SIMATIC PDM S7 V6.0 Product package for use in a SIMATIC S7 configuration environment, with • SIMATIC PDM Basic V6.0 • Integration in STEP 7 / PCS 7 • 128 TAGs 6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user Type of delivery: License key disk, certificate of license including terms and conditions; software SIMATIC PDM V6.0 and device library on CD/DVD	6ES7 658-3KX06-0YA5

Software for joint tasks in the maintenance sector

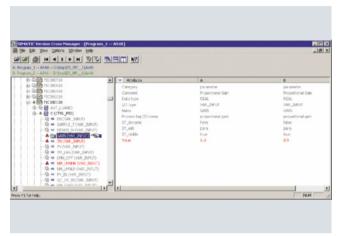
SIMATIC PDM process device manager

Ordering data	Order No.		Order No.
Optional product components for SIMATIC PDM V6.0		TAG options/PowerPacks for SIMATIC PDM V6.0	
Integration in STEP 7 / SIMATIC PCS 7 only required for integration of	6ES7 658-3BX06-2YB5	SIMATIC PDM TAG option for TAG expansion, additive to SIMATIC PDM Basic V6.0	
SIMATIC PDM into HW Config 6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user		6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user	
Type of delivery: License key disk, certificate of license including terms and conditions		Type of delivery: License key disk, certificate of license including terms and conditions Up to 128 TAGs	CECT CEO OVAGE OVE
Routing via S7-400	6ES7 658-3CX06-2YB5	• Up to 512 TAGs	6ES7 658-3XA06-2YB5
6 languages (German, English,		• Up to 1 024 TAGs	6ES7 658-3XB06-2YB5
French, Italian, Spanish, Chinese), software class A, executes with		• Up to 2 048 TAGs	6ES7 658-3XC06-2YB5 6ES7 658-3XD06-2YB5
Windows 2000 Professional or Windows XP Professional, floating license for 1 user Type of delivery: License key disk, certificate of license including terms and conditions		SIMATIC PDM PowerPack for TAG expansion, for any SIMATIC PDM V6.0 product packages 6 languages (German, English, French, Italian, Spanish, Chinese), software class A,	
Communication via standard HART multiplexer 6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP Professional.	6ES7 658-3EX06-2YB5	executes with Windows 2000 Professional or Windows XP Professional, floating license for 1 user Type of delivery: License key disk, certificate of license including terms and	
floating license for 1 user		conditions • From 128 TAGs to 512 TAGs	CEOZ CEO OVECE OVEC
Type of delivery:		• From 512 TAGs to 1 024 TAGs	6ES7 658-3XB06-2YD5
License key disk, certificate of license including terms and		• From 1 024 TAGs to 2 048 TAGs	6ES7 658-3XC06-2YD5
conditions		From 2 048 TAGs to unlimited number of TAGs	6ES7 658-3XD06-2YD5 6ES7 658-3XH06-2YD5
		Demonstration software	
		SIMATIC PDM Demo V6.0 without online communication and storage functionality	6ES7 658-3GX06-0YC8
		6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional or Windows XP professional	
		Type of delivery: SIMATIC PDM V6.0 software and device library on CD/DVD	

Software for joint tasks in the administration sector

Version cross manager

Overview



The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multi-projects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, technological hierarchy, CFC/SFC charts, SFC details, block types, alarms, global variables, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- · Color-coded identification of the differences

Ordering data

Order No.

SIMATIC Version Cross Manager V7.1

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional SP4, Windows XP Professional SP3, Windows Server 2003 R2 SP2, Windows Vista SP2 32 bit, Windows 7 32 bit; floating license for 1 user Type of delivery: License key memory stick, certificate of license including

terms and conditions as well as TIA Engineering Toolset CDs V7.1

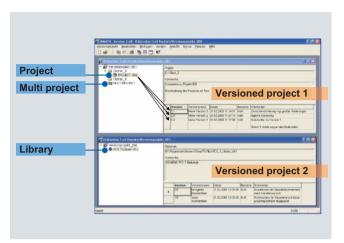
6ES7 658-1CX17-2YA5

11/54

Software for joint tasks in the administration sector

Version Trail

Overview



SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multiprojects.

Ordering data

SIMATIC Version Trail V7.1

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, executes with Windows 2000 Professional SP4, Windows XP Professional SP3, Windows Server 2003 R2 SP2, Windows Vista SP2 32 bit, Windows 7 32 bit; floating license for 1 user

Type of delivery: License key memory stick, certificate of license including terms and conditions as well as TIA Engineering Toolset CDs V7.1

Order No.

6ES7 658-1FX17-2YA5

Software for joint tasks in the administration sector

ADDM data management

Overview



With ADDM, you are completely in control of the SIMATIC and SINUMERIK controls – around the clock and with any program version. This tool is indispensable in a modern production area and ensures user-friendly backup, comparison and management of control data.

Ordering data	Order No.
ADDM	
Software package	
Languages: English, German	
ADDM Single User	
For PC/PG with Windows XP	
Single license with CD-ROM of current software version	6BQ3 030-1AA30-3AD0
Trial license with CD-ROM	6BQ3 030-1AA70-3AD0
of current software version	
Single user upgrade	6BQ3 030-1AB13-3AD0
ADDM Client	
For PC/PG with Windows XP	
Single license without data carrier	6BQ3 030-1AA20-1AC0
Single license with CD-ROM	6BQ3 030-1AA10-0AD0
of current software version	
 Client upgrade from V5.x to V6.2 with CD-ROM 	6BQ3 030-1AB11-3AD0
ADDM Server	
For server PC with Windows XP	
and Windows 2003 Server	CDO2 200 4 A A C
Single license with CD-ROM of current software version	6BQ3 030-1AA00-3AD0
Server upgrade from V5.x to	6BQ3 030-1AB10-3AD0
V6.2 with CD-ROM	
ADDM Agent For SINUMERIK PCU with	
HMI-Advanced	
• Single license D	6BQ3 030-1AA00-1AB0
without data carrier • Single license with CD-ROM	6BQ3 030-4AA00-0AD0
of current software version	ODGO OSU-4AAUU-UADU
 Agent upgrade from V1.x to V1.3 with CD-ROM 	6BQ3 030-1AB12-3AD0

D: Subject to export regulations AL: N and ECCN: 5D992

Additional software

KNX/EIB2S7

Overview



- Software for SIMATIC S7 communication with components of a building automation unit
- For use of industry automation components in building automation
- Allows the integration of actuators/sensors on a KNX/EIB bus in automation solutions with SIMATIC S7
- For the use of information from building automation for the automation of a production plant

Ordering data

Order No.

KNX/EIB2S7 program package J

lask

Software for connecting KNX/EIB building technology components to SIMATIC S7;

Type of delivery

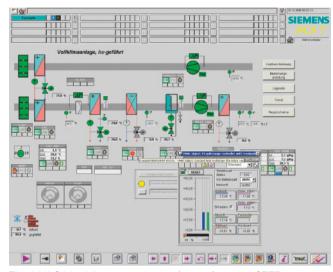
Editor, function blocks for SIMATIC S7, samples, documentation on C; license for editor on USB flash memory 6AV6 643-7AC10-0AA1

J: Subject to export regulations AL: N and ECCN: EAR99S

Additional software

HVAC Lite Library runtime software

Overview



The HVAC Lite Library runtime software features STEP 7 functions for all aspects of building automation, in particular for heating, ventilation, air conditioning and sanitary facilities as well as for the supply and distribution of media.

HVAC Lite Library provides users with the following features:

- Future-oriented thanks to constant updates and expansions
- Modifications in line with new SIMATIC components
- Use of all SIMATIC signal modules (input/output modules)
- Use of the new SIMATIC S7-300 central processing units with Micro Memory Card (CPU 313 or higher)
- Openness thanks to standardized and documented interfaces
- Expansion capability and flexibility thanks to bit-modular block concept
- Safety thanks to tested quality-assured software blocks
- Standardized software structure for easy expansion and modification
- Engineering guideline to support structured software generation
- · Predefined safety and operating philosophy
- Documented block functionality
- · Protection of user engineering through runtime license

Additional information is available in the Internet under:

www.siemens.com/industrial-hvac

Technical specifications

	HVAC Lite Library
Basic hardware	
SIMATIC S7	S7-300
Central processing units CPUs	CPU 313317 (with MMC card and flag memory area 0255)
Signal modules	All
Communication modules	PROFIBUS, Ethernet, AS-Interface
Functionality	
Input/output functions	Yes
Open-loop and closed-loop control functions	Yes
Optimization functions	Time switching
Operator control and monitoring	
SIMATIC HMI	Yes
Via S7 functions • WinCC	Yes
SCADA systems	Yes
 Operator control and monitoring via S7 OPC server 	Yes
Communication	
PROFIBUS DP as master	Yes
AS-Interface as master	Yes
PROFIBUS DP as slave	Yes
SR via Ethernet FDL via PROFIBUS	(optional instead of operator control and monitoring)
S7 functions via MPI, PROFIBUS, Ethernet	Yes
Engineering	
Automation software	STEP 7 STL (LAD/CSF)
HMI software	SIMATIC ProTool/WinCC flexible/ WinCC

Ordering data

HVAC Lite Library

STEP 7 functions for building automation, e.g. for heating, ventilation, air-conditioning and sanitation systems

- Runtime license for 1 SIMATIC-CPU; max 40 data points
- Runtime license for 1 SIMATIC-CPU; max 125 data points
- Runtime license for 1 SIMATIC-CPU; unlimited data points
- Powerpack for 1 SIMATIC-CPU; 40 to 125 data points
- Powerpack for 1 SIMATIC-CPU; 125 to unlimited data points
- Powerpack for 1 SIMATIC-CPU; 40 to unlimited data points

Order No.

6FL4 214-4ND40-0AB0

6FL4 214-4ND41-0AB0

6FL4 214-4ND42-0AB0

6FL4 214-4ND43-0AD0

6FL4 214-4ND44-0AD0

6FL4 214-4ND45-0AD0

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12/2 12/2	Programming devices Field PG M3
12/6	Accessories
12/6	External prommer
12/7	Communication software
12/7	SOFTNET for PROFIBUS
12/9	SOFTNET for Industrial Ethernet
12/11	SOFTNET PN IO
12/13	OPC server for Industrial Ethernet
12/15	SNMP OPC server

Brochures

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

Siemens ST 70 · 2011

SIMATIC programming devices

Programming devices

Field PG M3

Overview



- The mobile, industry-compatible programming device with powerful Intel Core i processor technology.
- Optimal for commissioning, service and maintenance of automation systems.
- Industrial notebook with wireless technology, large 15.6" widescreen display, long battery service life, high-speed RAM, and integral data backup concept.
- With all commonly used interfaces for industrial applications.

Technical specifications

	SIMATIC Field PG M3
General features	
Design	Notebook
Processor	 Intel P4500 Processor (1.86 GHz, 2 MB Cache) Intel CORE i5-520M processor (2.40 GHz, 3 MB cache)
RAM	Expandable up to 8 GB DDR3 SODIMM
Free slots for expansions	1 x PC Card (Type I, Type II)1 x Express Card (34 and 54 mm
Graphics	Intel HD Graphics with Dual View (e.g. desktop across 2 screens)
Display	15.6" widescreen display, 16:9 format • 1366 x 768 (HD ready) • 1920 x 1080 (full HD)
Speakers	Built-in stereo speakers
Pointing device	Touchpad with 2 mouse buttons
Operating system	Windows XP Prof. SP3 Engl. MUI (Eng, Ger, Fr, Sp, It; additional languages can be installed later)
Power supply	Wide-range power supply unit 100-240 V AC, 50-60 Hz, high-power lithium-ion battery 71 Wh (running time up to 3 hours)
Warranty conditions	24 months for hardware components (6 months for battery ¹)
Drives	
Hard disk	2.5" serial ATA with 250 GB or 500 GB; easily replaceable
Optical drive	Multistandard DVD+-R/+-RW

	SIMATIC Field PG M3
Interfaces	
PROFIBUS DP/MPI	CP 5611-compatible, 9.6 Kbit/s to 12 Mbit/s, 9-pin sub D socket
COM 1	V.24/TTY (for SIMATIC S5; TTY as optional version); over supplied adapter on 9-pin sub-D male connector
SIMATIC Memory Card	Programming interface for SIMATIC Memory Card and S5 memory module (S5 EPROM module as optional equipment version)
SIMATIC Micro Memory Card	Interface for SIMATIC Micro Memory Card
Media Card Reader	Interface for SMC (SIMATIC Memory Card) SD/SHC xD-Picture Card MS Pro
Ethernet	2 x Gigabit Ethernet (RJ45)
USB 2.0	5 interfaces for high-speed universal serial bus. Max. 2 high current (500 mA); for each interface block, only 1 interface can be used for high current
PC Card (PCMCIA)/ Express Card/54	1 x PC Card (Type I, Type II)1 x Express Card (34 and 54 mm)
DVI-I	1 interface for external monitor (VGA monitors can be operated with a DVI/VGA adapter)
WLAN ²⁾	Integrated IEEE802.11 a, b, g, n
Modem	Analog, V.92 compatible
Headphones/microphone	Connection in each case for 3.5 mm stereo jack

¹⁾ The capacity of the battery decreases for technological reasons with each charging/discharging operation and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore in the course of time. In normal use the battery can be charged and discharged over a period of six months from when the field PG is purchased.

Capacity loss is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

²⁾ Integral WLAN with antennas specially designed for the Field PG M3. The integral wireless LAN is approved for operation in Europe (CE), USA (FCC), Canada (IC) and China (CCC). For operation outside these countries, the relevant national regulations must be observed.

SIMATIC programming devices Programming devices

Field PG M3

Technical specifications (continued)

	SIMATIC Field PG M3		
Ambient conditions			
Degree of protection in accordance with IEC 60529	Front IP30 when covers closed		
Vibrations	Tested in accordance with IEC 60068-2-6		
Operation	10 to 58 Hz: Amplitude 0.0375 mm, 58 to 500 Hz: Acceleration 4.9 m/s ²		
Transport	5 to 9 Hz: Amplitude 3.5 mm; 9 to 500 Hz: Acceleration 9.8 m/s ²		
Resistance to shock	Tested in accordance with IEC 60068-2-27, IEC 60068-2-29		
Operation	Half-sine 50 m/s ² , 30 ms, 100 shocks		
Storage/transport	Half-sine 250 m/s ² , 6 ms, 1000 shocks		
Electromagnetic compatibility (EMC)			
Radiated interference	EN 61000-6-3:2007, EN 61000-3-2 Class D and EN 61000-3-3		
 Immunity to conducted inter- ference on the supply lines 	± 2 kV; (according to IEC 61000-4-4; burst) ± 1 kV; (according to IEC 61000-4-5; surge sym./line to line) ± 2 kV; (according to IEC 61000-4-5; surge sym./line to ground)		
Noise immunity on signal lines	± 1 kV; (according to IEC 61000-4-4; burst; length < 30 m) ± 2 kV; (according to IEC 61000-4-4; burst; length > 30 m) ± 2 kV; (according to IEC 61000-4-5; surge sym./line to ground; length > 30 m)		
• Immunity to static discharge	± 4 kV discharge on contact (in accordance with IEC 61000-4-2: ESD) ± 8 kV discharge to air (in accordance with IEC 61000-4-2: ESD)		
Immunity to high radio frequency interference	10 V (with modem operation max. 3 V), with 80% amplitude modulation with 1 kHz, 10 kHz 80 MHz (in accordance with IEC 61000-4-6) 10 V/m (with modem operation max. 3 V/m), with 80% amplitude modulation with 1 kHz, 80 MHz 1000 MHz and 1.4 GHz 2 GHz (in accordance with IEC 61000-4-3) 1 V/m, with 80% amplitude modulation with 1 kHz, 2.0 GHz 2.7 GHz 1 V/m (in accordance with IEC 61000-4-3)		
Immunity to magnetic fields	100 A/m; 50/60 Hz (in accordance with IEC 61000-4-8)		

	SIMATIC Field PG M3
Temperature Operation ³⁾ Storage/transport	Tested in accordance with IEC 60068-2-1, IEC 60068-2-2 + 5 °C + 40 °C max. 10°C/h (no condensation) - 20 °C + 60 °C max. 20°C/h (no condensation)
Relative humidity Operation Storage/transport	Tested according to IEC 60068-2-78, IEC 60068-2-30, IEC 60068-2-14 5 % 80% at 25°C/h (no condensation) 5 % 95% at 25°C/h (no condensation)
Safety	
Safety class	Safety class II according to IEC 61140
Safety regulations	 According to VDE 0805 in conformance with IEC 60950-1:2006 IEC 60950-1:2006 IEC 60950-1:2005 with change EN 60950-1:2006/A11:2009 EN 60950-1:2006/A11:2009 EN 60950-1 (VDE 0805-1):2006-11 with change EN 60950-1/A11 (VDE0805-1/A11):2009-11 UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1-07 Second Edition
Dimensions and weights	
Dimensions (W x H x D) in mm	385 x 53 x 275
Weight, approx.	Without battery approx. 3 kg With battery approx. 3.4 kg

 $^{^{3)}\,}$ Battery charging and CD/DVD writing is only possible at temperatures up to 35 $^{\circ}\text{C}\,$

SIMATIC programming devices Programming devices

Field PG M3

Ordering Data	Order No.				Order No.
Field PG M3 programming device			Field PG M3 programming device		
Field PG M3 standard: D	6ES7 715-0AA ■ ■ - 0	1	Field PG M3 Standard	D	6ES7 715-0AA ■ ■ -0 ■ ■ 1
Intel P4500 processor, 1.86 GHz, DL multistandard DVD RW drive.			Field PG M3 Premium	D	6ES7 715-1BB ■ ■ -0 ■ ■ 1
250 GB S-ATA hard disk,			Field PG M3 Premium /S5	D	6ES7 715-1CC ■ ■ -0 ■ ■ 1
1x 2 GB DDR3 RAM; no S5 interface/S5 PROMMER			Licenses for the SIMATIC		
Field PG M3 Premium: D	6ES7 715-1BB	1	softwareTrial license for STEP 7		A
Intel Core i5 processor, 2.4 GHz, DL Multistandard DVD RW drive,			Professional, WinCC flexible		Î
500 GB S-ATA hard disk, 3 GB			Advanced; without MPI cableUpgrade license STEP 7		В
DDR3 RAM (1x 1 GB, 1x 2 GB); no S5 interface/S5 PROMMER			Professional, STEP 5, WinCC		
Field PG M3 Premium/S5: D	6ES7 715-1CC	1	flexible Advanced (requires license for STEP 7		
Intel Core i5 processor, 2.4 GHz, DL Multistandard DVD RW drive,			Prof./STEP 5 (at least V3.0)); incl. MPI cable	.	
500 GB S-ATA hard disk, 3 GB			Powerpack license STEP 7		С
DDR3 RAM (1x 1 GB, 1x 2 GB); with S5 online interface/			Professional, upgrade license STEP 5 and		
S5 EPROMMER,			WinCC flexible Advanced		
incl. S5 PLC cable and S5 EPROM adapter			(requires license for STEP 7/ STEP 5 (at least V3.0)); incl.		
Display			MPI cable		
 15.6" display, HD ready (1366 x 768) 	0		 License for STEP 7 Professional, STEP 7 Basic, STEP 5, STEP 7- 		D
• 15.6" display, full HD	2		Micro/WIN, WinCC flexible Advanced: incl. MPI cable		
(1920 x 1080)			License for STEP 7 Professional,		E
Keyboard and power cable (absolutely necessary)			STEP 7 Basic, STEP 7 Micro/ WIN, WinCC flexible Advanced;		
Keyboard: QWERTY (&	0		incl. MPI cable		
German); power plug: EC, Switzerland, without UK;			Accessories		
approvals for Europe (CE)			Memory expansion		
 Keyboard: QWERTY (& German); power plug: United 	1		1 GB DDR3 RAM 1066 MHz	- 1	6ES7 648-2AH40-0KA0
Kingdom; approvals for Europe (CE)			2 GB DDR3 RAM 1066 MHz	1	6ES7 648-2AH50-0KA0
Keyboard: QWERTY (&	2		USB mouse (PS/2-compatible)	- 1	6ES7 790-0AA01-0XA0
German); power plug: USA, Canada; approvals for USA and			AC/DC external power supply unit	ı	6ES7 798-0GA02-0XA0
Canada (FCC, IC) • Keyboard: QWERTY (&	3		For Field PG M3 only		
German); power plug: China;	ŭ		Power cable (length 3 m)		
approvals for China (CCC) • Keyboard: AZERTY; power plug:	4		For Field PG M3 only		
EC, Switzerland, without UK			For EC, Switzerland, without UK		6ES7 900-5AA01-0XA0
approvals for Europe (CE) Operating system			For Great Britain		6ES7 900-5BA01-0XA0
Windows XP Professional SP3		A	For the USA and Canada		6ES7 900-5DA01-0XA0
English MUI (Fr., Span., Ital., Ger.; image			For China		6ES7 900-5FA01-0XA0
stored on HD, other language			Spare battery (lithium ion, 6.6 Ah) ¹⁾	ı	6ES7 798-0AA06-0XA0
packages available for downloading)			For Field PG M3 only		
 Windows 7 Ultimate, 32-bit (Eng, 		В	MPI cable		6ES7 901-0BF00-0AA0
Ger., Fr., Sp., It. selectable); STEP 5 and STEP 7-Micro/Win			for connecting a PG and		
are not pre-installed and do not run under Windows 7			SIMATIC S7 via MPI; 5 m		

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operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

¹⁾ The capacity of the battery decreases for technological reasons with each charging/discharging operation and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore in the course of time. In normal use the battery can be charged and discharged over a period of six months from when the field PG is purchased.

Capacity loss is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend

SIMATIC programming devices Programming devices

Field PG M3

Ordering data	Order No.		Order No.
S5 EPROM programming adapter	6ES7 798-0CA00-0XA0	Adapter serial ATA to USB	6ES7 790-1AA00-0AA0
for SIMATIC S5 EPROM programming using the Field PG		For using the replaceable hard disk of the hard disk kit as an external hard disk (for	
S5 PLC cable	6ES5 734-2BF00	Field PG M/M2 or M3 only)	
For connecting programming devices to SIMATIC S5 PLCs, 5 m		Backpack for Field PG M3	6ES7 798-0DA01-0XA0
Hard disk kit	6ES7 791-2BA01-0AA0		
Replaceable hard disk 500 GB serial ATA; with protective pocket and Torx screwdriver; for Field PG M3 only			

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External prommer

Overview



- External EPROM programming device
- For programming SIMATIC memory cards, SIMATIC micro memory cards as well as SIMATIC EPROM and EEPROM modules
- For connection to the PC via the USB interface

Technical specifications

	6ES7 792-0AA00-0XA0
Power supply	
Description	90 to 264 V; 47 to 63 Hz; wide range power supply unit
Operator control and monitoring	
Display	
 Design of display 	without
Environmental requirements	
Operating temperature	
• Min.	5 °C
• Max.	40 °C
Storage/transport temperature	
• Min.	-20 °C
• Max.	60 °C
Dimensions and weight	
Dimensions	
• Width	172 mm
Height	40 mm
• Depth	121 mm
Weight	
 Weight, approx. 	400 g

Ordering data Order No.

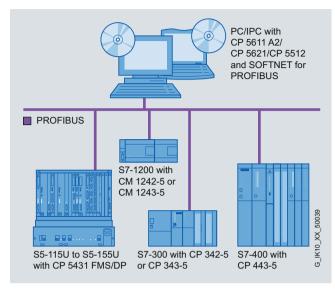
EPROM programming device **USB** prommer

for programming SIMATIC memory cards and EPROM modules

6ES7 792-0AA00-0XA0

SOFTNET for PROFIBUS

Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
•	•		•	•	G_MIQ_XX_10186

- Software for coupling PGs/PCs and notebooks to programmable controllers
- · Communication services:
 - PROFIBUS DP master Class 1 and 2 with acyclic expansions
 - PROFIBUS DP slave
 - PG/OP communication
 - S7 communication
 - Open communication (SEND/RECEIVE) based on the FDL interface
- The appropriate OPC servers are included in the scope of delivery of the respective communication software

Technical specifications

Performance data	CP 5611 A2/CP 5711/CP 5621/ CP 5512
Mono protocol mode	
Number of connectable DP slaves	max. 60
Number of FDL tasks waiting	max. 50
Number of PG/OP and S7 connections • DP master • DP slave	max. 8 DP-V0, DP-V1 with SOFTNET-DP DP-V0, DP-V1 with SOFTNET-DP
2. 6.4.6	slave

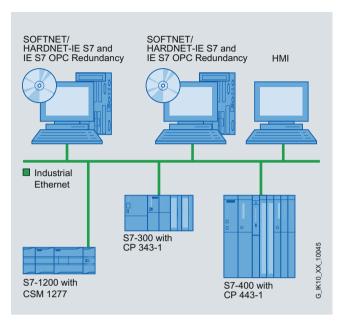
SOFTNET for PROFIBUS

Ordering data	Order No.		Order No.
SOFTNET-PB S7		SOFTNET-DP Edition 2008	
Software for S7 communication, incl. FDL protocol with OPC server and NCM-PC, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A; for CP 5611 A2, CP 5711, CP 5621;		for Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German • Single license for 1 installation	6GK1 704-5DW71-3AA0
SOFTNET-PB S7 V8.1		Software Update	6CK1 704 FDW00 2AL0
for 32/64 bit: Windows 7 Professional/Ultimate; for 64 bit: Windows 2008 Server R2; English/German		Software Update Service for 1 year, with automatic extension; requirement: Current software version Upgrade SOFTNET-DP, Edition 2006 or higher, to SOFTNET DP	6GK1 704-5DW00-3AL0 6GK1 704-5DW00-3AE0
• Single license for 1 installation	6GK1 704-5CW80-3AA0	2006 or higher, to SOFTNET-DP Edition 2008/V8.1	
SOFTNET-S7 Edition 2008 for 32 bit Windows XP Professional SP2/3; Windows 2003 Server R2,		 Upgrade SOFTNET-DP from V6.0, V6.1, V6.2 or V6.3 to SOFTNET-DP Edition 2008/V8.1 	6GK1 704-5DW00-3AE1
SP2; Windows Vista Business/ Ultimate SP1; Windows 2008		SOFTNET-PB DP slave	
Server; English/German • Single license for 1 installation D	6GK1 704-5DW08-1AA0	Software for DP slave, with DP OPC server and NCM PC, single	
Software Update		license for 1 installation, runtime software, software and electronic	
 Software Update Service for 1 year, with automatic extension; 	6GK1 704-5CW00-3AL0	manual on CD-ROM, license key on USB flash drive, Class A; for CP 5611 A2, CP 5711, CP 5621;	
requirement: Current software version		SOFTNET-DP Slave V8.1	
Upgrade SOFTNET-S7, Edition 2006 or higher, to SOFTNET-S7 Edition 2008/V8.1	6GK1 704-5CW00-3AE0	for 32/64 bit: Windows 7 Professional/Ultimate; for 64 bit:	
 Upgrade SOFTNET-S7 from V6.0, V6.1, V6.2 or V6.3 to SOFTNET- S7 Edition 2008/V8.1 	6GK1 704-5CW00-3AE1	Windows 2008 Server R2 English/German • Single license for 1 installation D	6GK1 704-5SW08-1AA0
SOFTNET-PB DP		SOFTNET-DP Slave Edition 2008	
Software for DP protocol (master class 1 and 2), incl. FDL protocol with OPC server and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive; for CP 5611 A2, CP 5711, CP 5621;		for 32 bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/ Ultimate SP1; Windows 2008 Server; English/German	6GK1 704-5SW71-3AA0
SOFTNET-PB DP V8.1		Software Update	COV4 704 FCW00 0ALC
for 32/64 bit: Windows 7 Professional/Ultimate; for 64 Bit; Windows 2008 Server R2;		 Software Update Service for 1 year, with automatic extension; requirement: Current software version 	6GK1 704-5SW00-3AL0
English/German Single license for 1 installation D	6GK1 704-5DW08-1AA0	 Upgrade SOFTNET-DP Slave, Edition 2006 or higher, to SOFTNET-DP Slave Edition 2008/ V8.1 	6GK1 704-5SW00-3AE0
		 Upgrade SOFTNET-DP Slave from V6.0, V6.1, V6.2 or V6.3 to SOFTNET-DP Slave Edition 2008/ V8.1 	6GK1 704-5SW00-3AE1

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SOFTNET for Industrial Ethernet

Overview



System configuration SOFTNET for Industrial Ethernet

ISO	TCP/ UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
•	•			•	•	•	5 IK10, XC, 10185

- For coupling PGs/PCs/workstations to programmable controllers
- · Communication services:
 - PG/OP communication
 - S7 communication
 - Open communication (SEND/RECEIVE)
- Can be used with
 - Layer 2 Ethernet card (PCI/PCIe)
 - Integrated Industrial Ethernet interface, e.g. CP 1612 A2
 - Modem (Remote Access Service RAS)
- Complete protocol stack as a software package
- The appropriate OPC server and configuration tools are included in the scope of delivery of the respective communication software

Technical specifications

Performance data S7 and PG/OP communication (number of operable connections) • SOFTNET-S7 max. 64 • SOFTNET-S7 Lean max. 8

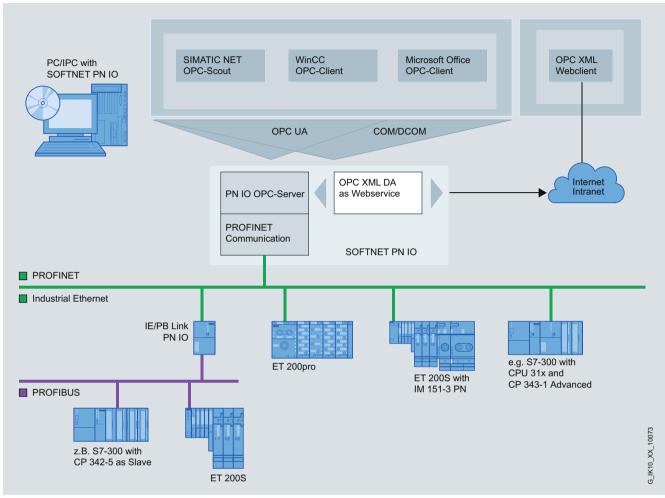
SOFTNET for Industrial Ethernet

Ordering data	Order No.		Order No.
SOFTNET S7 for Industrial Ethernet		SOFTNET-PG for Industrial Ethernet	
Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A		Software for PG/OP communication, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	
SOFTNET-IE S7 V8.1		for 32/64 bit: Windows 7	
for 32/64 bit: Windows 7 Professional/Ultimate; for 64 bit: Windows 2008 server R2; English/German		Professional/Ultimate; for 64 bit: Windows 2008 Server R2; English/German • Single license for 1 installation D SOFTNET-PG Edition 2008 for	6GK1 704-1PW08-1AA0
up to 64 connections • Single license for 1 installation D	6GK1 704-1CW08-1AA0	Industrial Ethernet	
SOFTNET Edition 2008 for Industrial Ethernet for 32 bit Windows XP Profes-	OGRI 704-10W00-1AA0	for 32 bit Windows XP Profes- sional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows	
sional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German		2008 Server; English/German • Single license for 1 installation Software Update	6GK1 704-1PW71-3AA0
up to 64 connections		 Software Update Service for 	6GK1 704-1PW00-3AL0
Single license for 1 installation	6GK1 704-1CW71-3AA0	1 year, with automatic extension; requirement: Current software	
Software Update Software Update Service for 1 year, with automatic extension;	6GK1 704-1CW00-3AL0	version • Upgrade from Edition 2006 and higher to Edition 2008 or V8.1	6GK1 704-1PW00-3AE0
requirements: Current software version		 Upgrade from V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V8.1 	6GK1 704-1PW00-3AE1
 Upgrade from Edition 2006 and higher to Edition 2008 or V8.1 	6GK1 704-1CW00-3AE0	IE S7 OPC Redundancy	
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V8.1 	6GK1 704-1CW00-3AE1	Software for redundant OPC server in the field of industrial	
SOFTNET-IE S7 Lean V8.1		ethernet software S7 products, runtime software, software and	
up to 8 connections • Single license for 1 installation D	6GK1 704-1LW08-1AA0	electronic manual on CD-ROM, license key on USB flash drive, class A	
SOFTNET-S7 Lean Edition 2008 for Industrial Ethernet		IE S7 OPC Redundancy V8.1	
up to 8 connections • Single license for 1 installation	6GK1 704-1LW71-3AA0	for 64 bit: Windows 2008 Server R2; English/German	
Software Update		• Single license for 1 installation D	6GK1 706-1CW08-1AA0
Software Update Service for 1 year, with automatic extension; requirements: current software version	6GK1 704-1LW00-3AL0	Software Update • Software update service for 1 year, with automatic extension; requirements: current software	6GK1 706-1CW00-3AL0
Upgrade from Edition 2006 and higher to Edition 2008 or V8.1	6GK1 704-1LW00-3AE0	version	
 Upgrade from V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V8.1 	6GK1 704-1LW00-3AE1		

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SOFTNET PN IO

Overview



PC with SOFTNET PN IO as PROFINET IO Controller

ISO	TCP/ UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
	•	•		•			JK10.3X,10170

- Software with PROFINET IO Controller function for coupling PG/PC and IPC with PROFINET IO Devices
- Possible applications:
 - PC-based control systems
 - HMI systems
 - Test applications
- Communication services:
 - PROFINET IO Controller
- Can be used with
 - Integrated interfaces of SIMATIC PG/PC
 - You can find more information about the environment of use at www.siemens.com/simatic-net/ik-info
- Cost-effective solution for the low-end performance range
- OPC server for I/O interfacing over PROFINET included in scope of delivery

SOFTNET PN IO

Technical specifications				
	SOFTNET PN IO			
Performance data				
Number of operable IO devices	max. 64			
Number of external IO-lines in one central rack	max. 1			
Size of IO data areas overall				
- I/O input area	max. 2 KB			
- I/O output area	max. 2 KB			
 Size of I/O data area per connected I/O device 				
- I/O input range	max. 1433 byte			
- I/O output range	max. 1433 byte			

Ordering data	Order No.
SOFTNET PN IO	
Software for PROFINET IO Controller with OPC server and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A,	
SOFTNET-IE PN IO V8.1	
for 32/64 bit: Windows 7 Professional/Ultimate; for 64 bit: Windows 2008 server R2; English/German	
• Single License for 1 installation D	6GK1 704-1HW08-1AA0
SOFTNET PN IO Edition 2008	
for 32 bit Windows XP Professional SP 2/3; Windows 2003 Server R2, SP2; Windows Vista Business/ Ultimate SP1; Windows 2008 Server; English/German	
Single license for one installation	6GK1 704-1HW71-3AA0
Software Update	
Software Update Service for 1 year, with automatic extension; requirements: current software version	6GK1 704-1HW00-3AL0
Upgrade SOFTNET PN IO Edition 2006 or higher to SOFTNET PN IO Edition 2008 or V8.1	6GK1 704-1HW00-3AE0
Upgrade SOFTNET PN IO from V6.0, V6.1, V6.2 or V6.3 to SOFTNET PN IO Edition 2008 or V8.1	6GK1 704-1HW00-3AE1

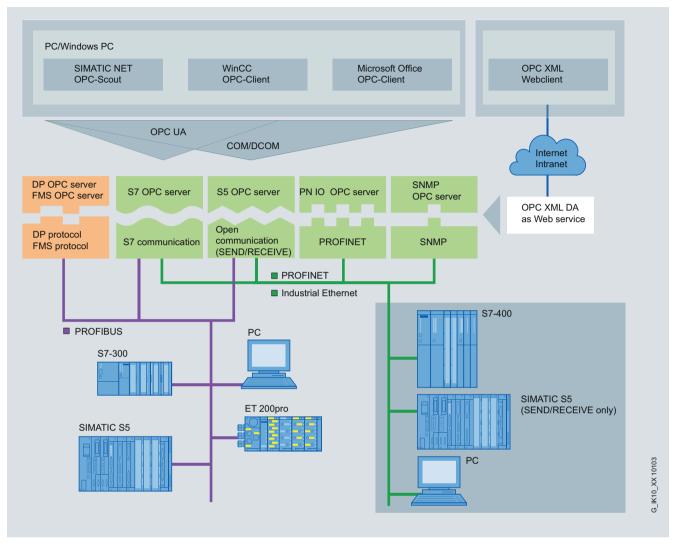
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SIMATIC programming devices

Communication software

OPC server for Industrial Ethernet

Overview



System integration with OPC server

OPC (Openness, Productivity & Collaboration) is a standardized, open, and multi-vendor interface and is widely used in automation engineering.

Currently it is differentiated between classic OPC and its consistent further development, OPC UA (Unified Architecture). A smooth migration to the new standard OPC UA, which provides added value such as security, is possible without problems. The SIMATIC NET OPC servers offer (currently for S7 and PROFINET) both interfaces, OPC UA and classic OPC.

- The appropriate OPC servers are included in the scope of delivery of the respective communication software
- Standardized, open multi-vendor interface
- It permits interfacing of OPC-capable Windows applications to S7-communication, open communication (SEND/ RECEIVE), PROFINET and SNMP.
- Increased availability due to additional option packages such as OPC server redundancy
- OPC Scout with browser functionality as an OPC client and OCX Data Control/.NET Data Control for simple OPC client creation

OPC server for Industrial Ethernet

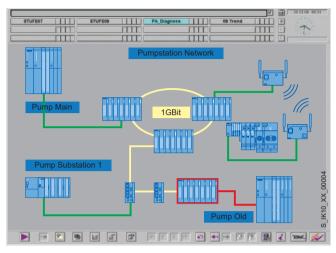
Technical specifications		Ordering data	Order No.
Programming	Synchronous and asynchronous reading and writing of variables	PN CBA OPC Server Edition 2008	
	 Monitoring of variables using the OPC server with a signal to the client when a change occurs PROFINET OPC server for CBA; runtime software, software and electronic manual on CD-ROM, 		
	 Use of quantity operations; so a large amount of data can be processed in a short time. license key on USB flash drive, Class A, for 32-bit Windows XP Professional SP 2/3; Windows 2003 Server R2. SP2: 	Class A, for 32-bit Windows XP	
Interfaces	 Custom Interface (C++, NET) for high OPC performance 	German/English • Single license for 1 installation	6GK1 706-0HB71-3AA0
	Automation Interface (VB, Excel, Access, Delphi,) for ease-of-use	Software update • Software update service for 1 year,	6GK1 706-0HB00-3AL0
	Graphics with OCX or .NET Data Control; for configuring instead of programming	with automatic extension; requirement: current software version	
	OPC XML-Interface for Data Access	 Upgrade from Edition 2006 and higher to Edition 2008, single license 	6GK1 706-0HB00-3AE0
Products	include OPC servers for:	 Upgrade from V6.0 to Edition 2008, single license 	6GK1 706-0HB00-3AE1
Industrial Ethernet		S7 OPC Redundancy	
S7-1613, SOFTNET-S7 for Industrial Ethernet, SOFTNET-S7 Lean	S7-OPC server for S7 communication, XML-DA	Software for redundant OPC server in the field of industrial ethernet software S7 products.	
	S5-OPC server for open communication 1) communication, XML-DA	runtime software, software and electronic manual on CD-ROM, license key on USB flash drive,	
	SNMP OPC server for SNMP protocol access; XML-DA	class A IE S7 OPC Redundancy V8.1	
IE S7 OPC Redundancy	Redundant S7-OPC server for S7 communication	for 64 bit: Windows 2008 Server R2; English/German	
PROFINET		• Single license for 1 installation D	6GK1 706-1CW08-1AA0
• SOFTNET PN IO	PN IO OPC server for PROFINET IO communication: XML-DA	Software update	
PN CBA OPC server	PN CBA OPC server for access to CBA components; XML-DA	 Software update service for 1 year, with automatic extension; 	6GK1 706-1CW00-3AL0
PROFIBUS		requirements: current software version	
 DP-5613, SOFTNET-DP, SOFTNET- DP slave 	DP-OPC server for PROFIBUS DP communication; XML-DA	VOLGIOTI	
• FMS-5613	FMS-OPC server for PROFIBUS FMS communication; XML-DA		
• DP-5613 SOFTNET-PB S7	S7-OPC server for S7 communication, XML-DA		
PB S7 OPC Redundancy	Redundant S7-OPC server for S7 communication		

¹⁾ also S5-compatible communication

D: Subject to export regulations AL: N and ECCN: 5D992

SNMP OPC server

Overview



- Status monitoring of SNMP-capable devices in any OPC client systems; e.g. SIMATIC HMI/SCADA, office application
- Easy access to SNMP-capable devices over the OPC
- Devices without SNMP agents can be monitored using the ping mechanism
- Configuring with STEP 7 or NCM PC
 Ready-to-use SNMP diagnostics profiles for SIEMENS devices, e.g. SCALANCE X/W
 Generation of any SNMP diagnostics profiles by means of
 - the integrated MIB-Compiler
 - Easy setup of the monitored devices using an Autodiscovery function

Ordering Data	Order No.		Order No.
SNMP OPC server		SNMP OPC server Extended	
Including MIB compiler; single license for 1 installation of runtime		Administration of up to 200 IP addresses	
software; software and electronic manual on CD-ROM; license key on USB flash drive, Class A;		Extended V8.1 for 32/64 bit: Windows 7 Professional/	6GK1 706-1NX08-1AA0
SNMP OPC server Basic		Ultimate;	
Administration of up to 20 IP addresses		for 64 bit: Windows 2008 server R2; Single license for 1 installation	
• Basic V8.1 D for 32/64 bit: Windows 7 Professional/ Ultimate; for 64 bit: Windows 2008 server R2; Single license for 1 installation	6GK1 706-1NW08-1AA0	• Extended 2008 for 32 bit: Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/ Ultimate SP1; Windows 2008 Server;	6GK1 706-1NX71-3AA0
• Basic 2008 for 32 bit: Windows XP Professional SP2/3;	6GK1 706-1NW71-3AA0	Single license for 1 installation Software update	
Windows 2003 Server R2, SP2; Windows Vista Business/ Ultimate SP1; Windows 2008 Server;		 Software update service for 1 year, with automatic extension; requirement: current software version 	6GK1 706-1NX00-3AL0
Single license for 1 installation		 Upgrade of SNMP OPC Server Extended, Edition 2006 or 	6GK1 706-1NX00-3AE0
Software update Software update service for 1 year, with automatic extension;	6GK1 706-1NW00-3AL0	higher, to SNMP OPC Server Extended Edition 2008	
requirements: current software version		Upgrade of SNMP OPC Server Extended from V6.0, V6.1, V6.2	6GK1 706-1NX00-3AE1
Upgrade of SNMP OPC Server Design Falibian 2000 and high and to	6GK1 706-1NW00-3AE0	or V6.3 to SNMP OPC Server Extended V8.0	
Basic, Edition 2006 or higher, to SNMP OPC Server Basic V8.0		Power Pack	
Upgrade of SNMP OPC Server Basic from V6.0, V6.1, V6.2 or V6.3 to SNMP OPC Server Basic	6GK1 706-1NW00-3AE1	For upgrade from SNM OPC Server Basic to SNM OPC Server Extended	
V8.0		Power Pack V8.1	6GK1 706-1NX08-1AC0
		Power Pack Edition 2008	6GK1 706-1NX71-3AC0
		D: Subject to export regulations Al	· N and ECCN: 5D002

D: Subject to export regulations AL: N and ECCN: 5D992

SIMATIC programming devices

13

Overviews

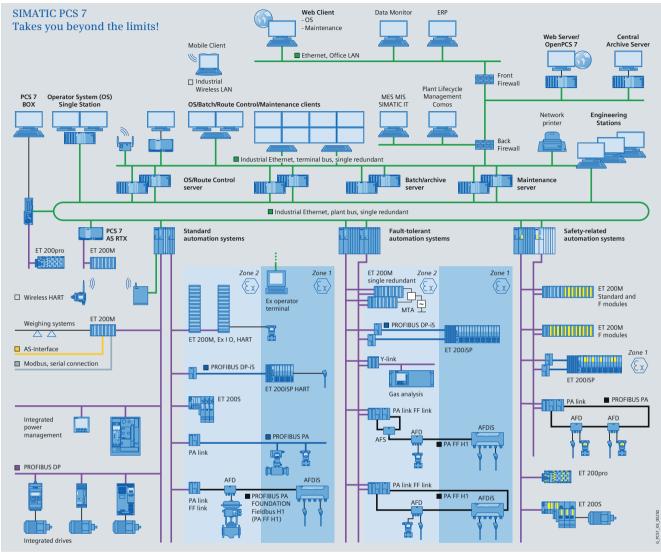


13/2	SIMATIC PCS 7
13/5	SIMATIC HMI
13/10	SIMATIC NET
19/11	SIMATIC Ident

Overviews SIMATIC PCS 7

Introduction

Overview



SIMATIC PCS 7 system architecture

Totally Integrated Automation with SIMATIC PCS 7

The SIMATIC PCS 7 Process Control System is a significant component of Totally Integrated Automation (TIA), the unique basis offered by Siemens for uniform and customized automation in all sectors of the production, process and hybrid industries. Using TIA, Siemens is the only company able to offer uniform automation technology on one single platform for all applications of process automation, starting with input logistics, covering production or primary processes as well as downstream (secondary) processes, up to output logistics. This platform is suitable for optimization of all the operating sequences of an entire company, i.e. from the ERP (Enterprise Resource Planning) level and MES (Management Execution System) level to the control level, right down to the field level.

Compatibility of further developments is guaranteed within TIA. This also ensures that the company's investments have a secure future, and allows the company to modernize and expand the plants throughout the complete lifecycle.

Integrated in a holistic automation solution for the production site, automation of the primary processes is the main task of SIMATIC PCS 7. On the other hand, secondary processes (e.g. filling, packaging) or input/output logistics (e.g. raw material distribution, storage) are frequently implemented using the PLC-based or PC-based components of SIMATIC.

The advantages of Totally Integrated Automation, in particular the uniform data management, communication and configuration, are already evident during planning and engineering, but also manifest during installation and commissioning, everyday operation as well as maintenance, repairs and modernization.

Overviews SIMATIC PCS 7

Introduction

Overview (continued)

Integrated data management

Integrated data management means that all software components access a common database. Within a project, inputs and modifications are therefore only necessary at one point. This reduces the work required, and simultaneously avoids potential faults. Once symbolic identifications have been introduced, they are understood by every software component. Data consistency is also ensured even if several persons are working simultaneously on a project. Parameters defined in the engineering system can be transferred beyond network boundaries down to sensors, actuators or drives in the field.

Integrated communication

Uniform communication from the corporate management level down to the field level is based on internationally recognized standards such as Industrial Ethernet, PROFIBUS or FOUNDATION Fieldbus, and also supports the global flow of information via the Internet. Since the hardware and software components involved also use these communications mechanisms, connections are extremely easy to configure, also cross-system or over different networks.

Integrated configuration

The use of an engineering system with a uniform and matched range of tools minimizes the configuration overhead. The engineering tools for the application software, the hardware components and the communications functions can be called from a central project manager (SIMATIC Manager). This is also the basic application for creation, management, saving and documentation of a project.

The SIMATIC PCS 7 Advanced Engineering System expands the functionality for plant configuration. It acts as a link between the standard engineering tools of the engineering system and the tools used for basic and detailed planning, e.g. EPlan, ELCAD or SmartPlant.

Benefits

With its pioneering design, modular and open architecture based on state-of-the-art SIMATIC technology, consistent application of industrial standards, and the I&C functionality paired with high-performance, the SIMATIC PCS 7 Process Control System allows cost-effective implementation and economical operation of I&C plants in all phases of their lifecycle and with consideration of all aspects: from planning, engineering, commissioning and training, through operation, maintenance and repair, up to expansion and refurbishment. In the process, SIMATIC PCS 7 combines high-performance and reliability with simple and safe operation and maximum convenience.

You primarily profit from Totally Integrated Automation with the SIMATIC PCS 7 Process Control System due to:

- · Calculable development, implementation and lifecycle costs
- · Minimization of engineering overhead
- Facilities for process optimization
- · Adaptability to changing requirements
- Advantages resulting from the use of standard SIMATIC components, such as:
 - Low hardware and engineering costs
 - Proven quality and stability
 - Simple, fast definition and selection of system components
 - Low costs for spare parts
 - Short delivery times for spare parts and expansion components
 - Global availability
 - Savings in logistics, maintenance and training costs

Function

Essential system properties and functions

In order to survive on a global market which is characterized by fierce competition and pricing pressures, competitors are required to constantly increase their productivity and flexibility. This simultaneously places high demands on the automation technology, which in turn lead to an increasing fusion with information technology.

Bearing in mind these requirements, the advantages of modern process control systems, such as SIMATIC PCS 7 which provides a horizontally and vertically uniform system platform as well as a secure future and can also be expanded flexibly in the context of TIA, become clear.

SIMATIC PCS 7 combines high performance with exceptional system properties and functions such as:

- Simple and reliable process control
- User-friendly operation and visualization, also using the Internet
- Powerful, fast and consistent system-wide engineering
- System-wide online modifications
- System openness at all levels
- Versatility and scalability
- Redundancy at all levels, flexible and modular
- Extensive fieldbus integration
- Remote I/O systems for different demand profiles
- Process device management and diagnostics with comprehensive device support
- Asset management of the process-related plant, in particular the control technology (diagnostics, preventive maintenance, and repairs)
- Flexible solutions for batch processes
- Efficient control of material transport
- Homogenous, integrated safety technology
- · Advanced Process Control for process optimization
- Telecontrol center can be integrated for remote plant sections
- Energy management
- Advanced IT security concept for safeguarding the I&C system
- OPC-based evaluation and management of process data
- · Direct interfacing to IT systems

Overviews SIMATIC PCS 7

Introduction

Function (continued)

All these are ideal requirements for cost-effective implementation and economic operation of process control plants.

Versatility and scalability

The architecture of the SIMATIC PCS 7 Process Control System is designed in such a way that instrumentation and control can be configured in accordance with customer requirements and optimally matched to the dimensions of the plant. SIMATIC PCS 7 instrumentation and control can be subsequently expanded or reconfigured with ease if there is an increase in capacity or a technological modification. Provision of expensive reserve capacity is unnecessary.

Various versions of the SIMATIC PCS 7 BOX compact system are suitable as low-cost starter solutions in the lower performance range, and are available as all-in-one systems equipped with functionalities for automation, HMI, and engineering.

With approximately 60 tags, these systems represent the lower end of the scale. Scalability extends up to the distributed multiuser system in client/server architecture with up to 60 000 tags for automation of a very large production facility, or of a plant network at one production location. This corresponds approximately to a scale ranging from 100 to 120 000 I/Os.

Open for the future

SIMATIC PCS 7 is based on modular hardware and software components which are perfectly matched to one another due to their conformance with TIA. These components can be expanded and innovated seamlessly and with little effort and are open for the future via long-term stable interfaces. This makes long-term protection of customer investments possible, despite the fast pace of innovation and short product lifecycles.

SIMATIC PCS 7 consistently applies new, powerful technologies together with internationally established industrial standards such as IEC, XML, PROFIBUS, Ethernet Gigabit technology, TCP/IP, OPC, ISA 88 or ISA 95, to mention just a few.

Openness with SIMATIC PCS 7 covers all levels, and equally applies to automation systems and process I/Os as well as industrial communications networks, operator systems or engineering systems.

It comprises not only system architecture and communication, but also the programming and data exchange interfaces for user programs and planning systems. SIMATIC PCS 7 can therefore also be combined with components from other vendors, and integrated in existing infrastructures.



Introduction

Overview

Gain transparency and lower costs:

SIMATIC HMI operator control and monitoring systems

The interface between human and machine – the human machine interface or HMI for short – connects the world of automation with the individual requirements of the operator. Operator control and monitoring is about managing the process, about optimizing machine and system operation, about availability and productivity.

Everything from a single source

With SIMATIC HMI, Siemens Automation and Drives offers a complete range of innovative and low-cost products and systems for the multi-faceted tasks of operator control and monitoring: Ranging from operator panels and visualization software for operator control and monitoring at the machine through to SCADA systems for widely differing requirements in process visualization. For special requirements, optimally adapted products are offered such as especially rugged HMI devices with all-round protection for mounting on support arms/pedestals, or operator panels with stainless steel front for use in the food and beverages industry. Of course, individual, customer-specific requirements can also be implemented.

Perfectly equipped for integration in the world of automation

With their open, standardized interfaces in hardware and software, SIMATIC HMI products can be integrated at any time in the production and automation level as well as in the corporate management level. Connectability to almost every controller on the market as well as multiple language capability of the configuration and visualization software - including Asian ideographic languages, of course - facilitate operation worldwide.

Increased production transparency through Plant Intelligence

Plant Intelligence is based on the rational use of information to improve processes within the company. It is designed to lower plant costs, consolidate and improve quality, avoid wastage, utilize production facilities better and ultimately ensure greater efficiency and cost effectiveness within the company. WinCC provides the best requirements for achieving this since WinCC features an integrated Historian for acquiring important production data. Using intelligent functions and tools, these process data can be edited into information necessary for making decisions and can be made available throughout the company whenever and wherever it is required – for operators as well as production managers or anyone else within the company. Even the WinCC basic system provides a wealth of display and evaluation functions, such as the statistics functions for the message and measured value logs. WinCC options for IT & business integration make additional 'smart' tools available for optimizing production using Plant Intelligence.

Integrated into the World Wide Web

SIMATIC HMI transforms the Internet into a control desk - within a plant as well as in the worldwide network. Using the WinCC/Web Navigator, you can monitor and operate plants over the Internet or over the internal corporate intranet. Thin Client solutions can be used to integrate rugged, local devices which simultaneously establish the connection between the automation level and the control center. And over a wireless LAN or cell phone connection, you can use mobile Thin Clients such as laptop computers, PDAs (personal digital assistants) or WebPads. In this way, process, service or management information can be made individually available to users. At the machine level, many control units support remote operation, e.g. as a link between the automation level and the control room through to service and diagnostics over the Internet.

With WinCC flexible, concepts with so-called Sm@rtClients and servers facilitate plant-wide access to variables and images, distributed operator stations as well as remote operation and diagnostics via the Internet – also in conjunction with SIMATIC Panels.

Traceability and simple validation

WinCC flexible and WinCC with 'FDA options' provide a high degree of support to machine and plant manufacturers who must fulfill demanding quality requirements, both with respect to the products to be manufactured as well as to the manufacturing processes themselves. These options simplify plant validation enormously and thus provide the most convincing and comprehensive solution for the requirements of these sectors. They support the user in fulfilling high quality requirements asp specified by the FDA (Food and Drug Administration) 21 CFR Part 11 for the food & beverages and pharmaceutical industries.

Increased plant availability

All operator panels and Panel PCs are designed for harsh industrial use. Redundant WinCC process visualization systems ensure a high degree of plant availability during normal operation. The ProAgent process diagnostics of SIMATIC HMI support you effectively with error locating and elimination and significantly reduce downtimes.

Distributed operator control concepts

SIMATIC HMI offers different solutions for various requirements for operator control of large machines and plants spread over extensive areas.

Thus, the Sm@rtAccess option of the SIMATIC WinCC flexible visualization software, for example, allows HMI devices such as panels, Thin Clients and PCs plant-wide access via PROFINET/Ethernet to current process values and the local screen images of all involved stations.

The Sm@rtService option is used for diagnostics, maintenance and remote control of local operator stations over the Internet.

As remote operator stations, SIMATIC Thin Clients make the functionality of machine-level panels available in the control room or in the office, thanks to their connection to PROFINET/Ethernet, and in the other direction, they bring SIMATIC WinCC, office or IT functionality straight to the machine.

In PC-based applications, the computing unit and the operating unit of a Panel PC 677B can be separated from each other by up to 30 m. When using PCs such as the SIMATIC Rack or Box PC, a SIMATIC Flat Panel monitor can also assume the function of the operating unit at a distance of up to 30 m.

Introduction

Overview (continued)

More than just operator control and monitoring

The Multi Panels under Windows CE combine the advantages of two worlds: On the one hand, the ruggedness of an operator panel and on the other hand the flexibility typical of a PC. Apart from classical operator control and monitoring, other automation functions such as control functions can execute simultaneously. And for PC-based automation, the SIMATIC Panel PCs are available as a compact automation platform - the embedded versions being especially compact and rugged, as well as maintenance-free.

All the advantages of Totally Integrated Automation

With Totally Integrated Automation (TIA), Siemens is the only supplier who offers a system-wide, integrated product and system range for automating the entire production workflow. The distinguishing feature of TIA is that it is completely integrated. The reduced number of interfaces results in very clear structures. This lowers time and costs required for engineering the automation solution and increases the availability of the plant.

SIMATIC WinCC flexible, the system-wide engineering tool for the SIMATIC HMI operator panels, is part of TIA and uses the same database as STEP 7, the programming software for the SIMATIC Controllers. This saves input overhead and ensures data consistency at all times.

In conjunction with other SIMATIC components, SIMATIC HMI also supports system diagnostics and process diagnostics during normal operation. You can start STEP 7 diagnostics directly from WinCC for comprehensive error diagnostics, from the circuit diagram through to the PLC program. The SIMATIC Maintenance Station visualizes the maintenance information for the automation technology of a system – from the controller and network components to switchgear, protective equipment and control devices and the drives. This gives a clear overview of the status of the automation sysem at any time.

A competent partner for automation solutions

With SIMATIC HMI, you not only get excellent products to suit your requirements, we will also support you with selecting a partner for your automation solution. In our worldwide network of Siemens Automation Solution Partners, you will find competent contact partners in your area who are always up-to-date with the latest SIMATIC HMI technology. The Siemens-internal WinCC Competence Centers implement technology-specific products as well as customer and sector-specific solutions on the basis of WinCC. WinCC specialists are external system integrators who combine their WinCC expertise with their sector and technology know-how to create tailor-made, cost-effective solutions. Numerous products from our partners that perfectly interact with WinCC are available as WinCC Add-ons.

Investment protection included

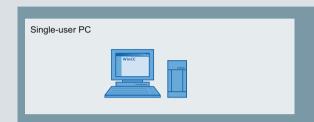
Our many years of experience in the automation engineering sector are to your advantage. The same applies to our global service network with its expert support. Further services, such as a software update service, training and ordering over the Internet round off what we have to offer.

SIMATIC HMI - The Human Machine Interface

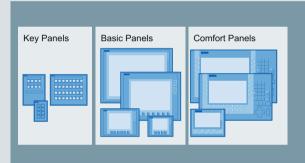
SIMATIC® HMI®

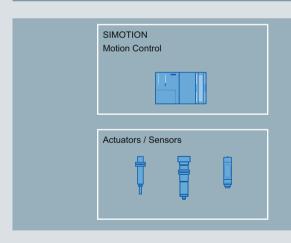
A whole world of operator control and monitoring

Process visualization



Operator control and monitoring directly at the machine



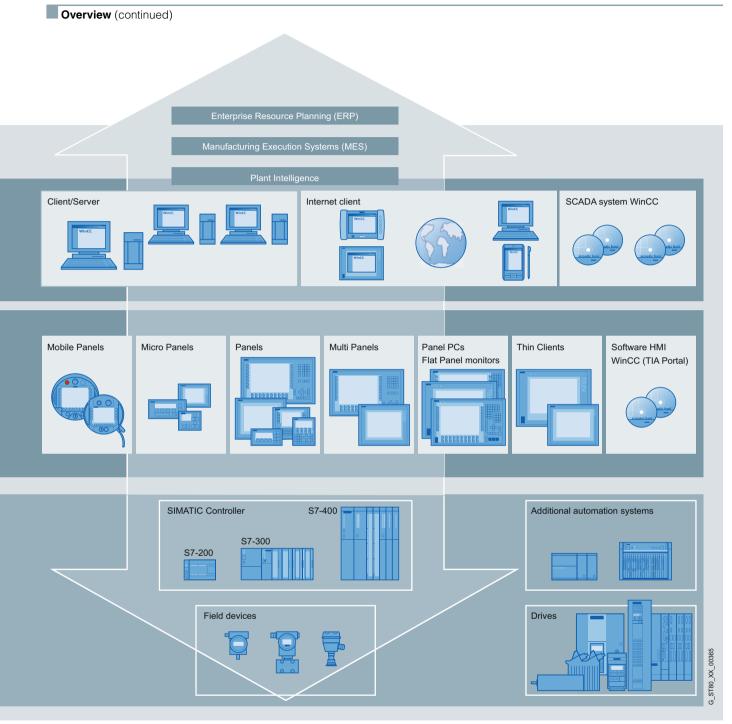


Process visualization

SIMATIC WinCC

The SCADA system for scalable process visualization to suit any requirement – from single-user through to redundant multi-user systems, as well as for plant operation and monitoring over the Internet. WinCC is also the ideal information hub for IT and business integration, with Plant Intelligence ensuring more transparency in the production process.

Introduction



Operator control and monitoring directly at the machine

Operator panels

SIMATIC Key Panels

Operator panels with bus capability for easy and direct operation of machines.

SIMATIC Basic Panels

Operator panels with basic functionality for small machines and plants.

SIMATIC Comfort Panels

Operator panels with high-end functionality for demanding applications.

SIMATIC Mobile Panels

Mobile operator panels with or without cables for direct operator control of the plant and machine from any location.

SIMATIC Micro Panels

Operator panels for small machines and specially designed for SIMATIC S7-200.

Introduction

Overview (continued)

SIMATIC Panels

Compact and rugged operator panels for use directly at the machine – finely graded in performance and convenience and available as operator panels and Touch Panels.

SIMATIC Multi Panels

Multifunctional platforms that, in addition to visualization, also perform other automation tasks such as controlling.

SIMATIC WinAC MP

The software PLC can be used on the Multi Panels of the 170/270 and 370 series and is suitable for complex processes in which control and visualization tasks are to be solved with one and the same device.

SIMATIC HMI devices with all-round protection

The SIMATIC HMI devices with all-round protection (MP 377 PRO, Thin Client PRO, Flat Panel PRO, and HMI IPC477C PRO) are specially designed for mounting on a support arm/stand. Thanks to their extremely rugged design, the devices are ideal for industrial applications in harsh environments.

Devices with stainless steel fronts

Panels and Panel PCs with touch screens and stainless steel fronts have been designed for use in the food & beverages industry for operator control and monitoring directly on food processing machines.

HMI devices for hazardous areas

Die SIMATIC HMI Ex devices are intrinsically safe Panel PCs and Thin Clients that have been specially designed for the 'Zone 1' and 'Zone 2' hazardous areas. Further SIMATIC HMI devices are also available for the hazardous area 'Zone 2' and can be found in Catalog ST 80/ST PC, Chapter 2 'Operator panels'.

HMI software

Flexibility in any HMI application – from Basic Panel up to process visualization

SIMATIC WinCC in the Totally Integrated Automation Portal (TIA Portal) is part of a new, integrated engineering framework which offers a uniform engineering environment for programming and configuration of control, visualization and drive solutions.

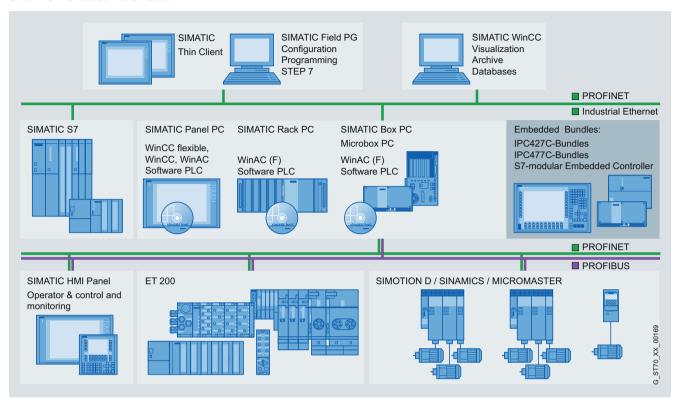
With WinCC in the TIA Portal it is possible to configure HMI applications ranging from the simplest operating solutions with Basic Panels and Comfort Panels up to SCADA applications on PC-based multi-user systems. The possible range of solutions is thus greatly extended compared to the predecessor product SIMATIC WinCC flexible.

SIMATIC WinCC V7 is still available for highly-complex applications with Plant Intelligence solutions, integral archive servers or redundant architectures, whereas WinCC Open Architecture is available for applications with high customer-specific adaptation requirements, even for non-Windows platforms.

Introduction

Overview (continued)

SIMATIC PC-based Automation



Industrial PC

The optimum PC hardware platforms for PC-based Automation from Siemens are our reliable and innovative industrial PCs.

PC-based Controllers

Siemens has developed a wide range of coordinated hardware and software components for PC-based Automation. Focal point: SIMATIC PC-based Control with SIMATIC WinAC, the open, flexible and reliable controller for your PC-based automation solution.

Embedded controllers

SIMATIC S7-mEC is a modular controller in S7-300 design with the latest embedded PC technology. It comprises the EC31 (CPU) and optional expansion modules.

Embedded bundles

Embedded bundles based on the embedded industrial PCs are extremely compact, powerful and rugged systems for use at machine level. The functions of PC-based Control (also fail-safe) and/or visualization are already pre-installed and ready to use.

Software packages for SIMATIC IPC

For a number of SIMATIC IPCs, low-cost software packages with the SIMATIC WinCC and WinCC flexible visualization software or the SIMATIC WinAC RTX (F) software controller are offered. An industrial PC must be purchased at the same time as the software package to take advantage of these offers.

Industrial monitors and Thin Clients

Flexible operating concepts can be implemented via Flat Panel monitors and Thin Clients. These can be industry-standard LCD monitors with high-luminance displays that can be placed up to 30 m away from the PC, or low-cost, rugged Thin Clients that offer HMI functionality over the network in large-scale, widely distributed plants.

Further information:

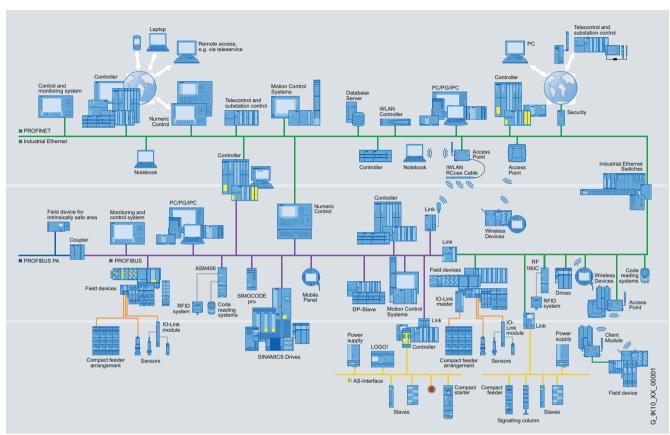
Catalog ST 80/ST PC

Overviews SIMATIC NET

Introduction

Overview

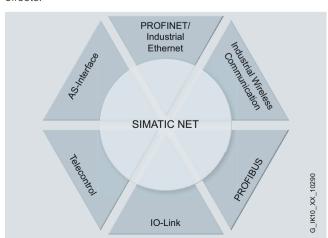
SIMATIC NET Industrial communication – the backbone of automation



Powerful and open communication systems ensure trouble-free communication for automation systems, covering

- data communication or
- process or field communication.

Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This guarantees maximum protection of investment, as existing networks can be extended without any adverse effects.



SIMATIC NET provides components for an integrated overall solution beyond network boundaries.

These include:

- Passive network components, e.g. FastConnect cabling systems
- Active network components, e.g. SCALANCE X Industrial Ethernet switches
- Interfaces for connecting automation devices to the communication systems:
 - Integrated interfaces
 - Communications processors
- Components for wireless networks, e.g. IWLAN
- Components for industrial security
- Gateways, e.g. IE/PB Link PN IO
- Software for configuration, monitoring and diagnostics of the network, e.g. SINEMA E/SINEMA Server

Further information:

- · Catalog IK PI
- Catalog CA 01 on DVD

Overviews SIMATIC Ident

Introduction

Overview

SIMATIC Ident – for more cost-effective production and logistic processes

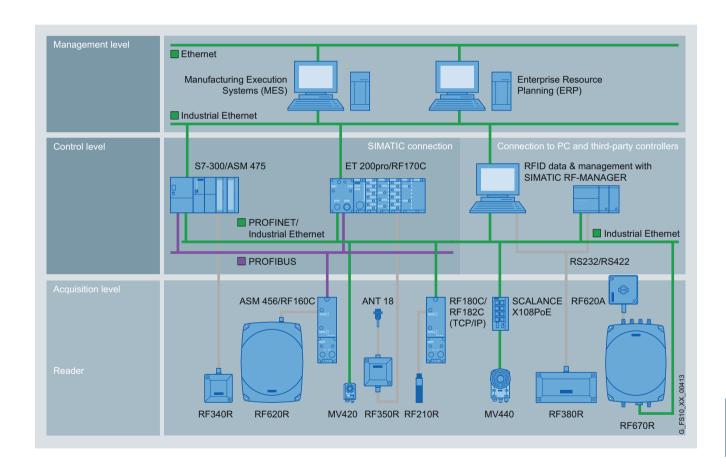
Fiercer competition, stricter standards and legal regulations, shorter product lifecycles, more individual customer requirements, and the increasing globalization of the added value: in order to survive in ever more dynamic markets, companies must increase the efficiency of their value chain. And this applies to production control, asset management, tracking & tracing as well as supply chain management. Through the use of innovative identification technology, companies can gain an important competitive edge.

But should RFID or optical code reading systems be used? Which technology is the right one for the respective application? Is an alternative or joint application appropriate, and how flexibly can you react to changing requirements? Siemens can help you to make the right decision. We offer SIMATIC Ident, a unique portfolio for industrial identification which can provide the perfect solution for your requirements while keeping you flexible for the future.

The two technologies constitute a single system

The appropriate identification technology depends on factors such as recording distance, light conditions, single or repeated identification, and environmental influences such as temperature and contamination. Depending on the application, optical and RFID systems can also be used together as a hybrid solution in the same production line, e.g. DMC for direct marking on the product and RFID for pallets or workpiece holders.

In this case, seamless connection of the two technologies is essential. Our SIMATIC Ident portfolios can offer you the appropriate solution: using joint communication modules or function blocks, connection of optical and RFID systems to the SIMATIC PLC is simple. This ensures that you have a uniform software architecture, and significantly saves effort and costs for engineering, commissioning and maintenance.



Introduction

Overview (continued)

Identification systems: RFID and optical codes

Whether barcode, DMC, RFID or OCR: every technology has its specific strengths. For example, OCR is used where information also has to be read by people, for example a freshness date. The high level of data security of 2D codes and RFID is impressive and they have proven their worth even in harsh industrial environments.

The decisive criterion for an identification system: your individual application.

Verification, identification: code reading systems



If an increased performance is required, 2D codes are recommendable as an alternative to a barcode since they offer a higher storage capacity and a better read rate. They are also inexpensive to attach, e.g. together with dispatch labels. Furthermore, they permit direct part marking (DPM) by means of lasers, printers or needles, which makes them particularly resistant to external influences. 2D codes can be recorded absolutely reliably even from an oblique angle or under difficult lighting conditions.

Our SIMATIC code reading systems provide the ideal solution for reading and verification of 1D and 2D codes and for optical character recognition (OCR), ensuring reliable traceability of production batches beyond the production plant.

Identification, mobile data storage:



If a line of sight does not exist between the recording unit and the code, if large data quantities or long distances are necessary, or if saved information has to be changed, these are fields for RFID. In this case the product or object is provided with a memory chip which can be programmed and read by radio. RFID is ideally suitable for the most diverse applications through the use of low-cost Smart Labels for logistics, rugged data memories for assembly lines, and transponders with a wide operating range.

Our intelligent SIMATIC RF range offers seamless transparency. This makes data available at all times along the complete production and distribution route - thus allowing perfect control and optimization of material flows and logistics.

Further information:

- Catalog ID 10
- Catalog CA 01 on DVD

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Supplementary components



14/2 14/2 14/5	Drive systems SINAMICS SIMODRIVE
14/5 14/5 14/6	Overvoltage protection SICROWBAR AC overvoltage protection SICROWBAR DC overvoltage protection
14/6 14/6	Time-delay, coupling and monitoring relays SIRIUS relays
14/7 14/7	Measuring systems SIMODRIVE sensors
14/8 14/8 14/9	Automation systems SIMOTION motion control system SINUMERIK CNC automation systems
14/11 14/11	Time synchronization systems SICLOCK
14/12 14/12	System cabling MOTION-CONNECT connection system

Drive systems

SINAMICS

Overview



The SINAMICS family

- Uniform range of drives for every application and sector.
- Wide output range from 0.12 kW up to 120 MW.
- Wide range of functions from simple V/f control up to highly dynamic servo control.
- Designed for trouble-free interaction with other automation components from Siemens.
- · Joint platform concept with uniform functionality, configuration, commissioning and operation as well as a standardized diagnostics concept and consistent communication mechanisms.

SINAMICS G110 -

The versatile drive for low outputs

- For variable-speed applications (V/f) in 200 to 240 V networks.
- Output range from 0.12 to 3 kW.
- Delivered ready for connection makes for fast installation.
- Simple commissioning through ready-to-connect delivery.
- · Available with integrated filter.
- Versions with increased flexibility and various types of communication.
- · Can be used in a wide range of applications in industry and

Further information:

- Catalog D 11.1
- Internet: www.siemens.com/sinamics-g110

SINAMICS G120 -

The modular single drive for low to medium outputs

- For variable-speed applications (V/f and vector regulation with/without encoder) in 380 to 480 V networks.
- Output range from 0.37 to 250 kW
- Modular system for increased flexibility: Various types of communication (USS protocol, PROFINET and PROFIBUS DP) and Safety Integrated with fail-safe control units.
- Can be used in a wide range of applications in industry and
- Innovative cooling concept and increased ruggedness thanks to external heat sinks.
- Available with integrated line filter and energy recovery

Further information:

- Catalog D 11.1
- Internet

www.siemens.com/sinamics-g120

SINAMICS G120P -

The specialist for pumps, fans, and compressors

- For variable-speed applications (V/f and vector regulation without encoder) in 380 to 480 V networks
- Output range from 0.37 to 90 kW
- Communication over RS 485 (USS, Modbus/RTU, BACnet MS/TP), PROFIBUS DP and CANopen
- Integrated technology functions specially for pump, fan, and compressor applications
- Available with integrated filter A or B
- Can be used in building services, water industry, and process industry

Further information:

- Catalog News D 11.1N, October 2010

www.siemens.com/sinamics-g120p

SINAMICS G110D -

The distributed, compact single drive with high degree of protection for simple applications

- For variable-speed applications (V/f) in 380 to 500 V networks
- Output range from 0.75 to 7.5 kW.
- Communication via AS-Interface
- Main focus is conveying technology, in particular distribution logistics and airports
- Low profile design with standard drilling dimensions in IP65 degree of protection.
- With integrated line filter and brake control
- · Version with repair switch

Further information:

- Catalog D 11.1
- Internet

www.siemens.com/sinamics-g110d

SINAMICS

Overview (continued)

SINAMICS G120D -

The distributed, modular single drive with high degree of protection for first-rate design

- For variable-speed applications (V/f and vector regulation with/without encoder) in 380 to 480 V networks.
- Output range from 0.75 to 7.5 kW.
- Modular system for increased flexibility: various types of communication (PROFINET and PROFIBUS DP) and Safety Integrated with fail-safe control units.
- Can be used in a wide range of applications in industry, main focus on automotive industry.
- Low profile design with standard drilling dimensions in IP65 degree of protection.
- · With integrated line filter and energy recovery.

Further information:

- Catalog D 11.1
- Internet:

www.siemens.com/sinamics-g120d

SINAMICS G130/G150 -

The universal drive solution for single drives in the medium and top performance ranges

- For variable-speed standard applications in the medium and top performance ranges.
- Ready-to-connect standard SINAMICS G150 cabinet, SINAMICS G130 rack-mounted units for plant-specific design.
- Output range from 75 to 2700 kW.
- Equipped as standard with PROFIBUS interface for connection to higher-level controls.
- Particularly suitable for economical use of pumps, fans, extruders, mixers etc.

Further information:

- Catalog D 11
- Internet:

www.siemens.com/sinamics-g130 www.siemens.com/sinamics-g150

SINAMICS S110 -

The compact single-axis servo drive for simple positioning with integrated safety functions

- Specially for single-axis positioning tasks in all sectors of machine and plant construction.
- · Servo control.
- Output range from 0.12 to 90 kW.
- For synchronous servo motors with encoder.
- For asynchronous servo motors with or without encoder.
- Supports practically all types of encoder used in practice for positioning tasks.
- · Integrated safety functions.
- Basic positioner (Epos).
- Free blocks (FFB).
- Pulse direction input.
- · PID controller.
- Brake control.

Further information:

- Catalog PM 22
- Internet:

www.siemens.com/sinamics-s110

SINAMICS S120 -

The flexible, modular drive system for demanding singleaxis and multi-axis applications from the lower to top performance ranges

- Specially for motion control and vector-regulated single-axis and multi-axis applications in all sectors of machine and plant construction.
- Servo/vector regulation, V/f.
- Output range from 0.12 to 1200 kW, as cabinet modules up to 4500 kW
- Various designs with different focal applications.
- Highly flexible, e.g. as result of modular system architecture, different types of cooling, support for a wide range of motors/encoders, simple expandability.
- High degree of scalability with regard to performance, number of axes, functionality.
- Integrated safety functions.
- · Comprehensive motion control functionality.
- High availability and efficiency even in unstable networks.
- Automatic parameterization and simple drive commissioning/optimization.

Further information:

- Catalogs PM 21, NC 61, D 21.3
- Catalog CA 01
- Internet

www.siemens.com/sinamics-s120 www.siemens.com/automation/mall

Supplementary components

Drive systems

SINAMICS

Overview (continued)

SINAMICS S150 -

The sophisticated drive solution for single drives in the medium to top performance ranges

- For applications with maximum demands on precision and dynamic response in the medium to top performance ranges such as test rig drives, elevator and crane systems, crosscutters and shears, conveyor belts, presses, cable winders and centrifuges.
- · Ready-to-use control cabinet.
- Output range from 75 to 1200 kW.
- High availability and efficiency even in unstable networks.
- Efficient operation through standard energy recovery.
- · Reactive power compensation possible.
- Equipped as standard with PROFIBUS interface for connection to higher-level controls.

Further information:

- Catalog D 21.3
- Internet:

www.siemens.com/sinamics-s150

SINAMICS GM150 -

The universal drive solution for single drives in the mediumvoltage range

- Single drive for applications with quadratic and constant load characteristic without regeneration.
- · Space-saving, quick and easy commissioning.
- Ready-to-connect cabinet unit.
- Particularly suitable for economical use of pumps, fans, extruders, mixers etc.
- Power unit with HV-IGBT technology for outputs up to 13 MVA, output voltage 2.3 to 4.16 kV, alternatively with air or water cooling.
- Power unit with IGCT technology for outputs from 10 MVA to 21 MVA, output voltage 3.3 kV, water cooling.
- Optimum interaction with SIMATIC.

Further information:

- Catalog D 12
- Internet:

www.siemens.com/sinamics-gm150

SINAMICS SM150 -

The sophisticated drive solution for single and multi-motor drives in the medium-voltage range

- Single or multi-motor drives for regenerative, highly dynamic applications.
- Roller drives (cold, warm), hoisting drives, test rigs, belt systems.
- Power unit with HV-IGBT technology for outputs from 3.4 to 5.8 MVA, output voltage 3.3 and 4.16 kV, alternatively with air or water cooling.
- Power unit with IGCT technology for outputs from approx. 5 to 31.5 MVA, output voltage 3.3 kV, water cooling.
- Ideal for direct power exchange over the common DC bus with multi-monitor drives with regenerative and motorized operation.
- Optimum interaction with SIMATIC.

Further information:

- Catalog D 12
- Internet:

www.siemens.com/sinamics-sm150

SINAMICS DCM -

The scalable drive system for basic and sophisticated DC drive applications

- In the output range from 6 kW to 30 MW for industrial machines and plants (steel/aluminum, plastics, printing, paper, lifting gear, mining, oil & gas, excitation systems) in new plants and for retrofitting.
- PROFIBUS as standard, PROFINET optional.
- Control unit variance.
- Field power supply in line with requirements.
- Electronics supply for connection to 24 V DC.
- Power unit isolated with respect to ground (floating voltage detection).
- Free function blocks and Drive Control Chart (DCC).
- · Expandable functionality using SINAMICS components.
- Single-phase operation possible.
- · Coated modules and nickel-plated copper busbars.
- Wide temperature range.

Further information:

- Catalog D 23.1
- Internet: www.siemens.com/sinamics-DCM

Supplementary components

Drive systems, overvoltage protection

SIMODRIVE

Overview



- Converter system for connection to machine tools, robots, special machines, manipulators, and production machines.
- Consists of the SIMODRIVE 611 digital/universal converter system as well as closed-loop control modules with analog or digital interface for operation of three-phase motors, e.g. synchronous or asynchronous motors.

- SIMODRIVE POSMO A with PROFIBUS DP connection enables simple interfacing to the SIMATIC using the STEP 7 programming software.
 - SIMODRIVE POSMO A is an intelligent positioner motor with integrated converter power unit, motor controller, positioning controller, and program memory.

Drive ES engineering system:

See Catalog Section 11, Engineering Tools, page 11/47.

Further information:

- Catalog NC 60/DA 65.4
- Catalog CA 01
- Internet:

www.siemens.com/drivesolutions www.siemens.com/industrymall

SICROWBAR overvoltage protection

Overview

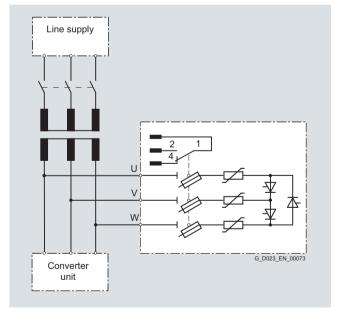
SICROWBAR AC overvoltage protection



SICROWBAR AC overvoltage protection is used to protect power semiconductors in converters (thyristors and diodes) against overvoltages that occur between the phases of a three-phase line supply. The range of applications is not restricted to protecting DC drive converters, but also comprises infeed/regenerative feedback units of the AC drive technology that are equipped with thyristors.

Overvoltages that occur on the AC side of converters are mainly caused by switching operations when disconnecting from the line supply at the transformer primary. This applies both to operational switching operations (shutdown at no-load) as well as in the case of a fault (shutdown under load).

The overvoltage protection is mainly used in the following configuration:



Further information:

- Catalog D 23.1
- Internet: www.siemens.com/sinamics-dcm

Overvoltage protection, time-delay, coupling and monitoring relays

SICROWBAR overvoltage protection

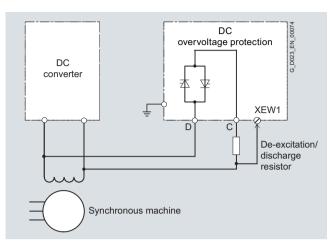
Overview (continued)

SICROWBAR DC overvoltage protection



SICROWBAR DCovervoltage protection protects coils and converters against overvoltage conditions when they are used to supply large inductances, for instance the excitation coils of synchronous machine motors, DC machine motors or hoisting solenoids.

As an option it is additionally possible to initiate high-speed deexcitation, triggered by a superimposed signal. A corresponding de-excitation/discharge resistor must be provided.



Further information:

- Catalog D 23.1
- Internet: www.siemens.com/sinamics-dcm

SIRIUS relays

Overview



Analog interface converters/isolating amplifiers/ transducers 3RS17

The conversion of one signal into another is required if e.g. a voltage signal has to be converted into a current signal for transmission over a longer distance, or if the output of a sensor and the input of the controller do not match.

Analog interface converters are particularly suitable for electrical isolation or for conversion of analog signals, and for EMC and overvoltage protection.

• Microprocessor-controlled and calibrated interface converters with an overall width of 6.2 mm or more.

- Extremely simple commissioning using DIP switches and integrated setpoint generators.
- All terminals are protected against reverse polarity and are short-circuit and surge-proof up to 30 V.

Interface relays 3TX70 and plug-in relay connectors LZS

Interface relays 3TX7 with an overall width of 6.2 mm:

- Can be used for contact multiplication, adaptation of potential, or for EMC and overvoltage protection.
- Semiconductor versions for applications with high switching rate or for switching capacitive loads.

Plug-in relay connectors 3TX701 with an overall width of 6.2 mm:

- Plug-in relays: At the end of its service life, a relay can be replaced without loosening the wiring.
- Wire inlet and connection screw are clearly accessible from the front.

Plug-in relay connectors LZS:

- Can be used for contact multiplication, adaptation of potential, or for switching small loads.
- Max. 4 changeover contacts in one device:
 - Wide-voltage versions with or without hard gold-plated contacts.
 - With screw-type or push-in spring-loaded terminals

Time-delay, coupling and monitoring relays, measuring systems

SIRIUS relays

Overview (continued)

Monitoring relays 3RS10/11, 3UG, 3RN1

Temperature monitoring relays 3RS10/11 operate autonomously or in parallel with a closed temperature control loop, and serve to monitor a defined limit temperature in solid, liquid or gaseous

· Simple operation without complicated menus or supplementary software.

Monitoring relays 3UG are used to monitor electric and nonelectric variables which cannot (or should not) be directly recorded by an automation system.

- Monitoring of networks for overvoltage or undervoltage, direction of rotation, or asymmetry.
- Monitoring of loads using Cos-phi or current measurement.
- · Monitoring of levels or speeds of rotation.

Thermistor motor protection devices 3RN1 monitor the winding temperature of motors fitted with a PTC sensor.

Compliance with the ATEX directive 94/9/EC through conformity with EN 60079-14 and EN 60947-8 standards.

- Fast fault diagnostics through display of open-circuit and short-circuit.
- Electronics-compatible output due to hard gold-plated contacts.

Time-delay relays 3RP15 and 3RP20

Time-delay relays 3RP15 and 3RP20 are used for all timedelayed switching operations in open-loop control, starting, protection and closed-loop control circuits. They guarantee high functionality and good repeatability of the set time. They are used, for example, in critical real-time operations such as the star-delta changeover of motors.

- Wide-voltage and multifunction versions.
- Electronics-compatible, hard gold-plated contacts.

Further information:

- · Catalog IC 10 Chapters 3 and 8
- · Product documentation for SIRIUS relays
- www.siemens.com/relays

SIMODRIVE sensors

Overview



- SIMODRIVE sensors are measuring systems for recording distances, angles of rotation, and velocities.
- Can be used on machines in various sectors, e.g. production machines, manipulators, machine tools, and special
- Can be connected to SIMATIC, SINAMICS, SINUMERIK, SIMOTION, SIMOVERT MASTERDRIVES and SIMODRIVE.

- Accessories available for SIMODRIVE sensors: couplings, mounting material, connectors, and completely preassembled signal cables.
- · SIMODRIVE sensors are available as built-on incremental or absolute-value encoders.
- Incremental encoders:
- Interfaces RS 422 (TTL), 1 V_{pp} and HTL.
 Operating voltage 5 V DC or 10 V to 30 V DC.
- · Absolute-value encoders:
 - All absolute-value encoders are available in single-turn and multiturn versions.
 - Interface SSI (synchronous serial interface) or connection for EnDat, PROFIBUS DP, PROFINET IO with RT/IRT and DRIVE-
 - Encoders with PROFIBUS DP support Class 1 ... 3 profiles as well as isochronous mode, internode communication, and application-specific supplementary functions. They are parameterizable.
 - Encoders with PROFINET IO support Class 1 ... 4 profiles.
- All measuring systems are available in synchro flange and supported flange joint versions.

Further information:

- Catalogs NC 60, NC 61, NC 82, PM 21
- Catalog CA 01
- Internet:

www.siemens.com/sensor-systems www.siemens.com/industrymall

Automation systems

SIMOTION motion control system

Overview



SIMOTION system

- The SIMOTION system is primarily used for machines in which
 motion control with servo or hydraulic axes has priority.
 Main fields of application include packaging, printing and
 plastics machines, as well as the automation of machines in
 the textile, converter technology, timber, glass, ceramic, and
 stone industries.
- The system approach: amalgamation of motion control with logic and technology functions. In this case, all movements, logic functions at motion level, and technology functions such as temperature and hydraulic controls or cams, are executed in the same system.
- · Advantages:
- No time-critical interfaces between the components.
- No programming requirements for these interfaces.
- Uniform and transparent programming and diagnostics, as already known from PLC systems.
- Free selection of hardware platform: Controller, PC or directly integrated in the drive.
- Simple, graphic sequential programming using Motion Control Chart.
- Integrated PLC functionality.
- Components of the SIMOTION system:
- SCOUT engineering system:
 - The engineering system for complete automation of machines, including:
 - MCC (Motion Control Chart) for simple, graphic sequential programming;
 - LAD and FBD for programming of PLC tasks;
 - ST as text language for simple creation of functions and comprehensive calculations.

- Runtime software modules:
- Various motion control and technology functions for implementing simple axis positioning by means of synchronous operation and cam disks up to 3D path interpolation with transformations for various handling kinematics. Specific selection allows flexible adaptation of the system to the machine.
- Hardware platforms:
- Different platforms allow adaptation to the respective machine. Available for selection are the compact version direct in the drive, the modular version in S7-300 design, and the open version as a pure software solution on an industrial PC.

SIMOTION D - Compact and integrated in the drive

- The complete automation of machines with drive control, PLC, motion control, and technology functionalities in a compact unit in SINAMICS \$120 design.
- Particularly fast response.
- Versatile networking via PROFIBUS, PROFINET or Ethernet.
- · Scalable with several performance versions.
- Available in two designs:
 - SIMOTION D410 is a compact control unit for single-axis applications and is snapped on to blocksize format SINAMICS S120 PM340 power modules.
 - SIMOTION D4x5/D4x5-2 are control units for multi-axis applications in SINAMICS S120 booksize format and are offered in 4 performance versions.
- · Ideally suited for:
 - Compact machines
 - Distributed automation concepts, e.g. for machines with multiple axes
 - Modular machines
 - Time-critical demands on axis couplings

SIMOTION C - Modularity and flexibility

- Controller in S7-300 design.
- Two versions, optionally with integrated drive interfaces for analog and stepper drives or with PROFINET interface.
- Onboard inputs/outputs expandable by I/O and function modules of the SIMATIC S7-300.
- With integrated isochronous PROFIBUS interfaces for distributed connection of drives or for communication with operator panels and higher-level controls.
- Ideally suited for:
 - Largest possible freedom in the choice of drives
 - Wide range of process signals
 - Retrofit applications through integral analog interfaces.

Automation systems

SIMOTION motion control system

Overview (continued)

SIMOTION P - Open for other tasks

- PC-based, open motion control system available in two versions:
 - SIMOTION P320-3 for embedded PC solutions with the Windows Embedded Standard 2009 operating system
 - SIMOTION P350-3 for high-performance applications with the Windows XP operating system.
- Control, motion control, and HMI functions are executed together with standard PC applications on the same platform. User advantages:

Through utilization of the PC platform and the Microsoft Windows operating system – with a real-time expansion for SIMOTION – SIMOTION P combines the advantages of two worlds:

- The openness of the Windows operating system
- The real-time capability of the SIMOTION operating system

- Ideally suited for:
- Applications requiring an open PC environment.
- Applications with particularly high-performance demands, e.g. hydraulic applications.
- Applications requiring control and visualization on one hardware platform.
- Comprehensive data storage, evaluation, and logging.

Further information:

- Catalog PM 21
- Catalog CA 01
- Internet:

www.siemens.com/simotion www.siemens.com/automation/mall

SINUMERIK CNC automation systems

Overview



SINUMERIK 802

- CNC range for simple applications
- Mainly for turning and milling applications; solutions in other technologies also possible.
- SINUMERIK 802S base line together with the SINAMICS V60 servo converter and 1FL5 servo motors is the appropriate solution for economical and simple implementation of control tasks for machine tools with up to three feed axes.
- SINUMERIK 802C base line with analog drives for increased dynamic response and performance. Perfect for retrofitting. Standard drives ±10 V, universal use, simple operation, and proven technology.

SINUMERIK 840D with SIMODRIVE 611 digital

- The digital system for the toughest demands.
- For use in mold making and tool manufacture, for complex industrial scale manufacturing in the job shop, and for almost all technologies.
- With up to 10 CNC channels and 31 axes per NCU module. Thus also appropriate for use in the rotary indexing and cyclic machines sector (e.g. presses, packaging and printing machines)
- Scalable NCU software with 2/6/12/31 axes for several different NCU modules and correspondingly high CNC functionality.
- Coupling facility for up to 8 NCUs with max. 248 axes via NC link.
- Special technology functions (e.g. laser machining, handling) available using reloadable compile cycles. Optimum adaptation to the machines and the equipping of uniform machine series is thus possible.
- All NCUs with optional PROFIBUS DP interface (master/slave).

Further information:

- Catalog NC 60
- Catalog CA 01
- Internet:

www.siemens.com/sinumerik www.siemens.com/industrymall

Automation systems

SINUMERIK CNC automation systems

Overview (continued)

SINUMERIK 802D sl

The SINUMERIK 802D sl is an operator panel control which combines all the components of a CNC control and drive control in one unit. Six digital drives can be connected via a DRIVE-CLiQ link.

- CNC for every application
- Turning/milling or nibbling/grinding
- · Simple and rugged installation with minimal wiring.
- Execution of programs over the network or from CF card

SINUMERIK 828D BASIC T/BASIC M with SINAMICS S120 Combi



Compact, strong, straightforward - simply ingenious

The compact, operator-panel based SINUMERIK 828D BASIC T/BASIC M CNC controls offer a maximum of ruggedness and easy maintainability.

Powerful CNC functions coupled with a unique 80 bit NANOFP accuracy result in maximum workpiece precision and minimum machining time. Thanks to a flexible CNC programming language and the exceptional ShopTurn/ShopMill machining step programming, both mass produced components and individual workpieces can be programmed and machined with the maximum possible efficiency. Pre-configured technologyspecific system software and unique servicing functions reduce the costs for commissioning and servicing to an absolute minimum.

Tailored for standard turning machines ...

The SINUMERIK 828D BASIC T CNC control is perfectly tailored to the requirements of modern standard turning machines. With powerful kinematic transformers and a comprehensive selection of technology cycles, the SINUMERIK 828D BASIC T is also wellequipped for sophisticated machining with rotating tools.

Perfectly tailored and pre-configured for:

- Up to 5 axes/spindles in one machining channel.
- Front side machining with rotating tools.
- · Lateral surface machining with rotating tools

... and standard milling machines.

The SINUMERIK 828D BASIC M CNC control is perfectly tailored to the requirements of modern standard milling machines. With the integrated SINUMERIK MDynamics technology package including the new intelligent motion and velocity control Advanced Surface, the SINUMERIK 828D BASIC M is also wellequipped for the machining of mold making workpieces.

Perfectly tailored and pre-configured for:

- Up to 5 axes/spindles in one machining channel.
- Lateral surface machining with A axis.
- · Machining and use in mold making

Further information:

- Catalog NC 82
- Catalog CA 01

www.siemens.com/sinumerik www.siemens.com/industrymall

SINUMERIK 840D sl



SINUMERIK 840D sl offers modularity, openness, flexibility and a uniform structure for operation, programming, and visualization. It provides a system platform with innovative functions for almost all technologies.

The new SINUMERIK Operate GUI is clear and intuitive. It combines the familiar HMI-Advanced, ShopMill and ShopTurn under a uniform and intuitive operation and programming GUI for efficient machine operation.

- **Open** for uniform integration of your specific know-how from operation down to the NCKs.
- Flexible for medium to complex multi-axis systems using scalable hardware and software and optimum integration in networks.
- **Strong** for maximum dynamics and precision thanks to innovative functions.

Supplementary components

Automation systems, time synchronization systems

SINUMERIK CNC automation systems

Overview (continued)

Integrated and certified SINUMERIK Safety Integrated functions are available with the SINUMERIK 840D sl. It is then possible to provide highly effective protection of personnel and machinery in a simple, economical and practice-oriented manner.

Functions

- Integrated in the SINAMICS S120 drive system.
- Up to 31 axes/spindles, plus up to 19 PLC axes.
- 10 machining channels.
- 80-bit NANOFP accuracy.
- 7.5"/10"/12"/15" TFT operator panel fronts.
- Operating and programming with animated graphics.
- programGUIDE programming support.
- ShopMill/ShopTurn machining step programming.
- · programSYNC multichannel programming.

- Strong NC functions.
- · Powerful and uniform S7 PLCs.
- SINUMERIK Safety Integrated functions.

Used for turning, drilling, milling, grinding, laser machining, nibbling, punching, in tool and mold making, for high-speed cutting applications, for timber and glass processing, for handling operations, in transfer lines and rotary indexing machines, for mass production and job-shop production.

Further information:

- Catalog NC 61
- Catalog CA 01
- Internet: www.siemens.com/sinumerik www.siemens.com/industrymall

SICLOCK

Overview



SICLOCK TC400



SICLOCK TC100

- Modular time systems for process synchronization, including radio receivers for GPS and DCF77.
- Can be used for synchronization from single PCs up to large systems with multiple redundancy.
- Can be connected to SIMATIC S7, S5, PCS 7, PC, computer etc. over Ethernet (SIMATIC NET or NTP).
- Individual connections with asynchronous data transmission, pulses, and fiber-optic connections.
- Consists of the SICLOCK TC400, SICLOCK TC100 or SICLOCK TS central system clocks, radio synchronization devices, pulse converters, and driver software for message frame reception.

SICLOCK TC400, SICLOCK TC100 and SICLOCK TS

- Central system clocks for process synchronization.
- Simple and fast adaptation to the process through parameterization of interfaces and message frame contents using LCD on the device (TS) and convenient Web interface (TC400 and TC100).
- Radio synchronization using GPS, DCF77, IRIG B.
- Process synchronization over Ethernet or point-to-point connections, e.g. with DCF77, minutes pulse, IRIG B, IRIG A message frames.

Note:

SICLOCK TS will be discontinued at the end of 2011.

Further information:

- Siemens AG, I IA CE EDM, Frauenauracher Strasse 98, 91056 Erlangen, Germany Tel.: +49 9131/7-28866 (Hotline) E-mail: siclock@siemens.com
- Internet: <u>www.siemens.com/siclock</u> <u>www.siemens.com/industrymall</u>

Supplementary components System cabling

MOTION-CONNECT connection system

Overview



MOTION-CONNECT cables are suitable for use with many different types of machine tools and production machinery.

The power cables and signal cables can be supplied by the meter or pre-assembled.

The following MOTION-CONNECT cable designs are available:

- MOTION-CONNECT 500 is the solution for mainly fixed routing.
- MOTION-CONNECT 700 is the ideal complement to linear motors and machines with high dynamic requirements. The cables are resistant to cutting oils.

MOTION-CONNECT 800 meets all the high mechanical requirements for use in cable carriers for machine tools and production machinery. The cables are resistant to cutting oils.

Benefits

SPEED-CONNECT

The new, pre-assembled cables with SPEED-CONNECT connectors permit fast, stable and reliable connections. By rotating briefly up to the stop, the union nut of the connector secures the lock and thus the connection.

The cables with SPEED-CONNECT connectors supplement the previous offering of MOTION-CONNECT cables with fully-threaded connectors.

Use of pre-assembled MOTION-CONNECT cables provides high quality and perfect, system-tested functionality.

Applications

The degree of protection of the pre-assembled power and signal cables and their extension cables is IP67 in the closed, inserted state.

Further information:

- Catalogs NC 60, NC 61, NC 82, PM 21
- Catalog CA 01
- Internet: www.siemens.com/industrymall

15

Appendix



15/2	Training
15/3 15/3 15/5	Additional documentation Specialist books for automation engineering SIMATIC Manual Collection
15/6 15/6 15/7	Standards and approbations CE marking Quality management
15/8 15/8 15/9	Partner at Industry Automation and Drive Technologies Siemens contacts worldwide Siemens Solution Partner Automation
15/10 15/10	Online Services Information and Ordering in the Internet and on DVD
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Appendix

Training

Faster and more applicable know-how: Hands-on training from the manufacturer

SITRAIN® – the Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation and plant engineering enables you to make independent decisions with confidence. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.



First-class know-how directly pays for itself: In shorter startup times, high-quality end products, faster troubleshooting and reduced downtimes. In other words, increased profits and lower costs.

Achieve more with SITRAIN

- Shorter times for startup, maintenance and servicing
- Optimized production operations
- · Reliable configuration and startup
- · Minimization of plant downtimes
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

Contact

Visit our site on the Internet at:

http://www.siemens.com/sitrain

or let us advise you personally.

SITRAIN Customer Support Germany:

Phone: +49 (0) 911 / 895 7575 Fax: +49 (0) 911 / 895 7576 E-Mail: info@sitrain.com SITRAIN highlights

Top trainers

Our trainers are skilled teachers with direct practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers enables them to teach theory effectively. But since theory can be pretty drab, we attach great importance to practical exercises which can comprise up to half of of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. This training approach will give you all the confidence you need.

Wide variety

With a total of about 300 local attendance courses, we train the complete range of Siemens Industry products as well as interaction of the products in systems.

Tailor-made training

We are only a short distance away. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You wish to have individual training instead of one of our 300 courses? Our solution: We will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

The right mixture: Blended learning

"Blended learning" means a combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teachyourself program as preparation or follow-up. Additional effect: Reduced traveling costs and periods of absence.



Appendix Additional documentation

Specialist books for automation engineering

Overview

Siemens specialist books provide you with a profound knowledge of the various fields of automation engineering. They help readers at various levels, from beginners to experts, to

familiarize themselves with individual topics, to consolidate their knowledge and they act as reference manuals.

Ordering data	Order No.		Order No.
Milestones in automation		Automation with STEP 7 in STL and SCL	
Easy to read and cleverly organized, the book offers technicians, engineers and managers a profound look into the development history and application possibilities of a technology which has shaped all types of industrial processes and technical systems like no other.		Now in its sixth edition, this book presents the most recent service pack version of the STEP 7 programming software. It explains elements and applications of the text-oriented programming languages STL (Statement List) and	
German	6ZB3 500-0AQ01-0AA0	SCL (Structured Control Language) for both SIMATIC S7-300 and	
English	6ZB3 500-0AQ02-0AA0	SIMATIC S7-400, including new products for distributed I/O and for	
Automation with SIMATIC		applications with PROFINET.	
The book is perfectly suited for all those will little advance experience		German	6ZB3 500-0AA01-0AA0
and who wish to familiarize		English	6ZB3 500-0AA02-0AA0
themselves quickly with the field of programmable controllers.		Automation with STEP 7 in LAD and FBD	
German	6ZB3 500-0AE01-0AA0	The book describes elements and	
English	6ZB3 500-0AE02-0AA0	applications of LAD and FBD both for SIMATIC S7-300 and for	
Automating with SIMATIC S7-1200		SIMATIC S7-400. PROFINET IO,	
The book introduces the new hardware components of the S7-1200 automation system and		SFC 109 Protect and function blocks for I/O access are outlined as special functions.	
describes its configuration and parameterization. A sound intro-		German	6ZB3 500-0AB01-0AA0
duction to STEP 7 Basic illustrates		English	6ZB3 500-0AB02-0AA0
the fundamentals of programming and troubleshooting. Beginners		Controlling with SIMATIC	
learn the fundamentals of automation engineering with SIMATIC S7-1200, and those changing from S7-200 and S7-300 can find the knowledge required for this.		This book describes control engineering in practical terms as a subset of open-loop control and automation engineering based on the SIMATIC S7 control system or the SIMATIC PCS 7 process control system within the scope of Totally	
German	6ZB3 500-0BK01-0AA0	Integrated Automation (TIA).	
English	6ZB3 500-0BL01-0AA0	German	6ZB3 500-0AD01-0AA0
LOGO! - Practical Training		English	6ZB3 500-0AD02-0AA0
This practical book describes program creation and hardware selection clearly. As well as		Distributed configurations with PROFIBUS DP/DPV1	
explaining standard control tasks in the form of a guide, it also contains a host of practical examples. Beginning with the quick start of the program simulation, the reader obtains comprehensive training in the different LOGO! versions.		Due to its practical nature, the book is especially suited for PROFIBUS planners, project engineers, and programmers. However, students and instructors will also find the basic and comprehensive illustration useful.	
English, 1 unit	6ZB3 500-0BH01-0AA0	German	6ZB3 500-0AC01-0AA0
English, 10 units	6ZB3 500-0BJ01-0AA0		

Appendix Additional documentation

Specialist books for automation engineering

Ordering data	Order No.		Order No.
Automating with PROFINET		Industrial Ethernet in industrial	
This book provides an introduction to the new PROFINET technology. Decision-makers, system designers and students get a compact overview of the concept, fundamentals, and current devices. Project engineers, start-up engineers and technicians obtain extensive knowledge that enables them to plan and solve their own		automation This book provides plant planners and operators, programmers and commissioning engineers with the fundamental information and terminology for using Ethernet LAN technologies in industrial automation with SIMATIC. German	6ZB3 500-0AM01-0AA0
PROFINET-based automation applications.		Dictionary of drive systems and mechatronics	
German	6ZB3 500-0AP01-0AA0	The dictionary contains a compre-	
English	6ZB3 500-0AP02-0AA0	hensive collection of terms related to drives and automation	
Electrical drive technology		engineering, mechatronics and	
This book deals with all aspects of modern electrical drive systems from a user viewpoint. It is aimed on the one hand at industrial users who		related technical areas, including fieldbus technologies and electrical machines. German/English	6ZB3 500-0AG01-0AA0
want to understand, plan, use and maintain electrical drives and on the		German/English, on CD-ROM	6ZB3 500-0AH02-0AA0
other hand at skilled operators, technicians, engineers and students who would like to acquire a comprehensive overview of electrical drive technology.		Dictionary of electrical engineering, power engineering and automation This dictionary is a standard reference work for translators.	
German	6ZB3 500-0BD01-0AA0	engineers and technical writers who	
Electrical feed drives in automation engineering This book provides a comprehensive introduction to the physical and technical fundamentals of control and drive technology. Particular attention is given to the computation and measurement of electric feed drives in automation technology.		need a comprehensive and reliable collection of technical terms from the areas of power generation, transmission and distribution as well as drive and automation engineering, electrical installation engineering, power electronics, and measuring and test engineering. German-English English-German	6ZB3 500-0AJ01-0AA0 6ZB3 500-0AJ02-0AA0
German	6ZB3 500-0AF01-0AA0	German-English/English-German,	6ZB3 500-0AJ03-0AA0
Electrical feed drives in production/automation engineering		on CD-ROM	
This book describes individual and up-to-date components for feed drives such as motors and mechanical transfer elements in a practical context.			
German	6ZB3 500-0BC01-0AA0		
Optimizing processes with RFID and Auto-ID			
Apart from the fundamentals of RFID/Auto-ID technology, this book also presents applications that are already being put to the test in various real-world situations. They demonstrate the approach, the process and the selection of RFID and Auto-ID systems for solving a variety of problems.			
German	6ZB3 500-0BE01-0AA0		
English	6ZB3 500-0BF01-0AA0		

Appendix Additional documentation

SIMATIC Manual Collection

Overview

The SIMATIC manual collection brings together the manuals of Totally Integrated Automation in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

The manual collection contains manuals in 5 languages for

- LOGO!
- SIMADYN
- SIMATIC bus components
- SIMATIC C7
- SIMATIC Distributed I/O
- SIMATIC HMI
- SIMATIC Sensors
- SIMATIC NET
- SIMATIC PC Based Automation
- SIMATIC PCS 7
- SIMATIC PG/PC
- SIMATIC S7
- SIMATIC Software
- SIMATIC TDC

Manuals that are not yet available in all 5 languages will at least be included in English and German.

There is an update contract for the SIMATIC Manual Collection that encompasses supply of the up-to-date collection and three subsequent updates which is valid for one year. If the update contract is not cancelled, it is automatically extended and the list price will be charged to the customer.

Ordering data	Order No.
SIMATIC Manual Collection	6ES7 998-8XC01-8YE0
Electronic manuals on DVD, in 5 languages: S7-200/300/400, C7, LOGOI, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET	
SIMATIC Manual Collection update service for 1 year	6ES7 998-8XC01-8YE2
Current Manual Collection DVD as well as the three following updates	

- D: Subject to export regulations AL: N and ECCN: 5D992
- J: Subject to export regulations AL: N and ECCN: EAR99S

AppendixStandards and approbations

CE marking

Overview

The electronic products described in this catalog comply with the requirements and protection objectives of the following EU guidelines and with the harmonized European standards (EN) which have been published for programmable controllers in the official Journal of the European Union:

- 89/336/EWG "Electromagnetic Compatibility" (EMC guideline).
- 73/23/EWG "Electrical Equipment for Use Within Specific Voltage Limits" (low voltage guideline).

We have declarations of conformity available for the responsible authorities.

The SIMATIC products are designed for operation in industrial environments and comply with the following requirements:

Noise emissions: EN 50081-2: 1993 Noise immunity: EN 50082-2: 1995

The products can also be used in the domestic environment (household, business and trade area, small plants) with individual approval:

Emitted interference: Individual approval

Immunity: EN 50082-1: 1992

For household use an individual approval from the respective national authority or testing body is required as far as emitted-interference is concerned. In Germany this approval is issued by the Federal Post and Telecommunications Office and its subsidaries.

For the installation and operation of the products described in this catalog, the installation guidelines described in the manuals and the important notes concerning installation in cabinets and concerning the use of shielded cable must be complied with.

Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. Therefore a declaration of conformity with regard to the EU machine directive 89/392/EEC or 2006/42/EU (new edition, applicable from end of 2009) may not be provided for SIMATIC.

The EU machine directive regulates the requirements placed on a machine or a part thereof. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine, and must therefore be integrated into the evaluation of the complete machine by the machine manufacturer.

As electrical equipment, SIMATIC is subject to the low-voltage directive which, as a "total safety directive", covers all dangers just like the machine directive.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table will help you in the provision of your declaration of conformity, and shows which criteria according to EN 60204-1 (2006-06) apply to SIMATIC. You can obtain further information from the enclosed declaration of conformity according to the low-voltage and EMC directives (with list of included standards).

EN 60204-1	Topic/criterion	Notes
Paragraph 4	General requirements	The requirements are met when the equipment is assembled/installed in accordance with the installation guidelines.
		Please note the relevant information in the manuals.
Paragraph 11.2	Digital input/output interfaces	The requirements are met
Paragraph 12.3	Programmable equipment	The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons
Paragraph 20.4	Voltage tests	The requirements are met

Appendix Standards and approbations

Quality management

Certificates, authorizations, approbations, declarations of conformity

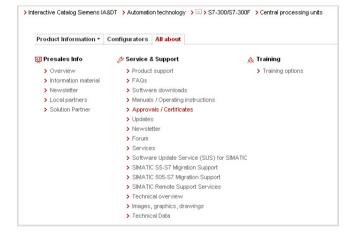
An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet at

http://www.siemens.com/simatic/certificates

The lists are continously updated. The data for products which have not yet been included in the overview is continously collected and prepared for the subsequent edition.



You can also find certificates, approbations, verification certificates or characteristic curves by going directly to the Link Box:



Quality management

The quality management system of the Industry Sector, Industry Automation Division, complies with the international standard ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

The DQS certificate is recognized in all EQ Net countries.

DQS Registered Certificate Nos.:

Siemens AG

 I IA AS Industrial Automation Systems Reg. No.: 001323 QM08

Appendix Partner at Industry Automation and Drive Technologies

Siemens contacts worldwide

Overview



At Siemens Industry Automation and Drive Technologies, more than 85 000 people are resolutely pursuing the same goal: longterm improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

Your personal contact can be found in our Contacts Database at: www.siemens.com/automation/partner

You start by selecting a

- Product group,
- Country,
- City,
- Service.





Partner at Industry Automation and Drive Technologies

Siemens Solution Partner Automation

Overview

Solution Partner

Automation

SIEMENS

Siemens Solution Partner Automation

The products and systems from Siemens Industry Automation and Drive Technologies offer the ideal platform for all automation applications.

Under the name of Siemens Solution Partners, selected system integrators around the world act as uniformly qualified solution providers for the Siemens range of products and services in the fields of automation and drives. Day after day, they utilize their qualified product and system know-how as well as their excellent industry expertise to your advantage – for all requirements.

The partner emblem is the guarantee and indicator of proven quality. The basis for this are defined quality features that identify Solution Partners as reliable and competent solution providers:

- Solution quality: Numerous reference reports offer you an insight into the solutions expertise of our Solution Partners.
- Expert quality:
 The Solution Partners are trained in specially planned workshops and are thus able to assess the potential of new technologies and implement innovative solutions.
- Project quality:
 Our Solution Partners obtain individual support from us in
 every industry, so that you can benefit from the highest project
 quality, greater safety and the comprehensive manufacturing
 expertise of Siemens.
- Product range quality:
 The Solution Partners offer a comprehensive service portfolio, ranging from consultation and implementation through to servicing.

Solution Partner Finder

The Siemens Solution Partner Program helps you to find the optimum partner for your specific requirements. Support is provided by the Solution Partner Finder, a comprehensive online database that showcases the profiles of all our solution partners. You can convince yourself of the competence of the respective Solution Partner by means of the references provided.

The following search criteria are possible:

- Country
- Technology
- Sector
- Company
- Zip code

Once you have located a partner, you are only one small step from contacting them.

You can locate the Solution Partner Finder as follows:

http://www.siemens.com/automation/partnerfinder

Additional information on the Siemens Solution Partner Program is available online at:

http://www.siemens.com/automation/solutionpartner

Appendix Online Services

Information and Ordering in the Internet and on DVD

Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

www.siemens.com/industry

you will find everything you need to know about products, systems and services.

Product Selection Using the Offline Mall of Industry



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 80 000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found in the Internet under

www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall



The Industry Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

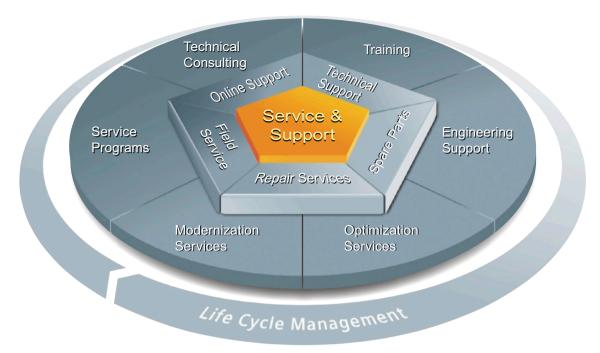
Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the Industry Mall on the Internet under:

www.siemens.com/industrymall

The unmatched complete service for the entire life cycle



For machine constructors, solution providers and plant operators: The service offering from Siemens Industry, Automation and Drive Technologies includes comprehensive services for a wide range of different users in all sectors of the manufacturing and process industry

To accompany our products and systems, we offer integrated and structured services that provide valuable support in every phase of the life cycle of your machine or plant - from planning and implementation through commissioning as far as maintenance and modernization.

Our Service & Support accompanies you worldwide in all matters concerning automation and drives from Siemens. We provide direct on-site support in more than 100 countries through all phases of the life cycle of your machines and plants.

You have an experienced team of specialists at your side to provide active support and bundled know-how. Regular training courses and intensive contact among our employees - even across continents - ensure reliable service in the most diverse areas.

Online Support



The comprehensive online information platform supports you in all aspects of our Service & Support at any time and from any location in the world.

www.siemens.com/ automation/service&support

Technical Consulting



Support in planning and designing your project: From detailed actual-state analysis, definition of the goal and consulting on product and system questions right through to the creation of the automation solution.

Technical Support



Expert advice on technical questions with a wide range of demand-optimized services for all our products and systems.

www.siemens.com/ automation/support-request

Training



Extend your competitive edge through practical know-how directly from the manufacturer.

www.siemens.com/sitrain

Contact information is available in the Internet at: www.siemens.com/automation/partner

Appendix Service &Support

The unmatched complete service for the entire life cycle

Engineering Support



Support during project engineering and development with services fine-tuned to your requirements, from configuration through to implementation of an automation project.

Modernization



You can also rely on our support when it comes to modernization - with comprehensive services from the planning phase all the way to commissioning.

Field Service



Our Field Service offers you services for commissioning and maintenance - to ensure that your machines and plants are always available.

Service programs



Our service programs are selected service packages for an automation and drives system or product group. The individual services are coordinated with each over to ensure smooth coverage of the entire life cycle and support optimum use of your products and systems.

The services of a Service Program can be flexibly adapted at any time and used separately.

Spare parts



In every sector worldwide, plants and systems are required to operate with constantly increasing reliability. We will provide you with the support you need to prevent a standstill from occurring in the first place: with a worldwide network and optimum logistics chains.

Examples of service programs:

- Service contracts
- Plant IT Security Services
- Life Cycle Services for Drive Engineering
- SIMATIC PCS 7 Life Cycle Services
- SINUMERIK Manufacturing Excellence
- SIMATIC Remote Support Servicess

Advantages at a glance:

- Reduced downtimes for increased productivity
- Optimized maintenance costs due to a tailored scope of services
- Costs that can be calculated and therefore planned
- Service reliability due to guaranteed response times and spare part delivery times
- Customer service personnel will be supported and relieved of additional tasks
- Comprehensive service from a single source, fewer interfaces and greater expertise

Repairs



Downtimes cause problems in the plant as well as unnecessary costs. We can help you to reduce both to a minimum - with our worldwide repair facilities.

Optimization



During the service life of machines and plants, there is often a great potential for increasing productivity or reducing costs. To help you achieve this potential, we are offering a complete range of optimization services.

Contact information is available in the Internet at: www.siemens.com/automation/partner

Knowledge Base Automation Value Card

Knowledge Base on DVD



For locations without online connections to the Internet there are excerpts of the free part of the information sources available on DVD (Service & Support Knowledge Base). This DVD contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service & Support.

The DVD also includes a full-text search and our Knowledge Manager for targeted searches for solutions. The DVD will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on DVD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the **Service & Support Knowledge Base** DVD from your Siemens contact.

Order no. 6ZB5310-0EP30-0BA2

Automation Value Card



Small card - great support

The Automation Value Card is an integral component of the comprehensive service concept with which Siemens Automation and Drives will accompany you in each phase of your automation project.

It doesn't matter whether you want just specific services from our Technical Support or want to purchase something on our Online portal, you can always pay with your Automation Value Card. No invoicing, transparent and safe. With your personal card number and associated PIN you can view the state of your account and all transactions at any time.

Services on card. This is how it's done.

Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

By entering the card number and PIN you have full access to the Service & Support services being offered. The charge for the services procured is debited from the credits on your Automation Value Card.

All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

Order your Automation and Value Card easily and comfortably like a product with your sales contact.

Detailed information on the services offered is available on our Internet site at:

www.siemens.com/automation/service&support

Service & Support à la Card: Examples

Technical Support			
"Priority"	Priority processing for urgent cases		
"24 h"	Availability round the clock		
"Extended"	Technical consulting for complex questions		
"Mature Products"	Consulting service for products that are not available any more		
Support Tools in the Support Shop			
	Tools that can be used directly for configuration, analysis and testing		

Overview

Software types

Software requiring a license is categorized into types. The following software types have been defined:

- · Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- · Single license
- Rental license
- Trial license

Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.

A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only <u>one</u> installation of the software.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Factory license

With the Factory License the user has the right to install and use the software at one permanent establishment only. The permanent establishment is defined by one address only. The number of hardware devices on which the software may be installed results from the order data or the Certificate of License (CoL).

Certificate of license

The Certificate of License (CoL) is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions

Software is constantly being updated. The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Detailed explanations concerning license conditions can be found in the "Terms and Conditions of Siemens AG" or under http://www.siemens.com/industrymall (Industry Mall Online-Help System)

A
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Accessories for SIMATIC TDC 10/13
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Appendix Catalog improvement suggestions

Fax form

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Appendix Notes

Appendix Notes

Appendix Notes

Conditions of sale and delivery, export regulations

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