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Brochures

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

www.siemens.com/simatic/printmaterial

Overview

Modular, scalable, and universally usable system in IP20 level of protection:

- The system solution for a variety of automation applications in discrete automation
- Highest performance with excellent usability
- Configurable exclusively in the Totally Integrated Automation Portal with STEP 7 Professional V12 or higher

Performance

- Increase in performance through:
  - Faster command execution
  - Language extensions
  - New data types
  - Faster backplane bus
  - Optimized code generation
- Powerful communication:
  - PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation
  - Expandable with communication modules for bus systems and point-to-point connection

Integrated technology

- Motion Control integrated without additional modules:
  - Standardized blocks (PLCopen) for connection of analog and PROFIdrive-capable drives
  - The Motion Control functionality supports speed-controlled and positioning axes as well as external encoders
  - Positionally precise gearing between axes
- Comprehensive trace functions for all CPU tags for real-time diagnosis and sporadic error detection; for effective commissioning and quick optimization of drives and controls
- Comprehensive control functionalities:
  E.g. easily configurable blocks for automatic optimization of the control parameters for optimum control quality
- Additional functions through available technology modules:
  E.g. high-speed counting, position detection, or measurement functions for signals up to 1 MHz

Safety Integrated

Protection of personnel and machinery – within the framework of an integrated complete system

- Failsafe SIMATIC S7-1500F controllers for processing standard and safety programs on the same controller. Generation of the failsafe and standard user program is carried out in the TIA Portal with the same editors; this enables failsafe data to be evaluated like standard data in the standard user program, for example. Due to this integration the system benefits and the comprehensive functionality of SIMATIC are also available for failsafe applications.

Security Integrated

- Password-based know-how protection against unauthorized reading and modification of program blocks
- Copy protection for greater protection against unauthorized copying of program blocks:
  With copy protection, individual blocks on the SIMATIC Memory Card can be tied to its serial number so that the block can only be run if the configured memory card is inserted into the CPU.
- Rights concept with four different authorization levels:
  Different access rights can be assigned to various user groups. The new protection level 4 makes it possible to also restrict communication to HMI devices.
- Improved manipulation protection:
  Changed or unauthorized transfers of engineering data are detected by the controller.
- For use of an Ethernet CP (CP 1543-1):
  - Additional access protection by means of a firewall
  - Setup of secure VPN connections (V12 SP1 or higher)

Design and handling

- CPUs with display for plain text information:
  - Information about article numbers, firmware version, and the serial number of all connected modules can be displayed
  - Setting the IP address of the CPU and additional network settings directly on site, without programming device
  - Display of occurring error messages directly as plain text message, meaning reduction in downtime
- Uniform front connectors for all modules and integrated potential bridges for flexible potential group formation simplify stock keeping and reduce wiring costs
- Integrated DIN rail in the S7-1500 mounting rail:
  Quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules:
  For flexible adaptation to any application
- System cabling for digital signal modules:
  For fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- Power supply:
  - Load power supply modules (PMs) for supplying the module with 24 V
  - Power supply modules to supply power to the internal module electronics via the backplane bus
- Distributed expansion:
  - Use of up to 30 signal modules, communication modules, and technology modules via the PROFINET interface module IM 155-5 for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

Overview (continued)

Integrated system diagnostics

- Integrated system diagnostics for CPUs, activated by default:
  - Consistent plain text display of system diagnostic information in the display, TIA Portal, HMI, and web server, even for drive messages. Messages are updated even if the CPU is in STOP state.
  - System diagnostics integrated in the CPU firmware. Configuration by user not required. The diagnostics is automatically updated on configuration changes.

Datalog (archives) and recipes

- SIMATIC Memory Card:
  - Plug-in load memory
  - Permits firmware updates
  - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv files (for recipes and archives)
  - Easy access to plant-relevant operating data and configuration data with Office tools via the SD Card reader (two-way data exchange from and to the controller)
- Integrated web server:
  - Easy access to plant-relevant operating data and configuration data via a Web browser

Approvals

The SIMATIC S7-1500 complies with the following national and international standards:

- cULus approval
- cULus HazLoc approval
- FM approval
- ATEX approval (only for 24 V; not for 230 V)
- CE
- C-TICK
- KCC
- IECEx (24 V only; not for 230 V)
- EN 61000-6-4
- EN 60068-2-1/ -2/ -6/ -14/ -27/ -30/ -32
- EN 61131-2

You can find the marine approvals available for the S7-1500 on the Internet (SIMATIC Customer Support): http://www.siemens.com/automation/support

Technical specifications

General technical specifications SIMATIC S7-1500	
Degree of protection	IP20 acc. to IEC 60 529
Ambient temperature	
• Horizontal installation	0...60 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.)
• Vertical installation	0... 40 °C (display: at an operating temperature of typ. 40 °C, the display is switched off.)
Relative humidity	5%...95%, no condensation
Atmospheric pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	707 V DC test voltage (type test)
• < 150 V	2200 V DC test voltage
• < 250 V	2500 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
	Requirements of the EMC directive; interference emission according to EN 61000-6-4
• Emission of radio frequency interference	Interference emission according to 61000-6-4
	Interference emission of electromagnetic fields according to EN 61000-6-4

General technical specifications SIMATIC S7-1500	
Mechanical stress	
• Vibrations	Testing according to EN 60068-2-6 Tested with: 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 7 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to EN 60068-2-27 Tested with: Half-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

Technical specifications (continued)

General technical specifications of the SIPLUS S7-1500	
Ambient temperature range	-40/-25/-20 ... +55/+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.

General technical specifications of the SIPLUS S7-1500	
Ambient conditions	
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
• against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
• against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
• against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Overview CPU 1511-1 PN

- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1513-1 PN

- The CPU for applications with medium requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1515-2 PN

- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

4

Overview CPU 1516-3 PN/DP

- The CPU with a large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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 IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1517-3 PN/DP

- The CPU with a large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking
- High processing speed for binary and floating-point arithmetic
- 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
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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 IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1518-4 PN/DP

- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- 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
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address; the PROFINET interface X3 also offers the option of transferring data at a rate of 1 Gbit/s
- PROFINET IO 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 IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Technical specifications

Article number	**6ES7511-1AK00-0AB0** CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	**6ES7513-1AL00-0AB0** CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	**6ES7515-2AM00-0AB0** CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
Product type designation			
General information			
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1
Display			
Screen diagonal (cm)	3.45 cm	3.45 cm	6.1 cm
Supply voltage			
Type of supply voltage	24 V DC	24 V DC	24 V DC
Power losses			
Power loss, typ.	5.7 W	5.7 W	6.3 W
Memory			
Work memory			
• integrated (for program)	150 kbyte	300 kbyte	500 kbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times			
for bit operations, typ.	60 ns	40 ns	30 ns
for word operations, typ.	72 ns	48 ns	36 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)

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Technical specifications (continued)

Article number	**6ES7511-1AK00-0AB0** CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	**6ES7513-1AL00-0AB0** CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	**6ES7515-2AM00-0AB0** CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
Data areas and their retentivity			
Flag			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock
Interfaces			
1st interface			
Interface types			
- Number of ports	2	2	2
- Integrated switch	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Protocols			
- PROFINET IO Controller	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes
2nd interface			
Interface types			
- Number of ports			1
- Integrated switch			No
- RJ 45 (Ethernet)			Yes; X2
Protocols			
- PROFINET IO Controller			No
- PROFINET IO Device			No
- SIMATIC communication			Yes
- Open IE communication			Yes
- Web server			Yes
Protocols			
Number of connections			
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs
PROFINET IO Controller			
Services			
- Number of connectable IO devices, max.	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	256; In total, up to 512 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64
- Max. number of connectable IO devices for RT	128	128	256
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 625 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 500 µs

Technical specifications (continued)

Article number	**6ES7511-1AK00-0AB0** CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	**6ES7513-1AL00-0AB0** CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	**6ES7515-2AM00-0AB0** CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
supported technology objects			
Motion	Yes	Yes	Yes
• Speed-controlled axis			
- Number of speed-controlled axes, max.	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
• Positioning axis			
- Number of positioning axes, max.	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
• Synchronized axes (relative gear synchronization)			
- Number of axes, max.	3; Requirement: There must be no other motion technology objects created	3; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created
• External encoders			
- Number of external encoders, max.	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration			
programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Dimensions			
Width	35 mm	35 mm	70 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	430 g	430 g	830 g

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Technical specifications (continued)

Article number	6ES7516-3AN00-0AB0 CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
Product type designation			
General information			
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1
Display			
Screen diagonal (cm)	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Type of supply voltage	24 V DC	24 V DC	24 V DC
Power losses			
Power loss, typ.	7 W	24 W	24 W
Memory			
Work memory			
• integrated (for program)	1 Mbyte	2 Mbyte	4 Mbyte
• integrated (for data)	5 Mbyte	8 Mbyte	20 Mbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times			
for bit operations, typ.	10 ns	2 ns	1 ns
for word operations, typ.	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	64 ns	12 ns	6 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock
Interfaces			
1st interface			
Interface types			
- Number of ports	2	2	2
- Integrated switch	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Protocols			
- PROFINET IO Controller	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes

Technical specifications (continued)

Article number	**6ES7516-3AN00-0AB0** CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
2nd interface			
Interface types			
- Number of ports	1	1	1
- Integrated switch	No	No	No
- RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
Protocols			
- PROFINET IO Controller	No	No	No
- PROFINET IO Device	No	No	No
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
3rd interface			
Interface types			
- Number of ports	1	1	1
- Integrated switch			No
- RJ 45 (Ethernet)			Yes; X3
- RS 485	Yes	Yes	
Protocols			
- PROFINET IO Controller			No
- PROFINET IO Device			No
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication			Yes
- Web server			Yes
- PROFIBUS DP master	Yes	Yes	
- PROFIBUS DP slave	No	No	
4th interface			
Interface types			
- Number of ports			1
- RS 485			Yes
Protocols			
- SIMATIC communication			Yes
- PROFIBUS DP master			Yes
- PROFIBUS DP slave			No
Protocols			
Number of connections			
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
PROFINET IO Controller			
Services			
- Number of connectable IO devices, max.	256; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64
- Max. number of connectable IO devices for RT	256	512	512
PROFIBUS DP master			
Services			
- Number of DP slaves	125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 250 µs

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Technical specifications (continued)

Article number	6ES7516-3AN00-0AB0 CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
supported technology objects			
Motion	Yes	Yes	Yes
• Speed-controlled axis			
- Number of speed-controlled axes, max.	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Positioning axis			
- Number of positioning axes, max.	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Synchronized axes (relative gear synchronization)			
- Number of axes, max.	15; Requirement: There must be no other motion technology objects created	48; Requirement: There must be no other motion technology objects created	64; Requirement: There must be no other motion technology objects created
• External encoders			
- Number of external encoders, max.	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration			
programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Dimensions			
Width	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	845 g	1 978 g	1 988 g

Ordering data	Article No.
CPU 1511-1 PN	**6ES7511-1AK00-0AB0**
Work memory 150 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required	
CPU 1513-1 PN	**6ES7513-1AL00-0AB0**
Work memory 300 KB for program, 1.5 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required	
CPU 1515-2 PN	**6ES7515-2AM00-0AB0**
500 KB RAM for program, 3 MB for data, PROFINET IO IRT interface, PROFINET interface; SIMATIC Memory Card required	
CPU 1516-3 PN/DP	**6ES7516-3AN00-0AB0**
1 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	
CPU 1517-3 PN/DP	**6ES7517-3AP00-0AB0**
2 MB RAM for program, 8 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	
CPU 1518-4 PN/DP	**6ES7518-4AP00-0AB0**
Work memory 4 MB for program, 20 MB for data, PROFINET IO IRT interface, 2 PROFINET/PROFIBUS interfaces; SIMATIC Memory Card required	
Accessories	
SIMATIC Memory Card	
4 MB	**6ES7954-8LC02-0AA0**
12 MB	**6ES7954-8LE02-0AA0**
24 MB	**6ES7954-8LF02-0AA0**
256 MB	**6ES7954-8LL02-0AA0**
2 GB	**6ES7954-8LP01-0AA0**
SIMATIC S7-1500 mounting rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	

	Article No.
Power supply	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3A	**6EP1332-4BA00**
24 V DC/8A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• with push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet	
With insulation displacement, max. transmission rate 12 Mbps	
Without programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**
PROFIBUS FC Standard Cable GP	**6XV1830-0EH10**
Standard type with special design for fast mounting, 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	
PROFIBUS FC Robust Cable	**6XV1830-0JH10**
2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	
PROFIBUS FC Flexible Cable	**6XV1831-2K**
2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	
PROFIBUS FC Trailing Cable	
2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**

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Ordering data	Article No.
PROFIBUS FC Food Cable 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	**6XV1830-0GH10**
PROFIBUS FC Ground Cable 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	**6XV1830-3FH10**
PROFIBUS FC FRNC Cable GP 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 Plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2 x 2 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. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Trailing Cable 2 x 2 (Type C) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP Marine Cable 2 x 2 (Type B) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-4AH10**

	Article No.
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display for CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6ES7591-1AA00-0AA0**
for CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1517-3 PN/DP and CPU 1518-4 PN/DP; spare part	**6ES7591-1BA00-0AA0**
Front cover for PROFIBUS DP interface for CPU 1517-3 PN/DP and CPU 1518-4 PN/DP; spare part	**6ES7591-8AA00-0AA0**
SIMATIC S7-1500 Starter Kit Comprising: CPU 1511-1 PN, SIMATIC Memory Card 4 MB, digital input DI 16 x 24 V DC HF, digital output DO 16 x 24 V DC/0.5 A ST, 160 mm mounting rail, front connector, STEP 7 Professional V12, 365-day license, power supply 60 W AC 120/230 V, Standard Ethernet CAT 5 cable (2 m), screwdriver, documentation	**6ES7511-1AK01-4YB5**
STEP 7 Professional V13 SP1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish	
STEP 7 Professional V13 SP1, floating license	**6ES7822-1AA03-0YA5**
STEP 7 Professional V13 SP1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-1AE03-0YA5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Overview SIPLUS CPU 1511-1 PN

- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode
- SIMATIC Memory Card required for operation of the CPU

Note:

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

Overview SIPLUS CPU 1513-1 PN

- The CPU for applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode
- SIMATIC Memory Card required for operation of the CPU

Note:

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

Overview SIPLUS CPU 1516-3 PN/DP

- The CPU with large program and data memory in the S7-1500 controller product range for applications with high program scope requirements.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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 IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- SIMATIC Memory Card required for operation of the CPU

Note:

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

Overview SIPLUS CPU 1518-4 PN/DP

- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- 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
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address
- PROFINET IO 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 IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

SIMATIC Memory Card required for operating the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

Technical specifications

Article number	**6AG1511-1AK00-2AB0**	**6AG1511-1AK00-7AB0**	**6AG1513-1AL00-2AB0**	**6AG1513-1AL00-7AB0**
Based on	**6ES7511-1AK00-0AB0**	**6ES7511-1AK00-0AB0**	**6ES7513-1AL00-0AB0**	**6ES7513-1AL00-0AB0**
	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1513-1 PN	SIPLUS S7-1500 CPU 1513-1 PN
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Technical specifications (continued)

Article number	6AG1511-1AK00-2AB0	6AG1511-1AK00-7AB0	6AG1513-1AL00-2AB0	6AG1513-1AL00-7AB0
Based on	6ES7511-1AK00-0AB0	6ES7511-1AK00-0AB0	6ES7513-1AL00-0AB0	6ES7513-1AL00-0AB0
	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1513-1 PN	SIPLUS S7-1500 CPU 1513-1 PN
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	6AG1516-3AN00-2AB0	6AG1516-3AN00-7AB0	6AG1518-4AP00-4AB0
Based on	6ES7516-3AN00-0AB0	6ES7516-3AN00-0AB0	6ES7518-4AP00-0AB0
	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Available soon
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Available soon
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Available soon

SIPLUS Standard CPUs

Ordering data	Article No.
SIPLUS CPU 1511-1 PN	
(extended temperature range and medial exposure)	
Work memory 150 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1511-1AK00-2AB0**
Temperature range -40 ... +70 °C	**6AG1511-1AK00-7AB0**
SIPLUS CPU 1513-1 PN	
(extended temperature range and medial exposure)	
Work memory 300 KB for program, 1.5 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1513-1AL00-2AB0**
Temperature range -40 ... +70 °C	**6AG1513-1AL00-7AB0**
SIPLUS CPU 1516-3 PN/DP	
(extended temperature range and medial exposure)	
1 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1516-3AN00-2AB0**
Temperature range -40 ... +70 °C	**6AG1516-3AN00-7AB0**
SIPLUS CPU 1518-4 PN/DP	**6AG1518-4AP00-4AB0**
(medial exposure)	
Work memory 3 MB for program, 10 MB for data, PROFINET IO IRT interface, 2 PROFINET/PROFIBUS interfaces; SIMATIC Memory Card required	

	Article No.
Power supply	
(extended temperature range and medial exposure)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load power supply	
(extended temperature range and medial exposure)	
24 V DC/3A	**6AG1332-4BA00-7AA0**
24 V DC/8A	**6AG1333-4BA00-7AA0**
Display	
(extended temperature range and medial exposure)	
For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6AG1591-1AA00-2AA0**
For SIPLUS CPU 1516-3 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part	**6AG1591-1BA00-2AA0**
Further accessories	See SIMATIC S7-1500, Standard CPUs, page 4/13

Overview CPU 1511F-1 PN

- Entry-level CPU in the S7-1500F Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1513F-1 PN

- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO 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
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1515F-2 PN

- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1516F-3 PN/DP

- The CPU with a large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO 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 IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1517F-3 PN/DP

- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- 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
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO 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 IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1518-4 PN/DP

- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with highest requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- 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.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO 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 IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC Memory Card required for operation of the CPU

Technical specifications

Article number	**6ES7511-1FK00-0AB0** CPU 1511F-1PN, 225KB PROG, 1MB DATA	**6ES7513-1FL00-0AB0** CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	**6ES7515-2FM00-0AB0** CPU 1515F-2 PN, 750KB PROG.,3MB DATA	**6ES7516-3FN00-0AB0** CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
Product type designation						
General information						
Engineering with						
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1	V13 SP1	V13 SP1	V13 SP1
Display						
Screen diagonal (cm)	3.45 cm	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage						
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Power losses						
Power loss, typ.	5.7 W	5.7 W	6.3 W	7 W	24 W	24 W
Memory						
Work memory						
• integrated (for program)	225 kbyte	450 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte	6 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte	20 Mbyte
Load memory						
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times						
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns	12 ns	6 ns

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Technical specifications (continued)

Article number	**6ES7511-1FK00-0AB0** CPU 1511F-1PN, 225KB PROG, 1MB DATA	**6ES7513-1FL00-0AB0** CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	**6ES7515-2FM00-0AB0** CPU 1515F-2 PN, 750KB PROG.,3MB DATA	**6ES7516-3FN00-0AB0** CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
Counters, timers and their retentivity						
S7 counter						
• Number	2 048	2 048	2 048	2 048	2 048	2 048
IEC counter						
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times						
• Number	2 048	2 048	2 048	2 048	2 048	2 048
IEC timer						
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity						
Flag						
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area						
I/O address area						
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day						
Clock						
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
Interfaces						
1st interface						
Interface types						
- Number of ports	2	2	2	2	2	2
- Integrated switch	Yes	Yes	Yes	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
Protocols						
- PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes	Yes	Yes
- Web server	Yes	Yes	Yes	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes	Yes	Yes	Yes
2nd interface						
Interface types						
- Number of ports			1	1	1	1
- Integrated switch			No	No	No	No
- RJ 45 (Ethernet)			Yes; X2	Yes; X2	Yes; X2	Yes; X2
Protocols						
- PROFINET IO Controller			No	No	No	No
- PROFINET IO Device			No	No	No	No
- SIMATIC communication			Yes	Yes	Yes	Yes
- Open IE communication			Yes	Yes	Yes	Yes
- Web server			Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	**6ES7511-1FK00-0AB0**	**6ES7513-1FL00-0AB0**	**6ES7515-2FM00-0AB0**	**6ES7516-3FN00-0AB0**	**6ES7517-3FP00-0AB0**	**6ES7518-4FP00-0AB0**
	CPU 1511F-1PN, 225KB PROG, 1MB DATA	CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	CPU 1515F-2 PN, 750KB PROG.,3MB DATA	CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
3rd interface						
Interface types						
- Number of ports				1	1	1
- Integrated switch						No
- RJ 45 (Ethernet)						Yes; X3
- RS 485				Yes	Yes	
Protocols						
- PROFINET IO Controller						No
- PROFINET IO Device						No
- SIMATIC communication				Yes	Yes	Yes
- Open IE communication						Yes
- Web server						Yes
- PROFIBUS DP master				Yes	Yes	
- PROFIBUS DP slave				No	No	
4th interface						
Interface types						
- Number of ports						1
- RS 485						Yes
Protocols						
- SIMATIC communication						Yes
- PROFIBUS DP master						Yes
- PROFIBUS DP slave						No
Protocols						
Number of connections						
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
PROFINET IO Controller						
Services						
- Number of connectable IO devices, max.	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	128; In total, up to 256 distributed I/O devices can be connected via CPs/CMs via PROFIBUS or PROFINET.	256; In total, up to 512 distributed I/O devices can be connected via PROFIBUS or PROFINET	256; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64	64	64	64
- Max. number of connectable IO devices for RT	128	128	256	256	512	512
PROFIBUS DP master						
Services						
- Number of DP slaves				125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
Isochronous mode						
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 625 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 250 µs

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Technical specifications (continued)

Article number	6ES7511-1FK00-0AB0 CPU 1511F-1PN, 225KB PROG, 1MB DATA	6ES7513-1FL00-0AB0 CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	6ES7515-2FM00-0AB0 CPU 1515F-2 PN, 750KB PROG.,3MB DATA	6ES7516-3FN00-0AB0 CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	6ES7517-3FP00-0AB0 CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
supported technology objects						
Motion	Yes	Yes	Yes	Yes	Yes	Yes
• Speed-controlled axis						
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Positioning axis						
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Synchronized axes (relative gear synchronization)						
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)	3; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created	48; Requirement: There must be no other motion technology objects created	64; Requirement: There must be no other motion technology objects created
• External encoders						
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
Controller						
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring						
• High-speed counter	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates						
Highest safety class achievable in safety mode						
• Low demand mode: PFDavg	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
• High demand/continuous mode: PFH	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09

Technical specifications (continued)

Article number	**6ES7511-1FK00-0AB0** CPU 1511F-1PN, 225KB PROG, 1MB DATA	**6ES7513-1FL00-0AB0** CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	**6ES7515-2FM00-0AB0** CPU 1515F-2 PN, 750KB PROG.,3MB DATA	**6ES7516-3FN00-0AB0** CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
Ambient conditions						
Ambient temperature in operation						
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration						
programming						
Programming language						
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes	Yes
Know-how protection						
• User program protection	Yes	Yes	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes	Yes	Yes
Access protection						
• Password for display	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions						
Width	35 mm	35 mm	70 mm	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm	129 mm
Weights						
Weight, approx.	430 g	430 g	830 g	845 g	1 978 g	1 988 g

Fail-safe CPUs

Ordering data	Article No.
CPU 1511F-1 PN	**6ES7511-1FK00-0AB0**
Fail-safe CPU, 230 KB RAM for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
CPU 1513F-1 PN	**6ES7513-1FL00-0AB0**
Fail-safe CPU, 450 KB RAM for program, 1.5 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
CPU 1515F-2 PN	**6ES7515-2FM00-0AB0**
Work memory 750 KB for program, 3 MB for data, PROFINET IO IRT interface, PROFINET interface; SIMATIC Memory Card required	
CPU 1516F-3 PN/DP	**6ES7516-3FN00-0AB0**
Fail-safe CPU, 1.5 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	
CPU 1517F-3 PN/DP	**6ES7517-3FP00-0AB0**
Failsafe CPU, 3 MB RAM for program, 8 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	
CPU 1518F-4 PN/DP	**6ES7518-4FP00-0AB0**
Fail-safe CPU, work memory 6 MB for program, 20 MB for data, PROFINET IO IRT interface, 2 PROFINET interfaces, PROFIBUS interface; SIMATIC Memory Card required	
Accessories	
SIMATIC Memory Card	
4 MB	**6ES7954-8LC02-0AA0**
12 MB	**6ES7954-8LE02-0AA0**
24 MB	**6ES7954-8LF02-0AA0**
256 MB	**6ES7954-8LL02-0AA0**
2 GB	**6ES7954-8LP01-0AA0**
SIMATIC S7-1500 mounting rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	

	Article No.
Power supply	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3A	**6EP1332-4BA00**
24 V DC/8A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet	
With insulation displacement, max. transmission rate 12 Mbps	
Without programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**
PROFIBUS FC Standard Cable GP	**6XV1830-0EH10**
Standard type with special design for fast mounting, 2-core, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Robust Cable	**6XV1830-0JH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Flexible Cable	**6XV1831-2K**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Trailing Cable	
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC Food Cable	**6XV1830-0GH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	

Ordering data	Article No.
PROFIBUS FC Ground Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-3FH10**
PROFIBUS FC FRNC Cable GP 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 Plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2 x 2 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. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Trailing Cable 2 x 2 (Type C) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP Marine Cable 2 x 2 (Type B) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-4AH10**

	Article No.
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
for CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6ES7591-1AA00-0AA0**
for CPU 1515-2 PN, CPU 1515F-2 PN, CPU 1516-3 PN/DP, CPU 1516F-3 PN/DP, CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP and CPU 1518F-4 PN/DP; spare part	**6ES7591-1BA00-0AA0**
STEP 7 Professional V13 SP1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish	
STEP 7 Professional V13 SP1, floating license	**6ES7822-1AA03-0YA5**
STEP 7 Professional V13 SP1, floating license, software download incl. license key [1]	**6ES7822-1AE03-0YA5**
Email address required for delivery	
STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1	
Floating license for 1 user	**6ES7833-1FA13-0YA5**
Floating license for 1 user, license key download without software or documentation [1]	**6ES7833-1FA13-0YH5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

SM 521 digital input modules

Overview

- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**
	DI 16X24VDC HF	DI 32X24VDC HF	DI 16X24VDC SRC BA	DI 16X230VAC BA
Product type designation				
General information				
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with				
• STEP 7 TIA Portal can be configured/integrated as of version			V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DI		Yes		
• Counter	Yes	Yes		
• MSI	Yes	Yes	Yes	Yes
Supply voltage				
Type of supply voltage	DC	DC		
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		
Digital inputs				
Number of digital inputs	16	32	16	16
Digital inputs, configurable	Yes	Yes		
m/p-reading	p-reading	p-reading	m-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 1				Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	
Input voltage				
• Type of input voltage	DC	DC	DC	AC
• Rated value (AC)				230 V
• Rated value (DC)	24 V	24 V	24 V	
• for signal "0"	-30 to +5V	-30 to +5V		0V AC to 40V AC
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79 to 264 V AC
Input current				
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC

Technical specifications (continued)

Article number	6ES7521-1BH00-0AB0 DI 16X24VDC HF	6ES7521-1BL00-0AB0 DI 32X24VDC HF	6ES7521-1BH50-0AA0 DI 16X24VDC SRC BA	6ES7521-1FH00-0AA0 DI 16X230VAC BA
Input delay (for rated value of input voltage)				
for standard inputs				
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No
for interrupt inputs				
- Parameterizable	Yes	Yes	No	No
for counter/technological functions				
- Parameterizable	Yes			
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	2 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time		
Bus cycle time (TDP), min.	250 µs	250 µs		
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes	Yes	No	No
• Hardware interrupt	Yes	Yes	No	No
Diagnostic messages				
• Diagnostics	Yes	Yes	No	
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No
• Short circuit	No	No	No	No
• Fuse blown	No	No	No	No
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	No	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	No	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	No	Yes; Red LED
Galvanic isolation				
Electrical isolation channels				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2500 V DC
Decentralized operation				
Fast Startup supported	Yes; 500 ms	Yes; 500 ms		
Prioritized startup	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	240 g	260 g	230 g	300 g

Technical specifications (continued)

Article number	**6ES7521-1BH10-0AA0** DI 16X24VDC BA	**6ES7521-1BL10-0AA0** DI 32X24VDC BA
Product type designation		
General information		
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• MSI	Yes	Yes
Supply voltage		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	16	32
m/p-reading	p-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.7 mA	2.7 mA
Input delay (for rated value of input voltage)		
for standard inputs		
- Parameterizable	No	No
for interrupt inputs		
- Parameterizable	No	No
Cable length		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	No	No

Technical specifications (continued)

Article number	**6ES7521-1BH10-0AA0** DI 16X24VDC BA	**6ES7521-1BL10-0AA0** DI 32X24VDC BA
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
Diagnostic messages		
• Diagnostics	No	No
• Monitoring the supply voltage	No	No
• Wire break	No	No
• Short circuit	No	No
• Fuse blown	No	No
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
Galvanic isolation		
Electrical isolation channels		
• between the channels and the backplane bus	Yes	Yes
Isolation		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
Decentralized operation		
Prioritized startup	Yes	Yes
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	260 g
other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

SM 521 digital input modules

Ordering data	Article No.
SM 521 digital input modules	
Module width 35 mm; with parameters and diagnostic functions	
16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BH00-0AB0**
32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BL00-0AB0**
16 inputs, 24 V DC, isolated, input delay 3.2 ms	**6ES7521-1BH50-0AA0**
16 inputs, 230 V AC, isolated, input delay 20 ms	**6ES7521-1FH00-0AA0**
Module width 25 mm; without parameters or diagnostic functions; front connector (push-in) included in delivery package	
16 inputs, 24 V DC, isolated	**6ES7521-1BH10-0AA0**
32 inputs, 24 V DC, isolated	**6ES7521-1BL10-0AA0**

Accessories	Article No.
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 units; spare part	
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**

Overview

- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7522-1BH00-0AB0**	**6ES7522-1BL00-0AB0**	**6ES7522-1BF00-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**
	DQ 16X24VDC/ 0.5A ST	DQ 32X24VDC/ 0.5A ST	DQ 8X24VDC/2A HF	DQ 8X230VAC/5A ST (RELAY)	DQ 8X230VAC/2A ST (TRIAC)
Product type designation					
General information					
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with					
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode					
• MSO	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Type of supply voltage	DC	DC	DC	DC	
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	Yes	
Digital outputs					
Type of digital output	Transistor	Transistor	Transistor	Relays	Triac
Number of digital outputs	16	32	8	8	8
Current-sinking				Yes	
Current-sourcing	Yes	Yes	Yes	Yes	Yes
Digital outputs, configurable	Yes	Yes	Yes	Yes	Yes
short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes; Clocked electronically	No	No
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V		
Controlling a digital input	Yes	Yes	Yes	possible	
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	10 W	1 500 W; 10,000 operating cycles	50 W
• Low energy/fluorescent lamps with electronic control gear				10 X 58 W (25,000 operating cycles)	
• Fluorescent tubes, conventionally compensated				1 X 58 W (25,000 operating cycles)	
• Fluorescent tubes, uncompensated				10 X 58 W (25,000 operating cycles)	

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Technical specifications (continued)

Article number	6ES7522-1BH00-0AB0	6ES7522-1BL00-0AB0	6ES7522-1BF00-0AB0	6ES7522-5HF00-0AB0	6ES7522-5FF00-0AB0
	DQ 16X24VDC/ 0.5A ST	DQ 32X24VDC/ 0.5A ST	DQ 8X24VDC/2A HF	DQ 8X230VAC/5A ST (RELAY)	DQ 8X230VAC/2A ST (TRIAC)
Load resistance range					
• lower limit	48 Ω	48 Ω	12 Ω		
• upper limit	12 kΩ	12 kΩ	4 kΩ		
Output voltage					
• Type of output voltage	DC	DC	DC		AC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)		L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
Output current					
• for signal "1" rated value	0.5 A	0.5 A	2 A	5 A	2 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0 A	2 mA
Output delay with resistive load					
• "0" to "1", max.	100 µs	100 µs	100 µs		1 AC cycle
• "1" to "0", max.	500 µs	500 µs	500 µs		1 AC cycle
Parallel switching of 2 outputs					
• for logic links	Yes	Yes	Yes	Yes	No
• for increased power	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	2 Hz	10 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	2 Hz	1 Hz
Aggregate current of the outputs					
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	8 A; see additional description in the manual	2 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	8 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	64 A; see additional description in the manual	10 A; see additional description in the manual
Relay outputs					
• Number of relay outputs				8	
• Rated input voltage of relay coil L+ (DC)				24 V	
• Current consumption of relays (coil current of all relays), max.				80 mA	
• external protection for relay outputs				With miniature circuit breaker with characteristic B for: cos φ 1.0: 600 A cos φ 0.5 ... 0.7: 900 A with 8 A Diazed fuse: 1000 A	
• Contact connection (internal)				No	
• Size of motor starters according to NEMA, max.				5	
• Number of operating cycles, max.				4 000 000; see additional description in the manual	
• Relay approved acc. to UL 508				Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300	

Technical specifications (continued)

Article number	6ES7522-1BH00-0AB0	6ES7522-1BL00-0AB0	6ES7522-1BF00-0AB0	6ES7522-5HF00-0AB0	6ES7522-5FF00-0AB0
	DQ 16X24VDC/ 0.5A ST	DQ 32X24VDC/ 0.5A ST	DQ 8X24VDC/2A HF	DQ 8X230VAC/5A ST (RELAY)	DQ 8X230VAC/2A ST (TRIAC)
Switching capacity of contacts					
- with inductive load, max.				see additional description in the manual	
- with resistive load, max.				see additional description in the manual	
Triac outputs					
• Size of motor starters according to NEMA, max.					5
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No	No
Execution and activation time (TCO), min.	70 µs	70 µs			
Bus cycle time (TDP), min.	250 µs	250 µs			
Interrupts/diagnostics/status information					
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
Diagnostic messages					
• Diagnostics	Yes	Yes	Yes	Yes	No
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire break	No	No	No	No	No
• Short circuit	Yes	Yes	Yes	No	No
• Fuse blown	No	No	No		No
Diagnostics indication LED					
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	Yes; Red LED	No	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
Galvanic isolation					
Electrical isolation channels					
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
Isolation					
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	Between the channels: 2500 V DC; between the channels and backplane bus: 2500 V DC; between L+ backplane bus 707 V DC (type test)	2500 V DC
Decentralized operation					
Prioritized startup	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	230 g	280 g	240 g	350 g	290 g

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Technical specifications (continued)

Article number	**6ES7522-1BH10-0AA0** DQ 16X24VDC/0.5A BA	**6ES7522-1BL10-0AA0** DQ 32X24VDC/0.5A BA
Product type designation		
General information		
Product function		
• I&M data	Yes	Yes
Engineering with		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• MSO	Yes	Yes
Supply voltage		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, configurable	No	No
short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of 2 outputs		
• for logic links	Yes	Yes
• for increased power	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Aggregate current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
Cable length		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m

Technical specifications (continued)

Article number	**6ES7522-1BH10-0AA0** DQ 16X24VDC/0.5A BA	**6ES7522-1BL10-0AA0** DQ 32X24VDC/0.5A BA
Interrupts/diagnostics/ status information		
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
Diagnostic messages		
• Diagnostics	No	No
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED
Galvanic isolation		
Electrical isolation channels		
• between the channels and the backplane bus	Yes	Yes
Isolation		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
Decentralized operation		
Prioritized startup	Yes	Yes
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	280 g
other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

SM 522 digital output modules

Ordering data	Article No.
SM 522 digital output modules	
Module width 35 mm; with parameters and diagnostic functions	
8 outputs, 24 V DC; 2 A, isolated	**6ES7522-1BF00-0AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6ES7522-1BH00-0AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6ES7522-1BL00-0AB0**
8 relay outputs, 230 V AC, 5 A	**6ES7522-5HF00-0AB0**
8 outputs (triac), 230 V AC, 2 A	**6ES7522-5FF00-0AB0**
Module width 25 mm; without parameters or diagnostic functions; front connector (push-in) included in delivery package	
16 outputs, 24 V DC; 0.5 A, isolated	**6ES7 522-1BH10-0AA0**
32 outputs, 24 V DC; 0.5 A, isolated	**6ES7 522-1BL10-0AA0**

Accessories	Article No.
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 units; spare part	
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**

Overview

- 16 digital inputs and 16 digital outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7523-1BL00-0AA0** DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -
Operating mode	
• MSI	Yes
• MSO	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group
Digital inputs	
Number of digital inputs	16
m/p-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.7 mA

Article number	**6ES7523-1BL00-0AA0** DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	No
for interrupt inputs	
- Parameterizable	No
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Digital outputs	
Type of digital output	transistor
Number of digital outputs	16
Current-sourcing	Yes
short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	100 µs
• "1" to "0", max.	500 µs
Parallel switching of 2 outputs	
• for logic links	Yes
• for increased power	No
• for redundant control of a load	Yes

Technical specifications (continued)

Article number	**6ES7523-1BL00-0AA0**
	DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per channel, max.	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Substitute values connectable	No
Alarms	
• Diagnostic alarm	No
• Hardware interrupt	No
Diagnostic messages	
• Diagnostics	No
• Monitoring the supply voltage	No
• Wire break	No
• Short circuit	No
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	No
• for module diagnostics	No
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	No
Decentralized operation	
Prioritized startup	Yes
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g
other	
Note:	Supplied incl. 40-pole push-in front connectors

Ordering data

	Article No.
SM 523 digital input/output module Module width 25 mm; without parameters or diagnostic functions; front connector (push-in) included in delivery package 16 inputs, 24 V DC, isolated; 16 outputs, 24 V DC; 0.5 A, isolated	**6ES7523-1BL00-0AA0**
Accessories	
Front connectors For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**

Overview

- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs

Note:

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

Technical specifications

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 16	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

SIPLUS SM 521 digital modules

Ordering data	Article No.
SIPLUS SM 521 digital input modules	
(extended temperature range and medial exposure)	
16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BH00-7AB0**
32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BL00-7AB0**
16 inputs, 24 V DC, isolated, input delay 3.2 ms	**6AG1521-1BH50-7AA0**
16 inputs, 230 V AC, isolated, input delay 20 ms	**6AG1521-1FH00-7AA0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 521 digital input modules, page 4/32

Overview

- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the task in hand
- For subsequent expansion of the system with additional outputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

Technical specifications

Article number	**6AG1522-1BF00-7AB0**	**6AG1522-1BH00-7AB0**	**6AG1522-1BL00-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**
Based on	**6ES7522-1BF00-0AB0**	**6ES7522-1BH00-0AB0**	**6ES7522-1BL00-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A ST	SIPLUS S7-1500 DQ 32X24VDC/0.5A ST	SIPLUS S7-1500 DO 8X230VAC/5A ST	SIPLUS S7-1500 DO 8X230VAC/2A ST (TRIAC)
Ambient conditions					
Ambient temperature in operation					
• horizontal installation, min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 8x 0.25 A, max. total current 2 A
• vertical installation, min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	50 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
Extended ambient conditions					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
Relative humidity					
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

SIPLUS SM 522 digital modules

Technical specifications (continued)

Article number	**6AG1522-1BF00-7AB0**	**6AG1522-1BH00-7AB0**	**6AG1522-1BL00-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**
Based on	**6ES7522-1BF00-0AB0**	**6ES7522-1BH00-0AB0**	**6ES7522-1BL00-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A ST	SIPLUS S7-1500 DQ 32X24VDC/0.5A ST	SIPLUS S7-1500 DO 8X230VAC/5A ST	SIPLUS S7-1500 DO 8X230VAC/2A ST (TRIAC)
Resistance					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 522 digital output modules	
(extended temperature range and medial exposure)	
8 outputs, 24 V DC; 2 A, isolated	**6AG1522-1BF00-7AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BH00-7AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BL00-7AB0**
8 relay outputs, 230 V AC, 5 A	**6AG1522-5HF00-2AB0**
8 outputs (triac), 230 V AC, 2 A	**6AG1522-5FF00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 522 digital output modules, page 4/38

Overview

- 4 or 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Technical specifications

Article number	**6ES7531-7QD00-0AB0** AI 4XU/I/RTD/TC ST	**6ES7531-7KF00-0AB0** AI 8XU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** AI 8XU/I HS
Product type designation			
General information			
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2	V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode			
• MSI	Yes	Yes	Yes
CiR - Configuration in RUN			
Reparameterization possible in RUN	Yes	Yes	
Calibration possible in RUN	Yes	Yes	
Supply voltage			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	4	8	8
• For current measurement	4	8	8
• For voltage measurement	4	8	8
• For resistance/resistance thermometer measurement	2	4	
• For thermocouple measurement	4	8	
permissible input voltage for voltage input (destruction limit), max.	28.8 V	28.8 V	28.8 V
Technical unit for temperature measurement adjustable	Yes	Yes	

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Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** AI 4XU/I/RTD/TC ST	**6ES7531-7KF00-0AB0** AI 8XU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** AI 8XU/I HS
Input ranges (rated values), voltages			
• 1 V to 5 V	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	
• -250 mV to +250 mV	Yes	Yes	
• -5 V to +5 V	Yes	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	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Input ranges (rated values), thermoelements			
• Type B	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	
Input ranges (rated values), resistance thermometer			
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	
• Pt 200	Yes; Standard/climate	Yes; Standard/climate	
• Pt 500	Yes; Standard/climate	Yes; Standard/climate	
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes	Yes	
• 0 to 300 ohms	Yes	Yes	
• 0 to 600 ohms	Yes	Yes	
• 0 to 6000 ohms	Yes	Yes	
• PTC	Yes	Yes	
Thermocouple (TC)			
• Technical unit for temperature measurement	°C/°F/K	°C/°F/K	
Temperature compensation			
- Parameterizable	Yes	Yes	
Resistance thermometer (RTD)			
• Technical unit for temperature measurement	°C/°F/K	°C/°F/K	
Cable length			
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m

Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** AI 4XU/I/RTD/TC ST	**6ES7531-7KF00-0AB0** AI 8XU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** AI 8XU/I HS
Analog value generation for the inputs			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	9 / 23 / 27 / 107 ms	
- additional conversion time for wire break monitoring	9 ms	9 ms	
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	
• Basic execution time of the module (all channels released)			62.5 µs; independent of number of activated channels
Smoothing of measured values			
• Parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	820 Ω	820 Ω	820 Ω
• for current measurement as 4-wire transducer	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC	Yes; All measuring ranges except PTC	
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input area, (+/-)	0.1 %	0.1 %	0.2 %
• Current, relative to input area, (+/-)	0.1 %	0.1 %	0.2 %
• Resistance, relative to input area, (+/-)	0.1 %	0.1 %	
• Resistance thermometer, relative to input area, (+/-)	0.1 %; Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K	Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K	
• Thermocouple, relative to input area, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K	Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB	
• common mode voltage, max.	10 V	10 V	10 V
• Common mode interference, min.	60 dB	60 dB	60 dB; at 400 Hz: 50 dB

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 AI 8XU/I HS
Isochronous mode			
Isochronous operation (application synchronized up to terminal)			Yes
Filtering and processing time (TCI), min.			80 µs
Bus cycle time (TDP), min.			250 µs
Interrupts/diagnostics/ status information			
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Overflow/underflow	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	
• ERROR LED	Yes; Red LED	Yes; Red LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
Electrical isolation channels			
• between the channels and the backplane bus	Yes	Yes	Yes
Isolation			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.			0 °C
• horizontal installation, max.			60 °C
• vertical installation, min.			0 °C
• vertical installation, max.			40 °C
Decentralized operation			
Prioritized startup	No	No	No
Dimensions			
Width	25 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	210 g	310 g	200 g
other			
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K	Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K	

Ordering data

	Article No.
SM 531 analog input modules	
Module width: 25 mm	
4 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7QD00-0AB0**
Module width: 35 mm	
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bit + sign; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7NF10-0AB0**
8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7KF00-0AB0**

	Article No.
Accessories	
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O	
For 35 mm modules; Infeed element, shield clamp, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

SM 532 analog output modules

Overview

- 2, 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

Technical specifications

Article number	**6ES7532-5NB00-0AB0**	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**
	AQ 2XU/I ST	AQ 4XU/I ST	AQ 8XU/I HS
Product type designation			
General information			
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2	V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode			
• MSO	Yes	Yes	Yes
CiR - Configuration in RUN			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN	Yes	Yes	Yes
Supply voltage			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	2	4	8
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels
Output ranges, voltage			
• 0 to 10 V	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Connection of actuators			
• for voltage output two-wire connection	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes

Technical specifications (continued)

Article number	**6ES7532-5NB00-0AB0** AQ 2XU/I ST	**6ES7532-5HD00-0AB0** AQ 4XU/I ST	**6ES7532-5HF00-0AB0** AQ 8XU/I HS
Load impedance (in rated range of output)			
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	100 nF
• with current outputs, max.	750 Ω	750 Ω	500 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH
Cable length			
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m
Analog value generation for the outputs			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 µs
Settling time			
• for resistive load	1.5 ms	1.5 ms	30 µs; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual
• for inductive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to output area, (+/-)	0.2 %	0.2 %	0.2 %
• Current, relative to output area, (+/-)	0.2 %	0.2 %	0.2 %
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No		Yes
Execution and activation time (TCO), min.			100 µs
Bus cycle time (TDP), min.			250 µs
Interrupts/diagnostics/ status information			
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"
• Short circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
Electrical isolation channels			
• between the channels and the backplane bus	Yes	Yes	Yes

SM 532 analog output modules

Technical specifications (continued)

Article number	6ES7532-5NB00-0AB0 AQ 2XU/I ST	6ES7532-5HD00-0AB0 AQ 4XU/I ST	6ES7532-5HF00-0AB0 AQ 8XU/I HS
Isolation			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Decentralized operation			
Prioritized startup	No	No	No
Dimensions			
Width	25 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	200 g	310 g	325 g
other			
Note:	Supplied incl. 40-pole push-in front connectors		

Ordering data

	Article No.
SM 532 analog output modules	
Module width 25 mm	
2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5NB00-0AB0**
Module width 35 mm	
4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HD00-0AB0**
8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HF00-0AB0**

	Article No.
Accessories	
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O	
For 35 mm modules; Infeed element, shield clamp, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield connection clamp 10 units; spare part	**6ES7590-5BA00-0AA0**

Overview

- 4 analog inputs/ 2 analog outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

Technical specifications

Article number	**6ES7534-7QE00-0AB0**
	AI/AQ 4XU/I/RTD/TC; 2XU, I ST
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -
Operating mode	
• MSI	Yes
• MSO	Yes
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
permissible input voltage for voltage input (destruction limit), max.	28.8 V
Technical unit for temperature measurement adjustable	Yes

Article number	**6ES7534-7QE00-0AB0**
	AI/AQ 4XU/I/RTD/TC; 2XU, I ST
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Input ranges (rated values), thermoelements	
• Type B	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 6000 ohms	Yes
• PTC	Yes

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 AI/AQ 4XU/I/RTD/TC; 2XU, I ST
Thermocouple (TC)	
• Technical unit for temperature measurement	°C/°F/K
Temperature compensation	
- Parameterizable	Yes
Resistance thermometer (RTD)	
• Technical unit for temperature measurement	°C/°F/K
Cable length	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
Analog outputs	
Number of analog outputs	2
Cycle time (all channels), min.	3.2 ms; ±0.5 ms, regardless of the number of activated channels
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	800 m; for current, 200 m for voltage
Analog value generation for the inputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2.5 / 16.67 / 20 / 100
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
- additional conversion time for wire break monitoring	9 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10
Smoothing of measured values	
• Parameterizable	Yes

Article number	6ES7534-7QE00-0AB0 AI/AQ 4XU/I/RTD/TC; 2XU, I ST
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	0.5 ms
Settling time	
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
• for inductive load	2.5 ms
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	0.1 %
• Current, relative to input area, (+/-)	0.1 %
• Resistance, relative to input area, (+/-)	0.1 %
• Resistance thermometer, relative to input area, (+/-)	0.1 %; Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K
• Thermocouple, relative to input area, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
• Voltage, relative to output area, (+/-)	0.2 %
• Current, relative to output area, (+/-)	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• common mode voltage, max.	10 V
• Common mode interference, min.	60 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 AI/AQ 4XU/I/RTD/TC; 2XU, I ST
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Wire break	Yes; only for input type 1 ... 5 V, 4 ... 20 mA, TC, R, RTD and output type current
• Short circuit	Yes; Only for output type "voltage"
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
Galvanic isolation	
Galvanic isolation analog inputs	
• between the channels and the backplane bus	Yes
Galvanic isolation analog outputs	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Decentralized operation	
Prioritized startup	No
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g
other	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K

Ordering data

	Article No.
SM 534 analog input/output module Module width 25 mm 4 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 Ohm, 16 bit; 2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6ES7534-7QE00-0AB0**
Accessories	
Front connectors For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, AI gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

SIPLUS SM 531 analog modules

Overview

- 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Note:

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

Technical specifications

Article number	**6AG1531-7NF10-7AB0**	**6AG1531-7KF00-7AB0**
Based on	**6ES7531-7NF10-0AB0**	**6AG1531-7KF00-7AB0**
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST
Ambient conditions		
Ambient temperature in operation		
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C	-25 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 4x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C	-25 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	50 °C; = Tmax
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 531 analog input modules	
(extended temperature range and medial exposure)	
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bit + sign; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7NF10-7AB0**
8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V , 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 Ohm, 16 bit	**6AG1531-7KF00-7AB0**
Accessories	See SIMATIC S7-1500 SM 531 analog input modules, page 4/49

Overview

- 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

Note:

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

4

Technical specifications

Article number	**6AG1532-5HD00-7AB0**	**6AG1532-5HF00-7AB0**
Based on	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**
	SIPLUS S7-1500 AO 4XU/I ST	SIPLUS S7-1500 AO 8XU/I HS
Ambient conditions		
Ambient temperature in operation		
• horizontal installation, min.	-25 °C; = Tmin	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-25 °C; = Tmin	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 532 analog output modules	
(extended temperature range and medial exposure)	
4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit	**6AG1532-5HD00-7AB0**
8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6AG1532-5HF00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 532 analog output modules, page 4/52

TM PosInput 2 position detection modules

Overview

- 2-channel counting and position detection module with RS 422 interface
- Extensive parameterization options for optimum task-specific adaptation
- Reduces load on controller due to preprocessing on the module
- Position detection with incremental and SSI absolute encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS 422 signals or 5V-TTL signals

Technical specifications

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 SP1 / V12 SP1
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	4; One 5 V and 24 V encoder supply per channel
5 V encoder supply	
• 5 V	Yes; 5.2 V +/-2%
• short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
Power	
Power available from the backplane bus	1.3 W
Power losses	
Power loss, typ.	5.5 W

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for counter/technological functions	
- Parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

Technical specifications (continued)

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per module, max.	2 A
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	32 m; at 1 MHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Message frame length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• RS422	Yes
• TTL 5 V	Yes; push-pull encoders only
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
• Frame error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED

TM PosInput 2 position detection modules

Technical specifications (continued)

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Integrated Functions	
Number of counters	2
Counter frequency (counter) max.	4 MHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Period measurement, min.	0.25 µs
- Period measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM POSINPUT 2
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Decentralized operation	
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	325 g

Ordering data

	Article No.
Counter and positioning module TM PosInput 2 with 2 channels, max. 1 MHz counting frequency; for SSI encoders and incremental encoders with RS 422 or 5V TTL interface	**6ES7551-1AB00-0AB0**
Accessories	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

Overview

- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Technical specifications

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM COUNT 2X24V
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	1; A common 24 V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	1 A; total current of all encoders/ channels
Power	
Power available from the backplane bus	1.3 W
Power losses	
Power loss, typ.	4 W

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM COUNT 2X24V
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for counter/technological functions	
- Parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

TM Count 2x24V counter modules

Technical specifications (continued)

Article number	6ES7550-1AA00-0AB0 S7-1500, TM COUNT 2X24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per module, max.	2 A
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	6ES7550-1AA00-0AB0 S7-1500, TM COUNT 2X24V
Encoder signal 24 V	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
• m/p-reading	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 µs
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	2
Counter frequency (counter) max.	800 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

Technical specifications (continued)

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM COUNT 2X24V
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Period measurement, min.	1.25 µs
- Period measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Decentralized operation	
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g

Ordering data

	Article No.
TM Count 2x24V counter module With 2 channels, max. 200 kHz; for 24 V encoder	**6ES7550-1AA00-0AB0**
Accessories	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

TM Timer DIDQ 16x24V time-based IO modules

Overview

- 8 digital inputs, 16 digital outputs, of which up to 16 can be used in different configurations as technological, time-controlled channels
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed operation

Technical specifications

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM TIMER DIDQ 16X24V
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 Update 3
Installation type/mounting	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
Load voltage 1L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 1L+ (without load), max.	40 mA; without load
from load voltage 2L+ (without load), max.	30 mA; without load
Encoder supply	
Number of outputs	8; max. depending on parameterization
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	1.2 A; Total current of all encoders / channels, max. 0.5 A per output
Power	
Power available from the backplane bus	1.3 W
Power losses	
Power loss, typ.	5 W

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM TIMER DIDQ 16X24V
Digital inputs	
Number of digital inputs	8; max. depending on parameterization
• In groups of	8
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
- Number, max.	8
• Counter	Yes
- Number, max.	4
• Counter for incremental encoder	Yes
- Number, max.	4
• Digital input with oversampling	Yes
- Number, max.	8
• HW enable for digital input	Yes
- Number, max.	4
• HW enable for digital output	Yes
- Number, max.	4
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
Cable length	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• Unshielded, max.	600 m; Depending on sensor, cable quality and rate of change

Technical specifications (continued)

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM TIMER DIDQ 16X24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• In groups of	8
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
- Number, max.	16
• PWM output	Yes
- Number, max.	16
• Digital output with oversampling	Yes
- Number, max.	16
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating
Cable length	
• shielded, max.	1 000 m; Depending on load and cable quality
• Unshielded, max.	600 m; Depending on load and cable quality

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM TIMER DIDQ 16X24V
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Pulse encoder	Yes
Encoder signal 24 V	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
Integrated Functions	
Number of counters	4
Counter frequency (counter) max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Electrical isolation channels	
• between the channels and the backplane bus	Yes

TM Timer DIDQ 16x24V time-based IO modules

Technical specifications (continued)

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM TIMER DIDQ 16X24V
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Decentralized operation	
To SIMATIC S7-1500	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	320 g

Ordering data

	Article No.
Time-based IO module TM Timer DIDQ 16x24V Max. 16 time-controlled inputs or outputs	**6ES7552-1AA00-0AB0**
Accessories	
Front connector For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part: Note: Only shield clamps and shield terminal are required for the TM Timer DIDQ 16x24V	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

Overview

- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Note:

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

Technical specifications

Article number	**6AG1550-1AA00-7AB0**
Based on	**6ES7550-1AA00-0AB0**
	SIPLUS S7-1500 TM COUNT 2X24V
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; note derating for inductive loads; > +60 °C total current of the encoder supply max. 0.5 A, total current of the outputs max. 1 A
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS TM Count 2x24V counter modules (extended temperature range and medial exposure) With 2 channels, max. 200 kHz; for 24 V encoder	**6AG1550-1AA00-7AB0**
Accessories	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/63

CM PtP

Overview

- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max.115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

Technical specifications

Article number	**6ES7540-1AD00-0AA0**	**6ES7541-1AD00-0AB0**	**6ES7540-1AB00-0AA0**	**6ES7541-1AB00-0AB0**
	CM PTP RS 232 BA	CM PTP RS 232 HF	CM PTP RS 422/485 BA	CM PTP RS 422/485 HF
Product type designation				
General information				
Product function				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
Engineering with				
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file
• PROFIBUS as of GSD version/GSD revision	- / -	- / -	- / -	- / -
• PROFINET as of GSD version/GSD revision	V2.3	V2.3 / -	V2.3	V2.3 / -
Installation type/mounting				
Type of fitting, rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
Supply voltage				
Type of supply voltage	system power supply	system power supply	system power supply	system power supply
Input current				
Current consumption (rated value)	35 mA; From the backplane bus	35 mA; From the backplane bus	33 mA; From the backplane bus	33 mA; From the backplane bus
Power				
Power available from the backplane bus	0.65 W	0.65 W	0.65 W	0.65 W
Power losses				
Power loss, typ.	0.6 W	0.6 W	0.6 W	0.6 W
Interfaces				
1st interface				
Interface types				
- RS 232	Yes	Yes		
- RS 422			Yes	Yes
- RS 485			Yes	Yes
RS 232				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS-232 accompanying signals	RTS, CTS, DTR, DSR, RI, DCD	RTS, CTS, DTR, DSR, RI, DCD		
RS 485				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m

Technical specifications (continued)

Article number	**6ES7540-1AD00-0AA0** CM PTP RS 232 BA	**6ES7541-1AD00-0AB0** CM PTP RS 232 HF	**6ES7540-1AB00-0AA0** CM PTP RS 422/485 BA	**6ES7541-1AB00-0AB0** CM PTP RS 422/485 HF
RS 422				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
• 4-wire full duplex connection			Yes	Yes
• 4-wire multipoint connection			No	No
Integrated protocols				
Freeport				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
3964 (R)				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
Modbus RTU master				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
- Number of slaves, max.		1		32
MODBUS RTU slave				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
Frame buffer				
• Buffer memory for message frames	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of message frames which can be buffered	255	255	255	255
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
Diagnostic messages				
• Diagnostics	Yes	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Receive RxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Send TxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
Galvanic isolation				
between the backplane bus and interface	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C

Technical specifications (continued)

Article number	6ES7540-1AD00-0AA0 CM PTP RS 232 BA	6ES7541-1AD00-0AB0 CM PTP RS 232 HF	6ES7540-1AB00-0AA0 CM PTP RS 422/485 BA	6ES7541-1AB00-0AB0 CM PTP RS 422/485 HF
Decentralized operation				
To SIMATIC S7-300	Yes	Yes	Yes	Yes
To SIMATIC S7-400	Yes	Yes	Yes	Yes
To SIMATIC S7-1500	Yes	Yes	Yes	Yes
To standard PROFINET controller	Yes	Yes	Yes	Yes
Fast Startup supported	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
Weights				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

Ordering data

	Article No.
CM PtP RS 232 BA communication modules Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbit/s	**6ES7540-1AD00-0AA0**
CM PtP RS 232 HF communication modules High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbit/s	**6ES7541-1AD00-0AB0**
CM PtP RS 422/485 BA communication modules Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbit/s	**6ES7540-1AB00-0AA0**
CM PtP RS 422/485 HF communication modules High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbit/s	**6ES7541-1AB00-0AB0**

	Article No.
Accessories	
RS 232 connecting cables	
For linking to SIMATIC S7	
5 m	**6ES7902-1AB00-0AA0**
10 m	**6ES7902-1AC00-0AA0**
15 m	**6ES7902-1AD00-0AA0**
RS 422/485 connecting cables	
For linking to SIMATIC S7	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**

Overview

DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

The CM 1542-5 communication module expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CM 1542-5 assumes all communication tasks, thus reducing the CPU workload.

The CM 1542-5 is suitable for S7 communication as well as for conventional PROFIBUS communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Technical specifications

Article number	**6GK7542-5DX00-0XE0**
Product type designation	CM 1542-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.2 A
Active power loss	3 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type

Technical specifications (continued)

Article number	**6GK7542-5DX00-0XE0**
Product type designation	CM 1542-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	125
Amount of data	
• of the address area of the inputs as DP master total	8 192 byte
• of the address area of the outputs as DP master total	8 192 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	40
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	40
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Time	
Product function pass on time synchronization	Yes

Ordering data

	Article No.
CM 1542-5 communication modules	
Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave	**6GK7542-5DX00-0XE0**
Accessories	
PROFIBUS RS 485 FastConnect connector	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without PG interface	**6ES7972-0BA52-0XA0**
• with PG interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard sable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●		

The CP 1542-5 communications processor expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbit/s. The processor also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CP 1542-5 handles all communication tasks, thus reducing the CPU load.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)

Communication services:

- PROFIBUS DP
- PG/OP communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG

Technical specifications

Article number	**6GK7542-5FX00-0XE0**
Product type designation	CP 1542-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.1 A
Active power loss	1.5 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.27 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type

Technical specifications (continued)

Article number	6GK7542-5FX00-0XE0
Product type designation	CP 1542-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	32
Amount of data	
• of the address area of the inputs as DP master total	2 048 byte
• of the address area of the outputs as DP master total	2 048 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	16
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Professional V12 SP1 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Time	
Product function pass on time synchronization	Yes

Ordering data

	Article No.
CP 1542-5 communications processors	
Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics	**6GK7542-5FX00-0XE0**
Accessories	
PROFIBUS FastConnect connection plugs	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• without programming device interface	**6ES7972-0BA52-0XA0**
• with programming device interface	**6ES7972-0BB52-0XA0**
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	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS stations for up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

Overview

ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●	●		●	●

G_IK10_XX_10363

Communication module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller.

The CM 1542-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;
  web diagnose by means of access to the Web server of the S7-1500 system

Technical specifications

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.22 A
Active power loss	3.3 W

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	6
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	64
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	64
Performance data PROFINET communication as PN IO-Controller	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Number of external PN IO lines with PROFINET per rack	10

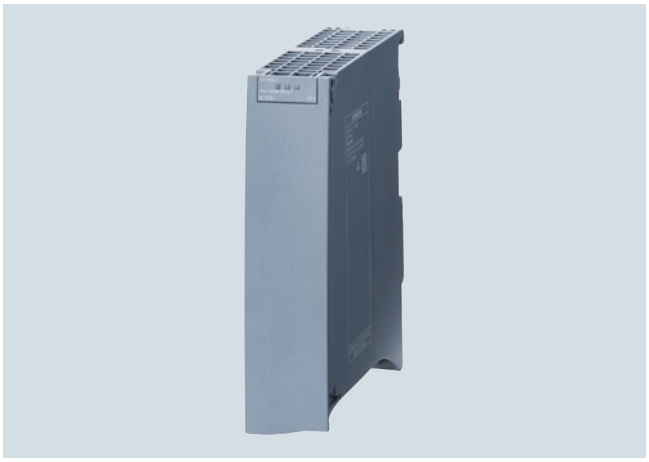
Technical specifications (continued)

Article number	6GK7542-1AX00-0XE0
Product type designation	CM 1542-1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V13 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
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
Protocol is supported Media Redundancy Protocol (MRP)	Yes
Product functions Security	
Product function	
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

Ordering data

	Article No.
CM 1542-1 communication module for connection of SIMATIC S7-1500 to PROFINET IO via TCP/IP, ISO-on-TCP, UDP S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 1 x RJ45 interface with 10/100 Mbit/s;	**6GK7542-1AX00-0XE0**
Accessories	
IE FC RJ45 Plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy 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	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP Standard Cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
• AWG22, for connection to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 Plug 4 x 2	**6XV1878-2A**
SCALANCE X204-2 Industrial Ethernet Switch Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	**6GK5204-2BB10-2AA3**
Industrial Ethernet Switch SCALANCE X308-2 2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	**6GK5308-2FL00-2AA3**

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●		●	●

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 controller to Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Sending e-mails via SMTP or ESMTP with "SMTP-Auth" for authentication on an e-mail server (also with IPv6)
- Security functions
  - Stateful Packet Inspection (layers 3 and 4) firewall
  - Secure communication via VPN (IPsec)
  - Secure access to the Web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the S7-1500 into IPv6-based networks; An IPv6-compliant IP address can be used for the following communication services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - E-mail transfer with addressing by program block

Technical specifications

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.35 A
Active power loss	5.3 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.35 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	118

Technical specifications (continued)

Article number	6GK7543-1AX00-0XE0
Product type designation	CP 1543-1
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	118
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	118
Performance data IT functions	
Number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	64 Kibyte
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	No
Configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	6GK7543-1AX00-0XE0
Product type designation	CP 1543-1
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	16
Product function	
• password protectio n for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

Ordering data

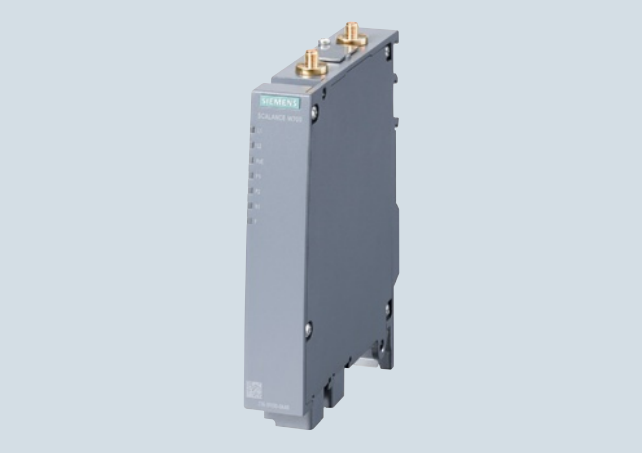
	Article No.
CP 1543-1 communications processor for connection of SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and Security functions; 1 x RJ45 interface with 10/100/1000 Mbit/s; electronic manual on DVD	**6GK7543-1AX00-0XE0**
Accessories	
IE FC RJ45 Plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure 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	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 Plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy 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	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 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	**6XV1840-2AH10**
IE FC TP Standard Cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
• AWG22, for connection to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 Plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**
Industrial Ethernet Switch SCALANCE X204-2 Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	**6GK5204-2BB10-2AA3**
Industrial Ethernet Switch SCALANCE X308-2 2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	**6GK5308-2FL00-2AA3**

Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

SCALANCE W774 RJ45 for use in the control cabinet

Overview



- Access points in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet

Product versions

SCALANCE W774-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

Technical specifications

Article number	**6GK5774-1FX00-0AA0** **6GK5774-1FX00-0AB0** [1]
Product type designation	**SCALANCE W774-1 RJ45**
Transmission rate	
Transfer rate	
• with WLAN maximum	300 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	**6GK5774-1FX00-0AA0** **6GK5774-1FX00-0AB0** [1]
Product type designation	**SCALANCE W774-1 RJ45**
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• for DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Active power loss	
• for DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30

[1] Wireless approval in the USA

Technical specifications (continued)

Article number	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0 [1]
Product type designation	SCALANCE W774-1 RJ45
Design, dimensions and weight	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure w/o antenna	26 mm
Height of the enclosure w/o antenna	147 mm
Depth of the enclosure w/o antenna	127 mm
Net weight	0.52 kg
Mounting type	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• wall mounting	Yes
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	Yes
Product function Client Mode	Yes
Number of SSIDs	4
Product function	
• Dual Client	No
• iPCF Access Point	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No
• iPCF-MC client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1
Product function iREF	No
Number of iREF-capable radio modules	0
Product functions management, configuration	
No.of manageable IP addr. in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	No
• configuration with STEP 7 in the TIA Portal	No
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0 [1]
Product type designation	SCALANCE W774-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes

[1] Wireless approval in the USA

SCALANCE W774 RJ45 for use in the control cabinet

Technical specifications (continued)

Article number	**6GK5774-1FX00-0AA0** **6GK5774-1FX00-0AB0** [1]
Product type designation	**SCALANCE W774-1 RJ45**
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

	Article No.
SCALANCE W774 access points	
IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60°C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W774-1 RJ45	
IWLAN Access Point with one built-in wireless interface	
• National approvals for operation outside the USA	**6GK5774-1FX00-0AA0**
• National approvals for operation within the USA [2]	**6GK5774-1FX00-0AB0**
Accessories	
KEY-PLUG W780 iFeatures	**6GK5907-8PA00**
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment	
C-PLUG	**6GK1900-0AB00**
Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 Plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Catalog IK PI, Industrial Wireless LAN/ accessories

[2] Please note national approvals under http://www.siemens.com/wireless-approvals

Overview

- Client modules in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet

ET 200MP station with SCALANCE W734 RJ45

SCALANCE W734-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W740 iFeatures

Technical specifications

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	300 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• for DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Active power loss	
• for DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W

[1] Wireless approval in the USA

4

Technical specifications (continued)

Article number	**6GK5734-1FX00-0AA0** **6GK5734-1FX00-0AB0** [1]
Product type designation	SCALANCE W734-1 RJ45
Permitted ambient conditions	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30
Design, dimensions and weight	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure without antenna	26 mm
Height of the enclosure without antenna	147 mm
Depth of the enclosure without antenna	127 mm
Net weight	0.52 kg
Mounting type	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• wall mounting	Yes
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No
• iPCF-MC client	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1

Article number	**6GK5734-1FX00-0AA0** **6GK5734-1FX00-0AB0** [1]
Product type designation	SCALANCE W734-1 RJ45
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	No
• configuration with STEP 7 in the TIA Portal	No
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes

[1] Wireless approval in the USA

Technical specifications (continued)

Article number	**6GK5734-1FX00-0AA0** **6GK5734-1FX00-0AB0** [1]
Product type designation	SCALANCE W734-1 RJ45
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

	Article No.
SCALANCE W734 Client Modules	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W734-1 RJ45	
for managing the wireless connection of up to eight linked devices with Industrial Ethernet connection	
• National approvals for operation outside the USA	**6GK5734-1FX00-0AA0**
• National approvals for operation within the USA [2]	**6GK5734-1FX00-0AB0**
Accessories	
KEY-PLUG W740 iFeatures	**6GK5907-4PA00**
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W client modules with PLUG compartment	
C-PLUG	**6GK1900-0AB00**
Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 Plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval Sold by the meter max. quantity 1000 m minimum order 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Catalog IK PI, Industrial Wireless LAN/ accessories

[2] Please note national approvals under http://www.siemens.com/wireless-approvals

Overview

- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max.115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

Note:

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

Technical specifications

Article number	**6AG1540-1AD00-7AA0**	**6AG1541-1AD00-7AB0**	**6AG1540-1AB00-7AA0**	**6AG1541-1AB00-7AB0**
Based on	**6ES7540-1AD00-0AA0**	**6ES7541-1AD00-0AB0**	**6ES7540-1AB00-0AA0**	**6ES7541-1AB00-0AB0**
	SIPLUS S7-1500 CM PTP RS 232 BA	SIPLUS S7-1500 CM PTP RS 232 HF	SIPLUS S7-1500 CM PTP RS 422/485 BA	SIPLUS S7-1500 CM PTP RS 422/485 HF
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS CM PtP RS 232 BA communication modules (extended temperature range and medial exposure) Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbit/s	**6AG1540-1AD00-7AA0**
SIPLUS CM PtP RS 232 HF communication modules (extended temperature range and medial exposure) High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbit/s	**6AG1541-1AD00-7AB0**
SIPLUS CM PtP RS 422/485 BA communication modules (extended temperature range and medial exposure) Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbit/s	**6AG1540-1AB00-7AA0**
SIPLUS CM PtP RS 422/485 HF communication modules (extended temperature range and medial exposure) High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbit/s	**6AG1541-1AB00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500, CM PtP communication module, page 4/70

SIPLUS CM 1542-5

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

The CM 1542-5 communication module expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CM 1542-5 handles all communication tasks, thus reducing the CPU load.

Apart from classic PROFIBUS communication; the CM 1542-5 is also suitable for S7 communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Note:

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

Ordering data

	Article No.
SIPLUS CM 1542-5 communication modules	
(extended temperature range and medial exposure)	
Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave	**6AG1542-5DX00-7XE0**
Accessories	See SIMATIC S7-1500, CM 1542-5 communication module, page 4/72

Overview

- Uniform, 40-pin front connector, suitable for SIMATIC S7-1500 I/O modules
- Versions for 25 mm wide or 35 mm wide modules
- With screw-type or push-in terminals
- Connectable core cross-sections: 0.25 mm^2 to 1.5 mm^2 (AWG 24 to 16)
- Front connector for 35 mm modules to be ordered separately; front connector for 25 mm modules included in scope of supply of modules

Ordering data

	Article No.
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in, 40-pin; Spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 units; spare part	

4

Introduction

Overview

With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500: Fully modular connection for fast and clearly arranged connecting to sensors and actuators in the field, and flexible connection for simple wiring inside the control cabinet.

With the TIA Selection Tool, you can select suitable system cabling for the individual I/O modules with a simple mouse click. Suitable components for the respective I/O module are always offered. These can be transferred to the order list and then ordered in the Industry Mall.

Further information can be found on the Internet at

http://www.siemens.com/tia-selection-tool

Design

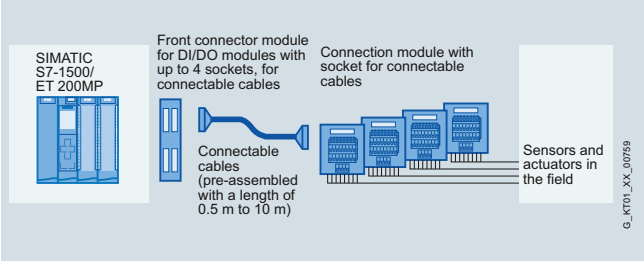
Two cabling variants are available for a wide range of control cabinet concepts:

Fully modular connection

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is significantly reduced. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled or easily assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

Flexible connection

Flexible connection with front connectors is available with 20 (Pin1 – 20) or 40 wired single cores.

These are available in lengths from 2.5 m to 10.0 m.

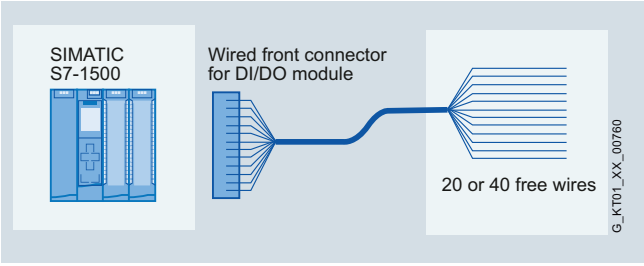
The single cores are available in different versions:

- Core type H05V-K is used for industrial applications
- The UL/CSA-approved core is available for export to North America
- The halogen-free version is used where low smoke gas density in the event of fire is required, e.g. in building automation

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 20 single cores per module is necessary.



SIMATIC TOP connect for S7-1500/ ET200 MP, flexible connection

Overview

The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Easy plugging in of front connector module, connecting cable and terminal module
- Fast and low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-bye distribution of the signals in the case of digital signals
- 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 I/O modules. These are plugged into the I/O module to be wired instead of the front connector. The front connector modules are available in many different versions for digital I/O modules, analog I/O modules and for the 24 V, 2-ampère module. 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 or 50-pole round cable (shielded or unshielded) up to a length of 10 m, or as a 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 (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the terminal module.

Connection module

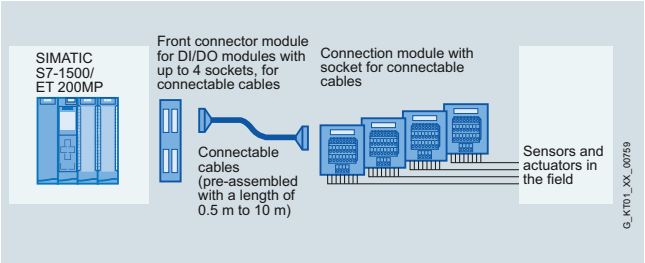
The system has digital and analog terminal modules for connecting the I/O signals. These are snapped onto the standard mounting rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals The potential can be fed in at the terminal module or at the front connector module.

If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal 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 or 110 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 230/110 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 terminal 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.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

4

Technical specifications 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 total current	2 A/byte
Permissible ambient temperature	0 to +60 °C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Clearance 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

SIMATIC TOP connect front connector module, connection for potential infeed		
	Push-in	Screw terminals
	Modules up to 4 connections	
Connectable cable cross-sections		
• Solid conductors	No	
• Flexible cables with/without wire end ferrule	0.25 to 1.5 mm^2	
Number of cables per connection	1 or a combination of 2 wires up to 1.5 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripped length of the cables		
• Without insulating collar	6 mm	
• With insulating collar	-	
Wire end ferrules according to DIN 46228		
• Without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm^2	-	
• with insulating collar 1.5 mm^2	-	
Blade width of the screwdriver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 Nm to 0.7 Nm

Technical specifications Connecting cable

Technical specifications of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. aggregate current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (16-pole)	Approx. 6.5/7.0
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (50-pole)	approx. 10.5/11.0
Outer diameter of round-sheath ribbon cable in mm 16-pole/2 x 16-pole	approx. 9.5/11.5

Ordering data

Front connector modules

	Article No.
Front connector module for digital modules for the connection of 16-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5AH20-0AA0**
• Screw terminals	**6ES7921-5AB20-0AA0**
Front connector module for digital modules for the connection of 50-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5CH20-0AA0**
• Screw terminals	**6ES7921-5CB20-0AA0**
Front connector module for 2 A digital modules for the connection of 16-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5AJ00-0AA0**
• Screw terminals	**6ES7921-5AD00-0AA0**
Front connector module for analog modules for the connection of 16-pin connecting cables	**6ES7921-5AK20-0AA0**
Front connector module for analog modules for the connection of 50-pin connecting cables	**6ES7921-5CK20-0AA0**

Ordering data

Connecting cables

	Article No.
Pre-assembled round cable	
16-pole, 0.14 mm²	
unshielded	
• 0.5 m	**6ES7923-0BA50-0CB0**
• 1.0 m	**6ES7923-0BB00-0CB0**
• 1.5 m	**6ES7923-0BB50-0CB0**
• 2.0 m	**6ES7923-0BC00-0CB0**
• 2.5 m	**6ES7923-0BC50-0CB0**
• 3.0 m	**6ES7923-0BD00-0CB0**
• 4.0 m	**6ES7923-0BE00-0CB0**
• 5.0 m	**6ES7923-0BF00-0CB0**
• 6.5 m	**6ES7923-0BG50-0CB0**
• 8.0 m	**6ES7923-0BJ00-0CB0**
• 10.0 m	**6ES7923-0CB00-0CB0**
shielded	
• 1.0 m	**6ES7923-0BB00-0DB0**
• 2.0 m	**6ES7923-0BC00-0DB0**
• 2.5 m	**6ES7923-0BC50-0DB0**
• 3.0 m	**6ES7923-0BD00-0DB0**
• 4.0 m	**6ES7923-0BE00-0DB0**
• 5.0 m	**6ES7923-0BF00-0DB0**
• 6.5 m	**6ES7923-0BG50-0DB0**
• 8.0 m	**6ES7923-0BJ00-0DB0**
• 10.0 m	**6ES7923-0CB00-0DB0**
50-pole, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0CB0**
• 1.0 m	**6ES7923-5BB00-0CB0**
• 1.5 m	**6ES7923-5BB50-0CB0**
• 2.0 m	**6ES7923-5BC00-0CB0**
• 2.5 m	**6ES7923-5BC50-0CB0**
• 3.0 m	**6ES7923-5BD00-0CB0**
• 4.0 m	**6ES7923-5BE00-0CB0**
• 5.0 m	**6ES7923-5BF00-0CB0**
• 6.5 m	**6ES7923-5BG50-0CB0**
• 8.0 m	**6ES7923-5BJ00-0CB0**
• 10.0 m	**6ES7923-5CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-5BB00-0DB0**
• 2.0 m	**6ES7923-5BC00-0DB0**
• 2.5 m	**6ES7923-5BC50-0DB0**
• 3.0 m	**6ES7923-5BD00-0DB0**
• 4.0 m	**6ES7923-5BE00-0DB0**
• 5.0 m	**6ES7923-5BF00-0DB0**
• 6.5 m	**6ES7923-5BG50-0DB0**
• 8.0 m	**6ES7923-5BJ00-0DB0**
• 10.0 m	**6ES7923-5CB00-0DB0**
Round-sheath ribbon cable	
16-pole, 0.14 mm²	
Unshielded	
• 30 m	**6ES7923-0CD00-0AA0**
• 60 m	**6ES7923-0CG00-0AA0**
Shielded	
• 30 m	**6ES7923-0CD00-0BA0**
• 60 m	**6ES7923-0CG00-0BA0**
Round-sheath ribbon cable	
2 x 16-pole, 0.14 mm²	
Unshielded	
• 30 m	**6ES7923-2CD00-0AA0**
• 60 m	**6ES7923-2CG00-0AA0**
Connector (female ribbon connector)	**6ES7921-3BE10-0AA0**
16-pole, insulation displacement system, with strain relief devices; packing unit: 8 connectors and 8 cable grips	
Accessories	
Manual pliers	**6ES7928-0AA00-0AA0**
For preparing the connectors (female ribbon connector)	

Terminal modules (for 16-pin connecting cables)

	Article No.
Terminal module TP1	
for 1-wire connection	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
Terminal module TP3	
for 3-wire connection	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LED and fuse per channel	**6ES7924-0CL20-0BC0**
• Push-in terminals with LED and fuse per channel	**6ES7924-0CL20-0BA0**
Terminal module TPRo	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
Terminal module TPRi	
Relay module for 8 outputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
Terminal module TPRi	
Relay module for 8 outputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
Terminal module TPOo	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**
Connection modules for digital output modules 2 A	
Terminal module TP2	
• Push-in terminals without LEDs	**6ES7924-0BB20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0BB20-0AA0**
Terminal module for analog modules (for S7-1500 only)	
Terminal module TPA	
• Push-in terminals without LEDs	**6ES7924-0CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CC20-0AA0**
Accessories	
ID labels for terminal modules in S7-1500 design	
ID labels, insertable, PU = 340 units	**3RT1900-1SB20**
Shield for analog terminal module	
PU = 4 units (for connection of 16-pin connecting cable)	**6ES7928-1AA20-4AA0**
Shield connection clamp	
for shield plate at SIMATIC end, PU = 10 units	**6ES7590-5BA00-0AA0**
for shield plate at field end, 2 x 2 ... 6 mm	**6ES7390-5AB00-0AA0**
for shield plate at field end, 3 ... 8 mm	**6ES7390-5BA00-0AA0**
for shield plate at field end, 4 ... 13 mm	**6ES7390-5CA00-0AA0**

Fully modular connection

Ordering data

Terminal modules (for 50-pin connecting cables)

	Article No.
Terminal module TP1	
for 1-wire connection	
• Push-in terminals without LEDs	**6ES7924-2AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2AA20-0BA0**
• Push-in terminals with LEDs	**6ES7924-2AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2AA20-0BA0**
Terminal module TP3	
for 3-wire connection	
• Push-in terminals without LEDs	**6ES7924-2CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2CA20-0BA0**
Terminal module for analog modules (for S7-1500 only)	
Terminal module TPA	
• Push-in terminals without LEDs	**6ES7924-2CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CC20-0AA0**

	Article No.
Accessories	
ID labels for terminal modules in S7-1500 design	
ID labels, insertable PU = 340 units	**3RT1900-1SB20**
Shield for analog terminal module	
PU = 4 units (for connection of 50-pin connecting cable)	**6ES7928-1BA20-4AA0**
Shield connection clamp	
for shield plate at SIMATIC end, PU = 10 units	**6ES7590-5BA00-0AA0**
for shield plate at field end, 2 x 2 ... 6 mm	**6ES7390-5AB00-0AA0**
for shield plate at field end, 3 ... 8 mm	**6ES7390-5BA00-0AA0**
for shield plate at field end, 4 ... 13 mm	**6ES7390-5CA00-0AA0**

Overview

Can be used for SIMATIC S7-1500 and ET 200MP digital modules (24 V DC)

The front connectors with single cores replace the SIMATIC standard connectors

- 6ES7592-1AM00-0XB0

Technical specifications

Front connector with single cores for 16 channels (pins 1-20)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	20
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 15
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw contacts

Front connector with single cores for 32 channels (pins 1-40)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 17
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw contacts

Ordering data

	Article No.
Front connector with single cores for 32 channels (pins 1-40)	
Core type H05V-K (0.5 mm^2 with screwed connection)	
• 2.5 m	**6ES7922-5BC50-0AC0**
• 3.2 m	**6ES7922-5BD20-0AC0**
• 5.0 m	**6ES7922-5BF00-0AC0**
• 6.5 m	**6ES7922-5BG50-0AC0**
• 8.0 m	**6ES7922-5BJ00-0AC0**
• 10.0 m	**6ES7922-5CB00-0AC0**
Core type H05Z-K, halogen-free (0.5 mm^2 with screwed connection)	
• 2.5 m	**6ES7922-5BC50-0HC0**
• 3.2 m	**6ES7922-5BD20-0HC0**
• 5.0 m	**6ES7922-5BF00-0HC0**
• 6.5 m	**6ES7922-5BG50-0HC0**
• 8.0 m	**6ES7922-5BJ00-0HC0**
• 10.0 m	**6ES7922-5CB00-0HC0**
Core type UL/CSA-certified (0.5 mm^2 with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UC0**
• 5.0 m	**6ES7922-5BF00-0UC0**
• 6.5 m	**6ES7922-5BG50-0UC0**
Front connector with single cores for 16 channels (pins 1-20)	
Core type H05V-K (0.5 mm^2 with screwed connection)	
• 2.5 m	**6ES7922-5BC50-0AB0**
• 3.2 m	**6ES7922-5BD20-0AB0**
• 5.0 m	**6ES7922-5BF00-0AB0**
• 6.5 m	**6ES7922-5BG50-0AB0**
• 8.0 m	**6ES7922-5BJ00-0AB0**
• 10.0 m	**6ES7922-5CB00-0AB0**
Core type H05Z-K, halogen-free (0.5 mm^2 with screwed connection)	
• 2.5 m	**6ES7922-5BC50-0HB0**
• 3.2 m	**6ES7922-5BD20-0HB0**
• 5.0 m	**6ES7922-5BF00-0HB0**
• 6.5 m	**6ES7922-5BG50-0HB0**
• 8.0 m	**6ES7922-5BJ00-0HB0**
• 10.0 m	**6ES7922-5CB00-0HB0**
Core type UL/CSA-certified (0.5 mm^2 with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UB0**
• 5.0 m	**6ES7922-5BF00-0UB0**
• 6.5 m	**6ES7922-5BG50-0UB0**

1-phase, 24 V DC (for S7-1500 and ET 200MP)

Overview

The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Technical specifications

Article number	**6EP1332-4BA00**	**6EP1333-4BA00**
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Input		
Input	1-phase AC	1-phase AC
Supply voltage		
• 1 with AC Rated value	120 V	120 V
• 2 with AC Rated value	230 V	230 V
• Note	Automatic range selection	Automatic range selection
Input voltage		
• 1 with AC	85 ... 132 V	85 ... 132 V
• 2 with AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	2.3 × $V_{in\ rated}$, 1.3 ms	2.3 × $V_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms; at V_{in} = 93/187 V	20 ms; at V_{in} = 93/187 V
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz
Rated line range	45 ... 65 Hz	45 ... 65 Hz
Input current		
• at rated input voltage 120 V	1.4 A	3.7 A
• at rated input voltage 230 V	0.8 A	1.7 A
Switch-on current limiting (+25 °C), max.	23 A	62 A
Duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
I^2t, max.	1.3 $A^2 \cdot s$	12 $A^2 \cdot s$
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

Technical specifications (continued)

Article number	**6EP1332-4BA00**	**6EP1333-4BA00**
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V
Total tolerance, static ±	1 %	1 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	150 mV
Product function Output voltage adjustable	No	No
Status display	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	1.5 s	1.5 s
Voltage rise, typ.	10 ms	10 ms
Rated current value Iout rated	3 A	8 A
Current range	0 ... 3 A	0 ... 8 A
Active power supplied typical	72 W	192 W
Short-term overload current		
• on short-circuiting during the start-up typical	12 A	35 A
• at short-circuit during operation typical	12 A	35 A
Duration of overloading capability for excess current		
• on short-circuiting during the start-up	70 ms	70 ms
• at short-circuit during operation	70 ms	70 ms
Parallel switching for enhanced performance	Yes; Parallel switching of 3 A and 8 A possible, devices must be switched on at the same time, max. 75% per device with I-load	Yes; Parallel switching of 3 A and 8 A possible, devices must be switched on at the same time, max. 75% per device with I-load
Numbers of parallel switchable units for enhanced performance	2	2
Efficiency		
Efficiency at $V_{out\ rated}$, Iout rated, approx.	87 %	90 %
Power loss at $V_{out\ rated}$, Iout rated, approx.	11 W	21 W
Closed-loop control		
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.1 %	0.1 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	1 %	2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	5 ms	5 ms
Load step setting time 90 to 10%, typ.	5 ms	5 ms
Setting time maximum	5 ms	5 ms
Protection and monitoring		
Output overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
Current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
Current limitation, typ.	3.4 A	9 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Overload/short-circuit indicator	-	-

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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Safety		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178 and EN 61131-2	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178 and EN 61131-2
Protection class	Class I	Class I
Leakage current		
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	ATEX (EX) II 3G Ex nA nC IIC T3 Gc; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
Certificate of suitability IECEx	No	No
Certificate of suitability NEC Class 2	No	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, DNV	GL, DNV
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	0 ... 60 °C	0 ... 60 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	Screw-/spring clamp connection	Screw-/spring clamp connection
Connections		
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2
Product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes
Width of the enclosure	50 mm	75 mm
Height of the enclosure	147 mm	147 mm
Depth of the enclosure	129 mm	129 mm
Weight, approx.	0.45 kg	0.74 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
SIMATIC PM 1507 Stabilized power supply for SIMATIC S7-1500 Input 120/230 V AC, output 24 V DC, 3 A	**6EP1332-4BA00**	**SIMATIC PM 1507** Stabilized power supply for SIMATIC S7-1500 Input 120/230 V AC, output 24 V DC, 8 A	**6EP1333-4BA00**

Overview

- Power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Configuration via STEP 7 V12 and higher

Technical specifications

Article number	**6ES7505-0KA00-0AB0** PS 25W 24V DC	**6ES7505-0RA00-0AB0** PS 60W 24/48/60V DC	**6ES7507-0RA00-0AB0** PS 60W 120/230V AC/DC
Product type designation			
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/ integrated as of version	V5.5 SP3 or higher	V5.5 SP3 or higher	V5.5 SP3 or higher
FH technology			
Redundancy			
• Redundancy capability	Yes	Yes	Yes
- for increased power	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V; SELV	24 V / 48 V / 60 V	120 V / 230 V
permissible range, lower limit (DC)	Static 19.2 V, dynamic 18.5 V	Static 19.2 V, dynamic 18.5 V	88 V
permissible range, upper limit (DC)	Static 28.8 V, dynamic 30.2 V	Static 72 V, dynamic 75.5 V	300 V
Rated value (AC)			120 V / 230 V
permissible range, lower limit (AC)			85 V
permissible range, upper limit (AC)			264 V
Reverse polarity protection	Yes	Yes	
short-circuit protection	Yes	Yes	Yes
Line frequency			
• Rated value 50 Hz			Yes
• permissible frequency range, lower limit			47 Hz
• permissible frequency range, upper limit			63 Hz
Mains buffering			
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms
Input current			
Rated value at 48 V DC		1.5 A	
Rated value at 60 V DC		1.2 A	
Rated value at 120 V DC			0.6 A
Rated value at 230 V DC			0.3 A
Rated value at 120 V AC			0.6 A
Rated value at 230 V AC			0.34 A
Output current			
short-circuit protection	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7505-0KA00-0AB0 PS 25W 24V DC	6ES7505-0RA00-0AB0 PS 60W 24/48/60V DC	6ES7507-0RA00-0AB0 PS 60W 120/230V AC/DC
Power			
Infeed power to the backplane bus	25 W	60 W	60 W
Power losses			
Power loss at nominal rating conditions	6.2 W	12 W	12 W
Interrupts/diagnostics/ status information			
Status indicator	Yes	Yes	Yes
Galvanic isolation			
primary/secondary	Yes; Electrical isolation for max. 60 V AC/75 V DC (base isolation)	Yes; Electrical isolation for 230 V AC (reinforced isolation)	Yes
Isolation			
Isolation checked with	707 V DC (type test)	2500V DC 2s (routine test)	2500V DC 2s (routine test)
EMC			
Surge immunity			
• on the supply lines acc. to IEC 61000-4-5	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required
Degree and class of protection			
Degree of protection to EN 60529	IP20	IP20	IP20
Protection class	3; with protective conductor	1; with protective conductor	1; with protective conductor
Dimensions			
Width	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	350 g	600 g	600 g

Ordering data

	Article No.
Power supplies	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**

	Article No.
Accessories	
SIMATIC S7-1500 mounting rails	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm Spare part, 20 units	**6ES7590-5AA00-0AA0**
Power connector With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**

Application

The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Note:

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

Ordering data

	Article No.
SIPLUS S7-1500 PM 1507 (extended temperature range and medial exposure) Input 120/230 V AC, output 24 V DC, 3 A	**6AG1332-4BA00-7AA0**

Single-phase, 24 V DC/8 A (SIPLUS PM 1507)

Application

The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Note:

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

Ordering data

	Article No.
SIPLUS S7-1500 PM 1507 (extended temperature range and medial exposure) Input 120/230 V AC, output 24 V DC, 8 A	**6AG1333-4BA00-7AA0**

Overview

- System power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Configuration via STEP 7 V12

Note:

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

Technical specifications

Article number	**6AG1505-0KA00-7AB0**	**6AG1505-0RA00-7AB0**	**6AG1507-0RA00-7AB0**
Based on	**6ES7505-0KA00-0AB0**	**6ES7505-0RA00-0AB0**	**6ES7507-0RA00-0AB0**
	SIPLUS S7-1500 PS 25W 24V DC	SIPLUS S7-1500 PS 60W 24/48/60V DC	SIPLUS S7-1500 PS 60W 120/230V AC/DC
Ambient conditions			
Ambient temperature in operation			
• Min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; > +60 °C max. power input 30 W; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C
Storage/transport temperature			
• Min.		-40 °C	
• max.		70 °C	
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
Relative humidity			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

SIPLUS system power supplies

Ordering data	Article No.
SIPLUS system power supplies	
(extended temperature range and medial exposure)	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**

Overview SIMATIC HMI Basic Panels (2nd Generation)

SIMATIC HMI Basic Panels, 2nd generation

With their fully developed HMI basic functions, 2nd generation SIMATIC HMI Basic Panels are the ideal entry level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" widescreen displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100 %. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB stick.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

For further information, see chapter 3, page 3/145.

Overview SIMATIC HMI Basic Panels (1st Generation)

- Ideal entry-level series from 3" to 15" for operating and monitoring compact machines and systems
- 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 RS 485/422
- Faster commissioning thanks to integrated diagnostics viewer and IP setting for SIMATIC S7-1200 and S7-1500 PLCs

For further information, see chapter 3, page 3/146.

SIMATIC HMI Basic Panels and Comfort Panels

Overview SIMATIC HMI Comfort Panels

SIMATIC HMI Comfort Panels

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2 x PROFINET with integrated switch for 7" models or larger; plus 1 x PROFINET with Gigabit support for 15" models or larger
- All versions can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

For further information, see chapter 3, page 3/151.

SIPLUS Basic Panels and Comfort Panels

Overview

SIPLUS extreme products are based on SIMATIC standard products.

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

For further information, see chapter 3, page 3/152.

Mounting rails

Overview

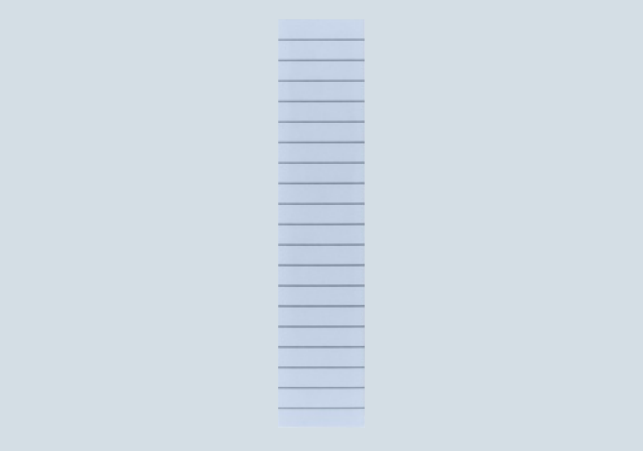
- Aluminum mounting rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used

Ordering data

	Article No.
SIMATIC S7-1500 mounting rails	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**

Labeling sheets

Overview



- Film sheets for the application-specific, automatic labeling of I/O modules of the SIMATIC S7-1500 using standard laser printers
- Printing direct from the TIA Portal possible
  - No double entry of symbols and/or addresses
  - Saves time and avoids typing errors
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - Perforated labeling sheets in DIN A4 format for easy separation of the labeling strips
  - Detached strips can be inserted directly into the I/O modules
- Different colors to differentiate module types; yellow reserved for failsafe systems

Ordering data

	Article No.
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, color Al grey	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, color Al grey	**6ES7592-1AX00-0AA0**

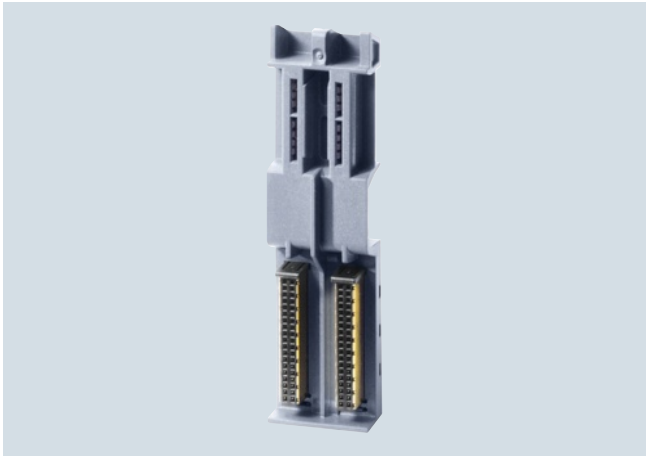
4

Overview

Front doors

- Versions:
  - Universal front doors for digital and analog I/O modules
  - Universal front doors for the interface module IM155-5 PN ST
- Included in the scope of delivery of the respective modules Can be ordered as a spare part in a set consisting of five universal (unlabeled) front doors
- Front doors for I/O modules: Universal labeling sheets and cabling diagrams are included. Cabling diagrams can be detached from preperforated sheets and inserted inside the door

U connector



- To interconnect the modules (self-assembling backplane bus)
- Implementation of a rugged, interference-free station setup through
  - consistent separation of supply voltage of modules and data signals
  - fully shielded, gold-plated contacts for the data bus
- Included in the scope of delivery of each module. Available as spare part in sets of 5

Shielding

- Components for implementing the integrated shielding concept of the S7-1500:
  - 24 V DC infeed element for supplying the analog module: Strict separation of infeed and analog signals ensures high EMC stability
  - Shield clamp for insertion in the front connector: Allows a low-impedance connection and optimally dissipates interference
  - Universal shield terminal: Connects the cable shield with the shield clamp and is simultaneously used for mechanical fixing
- Included in the scope of delivery of the analog modules. Available as a spare part in two versions:
  - Shielding set, comprising infeed element, shield clamp, and shield terminal (pack of 5 units each)
  - Individual shield terminals (pack of 20)
- No tool required for assembly/disassembly

Ordering data

	Article No.
Universal front door for IM 155-5 PN ST 5 front doors; spare part	**6ES7528-0AA70-7AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
• For module width 35 mm	**6ES7528-0AA00-7AA0**
• For module width 25 mm	**6ES7528-0AA00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
• For module width 35 mm	**6ES7590-5CA00-0AA0**
• For module width 25 mm	**6ES7590-5CA10-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**