Overview

With its extended ambient conditions, the SIMATIC S7-1500 can be used almost anywhere. Many controllers can be operated in a temperature range from -30 °C to +60 °C and at altitudes up to 5,000 m as standard. A wide range of SIPLUS Controllers is available for requirements beyond this.

The SIMATIC S7-1500 is

- a modular, scalable, and universally usable system in IP20 degree of protection
- the system solution for a variety of automation applications in discrete automation
- maximum performance combined with excellent usability
- configurable 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
- High-performance 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, for connecting further PROFINET devices or for high-speed communication as an I-Device
  - OPC UA server (data access) and client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems
  - Expandable with communications 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 axes, positioning axes, relative synchronous operation (synchronizing without specification of the synchronized position), as well as external encoders, output cams and probes.
  - Extended Motion Control functions such as velocity gearing, absolute synchronous operation (synchronizing with specification of the synchronized position), camming and functions for controlling kinematics are also integrated in the technology CPUs.
- Comprehensive trace functions for all CPU tags for real-time diagnostics 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
- Fail-safe SIMATIC S7-1500(T)F Controllers for processing standard and safety programs on the same controller. The fail-safe and standard user programs are created in the TIA Portal with the same editors; fail-safe data, for example, can therefore be evaluated like standard data in the standard user program. Due to this integration the system benefits and the comprehensive functionality of SIMATIC are also available for fail-safe applications.

Redundant systems

- Redundant S7-1500R/H CPUs for applications where availability of the PLC is crucial.
- Both CPUs are connected with the I/O stations via a PROFINET IO ring. Synchronization for the S7-1500R is via this ring, or via separate FOC synchronization cables for the S7-1500H. In the event of a CPU failure, the back-up CPU automatically assumes control of the process. No data is lost and the process can be continued extremely quickly. The PROFINET IO ring ensures that all nodes remain accessible in the event of a fieldbus interruption.
- The engineering corresponds to that of a standard CPU. The TIA Portal and redundant CPUs handle the synchronization of the programs and data. All without any additional overhead for the user.

Overview

Security Integrated

- Password-based know-how protection against unauthorized read-out 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
  - Establishment of secure VPN connections

Design and handling

- CPUs with display for plain text information (display simulator tool on the internet):
  - 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 possible directly on site, without programming device on the display
  - 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 effort
- Integrated DIN rail in the S7-1500 DIN rail:
  quick and easy installation of supplementary 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 current supply modules (Power Modules) for supplying the module with 24 V
  - Power supply modules to supply power to the internal module electronics via the backplane bus
  - System power supply modules for retentively storing the entire work memory (max. 20 MB) on the controller
- Distributed expansion:
  - Use of up to 30 signal modules, communications modules, and technology modules via the PROFINET IM 155-5 interface module for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

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.

Support of SIMATIC ProDiag S7-1500

- ProDiag is a concept for the easy creation of machine and plant diagnostics It increases availability and supports with fault analysis and elimination on site.

Data log (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/ASCII 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 PLC)
- Integrated web server:
  - Easy access to plant-relevant operating data and configuration data, Motion Control diagnostics and display of trace recordings 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)
- UKEX approval
- CCCEx approval
- CE
- RCM (formerly C-Tick)
- KCC
- UKCA marking
- 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) under http://www.siemens.com/automation/support.

The S7-1500 system is also suitable for operating at elevations up to 5000 m. You can find a list of all currently approved modules under https://support.industry.siemens.com/cs/ww/en/view/109763260.

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	10 %...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
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

General technical specifications 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 specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Extended range of ambient conditions	
• with reference to ambient temperature, air pressure and 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)
• at cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics 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
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

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
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- UA server and client as runtime option for easy connection of the SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics 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 very 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
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes
- Output cam/cam tracks and probes
- Integrated web server for diagnostics 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
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics 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 MFP

- 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
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP address for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.
In this way, in addition to the control function, typical PC applications can also be processed on the multifunctional platform, e.g. tasks which

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required. Controller-independent applications, e.g. protocol converter, database application and others can be created in C/C++. This simplifies the creation or reuse of customer-specific high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program.
By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms (e.g. object orientation) can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC Memory Card required for operation of the CPU.

Ordering data	Article No.
CPU 1511-1 PN	**6ES7511-1AL03-0AB0**
300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
CPU 1513-1 PN	**6ES7513-1AM03-0AB0**
600 KB work memory for program, 2.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
CPU 1515-2 PN	**6ES7515-2AN03-0AB0**
1 MB work memory for program, 4.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC Memory Card required	
CPU 1516-3 PN/DP	**6ES7516-3AP03-0AB0**
2 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	
CPU 1517-3 PN/DP	**6ES7517-3AP00-0AB0**
2 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	
CPU 1518-4 PN/DP	**6ES7518-4AP00-0AB0**
4 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	
CPU 1518-4 PN/DP MFP	**6ES7518-4AX00-1AC0**
CPU 1518-4 PN/DP MFP, including C/C++ Runtime and OPC UA Runtime license	
Accessories	
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB, also for CPU 1518-4 PN/DP MFP	**6ES7954-8LP03-0AA0**
32 GB, also for CPU 1518-4 PN/DP MFP	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN 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 2000 mm DIN rail	**6ES7590-5AA00-0AA0**
20 units	
System power supply	
For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power plug	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
With insulation displacement technology, max. transfer rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG 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 quick mounting, 2-wire, 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 protective jacket FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Pre-adjusted 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 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; 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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ 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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ 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**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display module 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	**6ES7591-1AB00-0AA0**
Display module 35 mm For 35 mm S7-1500 CPUs with firmware >= V3.0; spare part	**6ES7591-1AB10-0AA0**
Display module 70 mm For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	**6ES7591-1BB00-0AA0**
Display For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	**6ES7591-1BA02-0AA0**
Cover 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	**6ES7591-4AB00-0AA0**
Cover 70 mm For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	**6ES7591-4BB00-0AA0**
Front cover for PROFIBUS DP interface For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	**6ES7591-8AA00-0AA0**
STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
STEP 7 Professional V18, floating license	**6ES7822-1AA08-0YA5**
STEP 7 Professional V18, floating license, software download including license key [1] Email address required for delivery	**6ES7822-1AE08-0YA5**

Ordering data

	Article No.
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
SIMATIC Target for Simulink V6.0	**6ES7823-1BE05-0YA5**
Download incl. license key [1]	
Email address required for delivery	
Upgrade SIMATIC Target 1500S for Simulink V2.0...V5.0 to V6.0, download incl. license key [1]	**6ES7823-1BE05-0YE5**
Email address required for delivery	
SIMATIC Target + ODK 1500S bundle	**6ES7823-1BE15-0YA0**
Download incl. license key [1]	
Email address required for delivery	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

Technical specifications

Article number	**6ES7511-1AL03-0AB0**	**6ES7513-1AM03-0AB0**	**6ES7515-2AN03-0AB0**	**6ES7516-3AP03-0AB0**
	CPU 1511-1 PN, 300KB Prog., 1,5MB Data	CPU 1513-1 PN, 600KB Prog., 2,5MB Data	CPU 1515-2 PN, 1MB Prog., 4,5MB Data	CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
General information				
Product type designation	CPU 1511-1 PN	CPU 1513-1 PN	CPU 1515-2 PN	CPU 1516-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7511-1AK02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7513-1AL02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515-2AM02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7516-3AN02-0AB0
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Memory				
Work memory				
• integrated (for program)	300 kbyte	600 kbyte	1 Mbyte	2 Mbyte
• integrated (for data)	1.5 Mbyte	2.5 Mbyte	4.5 Mbyte	7.5 Mbyte
Load memory				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	25 ns	25 ns	6 ns	6 ns
for word operations, typ.	32 ns	32 ns	7 ns	7 ns
for fixed point arithmetic, typ.	42 ns	42 ns	9 ns	9 ns
for floating point arithmetic, typ.	170 ns	170 ns	37 ns	37 ns

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Technical specifications

Article number	**6ES7511-1AL03-0AB0** CPU 1511-1 PN, 300KB Prog., 1,5MB Data	**6ES7513-1AM03-0AB0** CPU 1513-1 PN, 600KB Prog., 2,5MB Data	**6ES7515-2AN03-0AB0** CPU 1515-2 PN, 1MB Prog., 4,5MB Data	**6ES7516-3AP03-0AB0** CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
Counters, timers and their retentivity				
S7 counter				
• Number	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)
S7 times				
• Number	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)
Data areas and their retentivity				
Flag				
• Size, max.	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
• 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
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7511-1AL03-0AB0**	**6ES7513-1AM03-0AB0**	**6ES7515-2AN03-0AB0**	**6ES7516-3AP03-0AB0**
	CPU 1511-1 PN, 300KB Prog., 1,5MB Data	CPU 1513-1 PN, 600KB Prog., 2,5MB Data	CPU 1515-2 PN, 1MB Prog., 4,5MB Data	CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
PROFINET IO Controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface				
Interface types				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No

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Technical specifications

Article number	**6ES7511-1AL03-0AB0** CPU 1511-1 PN, 300KB Prog., 1,5MB Data	**6ES7513-1AM03-0AB0** CPU 1513-1 PN, 600KB Prog., 2,5MB Data	**6ES7515-2AN03-0AB0** CPU 1515-2 PN, 1MB Prog., 4,5MB Data	**6ES7516-3AP03-0AB0** CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
PROFINET IO Controller				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
- Asset management record			Yes; per user program	Yes; per user program
3. Interface				
Interface types				
• RS 485				Yes; X3
• Number of ports				1
Protocols				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes
PROFIBUS DP master				
• Number of DP slaves, max.				125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

Technical specifications

Article number	**6ES7511-1AL03-0AB0**	**6ES7513-1AM03-0AB0**	**6ES7515-2AN03-0AB0**	**6ES7516-3AP03-0AB0**
	CPU 1511-1 PN, 300KB Prog., 1,5MB Data	CPU 1513-1 PN, 600KB Prog., 2,5MB Data	CPU 1515-2 PN, 1MB Prog., 4,5MB Data	CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
Protocols				
Number of connections				
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode				
Media redundancy				
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50
SIMATIC communication				
• S7 routing	Yes	Yes	Yes	Yes
OPC UA				
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes	Yes	Yes
Supported technology objects				
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	1 120	2 400	2 400
• Required Motion Control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
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
• 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
• 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
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes

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Technical specifications

Article number	**6ES7511-1AL03-0AB0** CPU 1511-1 PN, 300KB Prog., 1,5MB Data	**6ES7513-1AM03-0AB0** CPU 1513-1 PN, 600KB Prog., 2,5MB Data	**6ES7515-2AN03-0AB0** CPU 1515-2 PN, 1MB Prog., 4,5MB Data	**6ES7516-3AP03-0AB0** CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• 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
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• 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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Protection of confidential configuration data	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe		No	No	
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	336 g	336 g	456 g	469 g

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB Data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
General information			
Product type designation	CPU 1517-3 PN/DP	CPU 1518-4 PN/DP	CPU 1518-4 PN/DP MFP
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 Update 3 (FW V1.6) or higher	V17 (FW V2.9) / V13 (FW V1.5) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher
Display			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Rated value (DC)	24 V	24 V	24 V

Technical specifications

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB Data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Memory			
Work memory			
• integrated (for program)	2 Mbyte	6 Mbyte	6 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions			
• integrated (for C/C++ Runtime application)			1 024 Mbyte
• available (for Linux runtime application)			1 Gbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 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			
• Size, 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
1. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes

Technical specifications

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB Data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	Yes	Yes; Minimum send cycle of 250 µs	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

Technical specifications

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB Data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Direct data exchange	No	No	No
- IRT	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program
3. Interface			
Interface types			
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
Protocols			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
PROFIBUS DP master			
• Number of DP slaves, max.	125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET		

Technical specifications

Article number	**6ES7517-3AP00-0AB0**	**6ES7518-4AP00-0AB0**	**6ES7518-4AX00-1AC0**
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
4. Interface			
Interface types			
• RS 485		Yes; X4	Yes; X4
• Number of ports		1	1
Protocols			
• PROFIBUS DP master		Yes	Yes
• PROFIBUS DP slave		No	No
• SIMATIC communication		Yes	Yes
PROFIBUS DP master			
• Number of DP slaves, max.		125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols			
Number of connections			
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
Media redundancy			
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Client	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes	Yes
Supported technology objects			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240	15 360	15 360
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
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

Technical specifications

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB Data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Ambient conditions			
Ambient temperature during 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
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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/ password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• Protection of confidential configuration data	Yes	Yes	Yes
• 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
Open Development interfaces			
• Size of ODK SO file, max.			9.8 Mbyte
Dimensions			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	1 978 g	1 988 g	2 117 g

SIPLUS standard CPUs

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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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 memory 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIPLUS S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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 with a SIMATIC or non-Siemens PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

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 with 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.

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.

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Overview SIPLUS CPU 1518-4 PN/DP MFP

- 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
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP address for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (Data Access) as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.
In this way, in addition to the control function, typical PC applications can also be processed on the multifunctional platform, e.g. tasks which

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required.
Controller-independent applications, e.g. protocol converter, database application and others can be created in C/C++. This simplifies the creation or reuse of customer-specific high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program.
By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms (e.g. object orientation) can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC Memory Card required for operation of the CPU.

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 CPU 1511-1 PN	
(Extended temperature range and exposure to environmental substances)	
150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1511-1AK02-2AB0**
Temperature range -40 ... +70 °C	**6AG1511-1AK02-7AB0**
SIPLUS CPU 1513-1 PN	
(Extended temperature range and exposure to environmental substances)	
300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1513-1AL02-2AB0**
Temperature range -40 ... +70 °C	**6AG1513-1AL02-7AB0**
SIPLUS CPU 1516-3 PN/DP	
(Extended temperature range and exposure to environmental substances)	
1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1516-3AN02-2AB0**
Temperature range -40 ... +70 °C	**6AG1516-3AN02-7AB0**
SIPLUS CPU 1518-4 PN/DP	**6AG1518-4AP00-4AB0**
(Exposure to environmental substances)	
3 MB work memory for program, 10 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	
SIPLUS CPU 1518-4 PN/DP MFP	**6AG1518-4AX00-4AC0**
(Exposure to environmental substances)	
4 MB work memory for program, 20 MB for data, 50 MB for CPU function library in the CPU Runtime, 500 MB for C/C++ runtime application, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; C/C++ runtime and OPC UA Runtime license included; SIMATIC Memory Card required	
Accessories	
System power supply	
(Extended temperature range and exposure to environmental substances)	
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 current supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	
(Extended temperature range and exposure to environmental substances)	
For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6AG1591-1AB00-2AA0**
For SIPLUS CPU 1516-3 PN/DP, 6AG1516-3AN02-7AB0; spare part	**6AG1591-1BB00-2AA0**
For SIPLUS CPU 1518-4 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, standard CPUs, page 4/9

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Technical specifications

Article number	**6AG1511-1AK02-2AB0**	**6AG1511-1AK02-7AB0**	**6AG1513-1AL02-2AB0**	**6AG1513-1AL02-7AB0**
Based on	**6ES7511-1AK02-0AB0**	**6ES7511-1AK02-0AB0**	**6ES7513-1AL02-0AB0**	**6ES7513-1AL02-0AB0**
	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 during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• 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 (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• 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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

Technical specifications

Article number	6AG1511-1AK02-2AB0	6AG1511-1AK02-7AB0	6AG1513-1AL02-2AB0	6AG1513-1AL02-7AB0
Based on	6ES7511-1AK02-0AB0	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7513-1AL02-0AB0
	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
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1516-3AN02-2AB0	6AG1516-3AN02-7AB0	6AG1518-4AP00-4AB0	6AG1518-4AX00-4AC0
Based on	6ES7516-3AN02-0AB0	6ES7516-3AN02-0AB0	6ES7518-4AP00-0AB0	6ES7518-4AX00-1AC0
	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	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.	-40 °C; = Tmin	-40 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; 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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation/frost permitted (no commissioning under condensation conditions)

Technical specifications

Article number	6AG1516-3AN02-2AB0	6AG1516-3AN02-7AB0	6AG1518-4AP00-4AB0	6AG1518-4AX00-4AC0
Based on	6ES7516-3AN02-0AB0	6ES7516-3AN02-0AB0	6ES7518-4AP00-0AB0	6ES7518-4AX00-1AC0
	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes

Overview CPU 1511C-1 PN

- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, cycle duration measurement or stepper motor control, pulse width modulation, frequency output
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1512C-1 PN

- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, cycle duration measurement or stepper motor control, pulse width modulation, frequency output
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Compact CPUs

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Ordering data	Article No.
CPU 1511C-1 PN 175 KB work memory for program, 1 MB for data, 16 digital inputs, 16 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required	**6ES7511-1CK01-0AB0**
CPU 1512C-1 PN 250 KB work memory for program, 1 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required	**6ES7512-1CK01-0AB0**
Accessories	
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP03-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Front connectors For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
Shielding set I/O For 25 mm modules; infeed element, shielding bracket, 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**
SIMATIC S7-1500 DIN 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 2000 mm DIN rail 20 units	**6ES7590-5AA00-0AA0**

	Article No.
System power supply For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power plug With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
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 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; 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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

Ordering data

	Article No.
Display module 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	**6ES7591-1AB00-0AA0**
Cover 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	**6ES7591-4AB00-0AA0**

	Article No.
STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
STEP 7 Professional V18, floating license	**6ES7822-1AA08-0YA5**
STEP 7 Professional V18, floating license, software download including license key [1] Email address required for delivery	**6ES7822-1AE08-0YA5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

Technical specifications

Article number	**6ES7511-1CK01-0AB0** CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	**6ES7512-1CK01-0AB0** CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
General information		
Product type designation	CPU 1511C-1 PN	CPU 1512C-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1CK00-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7512-1CK00-0AB0
Display		
Screen diagonal [cm]	3.45 cm	3.45 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Memory		
Work memory		
• integrated (for program)	175 kbyte	250 kbyte
• integrated (for data)	1 Mbyte	1 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte

Technical specifications

Article number	**6ES7511-1CK01-0AB0** CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	**6ES7512-1CK01-0AB0** CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
CPU processing times		
for bit operations, typ.	60 ns	48 ns
for word operations, typ.	72 ns	58 ns
for fixed point arithmetic, typ.	96 ns	77 ns
for floating point arithmetic, typ.	384 ns	307 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	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
• Outputs	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
Digital inputs		
integrated channels (DI)	16	32
Digital outputs		
integrated channels (DO)	16	32
Short-circuit protection	Yes; electronic/thermal	Yes; electronic/thermal
Analog outputs		
integrated channels (AO)	2	2
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes

Technical specifications

Article number	**6ES7511-1CK01-0AB0**	**6ES7512-1CK01-0AB0**
	CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; in total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
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
Redundancy mode		
Media redundancy		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

Technical specifications

Article number	**6ES7511-1CK01-0AB0**	**6ES7512-1CK01-0AB0**
	CPU 1511C-1 PN, 175 KB Prog, 1 MB Data	CPU 1512C-1 PN, 250 KB Prog, 1 MB Data
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	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
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• Protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Dimensions		
Width	85 mm	110 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	1 050 g	1 360 g

Overview CPU 1511F-1 PN

- Entry-level CPU in the S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

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
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

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 safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- 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 fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 with 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, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- 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 fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 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 with 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, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518F-4 PN/DP

- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 with 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, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages.

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518F-4 PN/DP MFP

- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding standard and fail-safe applications with demanding requirements regarding program scope, performance and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- 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
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP address for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (Data Access) as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518F-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.
In this way, in addition to the control function, typical PC applications can also be processed on the multifunctional platform, e.g. tasks which

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518F-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required. Controller-independent applications, e.g. protocol converter, database application and others can be created in C/C++. This simplifies the creation or reuse of customer-specific high-level language applications.
The CPU 1518F-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518F-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program.
By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms (e.g. object orientation) can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC Memory Card required for operation of the CPU.

Ordering data

	Article No.
CPU 1511F-1 PN Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7511-1FL03-0AB0**
CPU 1513F-1 PN Fail-safe CPU, 900 KB work memory for program, 2.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7513-1FM03-0AB0**
CPU 1515F-2 PN Fail-safe CPU, 1.5 MB work memory for program, 4.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC Memory Card required	**6ES7515-2FN03-0AB0**
CPU 1516F-3 PN/DP Fail-safe CPU, 3 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7516-3FP03-0AB0**
CPU 1517F-3 PN/DP Fail-safe CPU, 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7517-3FP00-0AB0**
CPU 1518F-4 PN/DP Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7518-4FP00-0AB0**
CPU 1518F-4 PN/DP MFP CPU 1518F-4 PN/DP MFP, including C/C++ Runtime and OPC UA Runtime license	**6ES7518-4FX00-1AC0**

	Article No.
Accessories	
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB, also for CPU 1518F-4 PN/DP MFP	**6ES7954-8LP03-0AA0**
32 GB, also for CPU 1518F-4 PN/DP MFP	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN 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 2000 mm DIN rail 20 units	**6ES7590-5AA00-0AA0**
System power supply	
For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power plug With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**

Fail-safe CPUs

Ordering data	Article No.
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
With insulation displacement technology, max. transfer rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG 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 quick mounting, 2-wire, 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	
PROFIBUS FC ground cable	**6XV1830-3FH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC FRNC cable GP	**6XV1830-0LH10**
2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FastConnect stripping tool	**6GK1905-6AA00**
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
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**

	Article No.
IE FC TP standard cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP trailing cable 2 x 2 (type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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	
IE FC TP marine cable 2 x 2 (type B)	**6XV1840-4AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Display module 35 mm	**6ES7591-1AB10-0AA0**
For 35 mm S7-1500 CPUs with firmware >= V3.0; spare part	
Display module 70 mm	**6ES7591-1BB00-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
Display	**6ES7591-1BA02-0AA0**
For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	
Cover 35 mm	**6ES7591-4AB00-0AA0**
For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	
Cover 70 mm	**6ES7591-4BB00-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
Front cover for PROFIBUS DP interface	**6ES7591-8AA00-0AA0**
For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	

Ordering data	Article No.
STEP 7 Professional V18	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
STEP 7 Professional V18, floating license	**6ES7822-1AA08-0YA5**
STEP 7 Professional V18, floating license, software download including license key [1]	**6ES7822-1AE08-0YA5**
Email address required for delivery	
STEP 7 Safety Advanced V18	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V18 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA18-0YA5**
Floating license for 1 user, license key for download[2]; Email address required for delivery	**6ES7833-1FA18-0YH5**

	Article No.
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
SIMATIC Target for Simulink V6.0	
Download incl. license key [1]	**6ES7823-1BE05-0YA5**
Email address required for delivery	
Upgrade SIMATIC Target 1500S for Simulink V2.0...V5.0 to V6.0, download incl. license key [1]	**6ES7823-1BE05-0YE5**
Email address required for delivery	
SIMATIC Target + ODK 1500S bundle	**6ES7823-1BE15-0YA0**
Download incl. license key [1]	
Email address required for delivery	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

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Technical specifications

Article number	**6ES7511-1FL03-0AB0**	**6ES7513-1FM03-0AB0**	**6ES7515-2FN03-0AB0**	**6ES7516-3FP03-0AB0**
	CPU 1511F-1 PN, 450KB prog, 1,5MB Data	CPU 1513F-1 PN, 900KB Prog., 2,5MB data	CPU 1515F-2 PN, 1,5MB Prog., 4,5MB Data	CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
General information				
Product type designation	CPU 1511F-1 PN	CPU 1513F-1 PN	CPU 1515F-2 PN	CPU 1516F-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7 511-1FK02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7513-1FL02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515-2FM02-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7516-3FN02-0AB0
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Memory				
Work memory				
• integrated (for program)	450 kbyte	900 kbyte	1.5 Mbyte	3 Mbyte
• integrated (for data)	1.5 Mbyte	2.5 Mbyte	4.5 Mbyte	7.5 Mbyte
Load memory				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	25 ns	25 ns	6 ns	6 ns
for word operations, typ.	32 ns	32 ns	7 ns	7 ns
for fixed point arithmetic, typ.	42 ns	42 ns	9 ns	9 ns
for floating point arithmetic, typ.	170 ns	170 ns	37 ns	37 ns
Counters, timers and their retentivity				
S7 counter				
• Number	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)
S7 times				
• Number	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)
Data areas and their retentivity				
Flag				
• Size, max.	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
• 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
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7511-1FL03-0AB0**	**6ES7513-1FM03-0AB0**	**6ES7515-2FN03-0AB0**	**6ES7516-3FP03-0AB0**
	CPU 1511F-1 PN, 450KB prog, 1,5MB Data	CPU 1513F-1 PN, 900KB Prog., 2,5MB data	CPU 1515F-2 PN, 1,5MB Prog., 4,5MB Data	CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
PROFINET IO Controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface				
Interface types				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No

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Technical specifications

Article number	**6ES7511-1FL03-0AB0**	**6ES7513-1FM03-0AB0**	**6ES7515-2FN03-0AB0**	**6ES7516-3FP03-0AB0**
	CPU 1511F-1 PN, 450KB prog, 1,5MB Data	CPU 1513F-1 PN, 900KB Prog., 2,5MB data	CPU 1515F-2 PN, 1,5MB Prog., 4,5MB Data	CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
PROFINET IO Controller				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
- Asset management record			Yes; per user program	Yes; per user program
3. Interface				
Interface types				
• RS 485				Yes; X3
• Number of ports				1
Protocols				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes

Technical specifications

Article number	**6ES7511-1FL03-0AB0**	**6ES7513-1FM03-0AB0**	**6ES7515-2FN03-0AB0**	**6ES7516-3FP03-0AB0**
	CPU 1511F-1 PN, 450KB prog, 1,5MB Data	CPU 1513F-1 PN, 900KB Prog., 2,5MB data	CPU 1515F-2 PN, 1,5MB Prog., 4,5MB Data	CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
PROFIBUS DP master				
• Number of DP slaves, max.				125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols				
Number of connections				
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode				
Media redundancy				
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50
SIMATIC communication				
• S7 routing	Yes	Yes	Yes	Yes
OPC UA				
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes	Yes	Yes
Supported technology objects				
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	1 120	2 400	2 400
• Required Motion Control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
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
• 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
• 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
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes

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Technical specifications

Article number	**6ES7511-1FL03-0AB0** CPU 1511F-1 PN, 450KB prog, 1,5MB Data	**6ES7513-1FM03-0AB0** CPU 1513F-1 PN, 900KB Prog., 2,5MB data	**6ES7515-2FN03-0AB0** CPU 1515F-2 PN, 1,5MB Prog., 4,5MB Data	**6ES7516-3FP03-0AB0** CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
Standards, approvals, certificates				
Highest safety class achievable in safety mode				
Probability of failure (for service life of 20 years and repair time of 100 hours)				
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• 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
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• 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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration				
Programming				
Programming language				
- LAD	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
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Protection of confidential configuration data	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	336 g	336 g	456 g	469 g

Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
General information			
Product type designation	CPU 1517F-3PN/DP	CPU 1518F-4PN/DP	CPU 1518F-4 PN/DP MFP
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 Update 3 (FW V1.6) or higher	V17 (FW V2.9) / V13 (FW V1.5) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher
Display			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Memory			
Work memory			
• integrated (for program)	3 Mbyte	9 Mbyte	9 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions			
• Integrated (for C/C++ Runtime application)			512 Mbyte
• available (for Linux runtime application)			1 Gbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 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			
• Size, 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

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Technical specifications

Article number	**6ES7517-3FP00-0AB0**	**6ES7518-4FP00-0AB0**	**6ES7518-4FX00-1AC0**
	CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
1. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	Yes	Yes; Minimum send cycle of 250 µs	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program

Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
2. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Direct data exchange	No	No	No
- IRT	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program

Technical specifications

Article number	**6ES7517-3FP00-0AB0**	**6ES7518-4FP00-0AB0**	**6ES7518-4FX00-1AC0**
	CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
3. Interface			
Interface types			
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
Protocols			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
PROFIBUS DP master			
• Number of DP slaves, max.	125; in total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET		
4. Interface			
Interface types			
• RS 485		Yes; X4	Yes; X4
• Number of ports		1	1
Protocols			
• PROFIBUS DP master		Yes	Yes
• PROFIBUS DP slave		No	No
• SIMATIC communication		Yes	Yes
PROFIBUS DP master			
• Number of DP slaves, max.		125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols			
Number of connections			
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
Media redundancy			
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes; as ring node according to IEC 62439-2 Edition 2.0	Yes; as ring node according to IEC 62439-2 Edition 2.0	Yes; as ring node according to IEC 62439-2 Edition 2.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Client	Yes	Yes	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions			Yes

Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Supported technology objects			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240	15 360	15 360
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
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
Standards, approvals, certificates			
Highest safety class achievable in safety mode			
Probability of failure (for service life of 20 years and repair time of 100 hours)			
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09
Ambient conditions			
Ambient temperature during 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
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Configuration			
Programming			
Programming language			
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection/password 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; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Write protection for Failsafe		Yes	
• Protection level: Complete protection	Yes	Yes	Yes
Open Development interfaces			
• Size of ODK SO file, max.			9.8 Mbyte
Dimensions			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	1 978 g	1 988 g	2 117 g

Overview SIPLUS CPU 1511F-1 PN

- Entry-level CPU in the SIPLUS S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU.

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 1513F-1 PN

- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the SIPLUS 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU.

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.

SIPLUS fail-safe CPUs

Overview SIPLUS 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 safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 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 with a SIMATIC or non-Siemens PROFINET IO 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.

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 1516F-3 PN/DP

- The CPU with a large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 with 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

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 1518F-4 PN/DP

- The CPU with a very large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope, performance and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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 with 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.

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.

SIPLUS fail-safe CPUs

Ordering data	Article No.
SIPLUS CPU 1511F-1 PN	
(Extended temperature range and exposure to environmental substances)	
Fail-safe central processing unit with work memory 225 KB for program, 1 MB for data, 1st interface: PROFINET IRT with 2-port switch; SIMATIC Memory Card required	
Temperature range -25 ... +60 °C	**6AG1511-1FK02-2AB0**
SIPLUS CPU 1513F-1 PN	**6AG1513-1FL02-2AB0**
(Extended temperature range and exposure to environmental substances)	
Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
SIPLUS CPU 1515F-2 PN	**6AG1515-2FM02-2AB0**
(Extended temperature range and exposure to environmental substances)	
Fail-safe CPU, 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch; PROFINET RT interface; SIMATIC Memory Card required	
SIPLUS CPU 1516F-3 PN/DP	**6AG1516-3FN02-2AB0**
(Extended temperature range and exposure to environmental substances)	
Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	
CPU 1518F-4 PN/DP	**6AG1518-4FP00-4AB0**
(Exposure to environmental substances)	
Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	

Accessories	Article No.
System power supply	
(Extended temperature range and exposure to environmental substances)	
For supplying the backplane bus of the S7-1500 Controller	
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 current supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	
(Extended temperature range and exposure to environmental substances)	
For SIPLUS CPU 1511-1 PN; spare part	**6AG1591-1AA01-2AA0**
For SIPLUS CPU 1513F-1 PN; spare part	**6AG1591-1AB00-2AA0**
For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part	**6AG1591-1BB00-2AA0**
For SIPLUS CPU 1518-4F PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, fail-safe CPUs, page 4/39

Technical specifications

Article number	6AG1511-1FK02-2AB0	6AG1513-1FL02-2AB0	6AG1515-2FM02-2AB0	6AG1516-3FN02-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0	6ES7518-4FP00-0AB0
	SIPLUS S7-1500 CPU 1511F-1 PN	SIPLUS S7-1500 CPU 1513F-1 PN	SIPLUS S7-1500 CPU 1515F-2 PN	SIPLUS S7-1500 CPU 1516F-3 PN/DP	SIPLUS S7-1500 CPU 1518F-4 PN/DP
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	0 °C
• horizontal installation, max.	60 °C; = Tmax; display: 5 0 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin	-40 °C; = Tmin	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; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; 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
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

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Technical specifications

Article number	6AG1511-1FK02-2AB0	6AG1513-1FL02-2AB0	6AG1515-2FM02-2AB0	6AG1516-3FN02-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0	6ES7518-4FP00-0AB0
	SIPLUS S7-1500 CPU 1511F-1 PN	SIPLUS S7-1500 CPU 1513F-1 PN	SIPLUS S7-1500 CPU 1515F-2 PN	SIPLUS S7-1500 CPU 1516F-3 PN/DP	SIPLUS S7-1500 CPU 1518F-4 PN/DP
Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Overview CPU 1513R-1 PN

- The CPU for applications with medium requirements for program scope and processing speed, and increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as the central controller in production lines with distributed I/O
- PROFINET IO RT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1515R-2 PN

- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- PROFINET IO RT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1517H-3 PN

- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- PROFINET IO RT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1518HF-4 PN

- The CPU for applications with high availability requirements, also in connection with functional safety requirements.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- A very large program data memory enables the realization of extensive applications.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- Supports PROFIsafe in distributed configurations.
- PROFINET IO RT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU

Ordering data

	Article No.
CPU 1513R-1 PN SIMATIC S7-1500R CPU, 600 KB work memory for program, 2.5 MB for data, PROFINET RT interface with 2-port switch; SIMATIC Memory Card required	**6ES7513-1RM03-0AB0**
CPU 1515R-2 PN SIMATIC S7-1500R CPU, 1 MB work memory for program, 4.5 MB for data, PROFINET RT interface with 2-port switch, PROFINET interface; SIMATIC Memory Card required	**6ES7515-2RN03-0AB0**
CPU 1517H-3 PN SIMATIC S7-1500H CPU, 2 MB work memory for program, 8 MB for data, 1st PROFINET RT interface with 2-port switch, 2nd PROFINET interface, 3rd/4th interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	**6ES7517-3HP00-0AB0**
SIMATIC S7-1500H CPU 1517H System Bundle Comprising 2 CPUs 1517H-3 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization cables (1 m)	**6ES7500-0HP00-0AB0**
CPU 1518HF-4 PN SIMATIC S7-1500H CPU, 9 MB work memory for program, 60 MB for data, 1st PROFINET RT interface with 2-port switch, 2nd PROFINET interface, 3rd PROFINET interface, 4th/5th interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	**6ES7518-4JP00-0AB0**
SIMATIC S7-1500HF CPU 1518HF System Bundle Comprising 2 CPUs 1518HF-4 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization cables (1 m)	**6ES7 500-0JP00-0AB0**

	Article No.
Accessories	
Synchronization modules	
For patch cable FOC up to 10 m	**6ES7960-1CB00-0AA5**
For routing cable FOC up to 10 km	**6ES7960-1FB00-0AA5**
For routing cable FOC up to 40 km	**6ES7960-1FE00-0AA5**
Synchronization connecting cables FOC for S7-1500H	
Length 1 m	**6ES7960-1BB00-5AA5**
Length 2 m	**6ES7960-1BC00-5AA5**
Length 10 m	**6ES7960-1CB00-5AA5**
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP03-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN 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 2000 mm DIN rail 20 units	**6ES7590-5AA00-0AA0**

Ordering data

	Article No.
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
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 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP trailing cable 2 x 2 (type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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	
IE FC TP marine cable 2 x 2 (type B)	**6XV1840-4AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	

	Article No.
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Display module 35 mm	**6ES7591-1AB00-0AA0**
For CPU1513R-1 PN; spare part	
Display module 70 mm	
For CPU 1515R-2 PN; spare part	**6ES7591-1BB00-0AA0**
For CPU 1517H-3 PN and CPU 1518HF-4 PN; spare part	**6ES7591-1BA02-0AA0**
STEP 7 Professional V18 (required for S7-1500R/H)	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement:	
Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021	
Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2	
Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation)	
Type of delivery:	
9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
STEP 7 Professional V18, floating license	**6ES7822-1AA08-0YA5**
STEP 7 Professional V18, floating license, software download including license key [1]	**6ES7822-1AE08-0YA5**
Email address required for delivery	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

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Technical specifications

Article number	**6ES7513-1RM03-0AB0** CPU 1513R-1 PN, 600KB program/2,5MB data	**6ES7515-2RN03-0AB0** CPU 1515R-2 PN, 1MB program/4,5MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program/8MB data	**6ES7518-4JP00-0AB0** CPU 1518HF-4 PN, 9MB program/60MB data
General information				
Product type designation	CPU 1513R-1 PN	CPU 1515R-2 PN	CPU 1517H-3 PN	CPU 1518HF-4PN
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version			V18 (FW V3.0) / V15.1 (FW V2.6) or higher	V18 (FW V3.0) / V17 (FW V2.9)
Display				
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Memory				
Work memory				
• integrated (for program)	600 kbyte	1 Mbyte	2 Mbyte	9 Mbyte
• integrated (for data)	2.5 Mbyte	4.5 Mbyte	8 Mbyte	60 Mbyte
Load memory				
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	50 ns	20 ns	4 ns	4 ns
for word operations, typ.	64 ns	24 ns	6 ns	6 ns
for fixed point arithmetic, typ.	85 ns	32 ns	6 ns	6 ns
for floating point arithmetic, typ.	340 ns	128 ns	24 ns	24 ns
Counters, timers and their retentivity				
S7 counter				
• Number	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)
S7 times				
• Number	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)
Data areas and their retentivity				
Flag				
• Size, max.	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
• 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
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	No	No	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes	Yes	Yes	Yes
• Web server	No	No	No	No
• Media redundancy	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7513-1RM03-0AB0** CPU 1513R-1 PN, 600KB program/2,5MB data	**6ES7515-2RN03-0AB0** CPU 1515R-2 PN, 1MB program/4,5MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program/8MB data	**6ES7518-4JP00-0AB0** CPU 1518HF-4 PN, 9MB program/60MB data
PROFINET IO Controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	No	No	No	No
- PROFIenergy	Yes	Yes	Yes	Yes; per user program
- Number of connectable IO Devices, max.	64	64	256	256
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
2. Interface				
Interface types				
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1
• integrated switch		No	No	No
Protocols				
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No	No
• PROFINET IO Device		No	No	No
• SIMATIC communication		Yes; Only Server	Yes; Only Server	Yes; Only Server
• Open IE communication		Yes	Yes	Yes
• Web server		No	No	No
• Media redundancy		No	No	No
3. Interface				
Interface type			Pluggable synchronization submodule (FO)	
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7 960-1FE00-0AA5	
Interface types				
• RJ 45 (Ethernet)				Yes; X3
• Number of ports				1
• integrated switch				No
Protocols				
• IP protocol				Yes; IPv4
• SIMATIC communication				Yes; Only Server
• Open IE communication				Yes
• Web server				No
4. Interface				
Interface type			Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
5. Interface				
Interface type				Pluggable synchronization submodule (FO)
Plug-in interface modules				Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5

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Technical specifications

Article number	6ES7513-1RM03-0AB0 CPU 1513R-1 PN, 600KB program/2,5MB data	6ES7515-2RN03-0AB0 CPU 1515R-2 PN, 1MB program/4,5MB data	6ES7517-3HP00-0AB0 CPU 1517H-3 PN, 2MB program/8MB data	6ES7518-4JP00-0AB0 CPU 1518HF-4 PN, 9MB program/60MB data
Protocols				
Number of connections				
• Number of connections, max.	88	128	288	320
Redundancy mode				
Media redundancy				
- Media redundancy				only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No	No	No	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP	200 ms; PROFINET MRP	200 ms; PROFINET MRP	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50; Only 16 are recommended, however	50; Only 16 are recommended, however	50	50
SIMATIC communication				
• S7 routing	No	Yes	Yes	Yes
OPC UA				
• OPC UA Client	No	No	No	No
• OPC UA Server	No	No	No	No
Supported technology objects				
Motion Control	No	No	No	No
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
• 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
• 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
Counting and measuring	Yes	Yes	Yes	Yes
• High-speed counter	No	No	No	No
Standards, approvals, certificates				
Highest safety class achievable in safety mode				
Probability of failure (for service life of 20 years and repair time of 100 hours)				
- Low demand mode: PFDavg in accordance with SIL3				< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3				< 1.00E-09
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °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
• vertical installation, min.	-30 °C	-30 °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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Technical specifications

Article number	**6ES7513-1RM03-0AB0** CPU 1513R-1 PN, 600KB program/2,5MB data	**6ES7515-2RN03-0AB0** CPU 1515R-2 PN, 1MB program/4,5MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program/8MB data	**6ES7518-4JP00-0AB0** CPU 1518HF-4 PN, 9MB program/60MB data
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes; incl. failsafe
- FBD	Yes	Yes	Yes	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	No	No	No	No
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Protection of confidential configuration data	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe				Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	70 mm	210 mm	210 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	336 g	456 g	2 094 g; Interface modules: 2x 18 g	2 116 g

SIPLUS redundant CPUs

Overview SIPLUS CPU 1515R-2 PN

- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- PROFINET IO RT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU.

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 1517H-3 PN

- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- PROFINET IO RT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU.

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 1518HF-4 PN

- The CPU for applications with high availability requirements, also in connection with functional safety requirements.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- A very large program data memory enables the realization of extensive applications.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O.
- Supports PROFIsafe in distributed configurations.
- PROFINET IO RT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.

Note:

SIMATIC Memory Card required for operation of the CPU.

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.

SIPLUS redundant CPUs

Ordering data	Article No.
SIPLUS CPU 1515R-2 PN (Extended temperature range and exposure to environmental substances) SIPLUS S7-1500R CPU, 500 KB work memory for program, 3 MB for data, PROFINET RT interface with 2-port switch, PROFINET interface; SIMATIC Memory Card required	**6AG1515-2RM00-7AB0**
SIPLUS CPU 1517H-3 PN (Extended temperature range and exposure to environmental substances) SIPLUS S7-1500H CPU, 2 MB work memory for program, 8 MB for data, 1st PROFINET RT interface with 2-port switch, 2nd PROFINET RT interface, 3rd interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	**6AG1517-3HP00-4AB0**
SIPLUS S7-1500 CPU 1517H System Bundle (Extended temperature range and exposure to environmental substances) Comprising 2 SIPLUS CPU 1517H-3 PN, 4 SIPLUS synchronization modules up to 10 m, 2 FOC synchronization cables (1 m); without memory card	**6AG1500-0HP00-4AB0**
SIPLUS CPU 1518HF-4 PN With conformal coating CPU with 9 MB work memory for program and 60 MB work memory for data,1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd interface: PROFINET, 4th/5th interface: H-SYNC; SIMATIC Memory Card required	**6AG1518-4JP00-4AB0**

	Article No.
Accessories	
Synchronization modules (Extended temperature range and exposure to environmental substances)	
• For patch cable FOC up to 10 m	**6AG1960-1CB00-4AA5**
• For routing cable FOC up to 10 km	**6AG1960-1FB00-4AA5**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
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 current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1515R-2 PN/DP and CPU 1517H-3 PN; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1515R-2 PN, page 4/60

Technical specifications

Article number	**6AG1515-2RM00-7AB0**	**6AG1517-3HP00-4AB0**	**6AG1518-4JP00-4AB0**
Based on	**6ES7515-2RM00-0AB0**	**6ES7517-3HP00-0AB0**	**6ES7518-4JP00-0AB0**
	SIPLUS S7-1500 CPU 1515R-2 PN	SIPLUS S7-1500 CPU 1517H-3 PN	SIPLUS S7-1500 CPU 1518HF-4 PN
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	0 °C; = Tmin	0 °C
• horizontal installation, max.	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	0 °C; = Tmin	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
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

Technical specifications

Article number	**6AG1515-2RM00-7AB0**	**6AG1517-3HP00-4AB0**	**6AG1518-4JP00-4AB0**
Based on	**6ES7515-2RM00-0AB0**	**6ES7517-3HP00-0AB0**	**6ES7518-4JP00-0AB0**
	SIPLUS S7-1500 CPU 1515R-2 PN	SIPLUS S7-1500 CPU 1517H-3 PN	SIPLUS S7-1518HF-4 PN
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)		Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)		Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Overview CPU 1511T-1 PN

- Entry-level CPU in the S7-1500T 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes
- Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1511TF-1 PN

- Entry-level CPU in the S7-1500T 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
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1515T-2 PN

- The CPU for applications with medium to high requirements regarding program/data storage in the S7-1500T 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
- Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1515TF-2 PN

- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the S7-1500T 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
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1516T-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
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA
  User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1516TF-3 PN/DP

- The CPU with a large program and data memory in the S7-1500 Controller product range for standard and fail-safe applications with high requirements regarding program scope and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1517T-3 PN/DP

- The CPU with a very 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
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1517TF-3 PN/DP

- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518T-4 PN/DP

- The CPU with a very 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
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta-Picker 3D with 2 orientations,
    6-axis articulated arm with central hand.
  - User-defined kinematics 3D with 3 orientations
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518TF-4 PN/DP

- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e 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
- 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 with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA. User-defined kinematics are also supported.
- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta-Picker 3D with 2 orientations,
    6-axis articulated arm with central hand.
  - User-defined kinematics 3D with 3 orientations
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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Ordering data	Article No.
CPU 1511T-1 PN 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7511-1TL03-0AB0**
CPU 1511TF-1 PN 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7511-1UL03-0AB0**
CPU 1515T-2 PN 1.5 MB work memory for program, 4.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	**6ES7515-2TN03-0AB0**
CPU 1515TF-2 PN 1.5 MB work memory for program, 4.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	**6ES7515-2UN03-0AB0**
CPU 1516T-3 PN/DP 3 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7516-3TN00-0AB0**
CPU 1516TF-3 PN/DP 3 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7516-3UN00-0AB0**
CPU 1517T-3 PN/DP 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7517-3TP00-0AB0**
CPU 1517TF-3 PN/DP 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7517-3UP00-0AB0**
CPU 1518T-4 PN/DP 9 MB work memory for program, 60 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7518-4TP00-0AB0**
CPU 1518TF-4 PN/DP 9 MB work memory for program, 60 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7518-4UP00-0AB0**

Accessories	Article No.
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP03-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
S7-1500T Motion Control KinPlus	
For up to 6 interpolating axes	
• Firmware S7-1500T Motion Control KinPlus	**6ES7 823-0KE00-1AA0**
• 2 GB memory card for S7-1500T Motion Control KinPlus	**6ES7 954-8LP80-0AA0**
• 32 GB memory card for S7-1500T Motion Control KinPlus	**6ES7 954-8LT80-0AA0**
SIMATIC S7-1500 DIN 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 2000 mm DIN rail 20 units	**6ES7590-5AA00-0AA0**
System power supply	
For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power plug With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
With insulation displacement technology, max. transfer rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**

Ordering data	Article No.
PROFIBUS FC standard cable GP Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FC robust cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0JH10**
PROFIBUS FC flexible cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1831-2K**
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 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0GH10**
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 protective jacket FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Pre-adjusted 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 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; 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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/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**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
Display module 35 mm For CPU 1511T-1 PN and CPU 1511TF-1 PN; spare part	**6ES7591-1AB00-0AA0**
Display module 70 mm For CPU 1515T-2 PN, CPU 1515TF-2 PN; spare part	**6ES7591-1BB00-0AA0**
For CPU 1515T-2 PN, CPU 515TF-2 PN, CPU 1516T-3 PN/DP, CPU 1516TF-3 PN/DP, CPU 1517T-3 PN/DP, CPU 1517TF-3 PN/DP, CPU 1518T-4 PN/DP and CPU 1518TF-4 PN/DP; spare part	**6ES7591-1BA02-0AA0**
Cover 35 mm For CPU 1511T-1 PN, CPU 1511TF-1 PN; spare part	**6ES7591-4AB00-0AA0**
Cover 70 mm For CPU 1515T-2 PN, CPU 1515TF-2 PN; spare part	**6ES7591-4BB00-0AA0**
Front cover for PROFIBUS DP interface For CPU 1516T-3 PN/DP, CPU 1516TF-3 PN/DP, CPU 1517T-3 PN/DP, CPU 1517TF-3 PN/DP, CPU 1518T-4 PN/DP and CPU 1518TF-4 PN/DP; spare part	**6ES7591-8AA00-0AA0**

Ordering data

	Article No.
STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
STEP 7 Professional V18, floating license	**6ES7822-1AA08-0YA5**
STEP 7 Professional V18, floating license, software download including license key [1] Email address required for delivery	**6ES7822-1AE08-0YA5**

	Article No.
STEP 7 Safety Advanced V18 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V18 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA18-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA18-0YH5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

Technical specifications

Article number	**6ES7511-1TL03-0AB0**	**6ES7515-2TN03-0AB0**	**6ES7517-3TP00-0AB0**	**6ES7516-3TN00-0AB0**	**6ES7518-4TP00-0AB0**
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
General information					
Product type designation	CPU 1511T-1 PN	CPU 1515T-2 PN	CPU 1517T-3 PN/DP	CPU 1516T-3 PN/DP	CPU 1518T-4 PN/DP
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version			V18 (FW V3.0) / V14 (FW V2.0) or higher	V18 (FW V3.0) / V15 (FW V2.5) or higher	V18 (FW V3.0) / V17 (FW V2.9) or higher
Display					
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Memory					
Work memory					
• integrated (for program)	450 kbyte	1.5 Mbyte	3 Mbyte	3 Mbyte	9 Mbyte
• integrated (for data)	1.5 Mbyte	4.5 Mbyte	8 Mbyte	7.5 Mbyte	60 Mbyte
Load memory					
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte

Technical specifications

Article number	**6ES7511-1TL03-0AB0**	**6ES7515-2TN03-0AB0**	**6ES7517-3TP00-0AB0**	**6ES7516-3TN00-0AB0**	**6ES7518-4TP00-0AB0**
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
CPU processing times					
for bit operations, typ.	25 ns	6 ns	2 ns	6 ns	1 ns
for word operations, typ.	32 ns	7 ns	3 ns	7 ns	2 ns
for fixed point arithmetic, typ.	42 ns	9 ns	3 ns	9 ns	2 ns
for floating point arithmetic, typ.	170 ns	37 ns	12 ns	37 ns	6 ns
Counters, timers and their retentivity					
S7 counter					
• Number	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)
S7 times					
• Number	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)
Data areas and their retentivity					
Flag					
• Size, max.	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
• 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
Time of day					
Clock					
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface					
Interface types					
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes	Yes
Protocols					
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes	Yes

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Technical specifications

Article number	6ES7511-1TL03-0AB0	6ES7515-2TN03-0AB0	6ES7517-3TP00-0AB0	6ES7516-3TN00-0AB0	6ES7518-4TP00-0AB0
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
PROFINET IO Controller					
Services					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	512	256	512
- of which in line, max.	128	256	512	256	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device					
Services					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No	No
- IRT	Yes	Yes	Yes	Yes	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface					
Interface types					
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1	1
• integrated switch		No	No	No	No
Protocols					
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		Yes	Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes	Yes
• Open IE communication		Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server		Yes	Yes	Yes	Yes
• Media redundancy		No	No	No	No

Technical specifications

Article number	**6ES7511-1TL03-0AB0**	**6ES7515-2TN03-0AB0**	**6ES7517-3TP00-0AB0**	**6ES7516-3TN00-0AB0**	**6ES7518-4TP00-0AB0**
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
PROFINET IO Controller					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- Direct data exchange		No	No	No	No
- IRT		No	No	No	No
- PROFIenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Number of connectable IO Devices, max.		32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	128	32	128
- of which in line, max.		32	128	32	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFIenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Shared device		Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		4	4	4	4
- activation/deactivation of I-devices		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
3. Interface					
Interface types					
• RJ 45 (Ethernet)					Yes; X3
• RS 485			Yes; X3	Yes; X3	
• Number of ports			1	1	1
• integrated switch					No

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Technical specifications

Article number	6ES7511-1TL03-0AB0	6ES7515-2TN03-0AB0	6ES7517-3TP00-0AB0	6ES7516-3TN00-0AB0	6ES7518-4TP00-0AB0
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
Protocols					
• IP protocol					Yes; IPv4
• PROFINET IO Controller					No
• PROFINET IO Device					No
• PROFIBUS DP master			Yes	Yes	
• PROFIBUS DP slave			No	No	
• SIMATIC communication			Yes	Yes	Yes
• Open IE communication					Yes; Optionally also encrypted
• Web server			Yes	Yes	Yes
PROFIBUS DP master					
• Number of DP slaves, max.			125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
4. Interface					
Interface types					
• RS 485					Yes; X4
• Number of ports					1
Protocols					
• PROFIBUS DP master					Yes
• PROFIBUS DP slave					No
• SIMATIC communication					Yes
PROFIBUS DP master					
• Number of DP slaves, max.					125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols					
Number of connections					
• Number of connections, max.	128; 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	256; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode					
Media redundancy					
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50	50
SIMATIC communication					
• S7 routing	Yes	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7511-1TL03-0AB0**	**6ES7515-2TN03-0AB0**	**6ES7517-3TP00-0AB0**	**6ES7516-3TN00-0AB0**	**6ES7518-4TP00-0AB0**
	CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	CPU 1517T-3 PN/DP, 3MB prog./8MB Data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
OPC UA					
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes	Yes	Yes	Yes
Supported technology objects					
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	2 400	10 240	6 400	15 360
• Required Motion Control resources					
- per speed-controlled axis	40	40	40	40	40
- per positioning axis	80	80	80	80	80
- per synchronous axis	160	160	160	160	160
- per external encoder	80	80	80	80	80
- per output cam	20	20	20	20	20
- per cam track	160	160	160	160	160
- per probe	40	40	40	40	40
• Number of available Extended Motion Control resources for technology objects	90	120	256	192	512
• Required Extended Motion Control resources					
- per cam (1 000 points and 50 segments)	2	2	2	2	2
- per cam (10 000 points and 50 segments)	20	20	20	20	20
- for each set of kinematics	30	30	30	30	30
- per leading axis proxy	3	3	3	3	3
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
• 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
• 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
Counting and measuring					
• High-speed counter	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	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
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	0 °C	0 °C	0 °C

Technical specifications

Article number	**6ES7511-1TL03-0AB0** CPU 1511T-1 PN, 450KB Prog., 1.5MB Data	**6ES7515-2TN03-0AB0** CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data	**6ES7517-3TP00-0AB0** CPU 1517T-3 PN/DP, 3MB prog./8MB Data	**6ES7516-3TN00-0AB0** CPU 1516T-3 PN/DP, 1.5MB prog./5MB Data	**6ES7518-4TP00-0AB0** CPU 1518T-4 PN/DP, 9MB Prog., 60MB Data
• 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
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration					
Programming					
Programming language					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
Know-how protection					
• User program protection/ password protection	Yes	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes	Yes
Access protection					
• Protection of confidential configuration data	Yes	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe	No	No			
• Protection level: Complete protection	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	35 mm	70 mm	175 mm	175 mm	175 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.	336 g	535 g	1 929 g	1 929 g	2 079 g

Article number	**6ES7511-1UL03-0AB0** CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	**6ES7515-2UN03-0AB0** CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	**6ES7516-3UN00-0AB0** CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	**6ES7517-3UP00-0AB0** CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4UP00-0AB0** CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
General information					
Product type designation	CPU 1511TF-1 PN	CPU 1515TF-2 PN	CPU 1516TF-3 PN/DP	CPU 1517TF-3 PN/DP	CPU 1518TF-4 PN/DP
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7 511-1UK01-0AB0	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515-2UM01-0AB0	V18 (FW V3.0) / V15 (FW V2.5) or higher	V18 (FW V3.0) / V14 (FW V2.0) or higher	V18 (FW V3.0) / V17 (FW V2.9) or higher
Display					
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Memory					
Work memory					
• integrated (for program)	450 kbyte	1.5 Mbyte	3 Mbyte	3 Mbyte	9 Mbyte
• integrated (for data)	1.5 Mbyte	4.5 Mbyte	7.5 Mbyte	8 Mbyte	60 Mbyte

Technical specifications

Article number	**6ES7511-1UL03-0AB0**	**6ES7515-2UN03-0AB0**	**6ES7516-3UN00-0AB0**	**6ES7517-3UP00-0AB0**	**6ES7518-4UP00-0AB0**
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
Load memory					
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times					
for bit operations, typ.	25 ns	6 ns	6 ns	2 ns	1 ns
for word operations, typ.	32 ns	7 ns	7 ns	3 ns	2 ns
for fixed point arithmetic, typ.	42 ns	9 ns	9 ns	3 ns	2 ns
for floating point arithmetic, typ.	170 ns	37 ns	37 ns	12 ns	6 ns
Counters, timers and their retentivity					
S7 counter					
• Number	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)
S7 times					
• Number	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)
Data areas and their retentivity					
Flag					
• Size, max.	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
• 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
Time of day					
Clock					
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface					
Interface types					
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes	Yes
Protocols					
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes	Yes

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Technical specifications

Article number	6ES7511-1UL03-0AB0	6ES7515-2UN03-0AB0	6ES7516-3UN00-0AB0	6ES7517-3UP00-0AB0	6ES7518-4UP00-0AB0
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
PROFINET IO Controller					
Services					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; in total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- of which IO devices with IRT, max.	64	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	256	512	512
- of which in line, max.	128	256	256	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device					
Services					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No	No
- IRT	Yes	Yes	Yes	Yes	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface					
Interface types					
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2	Yes; X2
• Number of ports		1	1	1	1
• integrated switch		No	No	No	No
Protocols					
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		Yes	Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes	Yes
• Open IE communication		Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server		Yes	Yes	Yes	Yes
• Media redundancy		No	No	No	No

Technical specifications

Article number	**6ES7511-1UL03-0AB0**	**6ES7515-2UN03-0AB0**	**6ES7516-3UN00-0AB0**	**6ES7517-3UP00-0AB0**	**6ES7518-4UP00-0AB0**
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
PROFINET IO Controller					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- Direct data exchange		No	No	No	No
- IRT		No	No	No	No
- PROFIenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Number of connectable IO Devices, max.		32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	32	128	128
- of which in line, max.		32	32	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFIenergy		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		No	No	No	No
- Shared device		Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		4	4	4	4
- activation/deactivation of I-devices		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record		Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
3. Interface					
Interface types					
• RJ 45 (Ethernet)					Yes; X3
• RS 485			Yes; X3	Yes; X3	
• Number of ports			1	1	1
• integrated switch					No
Protocols					
• IP protocol					Yes; IPv4
• PROFINET IO Controller					No
• PROFINET IO Device					No
• PROFIBUS DP master			Yes	Yes	
• PROFIBUS DP slave			No	No	
• SIMATIC communication			Yes	Yes	Yes
• Open IE communication					Yes; Optionally also encrypted
• Web server			Yes	Yes	Yes

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Technical specifications

Article number	6ES7511-1UL03-0AB0	6ES7515-2UN03-0AB0	6ES7516-3UN00-0AB0	6ES7517-3UP00-0AB0	6ES7518-4UP00-0AB0
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
PROFIBUS DP master					
• Number of DP slaves, max.			125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
4. Interface					
Interface types					
• RS 485					Yes; X4
• Number of ports					1
Protocols					
• PROFIBUS DP master					Yes
• PROFIBUS DP slave					No
• SIMATIC communication					Yes
PROFIBUS DP master					
• Number of DP slaves, max.					125; in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols					
Number of connections					
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	256; 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
Redundancy mode					
Media redundancy					
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50	50
SIMATIC communication					
• S7 routing	Yes	Yes	Yes	Yes	Yes
OPC UA					
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7511-1UL03-0AB0**	**6ES7515-2UN03-0AB0**	**6ES7516-3UN00-0AB0**	**6ES7517-3UP00-0AB0**	**6ES7518-4UP00-0AB0**
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
Supported technology objects					
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	2 400	6 400	10 240	15 360
• Required Motion Control resources					
- per speed-controlled axis	40	40	40	40	40
- per positioning axis	80	80	80	80	80
- per synchronous axis	160	160	160	160	160
- per external encoder	80	80	80	80	80
- per output cam	20	20	20	20	20
- per cam track	160	160	160	160	160
- per probe	40	40	40	40	40
• Number of available Extended Motion Control resources for technology objects	90	120	192	256	512
• Required Extended Motion Control resources					
- per cam (1 000 points and 50 segments)	2	2	2	2	2
- per cam (10 000 points and 50 segments)	20	20	20	20	20
- for each set of kinematics	30	30	30	30	30
- Per leading axis proxy	3	3	3	3	3
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
• 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
• 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
Counting and measuring					
• High-speed counter	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Highest safety class achievable in safety mode					
Probability of failure (for service life of 20 years and repair time of 100 hours)					
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09

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Technical specifications

Article number	**6ES7511-1UL03-0AB0**	**6ES7515-2UN03-0AB0**	**6ES7516-3UN00-0AB0**	**6ES7517-3UP00-0AB0**	**6ES7518-4UP00-0AB0**
	CPU 1511TF-1 PN, 450KB Prog., 1.5MB Data	CPU 1515TF-2 PN, 1.5MB Prog, 4.5MB Data	CPU 1516TF-3 PN/DP, 1.5MB Prog./5MB Data	CPU 1517TF-3 PN/DP, 3MB Prog., 8MB Data	CPU 1518TF-4 PN/DP, 9MB Prog, 60MB Data
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	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
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	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
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration					
Programming					
Programming language					
- LAD	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
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
Know-how protection					
• User program protection/ password protection	Yes	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes	Yes
Access protection					
• Protection of confidential configuration data	Yes	Yes	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	35 mm	70 mm	175 mm	175 mm	175 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.	336 g	456 g	1 929 g	1 929 g	2 079 g

Overview

- 16, 32 and 64-channel digital input modules
- Sinking and sourcing input versions available
- Module for recording NAMUR signals
- For flexible adaptation of the PLC 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

Ordering data

	Article No.
SM 521 digital input modules	
Module width 35 mm	
16 inputs, 24 V DC High Feature, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BH00-0AB0**
32 inputs, 24 V DC High Feature, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BL00-0AB0**
16 inputs, 24 V DC High Speed, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-7BH00-0AB0**
64 inputs, 24 V DC Basic, source-sinking input, input delay 3.2 ms; cables and terminal blocks can be ordered separately (SIMATIC TOP connect)	**6ES7521-1BP00-0AA0**
16 inputs, 24 V DC basic, isolated, input delay 3.2 ms	**6ES7521-1BH50-0AA0**
16 inputs, 230 V AC basic, isolated, input delay 20 ms	**6ES7521-1FH00-0AA0**
16 inputs, 24 ... 125 V UC High Feature, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts	**6ES7521-7EH00-0AB0**
16 inputs to record NAMUR signals (8.2 V DC), 2 potential groups, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts	**6ES7521-7TH00-0AB0**
Module width 25 mm; front connector (push-in) included in scope of delivery	
16 inputs, 24 V DC basic, isolated	**6ES7521-1BH10-0AA0**
32 inputs, 24 V DC basic, isolated	**6ES7521-1BL10-0AA0**
Accessories	
Front connectors	
For 35 mm modules (not 64-channel); including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
Front connectors	
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 pieces; 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 on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

SM 521 digital input modules

Technical specifications

Article number	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-7BH00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-1BP00-0AA0**
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC HS	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 64x24VDC SNK/SRC BA
General information						
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24 V DC HS	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 64x24VDC BA
Product function						
• Isochronous mode	Yes	Yes	Yes	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes	No
Engineering with						
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	STEP 7 V17 or higher	V12 / V12	V12 / V12	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.35 / -
Operating mode						
• DI	Yes	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	Yes	No	No	No
• Oversampling	No	No	Yes			No
• MSI	Yes	Yes	Yes	Yes	Yes	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V			
Reverse polarity protection	Yes	Yes	Yes			
Encoder supply						
Number of outputs			16; 2x 24 V DC			
Short-circuit protection			Yes			
24 V encoder supply						
• 24 V			Yes			
• Short-circuit protection			Yes; Per group, electronic			
• Output current, max.			150 mA; per group			
• Output current per module, max.			300 mA			
Digital inputs						
Number of digital inputs	16	32	16	16	16	64
Digital inputs, parameterizable	Yes	Yes	Yes	No	No	No
Source/sink input	P-reading	P-reading	P-reading	Sourcing	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1					Yes	
Input characteristic curve in accordance with IEC 61131, type 2			Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes		Yes		Yes
Pulse extension			Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s			
Edge evaluation			Yes; Positive edge, negative edge			
Signal change flutter			Yes; 2 to 32 signal changes			
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps			
Number of simultaneously controllable inputs						
• Number of simultaneously controllable inputs						64; see additional description in the manual
Digital input functions, parameterizable						
• Gate start/stop	Yes	Yes	Yes; software/ hardware gate			
• Freely usable digital input	Yes	Yes	Yes			
• Digital input with oversampling			Yes			

Technical specifications

Article number	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-7BH00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-1BP00-0AA0**
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC HS	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 64x24VDC SNK/SRC BA
Input voltage						
• Rated value (DC)	24 V	24 V	24 V	24 V		24 V
• Rated value (AC)					230 V; 120/230 V AC, 50/60 Hz	
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
Input current						
• for signal "1", typ.	2.5 mA	2.5 mA	9 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	2.7 mA
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	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
for interrupt inputs						
- parameterizable	Yes	Yes	Yes	No	No	No
for technological functions						
- parameterizable	Yes	Yes	Yes	No	No	No
Encoder						
Connectable encoders						
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	2 mA	1.5 mA	2 mA	1.5 mA
Isochronous mode						
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time	60 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs	250 µs			
Interrupts/diagnostics/status information						
Diagnostics function	Yes	Yes	Yes	No	No	No
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	No	No	No
• Hardware interrupt	Yes	Yes	Yes	No	No	No
Diagnoses						
• Monitoring the supply voltage	Yes	Yes	Yes	No	No	No
• Monitoring of encoder power supply			Yes; short-circuit			
• Wire-break	Yes; to I < 350 µA	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	No
• Short-circuit	No	No	No	No	No	No
• Group error						No
Diagnostics indication LED						
• RUN LED	Yes; green 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	Yes; red LED
• MAINT LED						No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	No	No	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No	Yes; red LED	No

Technical specifications

Article number	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-7BH00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-1BP00-0AA0**
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC HS	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 64x24VDC SNK/SRC BA
Potential separation						
Potential separation channels						
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates						
Suitable for safety functions	No	No	No	No	No	No
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	0 °C	0 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	0 °C	0 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual		5 000 m
Dimensions						
Width	35 mm	35 mm	35 mm	35 mm	35 mm	35 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.	240 g	260 g	240 g	230 g	300 g	250 g
Other						
Note:						Please order cable and connection modules separately

Article number	**6ES7521-7EH00-0AB0**	**6ES7521-7TH00-0AB0**
	S7-1500, DI 16 x 24...125V UC HF	S7-1500, DI 16XNAMUR HF
General information		
Product type designation	DI 16x24 ... 125 V UC HF	DI 16xNAMUR HF
Product function		
• Isochronous mode	No	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	STEP 7 V17 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	Yes
• Oversampling	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes
Encoder supply		
Number of outputs		16; 2x 8.2 V DC
Short-circuit protection		Yes

Technical specifications

Article number	**6ES7521-7EH00-0AB0** S7-1500, DI 16 x 24...125V UC HF	**6ES7521-7TH00-0AB0** S7-1500, DI 16XNAMUR HF
NAMUR encoder supply		
• 8.2 V		Yes
• Short-circuit protection		Yes; Per group, electronic
• Output current, max.		100 mA; per group
• Output current per module, max.		200 mA
Digital inputs		
Number of digital inputs	16	16; NAMUR
Digital inputs, parameterizable	Yes	Yes
Source/sink input	Yes	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes; At 24 V DC	
Pulse extension		Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s
Edge evaluation		Yes; rising edge, falling edge, edge change
Signal change flutter		Yes; 2 to 32 signal changes
Flutter observation window		Yes; 0.5 s, 1 s to 100 s in 1-s steps
Digital input functions, parameterizable		
• Gate start/stop		Yes; software/hardware gate
• Freely usable digital input		Yes
Input voltage		
• Rated value (DC)	24 V; 48 V, 125 V	8.2 V
• Rated value (AC)	24 V; 48 V, 125 V (50 - 60 Hz)	
• for signal "0"	-5 ... +5 V	
• for signal "1"	+11 ... +146 V	
Input current		
• for signal "1", typ.	3 mA; At 24 V DC	10 mA
for 10 k switched contact		
- for signal "0"		0.35 to 1.2 mA
- for signal "1"		2.1 ... 10 mA
for unswitched contact		
- for signal "0", max. (permissible quiescent current)		0.35 to 1.2 mA
- for signal "1"		2.1 ... 10 mA
for NAMUR encoders		
- for signal "0", min.		0.35 mA
- for signal "0", max.		1.2 mA
- for signal "1", min.		2.1 mA
- for signal "1", max.		10 mA
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 parameterizable with DC, 20 ms fixed with AC	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms
for interrupt inputs		
- parameterizable	Yes	Yes
for technological functions		
- parameterizable	No	Yes
for NAMUR inputs		
- at "0" to "1", max.		20 ms
- at "1" to "0", max.		20 ms
Encoder		
Connectable encoders		
• NAMUR encoder/changeover contact according to EN 60947		Yes; no CO contact
• Single contact / changeover contact unconnected		Yes; no CO contact
• Single contact / changeover contact connected with 10 kΩ		Yes; no CO contact
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.2 mA

Technical specifications

Article number	**6ES7521-7EH00-0AB0** S7-1500, DI 16 x 24...125V UC HF	**6ES7521-7TH00-0AB0** S7-1500, DI 16XNAMUR HF
Isochronous mode		
Filtering and processing time (TCI), min.		60 µs; At 50 µs filter time
Bus cycle time (TDP), min.		250 µs
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Hardware interrupt	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	No	Yes
• Monitoring of encoder power supply		Yes; short-circuit
• Wire-break	Yes; To I < 550 µA	Yes; to I < 350 µA
• Short-circuit	No	No
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)	No	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	240 g	240 g

Article number	**6ES7521-1BH10-0AA0** S7-1500, DI 16x24VDC BA	**6ES7521-1BL10-0AA0** S7-1500, DI 32x24VDC BA
General information		
Product type designation	DI 16 x 24 V DC BA	DI 32x24VDC BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -

Technical specifications

Article number	**6ES7521-1BH10-0AA0** S7-1500, DI 16x24VDC BA	**6ES7521-1BL10-0AA0** S7-1500, DI 32x24VDC BA
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• 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
for technological functions		
- parameterizable	No	No
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Alarms		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
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)	No	No
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C

Technical specifications

Article number	**6ES7521-1BH10-0AA0** S7-1500, DI 16x24VDC BA	**6ES7521-1BL10-0AA0** S7-1500, DI 32x24VDC BA
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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

Overview

- 8, 32, 16 and 64-channel digital output modules
- Sinking and sourcing output versions available
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional outputs
- High Feature modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Ordering data

	Article No.
SM 522 digital output modules	
Module width 35 mm	
8 outputs, 24 V DC, 2 A High Feature, isolated	**6ES7522-1BF00-0AB0**
16 outputs, 24 V DC, 0.5 A High Feature, isolated	**6ES7522-1BH01-0AB0**
32 outputs, 24 V DC, 0.5 A High Feature, isolated	**6ES7522-1BL01-0AB0**
64 outputs, 24 V DC; 0.3A Basic; sinking output; cables and terminal blocks can be ordered separately (SIMATIC TOP connect)	**6ES7522-1BP00-0AA0**
64 outputs, 24 V DC; 0.3A Basic; sourcing; cables and terminal blocks can be ordered separately (SIMATIC TOP connect)	**6ES7522-1BP50-0AA0**
8 relay outputs, 230 V AC, 5 A Standard	**6ES7522-5HF00-0AB0**
16 relay outputs, 230 V AC, 2 A Standard	**6ES7522-5HH00-0AB0**
8 outputs (triac), 230 V AC, 2 A Standard	**6ES7522-5FF00-0AB0**
16 outputs (triac), 230 V AC, 1 A Standard	**6ES7522-5FH00-0AB0**
16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A Standard, isolated	**6ES7522-5EH00-0AB0**
Module width 25 mm; front connector (push-in) included in scope of delivery	
16 outputs, 24 V DC, 0.5 A Basic, isolated	**6ES7 522-1BH10-0AA0**
32 outputs, 24 V DC, 0.5 A Basic, isolated	**6ES7 522-1BL10-0AA0**
Accessories	
Front connectors	
For 35 mm modules (not 64-channel); 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 pieces; 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 on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

Technical specifications

Article number	**6ES7522-1BH01-0AB0** S7-1500, DQ 16x24V DC/0.5A HF	**6ES7522-1BL01-0AB0** S7-1500, DQ 32x24VDC/0.5A HF	**6ES7522-1BF00-0AB0** S7-1500, DQ 8x24VDC/2A HF	**6ES7522-5EH00-0AB0** S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
General information				
Product type designation	DQ 16x24VDC/0.5A HF	DQ 32x24VDC/0.5A HF	DQ 8x24VDC/2A HF	DQ 16x24 ... 48 V UC/ 125 V DC/0.5 A ST
Product function				
• Isochronous mode	Yes	Yes	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	Yes; with an application	No
• PWM	No	No	Yes; FS02 and FW V2.1.0 or higher; two outputs can be operated with max. 500 Hz PWM	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	No
Supply voltage				
Rated value (DC)	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	
Digital outputs				
Type of digital output	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	16	32	8	16
Current-sinking				Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes	
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes
Digital output functions, parameterizable				
• Freely usable digital output			Yes	
• PWM output			Yes; FS02 and FW V2.1.0 or higher	
- Number, max.			2	
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A		0.5 A
• on lamp load, max.	5 W	5 W	10 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
Load resistance range				
• lower limit	48 Ω	48 Ω	12 Ω	
• upper limit	12 kΩ	12 kΩ	4 kΩ	
Output voltage				
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
Output current				
• for signal "1" rated value	0.5 A	0.5 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	

Technical specifications

Article number	**6ES7522-1BH01-0AB0** S7-1500, DQ 16x24V DC/0.5A HF	**6ES7522-1BL01-0AB0** S7-1500, DQ 32x24VDC/0.5A HF	**6ES7522-1BF00-0AB0** S7-1500, DQ 8x24VDC/2A HF	**6ES7522-5EH00-0AB0** S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Output delay with resistive load				
• "0" to "1", typ.			80 µs	
• "0" to "1", max.	100 µs	100 µs	100 µs	5 ms
• "1" to "0", typ.			300 µs	
• "1" to "0", max.	500 µs	500 µs	500 µs	5 ms
Parallel switching of two outputs				
• for logic links	Yes	Yes	Yes	Yes
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz; With PWM operation: 500 Hz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz
Total 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	0.5 A
• 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	0.5 A
• 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	8 A
Isochronous mode				
Execution and activation time (TCO), min.	70 µs	70 µs		
Bus cycle time (TDP), min.	250 µs	250 µs		
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	No
• Maintenance interrupt	Yes	Yes	Yes	No
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	No
• Wire-break	Yes	Yes	No	No
• Short-circuit	Yes	Yes	Yes	No
• Group error	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
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-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
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

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Technical specifications

Article number	**6ES7522-1BH01-0AB0** S7-1500, DQ 16x24V DC/0.5A HF	**6ES7522-1BL01-0AB0** S7-1500, DQ 32x24VDC/0.5A HF	**6ES7522-1BF00-0AB0** S7-1500, DQ 8x24VDC/2A HF	**6ES7522-5EH00-0AB0** S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02	Yes; From FS03	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2	SIL 2
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• horizontal installation, max.	60 °C	60 °C		60 °C
• vertical installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• vertical installation, max.	40 °C	40 °C		40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
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.	230 g	280 g	240 g	230 g

Article number	**6ES7522-5HF00-0AB0** S7-1500, DQ 8x230VAC/5A ST (Relay)	**6ES7522-5HH00-0AB0** S7-1500, DQ 16x230VAC/2A ST (Relay)	**6ES7522-5FF00-0AB0** S7-1500, DQ 8x230VAC/2A ST (Triac)	**6ES7522-5FH00-0AB0** S7-1500, DQ 16x230VAC/1A ST (Triac)
General information				
Product type designation	DQ 8x230 V AC/5 A ST (relay)	DQ 16x 230 V AC/2 A ST (relay)	DQ 8x230 V AC/2A ST (triac)	DQ 16x230VAC/1A ST (Triac)
Product function				
• Isochronous mode	No	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V12 / V12	V13 SP1 / -	V12 / V12	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes; FW V2.1.0 or higher	Yes; FW V1.1.0 or higher	Yes; FW V2.2.0 or higher	Yes; FW V1.2.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		

Technical specifications

Article number	**6ES7522-5HF00-0AB0** S7-1500, DQ 8x230VAC/5A ST (Relay)	**6ES7522-5HH00-0AB0** S7-1500, DQ 16x230VAC/2A ST (Relay)	**6ES7522-5FF00-0AB0** S7-1500, DQ 8x230VAC/2A ST (Triac)	**6ES7522-5FH00-0AB0** S7-1500, DQ 16x230VAC/1A ST (Triac)
Digital outputs				
Type of digital output	Relays	Relays	Triac	Triac
Number of digital outputs	8	16	8	16
Current-sinking	Yes	Yes		Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No	No	No	No
Controlling a digital input	Yes; possible	Yes		
Size of motor starters according to NEMA, max.	5	5	5	4
Switching capacity of the outputs				
• with resistive load, max.			2 A	1 A
• on lamp load, max.	1 500 W; 10 000 operating cycles	50 W (230 V AC), 5 W (24 V DC)	50 W	50 W
• Low energy/fluorescent lamps with electronic control gear	10x 58 W (25 000 operating cycles)			
• Fluorescent tubes, conventionally compensated	1x 58 W (25 000 operating cycles)			
• Fluorescent tubes, uncompensated	10x 58 W (25 000 operating cycles)			
Output voltage				
• for signal "1", min.			L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current	L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
Output current				
• for signal "1" rated value	5 A	2 A	2 A	1 A
• for signal "0" residual current, max.	0 A	0 A	2 mA	2 mA
Output delay with resistive load				
• "0" to "1", max.			1 AC cycle	1 AC cycle
• "1" to "0", max.			1 AC cycle	1 AC cycle
Parallel switching of two outputs				
• for logic links	Yes	Yes	No	No
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	2 Hz	1 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per channel, max.	8 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual	1 A; see additional description in the manual
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	64 A; see additional description in the manual	32 A; see additional description in the manual	10 A; see additional description in the manual	10 A; see additional description in the manual

Technical specifications

Article number	**6ES7522-5HF00-0AB0**	**6ES7522-5HH00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Relay outputs				
• Number of relay outputs	8	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Current consumption of relays (coil current of all relays), typ.	80 mA	150 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: 1 000 A	Miniature circuit breaker B10 / B16		
• Contact connection (internal)	No	No		
• Number of operating cycles, max.	4 000 000; see additional description in the manual	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	No		
Switching capacity of contacts				
- with inductive load, max.	see additional description in the manual	2 A; see additional description in the manual		
- with resistive load, max.	see additional description in the manual	2 A; see additional description in the manual		
Interrupts/diagnostics/ status information				
Diagnostics function	Yes		No	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	No	No
• Maintenance interrupt		Yes	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire-break	No	No	No	No
• Short-circuit	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
• MAINT LED	Yes; Yellow LED	Yes; Yellow 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	No	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS03	Yes; From FS02		
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL c	PL c		
• Category according to ISO 13849-1	Cat. 2	Cat. 2		

Technical specifications

Article number	**6ES7522-5HF00-0AB0**	**6ES7522-5HH00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
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.	350 g	350 g	290 g	310 g

Article number	**6ES7522-1BP00-0AA0**	**6ES7522-1BP50-0AA0**
	S7-1500, DQ 64x24VDC/0.3A BA	S7-1500, DQ 64x24VDC/0.3A SNK BA
General information		
Product type designation	DQ 64x24VDC/0.3A BA	DQ 64x24VDC/0.3A SNK BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0319 / V17	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.35 / -	V2.35 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	64	64
Current-sinking	No	Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
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.	0.3 A	0.3 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	80 Ω	80 Ω
• upper limit	10 kΩ	10 kΩ

SM 522 digital output modules

Technical specifications

Article number	**6ES7522-1BP00-0AA0**	**6ES7522-1BP50-0AA0**
	S7-1500, DQ 64x24VDC/0.3A BA	S7-1500, DQ 64x24VDC/0.3A SNK BA
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current		
• for signal "1" rated value	0.3 A	0.3 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 two outputs		
• for logic links	Yes	Yes
• for uprating	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; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.3 A	0.3 A
• Current per group, max.	2 A	2 A
• Current per module, max.	8 A	8 A
Total current of the outputs (per module)		
horizontal installation		
- up to 60 °C, max.	8 A	8 A
vertical installation		
- up to 40 °C, max.	8 A	8 A
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	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; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes

Technical specifications

Article number	**6ES7522-1BP00-0AA0**	**6ES7522-1BP50-0AA0**
	S7-1500, DQ 64x24VDC/0.3A BA	S7-1500, DQ 64x24VDC/0.3A SNK BA
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS01	No
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	270 g	270 g
Other		
Note:	Please order cable and connection modules separately	Please order cable and connection modules separately

Article number	**6ES7522-1BH10-0AA0**	**6ES7522-1BL10-0AA0**
	S7-1500, DQ 16x24VDC/0.5A BA	S7-1500, DQ 32x24VDC/0.5A BA
General information		
Product type designation	DQ 16x24VDC/0.5A BA	DQ 32x24VDC/0.5A BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Oversampling	No	No
• MSO	Yes	Yes
Supply voltage		
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

SM 522 digital output modules

Technical specifications

Article number	**6ES7522-1BH10-0AA0** S7-1500, DQ 16x24VDC/0.5A BA	**6ES7522-1BL10-0AA0** S7-1500, DQ 32x24VDC/0.5A BA
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	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		
• 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 two outputs		
• for logic links	Yes	Yes
• for uprating	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; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total 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
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
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
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No

Technical specifications

Article number	**6ES7522-1BH10-0AA0**	**6ES7522-1BL10-0AA0**
	S7-1500, DQ 16x24VDC/0.5A BA	S7-1500, DQ 32x24VDC/0.5A BA
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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 523 digital input/output modules

Overview

- 16 digital inputs and 16 digital outputs (25 mm wide)
- 32 digital inputs, sinking/sourcing / 32 digital outputs, sourcing (35 mm wide)
- For flexible adaptation of the PLC 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

Ordering data

	Article No.
SM 523 digital input/output module	
Module width 35 mm	
32 inputs, 24 V DC Basic, sourcing-sinking input, input delay 3.2 ms, input type 3 (IEC 61131); 32 outputs, 24 V DC / 0.3 A Basic, sourcing	**6ES7523-1BP50-0AA0**
Module width 25 mm; front connector (push-in) included in scope of delivery	
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	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

Technical specifications

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	**6ES7523-1BP50-0AA0** S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
General information		
Product type designation	DI 16x24VDC / DQ16x24VDC/0.5A BA	DI 32 x 24 V DC / DQ 32 x 24 V DC/0.3A SNK BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.35 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)		No
• Oversampling	No	No
• MSI	Yes	Yes
• MSO	Yes	Yes
• Integrated operating cycle counter		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs		32
horizontal installation		
- up to 60 °C, max.		32
vertical installation		
- up to 40 °C, max.		16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
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
for technological functions		
- parameterizable		No

Technical specifications

Article number	**6ES7523-1BL00-0AA0**	**6ES7523-1BP50-0AA0**
	S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sinking		Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
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	0.3 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	80 Ω
• upper limit	12 kΩ	10 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current		
• for signal "1" rated value	0.5 A	0.3 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 two outputs		
• for logic links	Yes	Yes
• for uprating	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	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.3 A
• Current per group, max.	4 A; see additional description in the manual	2 A
• Current per module, max.	8 A; see additional description in the manual	4 A
Total current of the outputs (per module)		
horizontal installation		
- up to 60 °C, max.		4 A
vertical installation		
- up to 40 °C, max.		4 A
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

Technical specifications

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	**6ES7523-1BP50-0AA0** S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
• Hardware interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED		No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS03	
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m
Dimensions		
Width	25 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	280 g	250 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Please order cable and connection modules separately

SIPLUS 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

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

Ordering data	Article No.
SIPLUS SM 521 digital input modules	
(Extended temperature range and exposure to environmental substances)	
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**
16 inputs, 48 ... 125 V UC, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts	**6AG1521-7EH00-7AB0**
Accessories	See SIMATIC S7-1500 SM 521 digital input modules, page 4/91

Technical specifications

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**	**6AG1521-7EH00-7AB0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-7EH00-0AB0**
	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	SIPLUS S7-1500 DI 48VUC/125VDC HF
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• 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	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 4 inputs (no adjacent points)
• 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	
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

Technical specifications

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**	**6AG1521-7EH00-7AB0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-7EH00-0AB0**
	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	SIPLUS S7-1500 DI 48VUC/125VDC HF
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 in bedewed state), horizontal installation
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

SIPLUS SM 521 digital input modules

4

Technical specifications

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**	**6AG1521-7EH00-7AB0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-7EH00-0AB0**
	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	SIPLUS S7-1500 DI 48VUC/125VDC HF
Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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

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.

Ordering data

Ordering data	Article No.
SIPLUS SM 522 digital output modules	
(Extended temperature range and exposure to environmental substances)	
8 outputs, 24 V DC; 2 A, isolated	**6AG1522-1BF00-7AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BH01-7AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BL01-7AB0**
8 relay outputs, 230 V AC, 5 A	**6AG1522-5HF00-2AB0**
16 relay outputs, 230 V AC, 2 A	**6AG1522-5HH00-7AB0**
8 outputs (triac), 230 V AC, 2 A	**6AG1522-5FF00-7AB0**
16 outputs (triac), 230 V AC, 1 A	**6AG1522-5FH00-7AB0**
16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A, isolated	**6AG1522-5EH00-7AB0**
Accessories	See SIMATIC S7-1500 SM 522 digital output modules, page 4/99

Technical specifications

Article number	**6AG1522-1BF00-7AB0**	**6AG1522-1BH01-7AB0**	**6AG1522-1BL01-7AB0**	**6AG1522-5EH00-7AB0**
Based on	**6ES7522-1BF00-0AB0**	**6ES7522-1BH01-0AB0**	**6ES7522-1BL01-0AB0**	**6ES7522-5EH00-0AB0**
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• 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; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; > +60 °C max. 0.25 A per output
• vertical installation, min.	-40 °C; = Tmin			
• vertical installation, max.	40 °C; = Tmax			
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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 in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation

SIPLUS SM 522 digital output modules

Technical specifications

Article number	6AG1522-1BF00-7AB0	6AG1522-1BH01-7AB0	6AG1522-1BL01-7AB0	6AG1522-5EH00-7AB0
Based on	6ES7522-1BF00-0AB0	6ES7522-1BH01-0AB0	6ES7522-1BL01-0AB0	6ES7522-5EH00-0AB0
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Technical specifications

Article number	**6AG1522-5HH00-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**	**6AG1522-5FH00-7AB0**
Based on	**6ES7522-5HH00-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	SIPLUS S7-1500 16DQ 230VAC 2A RLY	SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)	SIPLUS S7-1500 16DQ 230VAC 1A ST TRIAC
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 8 outputs (no adjacent points)	60 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 8x 0.25 A, max. total current 2 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 4 A aggregate current per module, max. 0.25 A per output
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C	-25 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C	40 °C; = Tmax	40 °C; = Tmax	60 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	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 in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

SIPLUS SM 522 digital output modules

Technical specifications

Article number	**6AG1522-5HH00-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**	**6AG1522-5FH00-7AB0**
Based on	**6ES7522-5HH00-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	SIPLUS S7-1500 16DQ 230VAC 2A RLY	SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)	SIPLUS S7-1500 16DQ 230VAC 1A ST TRIAC
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Overview

- 4, 8 or 16-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

Ordering data

	Article No.
SM 531 analog input modules	
4 x U/I/RTD/TC 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, Pt100, Pt1000, Pt250, Pt500, resistors 0 ... 150/300/600/6000 ohms; 16 bits; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7QD00-0AB0**
8 x U/I/R/RTD/ 8 analog inputs ±1 V, ±10 V, ±5 V, ±50 mV, ±500 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt100, Pt1000, resistors 0 ... 600/6000 ohms, PTC; 16 bits; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7QF00-0AB0**
8 x U/I HS 8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7NF10-0AB0**
8 x U/I/RTD/TC 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, Pt100, Pt1000, Pt250, Pt500, resistors 0 ... 150/300/600/6000 ohms; 16 bits; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7KF00-0AB0**
8 x U/I HF 8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7NF00-0AB0**
8 x U/R/RTD/TC 8 analog inputs, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, ±25 mV; thermocouples type B, E, J, K, N, R, S, T, TXK/TXK(L) according to GOST; resistance thermometers Cu 10, Cu 50, Cu 100, Ni 10, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000; resistors 0...150/300/600/6000 ohms, PTC; 16 bits; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7PF00-0AB0**
16 x U BA 16 analog inputs 1 ... 5 V, ±1 V, ±5 V, ±10 V, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shielding bracket and shield terminal: Order front connectors (screw terminals or push-in) separately	**6ES7531-7LH00-0AB0**
16 x I BA 16 analog inputs 0/4 ... 20 mA, ±20 mA, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shielding bracket and shield terminal: Order front connectors (screw terminals or push-in) separately	**6ES7531-7MH00-0AB0**

SM 531 analog input modules

Ordering data

	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, AI gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, AI 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 on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**

	Article No.
Shielding set I/O	
For 35 mm modules; infeed element, shielding bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; infeed element, shielding bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element	**6ES7590-5BA00-0AA0**
10 units; spare part	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current Manual Collection DVD and the three subsequent updates	

Technical specifications

Article number	**6ES7531-7QD00-0AB0**	**6ES7531-7QF00-0AB0**	**6ES7531-7KF00-0AB0**	**6ES7531-7NF10-0AB0**	**6ES7531-7NF00-0AB0**
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
General information					
Product type designation	AI 4xU/I/RTD/TC ST	AI 8xU/I/R/RTD BA	AI 8xU/I/RTD/TC ST	AI 8xU/I HS	AI 8xU/I HF
Product function					
• Isochronous mode	No		No	Yes	No
• Prioritized startup	No	No	No	Yes	Yes
• Measuring range scalable	No		No	No	No
• Scalable measured values	No		No	No	Yes
• Adjustment of measuring range	No		No	No	Yes
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13.0.2	V15.1 / V16	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from 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 from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode					
• Oversampling	No	No	No	Yes	No
• MSI	Yes	Yes	Yes	Yes	Yes

Technical specifications

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Supply voltage					
Rated value (DC)	24 V		24 V	24 V	24 V
Reverse polarity protection	Yes		Yes	Yes	Yes
Analog inputs					
Number of analog inputs	4	8	8	8	8
• For current measurement	4	8	8	8	8
• For voltage measurement	4	8	8	8	8
• For resistance/resistance thermometer measurement	2	8	4		
• For thermocouple measurement	4		8		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	12 V; 12 V continuous, 30 V for max. 1 s	28.8 V	28.8 V	28.8 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA	230 ... 370 µA	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA		
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K		
Analog input with oversampling	No				
Standardization of measured values	No				
Input ranges (rated values), voltages					
• 0 to +5 V	No	No	No	No	No
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	Yes	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	Yes		
• -10 V to +10 V	Yes	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	No	Yes	No	Yes
• -25 mV to +25 mV	No	No	No	No	No
• -250 mV to +250 mV	Yes	No	Yes	No	No
• -5 V to +5 V	Yes	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	Yes	No	No
• -500 mV to +500 mV	Yes	Yes	Yes	No	No
• -80 mV to +80 mV	Yes	No	Yes	No	No
Input ranges (rated values), currents					
• 0 to 20 mA	Yes	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes	Yes
Input ranges (rated values), thermocouples					
• Type B	Yes	No	Yes	No	No
• Type C	No	No	No	No	No
• Type E	Yes	No	Yes	No	No
• Type J	Yes	No	Yes	No	No
• Type K	Yes	No	Yes	No	No
• Type L	No	No	No	No	No
• Type N	Yes	No	Yes	No	No
• Type R	Yes	No	Yes	No	No
• Type S	Yes	No	Yes	No	No
• Type T	Yes	No	Yes	No	No
• Type U	No	No			
• Type TXK/TXK(L) to GOST	No	No	No	No	No

SM 531 analog input modules

Technical specifications

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Input ranges (rated values), resistance thermometer					
• Cu 10	No	No	No	No	No
• Cu 10 according to GOST	No	No	No	No	No
• Cu 50	No	No	No	No	No
• Cu 50 according to GOST	No	No	No	No	No
• Cu 100	No	No	No	No	No
• Cu 100 according to GOST	No	No	No	No	No
• Ni 10	No	No	No	No	No
• Ni 10 according to GOST	No	No	No	No	No
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 100 according to GOST	No	No	No	No	No
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 1000 according to GOST	No	No	No	No	No
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 120	No	No	No	No	No
• Ni 120 according to GOST	No	No	No	No	No
• Ni 200	No	No		No	No
• Ni 200 according to GOST	No	No	No	No	No
• Ni 500	No	No	No	No	No
• Ni 500 according to GOST	No	No	No	No	No
• Pt 10	No	No	No	No	No
• Pt 10 according to GOST	No	No	No	No	No
• Pt 50	No	No	No	No	No
• Pt 50 according to GOST	No	No	No	No	No
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 100 according to GOST	No	No	No	No	No
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 1000 according to GOST	No	No	No	No	No
• Pt 200	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 200 according to GOST	No	No	No	No	No
• Pt 500	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 500 according to GOST	No	No	No	No	No
Input ranges (rated values), resistors					
• 0 to 150 ohms	Yes	No	Yes	No	No
• 0 to 300 ohms	Yes	No	Yes	No	No
• 0 to 600 ohms	Yes	Yes	Yes	No	No
• 0 to 3000 ohms	No	No	No	No	No
• 0 to 6000 ohms	Yes	Yes	Yes	No	No
• PTC	Yes	Yes	Yes	No	No
Thermocouple (TC)					
Temperature compensation					
- parameterizable	Yes		Yes		
Cable length					
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	200 m; 50 m at 50 mV	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m	800 m

Technical specifications

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
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	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes	Yes	Yes		Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms		Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	10 / 24 / 27 / 107 ms	9 / 23 / 27 / 107 ms		Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 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	8 ms	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	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz		400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)				62.5 µs; independent of number of activated channels	Corresponds to the channel with the highest basic conversion time
Smoothing of measured values					
• parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	Yes	Yes	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes; with external supply	Yes	Yes	Yes; with external transmitter supply
- Burden of 2-wire transmitter, max.	820 Ω		820 Ω	820 Ω	
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	Yes; Only for PTC	No	No
• 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	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	No
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC		Yes; All measuring ranges except PTC	No	No

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Technical specifications

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Current, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Resistance, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %		
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K	Ptxxx Standard: ±1.0 K, Ptxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K	Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K		
• Thermocouple, relative to input range, (+/-)	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	40 dB		80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	10 V	4 V	10 V	10 V	60 V DC/30 V AC
• Common mode interference, min.	60 dB	60 dB	60 dB	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	80 dB
Isochronous mode					
Filtering and processing time (TCI), min.				80 µs	
Bus cycle time (TDP), min.				250 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	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	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses					
• Monitoring the supply voltage	Yes	No	Yes	Yes	Yes
• Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 ... 5 V, 4 ... 20 mA, 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	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Short-circuit		No			
• Group error		No			
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
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
• MAINT LED		No			
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	No	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED

Technical specifications

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262		
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-25 °C; From FS03	0 °C	0 °C	-25 °C; From FS02	-30 °C; From FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C; From FS03	0 °C	0 °C	-25 °C; From FS02	-30 °C; From FS02
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
Dimensions					
Width	25 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.	210 g	250 g	310 g	300 g	280 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		

SM 531 analog input modules

Technical specifications

Article number	**6ES7531-7LH00-0AB0** S7-1500, AI 16xU BA	**6ES7531-7MH00-0AB0** S7-1500, AI 16xI BA
General information		
Product type designation	AI 16xU BA	AI 16xI BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	No	No
• Measuring range scalable	No	No
• Scalable measured values	No	No
• Adjustment of measuring range	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 312 / V17	V16 with HSP 312 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• Oversampling	No	No
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	16	16
• For current measurement		16
• For voltage measurement	16	
permissible input voltage for voltage input (destruction limit), max.	12 V; 12 V continuous, 30 V for max. 1 s	
permissible input current for current input (destruction limit), max.		40 mA
Input ranges (rated values), voltages		
• 0 to +5 V	No	
• 0 to +10 V	No	
• 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	No	
• -25 mV to +25 mV	No	
• -250 mV to +250 mV	No	
• -5 V to +5 V	Yes	
• -50 mV to +50 mV	No	
• -500 mV to +500 mV	No	
• -80 mV to +80 mV	No	
Input ranges (rated values), currents		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
Cable length		
• shielded, max.	200 m	800 m

Technical specifications

Article number	**6ES7531-7LH00-0AB0** S7-1500, AI 16xU BA	**6ES7531-7MH00-0AB0** S7-1500, AI 16xI BA
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	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)	10 / 24 / 27 / 107 ms	10 / 24 / 27 / 107 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz
Smoothing of measured values		
• parameterizable	Yes	Yes
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	No
• for current measurement as 2-wire transducer		Yes; with external supply
• for current measurement as 4-wire transducer		Yes
• for resistance measurement with two-wire connection		No
• for resistance measurement with three-wire connection		No
• for resistance measurement with four-wire connection		No
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.3 %	
• Current, relative to input range, (+/-)		0.3 %
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.	4 V	4 V
• Common mode interference, min.	60 dB	60 dB
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	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
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	Yes; Only for 1 ... 5 V	Yes; Only for 4 ... 20 mA
• Short-circuit	No	No
• Group error	No	No
• Overflow/underflow	Yes	Yes
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	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED

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Technical specifications

Article number	**6ES7531-7LH00-0AB0** S7-1500, AI 16xU BA	**6ES7531-7MH00-0AB0** S7-1500, AI 16xI BA
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	250 g	250 g

Article number	**6ES7531-7PF00-0AB0** S7-1500, AI 8 X U/R/RTD/TC HF
General information	
Product type designation	AI 8xU/R/RTD/TC HF
Product function	
• Isochronous mode	No
• Prioritized startup	Yes
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	8; Plus one additional RTD (reference) channel
• For voltage measurement	8; Plus one additional RTD (reference) channel
• For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel
• For thermocouple measurement	8; Plus one additional RTD (reference) channel
permissible input voltage for voltage input (destruction limit), max.	20 V

Article number	**6ES7531-7PF00-0AB0** S7-1500, AI 8 X U/R/RTD/TC HF
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200 climate: 1 mA; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200 standard, Pt500, Pt1000, PTC: 0.25 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	No
• -1 V to +1 V	Yes
• -10 V to +10 V	No
• -2.5 V to +2.5 V	No
• -25 mV to +25 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	No
• -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	No
• -20 mA to +20 mA	No
• 4 mA to 20 mA	No
Input ranges (rated values), thermocouples	
• Type B	Yes
• Type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes

Technical specifications

Article number	**6ES7531-7PF00-0AB0**
	S7-1500, AI 8 X U/R/RTD/TC HF
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; Standard/climate
• Cu 10 according to GOST	Yes; Standard/climate
• Cu 50	Yes; Standard/climate
• Cu 50 according to GOST	Yes; Standard/climate
• Cu 100	Yes; Standard/climate
• Cu 100 according to GOST	Yes; Standard/climate
• Ni 10	Yes; Standard/climate
• Ni 10 according to GOST	Yes; Standard/climate
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	Yes; Standard/climate
• Ni 120 according to GOST	Yes; Standard/climate
• Ni 200	Yes; Standard/climate
• Ni 200 according to GOST	Yes; Standard/climate
• Ni 500	Yes; Standard/climate
• Ni 500 according to GOST	Yes; Standard/climate
• Pt 10	Yes; Standard/climate
• Pt 10 according to GOST	Yes; Standard/climate
• Pt 50	Yes; Standard/climate
• Pt 50 according to GOST	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	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 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	Yes
Cable length	
• shielded, max.	800 m; at U; 200 m at R/RTD/TC

Article number	**6ES7531-7PF00-0AB0**
	S7-1500, AI 8 X U/R/RTD/TC HF
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32 bit REAL format); 16 bit for measuring mode R and U; 16 bit for all measuring modes when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes
• Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)	Corresponds to the channel with the highest basic conversion time
Smoothing of measured values	
• parameterizable	Yes
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	No
• for current measurement as 4-wire transducer	No
• for resistance measurement with two-wire connection	Yes
• 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 range, (+/-)	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %
• Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K
• Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 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.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	60 V DC/30 V AC
• Common mode interference, min.	80 dB

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Technical specifications

Article number	**6ES7531-7PF00-0AB0** S7-1500, AI 8 X U/R/RTD/TC HF
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Only with TC, R, RTD
• 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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Article number	**6ES7531-7PF00-0AB0** S7-1500, AI 8 X U/R/RTD/TC HF
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	290 g
Other	
Note:	for the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement; this then requires two module cycles for a measured value

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

Ordering data

	Article No.
SM 532 analog output modules	
Module width 25 mm	
2 x U/I ST; 2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5NB00-0AB0**
Module width 35 mm	
4 x U/I ST; 4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HD00-0AB0**
8 x U/I HF; 8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HF00-0AB0**
4 x U/I HF; 4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5ND00-0AB0**
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**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**

	Article No.
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, shielding bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; infeed element, shielding bracket, 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**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Technical specifications

Article number	**6ES7532-5NB00-0AB0** S7-1500, AQ 2xU/I ST	**6ES7532-5HD00-0AB0** S7-1500, AQ 4xU/I ST	**6ES7532-5HF00-0AB0** S7-1500, AQ 8xU/I HS	**6ES7532-5ND00-0AB0** S7-1500, AQ 4xU/I HF
General information				
Product type designation	AQ 2xU/I ST	AQ 4xU/I ST	AQ 8xU/I HS	AQ 4xU/I HF
Product function				
• Isochronous mode	No	No	Yes	Yes
• Prioritized startup	No	No	No	Yes
• Output range scalable	No	No	No	
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13.0.2	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• Oversampling	No	No	Yes	No
• MSO	Yes	Yes	Yes	Yes
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog outputs				
Number of analog outputs	2	4	8	4
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	125 µs; independent of number of activated channels
Output ranges, voltage				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -5 V to +5 V	No	No	No	No
• -10 V to +10 V	Yes	Yes	Yes	Yes
Output ranges, current				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
Connection of actuators				
• for voltage output two-wire connection	Yes	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes	Yes
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	1 kΩ; 0.5 kOhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF	1 µF	100 nF	1 µF
• with current outputs, max.	750 Ω	750 Ω	500 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH	10 mH
Cable length				
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m	800 m; for current, 200 m for voltage

Technical specifications

Article number	**6ES7532-5NB00-0AB0**	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**	**6ES7532-5ND00-0AB0**
	S7-1500, AQ 2xU/I ST	S7-1500, AQ 4xU/I ST	S7-1500, AQ 8xU/I HS	S7-1500, AQ 4xU/I HF
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	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 µs; independent of number of activated channels	125 µs; independent of number of activated channels
Settling time				
• for resistive load	1.5 ms	1.5 ms	30 µs; see additional description in the manual	0.2 ms; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	1.8 ms; see additional description in the manual
• for inductive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	2 ms; see additional description in the manual
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.06 %
• Current, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.1 %
Isochronous mode				
Execution and activation time (TCO), min.			100 µs	100 µs
Bus cycle time (TDP), min.			250 µs	250 µs
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; Only for output type "current"	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"	Yes; Only for output type "voltage"
• Overflow/underflow	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
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

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Technical specifications

Article number	**6ES7532-5NB00-0AB0** S7-1500, AQ 2xU/I ST	**6ES7532-5HD00-0AB0** S7-1500, AQ 4xU/I ST	**6ES7532-5HF00-0AB0** S7-1500, AQ 8xU/I HS	**6ES7532-5ND00-0AB0** S7-1500, AQ 4xU/I HF
Standards, approvals, certificates				
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS05	Yes; from FS04	Yes; From FS03
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061		SIL 2	SIL 2	SIL 2
• SILCL according to IEC 62061	SIL 2			
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; from FS04	-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation reating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
Dimensions				
Width	25 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.	200 g	310 g	325 g	300 g
Other				
Note:	Supplied incl. 40-pole push-in front connectors			

Overview

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

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 ohms, 16 bits; 2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bits; incl. infeed element, shielding bracket, 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, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**

	Article No.
Universal front door for I/O modules For 25 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O For 25 mm modules; infeed element, shielding bracket, 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**
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Technical specifications

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
General information	
Product type designation	AI 4xU/I/RTD/TC /AQ 2xU/I ST
Product function	
• Isochronous mode	No
• Prioritized startup	No
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
• Output range scalable	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13.0.2
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
• MSO	Yes
Supply voltage	
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
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Analog input with oversampling	No
Standardization of measured values	No
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 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
• -25 mV to +25 mV	No
• -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

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
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), thermocouples	
• Type B	Yes
• Type C	No
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	No
• Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	No
• Ni 10	No
• Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	No
• Ni 120 according to GOST	No
• Ni 200	No
• Ni 200 according to GOST	No
• Ni 500	No
• Ni 500 according to GOST	No
• Pt 10	No
• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	No
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	No
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	No
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	No

Technical specifications

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	Yes
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
• -5 V to +5 V	No
• -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

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
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 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 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
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

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Technical specifications

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
• Thermocouple, relative to input range, (+/-)	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 range, (+/-)	0.2 %
• Current, relative to output range, (+/-)	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
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• 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

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Potential separation	
Potential separation analog inputs	
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; From FS03
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; From FS03
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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

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.

Ordering data

	Article No.
SIPLUS SM 531 analog input modules	
(Extended temperature range and exposure to environmental substances)	
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shielding bracket, 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 ohms, 16 bits	**6AG1531-7KF00-7AB0**
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; including infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7NF00-7AB0**
8 analog inputs, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, ±25 mV; thermocouples type B, E, J, K, N, R, S, T, TXK/TXK(L) according to GOST; resistance thermometers Cu 10, Cu 50, Cu 100, Ni 10, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000; resistors 0...150/300/600/6000 ohms, PTC; 16 bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7PF00-4AB0**
Analog input module, AI 16xU BA, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts;	**6AG1531-7LH00-7AB0**
Analog input module, AI 16xI BA, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts;	**6AG1531-7MH00-7AB0**
Accessories	See SIMATIC S7-1500 SM 531 analog input modules, page 4/122

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Technical specifications

Article number	6AG1531-7NF10-7AB0	6AG1531-7KF00-7AB0	6AG1531-7NF00-7AB0	6AG1531-7PF00-4AB0	6AG1531-7LH00-7AB0	6AG1531-7MH00-7AB0
Based on	6ES7531-7NF10-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF00-0AB0	6ES7531-7PF00-0AB0	6ES7531-7LH00-0AB0	6ES7531-7MH00-0AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost)	-40 °C; = Tmin (incl. condensation/ frost)	-40 °C; = Tmin (incl. condensation/ frost)	0 °C; = Tmin (incl. condensation/ frost)	-40 °C; = Tmin (incl. condensation/ frost)	-40 °C; = Tmin (incl. condensation/ frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	0 °C; = Tmin	-40 °C; = Tmin (incl. condensation/ frost)	-40 °C; = Tmin (incl. condensation/ frost)
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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 in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation
Resistance						
Coolants and lubricants						
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems						
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 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!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	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!

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Technical specifications

Article number	6AG1531-7NF10-7AB0	6AG1531-7KF00-7AB0	6AG1531-7NF00-7AB0	6AG1531-7PF00-4AB0	6AG1531-7LH00-7AB0	6AG1531-7MH00-7AB0
Based on	6ES7531-7NF10-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF00-0AB0	6ES7531-7PF00-0AB0	6ES7531-7LH00-0AB0	6ES7531-7MH00-0AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
Use on ships/at sea						
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology						
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark						
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating						
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

SIPLUS SM 532 analog output modules

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.

Ordering data

	Article No.
SIPLUS SM 532 analog output modules	
(Extended temperature range and exposure to environmental substances)	
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, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1532-5HF00-7AB0**
Accessories	See SIMATIC S7-1500 SM 532 analog output modules, page 4/133

Technical specifications

Article number	**6AG1532-5HD00-7AB0**	**6AG1532-5HF00-7AB0**
Based on	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**
	SIPLUS S7-1500 AQ 4XU/I ST	SIPLUS S7-1500 AQ 8XU/I HS
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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)

Technical specifications

Article number	**6AG1532-5HD00-7AB0**	**6AG1532-5HF00-7AB0**
Based on	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**
	SIPLUS S7-1500 AQ 4XU/I ST	SIPLUS S7-1500 AQ 8XU/I HS
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

TM Count 2x24V counter module

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

Ordering data

	Article No.
TM Count 2x24V counter module With 2 channels, max. 200 kHz; for 24 V encoder	**6ES7550-1AA01-0AB0**
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**

	Article No.
Shielding set I/O Infeed element, shielding bracket, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

Technical specifications

Article number	**6ES7550-1AA01-0AB0** S7-1500, TM Count 2x24V
General information	
Product type designation	TM Count 2x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0332 / V17
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
• PROFINET from GSD version/ GSD revision	V2.3 / -

Article number	**6ES7550-1AA01-0AB0** S7-1500, TM Count 2x24V
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1; A common 24V 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

Technical specifications

Article number	**6ES7550-1AA01-0AB0**
	S7-1500, TM Count 2x24V
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	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"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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 technological functions	
- parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 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

Article number	**6ES7550-1AA01-0AB0**
	S7-1500, TM Count 2x24V
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
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
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• 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

TM Count 2x24V counter module

Technical specifications

Article number	**6ES7550-1AA01-0AB0**
	S7-1500, TM Count 2x24V
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	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
• suitable for SIMOTION	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.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration 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
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	**6ES7550-1AA01-0AB0**
	S7-1500, TM Count 2x24V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g

Overview

- 2-channel counter 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
- Fast Mode with reduced functionality for particularly short cycle times

Ordering data

	Article No.
TM PosInput 2 counter and position detection module With 2 channels, max. 1 MHz counting frequency; for SSI encoders and incremental encoders with RS 422 or 5V TTL interface	**6ES7551-1AB01-0AB0**
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**

	Article No.
Shielding set I/O Infeed element, shielding bracket, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

Technical specifications

Article number	**6ES7551-1AB01-0AB0** S7-1500, TM PosInput 2
General information	
Product type designation	TM PosInput 2
Number of channels	2
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
• PROFINET from GSD version/ GSD revision	V2.3 / -

Article number	**6ES7551-1AB01-0AB0** S7-1500, TM PosInput 2
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4; One 5V and 24V 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

TM PosInput 2 counter and position detection module

Technical specifications

Article number	**6ES7551-1AB01-0AB0**
	S7-1500, TM PosInput 2
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	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"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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 technological functions	
- parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	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

Article number	**6ES7551-1AB01-0AB0**
	S7-1500, TM PosInput 2
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 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
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, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset 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
• Telegram 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	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes

Technical specifications

Article number	**6ES7551-1AB01-0AB0**
	S7-1500, TM PosInput 2
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram 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
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	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

Article number	**6ES7551-1AB01-0AB0**
	S7-1500, TM PosInput 2
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
- Cycle duration measurement, min.	0.25 µs
- Cycle duration 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
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	325 g

TM Timer DIDQ 16x24V time-based IO module

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

Ordering data

	Article No.
TM Timer DIDQ 16x24V time-based IO module Max. 16 time-controlled inputs or outputs	**6ES7552-1AA00-0AB0**
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, shielding bracket, and shield terminal; 5 units, spare part: Note: Only shielding bracket and shield terminal are required for the TM Timer DIDQ 16x24V	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

Technical specifications

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
General information	
Product type designation	TM Timer DIDQ 16x24V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 Update 3
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
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
Digital inputs	
Number of digital inputs	8; max. depending on parameterization
• in groups of	8
Digital inputs, parameterizable	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"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
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"
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• in groups of	8
Digital outputs, parameterizable	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
Total current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating

TM Timer DIDQ 16x24V time-based IO module

Technical specifications

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° phase offset	Yes
• pulse encoder	Yes
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• 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

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
Integrated Functions	
Counter	Yes
• Number of counters	4
• Counting frequency, max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Position detection	
• Incremental acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	320 g

Overview

- 4-channel interface module for PTO (Pulse Train Output)
- 3 signal interfaces can be configured for speed and direction:
  - 24 V asymmetrical up to 200 kHz
  - RS422, 5 V symmetrical up to 1 MHz
  - TTL 5 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
  - Pulse and direction
  - Pulses for forward movement and pulses for backwards movement
  - 2 phase-shifted signals, with simple or quadruple evaluation
- Supported technology objects:
  - Speed controlled axis (S7-1500, S7-1500T)
  - Positioning axis (S7-1200, S7-1500, S7-1500T)
  - Synchronous axis (S7-1500, S7-1500T)
  - Probe (S7-1500, S7-1500T)

Ordering data

TM PTO 4 interface module for stepper drives 4 Pulse Train Output PTO channels; PTO: 24 V or RS422; 2 DQ PTO, 2 DI 24 V, 1 DIQ 24 V per channel	**6ES7553-1AA00-0AB0**
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	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

Technical specifications

Article number	**6ES7553-1AA00-0AB0** S7-1500, TM PTO4
General information	
Product type designation	TM PTO 4
Number of channels	4; Axes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V14 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 with GSD file / -
• PROFINET from GSD version/ GSD revision	GSDML V2.32

Article number	**6ES7553-1AA00-0AB0** S7-1500, TM PTO4
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	12; 3 per channel, of which 1 DIQ
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

TM PTO 4 interface module for PTO (Pulse Train Output)

Technical specifications

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PTO4
Digital input functions, parameterizable	
• Synchronization	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-5 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.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes
Digital outputs	
Number of digital outputs	12; 3 per channel, of which 1 DIQ
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
Digital output functions, parameterizable	
• PTO (pulse train output) signal interface	
- 24 V asymmetrical	Yes
- RS 422 symmetrical	Yes
- TTL (5 V) asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.5 A for DIQn.2
• on lamp load, max.	1 W; 5 W for DIQn.2
Load resistance range	
• lower limit	240 Ω; 48 ohms for DIQn.2
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
Output current	
• for signal "1" rated value	0.1 A; 0.5 A for DIQn.2
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", typ.	1 µs; 28 µs for DIQn.2
• "1" to "0", typ.	1 µs; 25 µs for DIQn.2

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PTO4
Switching frequency	
• with resistive load, max.	1 kHz; For DIQn.2
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2
• on lamp load, max.	10 Hz; For DIQn.2
• For signal interface 24 V asymmetrical	200 kHz; With DQn.0 and DQn.1
• For signal interface RS 422 symmetrical	1 MHz
• For signal interface TTL (5 V) asymmetrical	200 kHz
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes; Thermal overload protection
• Group error	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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes; Via control and feedback interface
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

Overview

TM SIWAREX WP521 ST (left) and TM SIWAREX WP522 ST (right) weighing electronics

The TM SIWAREX WP521 ST and WP522 ST (ST = Standard) are versatile weighing modules for the SIMATIC S7-1500 Advanced Controller family. With these electronic weighing systems, simple weighing applications, such as platform or hopper scales, can be seamlessly integrated into the S7-1500 automation environment.

Ordering data

	Article No.
TM SIWAREX WP521 ST weighing electronics Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 x LC, 4 × DQ, 3 × DI, 1 × RS 485, Ethernet port, including shielding set.	**7MH4980-1AA01**
TM SIWAREX WP522 ST weighing electronics Two-channel, for two separate platform scales or hopper scales with analog load cells (1 - 4 mV/V), per channel 1 × LC, 4 × DQ, 3 × DI, 1 × RS 485, Ethernet port, including shielding set.	**7MH4980-2AA01**
SIMATIC S7-1500, front connector with screw-type terminals 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP52x ST to a PC (SIWATOOL V7 or Modbus TCP/IP)	**6XV1850-2GH20**

	Article No.
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**

TM SIWAREX WP521 ST and WP522 ST weighing electronics

Ordering data

	Article No.
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

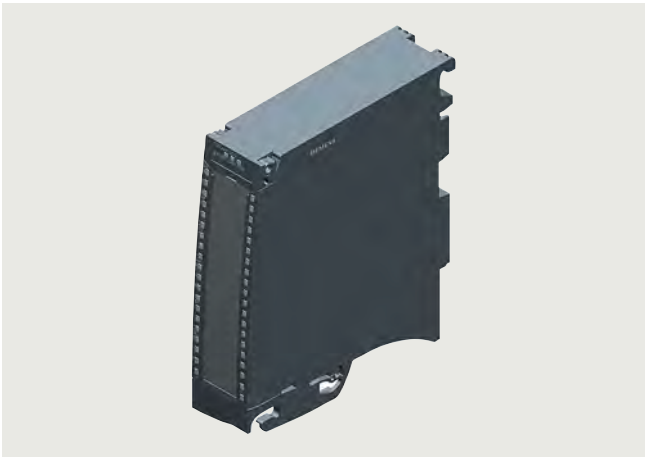
	Article No.
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface. Suitable remote display: S102 Siebert Industrieelektronik GmbH PO Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999 http://www.siebert.com Detailed information is available from the manufacturer.	

Technical specifications

SIWAREX WP521 ST / WP522 ST	
Weighing modes	• Non-automatic scales, e.g. platform and hopper scales
Ports	• 1 × SIMATIC S7-1500 system bus • 1 × Ethernet (SIWATOOL, Modbus TCP/IP) • 1 × RS 485 per channel (Modbus RTU or remote display) • 3 × digital inputs per channel (24 V DC) • 4 × digital outputs (24 V DC short-circuit proof) per channel
Functions	• 3 limits • Zeroing • Tare • Tare specification • Zero adjustment • Trace function for signal analysis • Internal restore point • SIMATIC S7-1500 integrated and/or stand-alone operation
Parameter assignment	• Using function block in SIMATIC S7-1500 and HMI • Using SIWATOOL V7 • Using Modbus TCP/IP • Using Modbus RTU
Remote display (see accessories)	
Connection	Via RS 485
Display	Additional display for weight value
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	• Low-pass filter 0.05 ... 50 Hz • Average value filter
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 × min/max • 1 × empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command

SIWAREX WP521 ST / WP522 ST	
Compatible sensors	Analog load cells / full-bridge strain gauges (1-4 mV/V) in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	800 m (2 624 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	• ATEX Zone 2 • UL • KCC • EAC • RCM • FM • IECEx
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption WP521 ST / WP522 ST	120 mA / 200 mA
Max. power consumption SIMATIC Bus	35 mA @ 15 V
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Horizontal installation	-10 ... +60 °C (14 ... 140 °F)
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements	According to IEC 61000-6-2:2004; IEC 61000-6-4:2007+A1:2011
Dimensions (W × H × D)	35 × 147 × 129 mm (1.38 × 5.79 × 5.08 inch)

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.

Ordering data

	Article No.
SIPLUS TM Count 2x24V counter module (Extended temperature range and exposure to environmental substances) With 2 channels, max. 200 kHz; for 24 V encoder	**6AG1550-1AA01-7AB0**
Accessories	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/146

Technical specifications

Article number	**6AG1550-1AA01-7AB0**
Based on	**6ES7550-1AA01-0AB0** SIPLUS S7-1500 TM COUNT 2X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	
• horizontal installation, max.	
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

SIPLUS TM PosInput 2 position detection module

Overview

- 2-channel counter and position detection module with RS422 interface
- Comprehensive parameterization options for optimum adaptation to the task
- Offloading of controller through preprocessing on the module
- Position detection with incremental and SSI absolute-value encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS422 signals or 5 V TTL signals

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 TM PosInput 2 counter and positioning module (extended temperature range and medial exposure) With 2 channels, max. 1 MHz counter frequency; for SSI and incremental encoders with RS422 or 5 V TTL interface	**6AG1551-1AB00-7AB0**
Accessories	See SIMATIC S7-1500, TM PosInput 2 counter and positioning module, page 4/149

Technical specifications

Article number	**6AG1551-1AB00-7AB0**
Based on	**6ES7551-1AB00-0AB0** SIPLUS S7-1500 TM POSINPUT 2
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads

Article number	**6AG1551-1AB00-7AB0**
Based on	**6ES7551-1AB00-0AB0** SIPLUS S7-1500 TM POSINPUT 2
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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 Kbps
  - RS 232C, max. 115.2 Kbps
  - RS 422/RS 485, max. 19.2 Kbps
  - RS 422/RS 485, max. 115.2 Kbps
- 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

Ordering data

	Article No.
CM PtP RS232 BA communications module Basic communications module with one RS 232 interface, Freeport, 3964(R) and USS protocols, 9-pin D-sub connector, max. 19.2 Kbps	**6ES7540-1AD00-0AA0**
CM PtP RS232 HF communications module High Feature communications module with one RS 232 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin D-sub connector, max. 115.2 Kbps	**6ES7541-1AD00-0AB0**
CM PtP RS422/485 BA communications module Basic communications module with one RS 422/485 interface, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbps	**6ES7540-1AB00-0AA0**
CM PtP RS422/485 HF communications module High Feature communications module with one RS 422/485 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin D-sub socket, max. 115.2 Kbps	**6ES7541-1AB00-0AB0**

	Article No.
Accessories	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-1AB00-0AA0**
10 m	**6ES7902-1AC00-0AA0**
15 m	**6ES7902-1AD00-0AA0**
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

4

Technical specifications

Article number	**6ES7540-1AD00-0AA0** S7-1500, CM PTP RS232 BA	**6ES7541-1AD00-0AB0** S7-1500, CM PTP RS232 HF	**6ES7540-1AB00-0AA0** S7-1500, CM PTP RS422/485 BA	**6ES7541-1AB00-0AB0** S7-1500, CM PTP RS422/485 HF
General information				
Product type designation	CM PtP RS 232 BA	CM PtP RS 232 HF	CM PtP RS 422 / 485 BA	CM PtP RS 422 / 485 HF
Product function				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
• Fast startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 configurable/integrated from 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 from GSD version/ GSD revision	- / -	- / -	- / -	- / -
• PROFINET from GSD version/ GSD revision	V2.3	V2.3 / -	V2.3	V2.3 / -
Installation type/mounting				
Rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
Interface types				
RS 232				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS 232 auxiliary 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
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
Protocols				
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
Telegram buffer				
• Buffer memory for telegrams	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of telegrams which can be buffered	255	255	255	255

Technical specifications

Article number	**6ES7540-1AD00-0AA0** S7-1500, CM PTP RS232 BA	**6ES7541-1AD00-0AB0** S7-1500, CM PTP RS232 HF	**6ES7540-1AB00-0AA0** S7-1500, CM PTP RS422/485 BA	**6ES7541-1AB00-0AB0** S7-1500, CM PTP RS422/485 HF
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
Diagnoses				
• 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
• Transmit TxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
Potential separation				
between backplane bus and interface	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during 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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
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
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

CM 8xIO-Link

Overview

- Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors
- Can be used directly downstream of an S7-1500 CPU or distributed in ET 200MP via PROFINET or PROFIBUS
- Powerful diagnostics functions facilitate preventive maintenance to avoid plant standstills
- Easy replacement of sensors/actuators without time-consuming parameter assignment

Ordering data

	Article No.
CM 8xIO-Link communications module Communications module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors	**6ES7547-1JF00-0AB0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: All manuals for S7-1200/1500/200/300/400,LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

Technical specifications

Article number	**6ES7547-1JF00-0AB0** S7-1500, CM 8xIO-Link
General information	
Product type designation	CM 8xIO-Link
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V15.1 with HSP 274
• STEP 7 configurable/integrated from version	Configurable via GSD file
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Output current	
• Rated value	1 A; 4 A total current per module
24 V encoder supply	
• Short-circuit protection	Yes; per channel, electronic
IO-Link	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Cycle time, min.	2 ms
Size of process data, input per port	33 byte; max.
Size of process data, input per module	240 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	240 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	No
Time Based IO	
- TIO IO-Link IN	No
- TIO IO-Link OUT	No
- TIO IO-Link IN/OUT	No
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal

Technical specifications

Article number	**6ES7547-1JF00-0AB0**
	S7-1500, CM 8xIO-Link
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication 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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Article number	**6ES7547-1JF00-0AB0**
	S7-1500, CM 8xIO-Link
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

CM 1542-5

Overview

DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

G_IK10_XX_10148

The CM 1542-5 communications module expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of 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 PLC 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 Mbps (including 45.45 kbps)
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open user communication (SEND/RECEIVE) via FDL
- 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

Hardware innovations of the CM 1542-5 product with new article number 6GK7542-5DX10-0XE0 extend the permissible ambient temperature for operation from -25 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -25 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

Furthermore, the permissible installation altitude for the CM 1542-5 module (6GK7542-5DX10-0XE0) has been extended to installation altitudes of up to 5000 m.

Ordering data

	Article No.
CM 1542-5 communications module	
Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; S7 and PG/OP communication, data record routing, time synchronization, diagnostics	**6GK7542-5DX00-0XE0**
PROFIBUS FastConnect RS485 connection plug	
With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• 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 installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**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 up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Technical specifications

Article number	**6GK7542-5DX10-0XE0**
Product type designation	CM 1542-5
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
type of electrical connection	
• at the 1st interface according 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 at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.2 A
power loss [W]	3 W

Technical specifications

Article number	**6GK7542-5DX10-0XE0**
Product type designation	CM 1542-5
ambient conditions	
ambient temperature	
• for vertical installation during operation	-25 ... +40 °C
• for horizontally arranged busbars during operation	-25 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product 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 SEND/RECEIVE blocks maximum	30
data volume	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte
performance data PROFIBUS DP	
service as DP master	
• DPV1	Yes
number of DP slaves	
• on DP master operable	125
data volume	
• of the address range of the inputs as DP master total	8 192 byte
• of the address range of the outputs as DP master total	8 192 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
service as DP slave	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte

Article number	**6GK7542-5DX10-0XE0**
Product type designation	CM 1542-5
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	48; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	48
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions time	
product function pass on time synchronization	Yes
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

G_IK10_XX_10144

The CP 1542-5 communications processor expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. This CPU allows the implementation of separate PROFIBUS lines, in other words the control of multiple field devices over multiple 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 Mbps (including 45.45 kbps)

Communications 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

Hardware innovations of the CP 1542-5 product with new article number 6GK7542-5FX10-0XE0 extend the permissible ambient temperature for operation from -25 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -25 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

In addition, the permissible installation altitude for the CP 1542-5 module (6GK7542-5FX10-0XE0) has been extended to installation altitudes of up to 5000 m.

The use of innovative, high-quality hardware components to fulfill the requirements listed above results in higher power consumption from the backplane bus in the new product CP 1542-5 (6GK7542-5FX10-0XE0) compared with the predecessor product.

Ordering data

	Article No.
CP 1542-5 communications processor Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics; smaller quantity structure	**6GK7542-5FX00-0XE0**
PROFIBUS FastConnect RS485 connection plug With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• 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 installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**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 up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Technical specifications

Article number	**6GK7542-5FX10-0XE0**
Product type designation	CP 1542-5
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
type of electrical connection	
• at the 1st interface according 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 at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.2 A
power loss [W]	3 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-25 ... +40 °C
• for horizontally arranged busbars during operation	-25 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Article number	**6GK7542-5FX10-0XE0**
Product type designation	CP 1542-5
performance data PROFIBUS DP	
service as DP master	
• DPV1	Yes
number of DP slaves	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	2 048 byte
• of the address range of the outputs as DP master total	2 048 byte
• of the address range of the inputs per DP slave	244 byte
• of the address range of the outputs per DP slave	244 byte
service as DP slave	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP slave total	240 byte
• of the address range of the outputs as DP slave total	240 byte
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16; 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, engineering	
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions time	
product function pass on time synchronization	Yes
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

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Overview

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

G_IK10_XX_10383

Communications module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller or PROFINET IO device.

The CM 1542-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;
  - Web diagnostics by means of access to the web server of the S7-1500 system
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1/CM 1542-1 units in an S7-1500 system, e.g. for web server access without real-time capability

Ordering data

	Article No.
CM 1542-1 communications module For connecting SIMATIC S7-1500 to PROFINET IO, TCP/IP, ISO-on-TCP, UDP, S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 2 x RJ45 interface with 10/100 Mbps	**6GK7542-1AX00-0XE0**
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
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. delivery unit 1000 m, minimum order quantity 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 XC206-2SFP Industrial Ethernet switch Manageable Layer 2 IE switch; IEC 62443-4-2 certified; 6x 10/100 Mbps RJ45 ports; 2x 100/1000 Mbps SFP; 1x console port	**6GK5206-2BS00-2AC2**

Technical specifications

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according 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 at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.22 A
power loss [W]	3.3 W
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 weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
data volume	
• 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; 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 operable total	128
number of PN IO IRT devices on PROFINET IO controller operable	64
number of external PN IO lines with PROFINET per rack	10
data volume	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for output 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

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Technical specifications

Article number	6GK7542-1AX00-0XE0
Product type designation	CM 1542-1
performance data PROFINET communication as PN IO device	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	8 192 byte
• as user data for output variables as PROFINET IO device maximum	8 192 byte
• as user data for input variables for each sub-module as PROFINET IO device	256 byte
• as user data for output variables for each sub-module as PROFINET IO device	256 byte
• as user data for the consistency area for each sub-module	256 byte
number of submodules per PROFINET IO-Device	32
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	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

Article number	6GK7542-1AX00-0XE0
Product type designation	CM 1542-1
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
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
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

Overview

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

G_IK10_XX_10353

The SIMATIC CP 1543-1 communications processor securely connects the SIMATIC S7-1500 PLC to Industrial Ethernet networks. By combining a variety of security features such as stateful packet inspection firewalls and VPNs, 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 integrating 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 user 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)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1/CM 1542-1 units in an S7-1500 system, e.g. for web server access without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
  - Network authentication according to IEEE 802.1X using the EAP methods MD5, TLS, PEAP, TTLS, MSCHAPv2 or PWD
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure time of day transfer (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
  - Connection to SINEMA Remote Connect via OpenVPN
- Integration of the S7-1500 into IPv6-based networks; An IPv6-compliant IP address can be used for the following communications services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing via program block
  - Email transfer with addressing via program block

Ordering data

	Article No.
CP 1543-1 communications processor For connecting SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, ISO, UDP, S7 communication, IP broadcast/multicast, security (VPN, firewall) diagnostics SNMPv1/v3, DHCP, FTP client/server, email, IPv4/IPv6, IEEE 802.1X (radius), time synchronization via NTP, 1x RJ45 (10/100/1000 Mbps)	**6GK7543-1AX00-0XE0**
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**

	Article No.
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**

4

Ordering data

	Article No.
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. delivery unit 1000 m, minimum order quantity 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 Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

	Article No.
SCALANCE XC206-2SFP Industrial Ethernet switch Manageable Layer 2 IE switch; IEC 62443-4-2 certified; 6x 10/100 Mbps RJ45 ports; 2x 100/1000 Mbps SFP; 1x console port	**6GK5206-2BS00-2AC2**

Technical specifications

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface according 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 at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.35 A
power loss [W]	5.3 W
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

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.35 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product 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
data volume	
• 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
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	118

Technical specifications

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
performance data IT functions	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
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
number of possible connections with VPN connection	16
product function	
• IEEE 802.1x (radius)	Yes
• password protection 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	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

CP 1545-1

Overview

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

G_IK10_XX_10353

The SIMATIC CP 1545-1 communications processor securely connects the SIMATIC S7-1500 PLC to Industrial Ethernet networks. The new CloudConnect functionality enables easy and reliable transfer of all selected data from the SIMATIC S7-1500 to MindSphere, or a cloud solution that supports the standardized MQTT protocol, e.g. Microsoft Azure or IBM Cloud. The CP protects the SIMATIC S7-1500 station from unauthorized access with the integrated SPI (Stateful Packet Inspection) firewall. Data from cloud systems or MQTT brokers can also be received using the MQTT protocol.

The CloudConnect function of the CP 1545-1 is easy to configure with a few input screens in TIA Portal. First, all the parameters required for the different cloud platforms are specified. The data intended for the cloud is then selected from the tag management of the SIMATIC S7-1500 and saved as topics to be transferred with the corresponding trigger conditions.

All functions are configured using STEP 7 Professional V15.1 update 3 (TIA Portal) or higher.
The CP 1545-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - MQTT Publish for transferring selected data to a cloud system or MQTT broker
  - MQTT Subscribe for receiving data from a cloud system or MQTT broker
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1545-1 / CP 1543-1 / CM 1542-1 units in the S7-1500 system, e.g. for web server accesses without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure time of day transfer (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
- Integration of the S7-1500 into IPv6-based networks
  An IPv6-compliant IP address can be used for the following communications services:
  - MQTT
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing via program block
  - Email transfer with addressing via program block

Ordering data

	Article No.
CP 1545-1 communications processor CP 1545-1 communications processor for connecting the SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, UDP, S7 communication, security (firewall), SNMPv1/v3, DHCP, FTP client/server, email, IPv4/IPv6, time synchronization via NTP, connection to cloud systems via MQTT, 1x RJ45 (10/100/1000 Mbps)	**6GK7545-1GX00-0XE0**

Technical specifications

Article number	**6GK7545-1GX00-0XE0**
Product type designation	CP 1545-1
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port

Technical specifications

Article number	**6GK7545-1GX00-0XE0**
Product type designation	CP 1545-1
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 at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.3 A
power loss [W]	4.5 W
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 weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.32 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type
product functions cloud connectivity	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of data points per device maximum	500

Article number	**6GK7545-1GX00-0XE0**
Product type designation	CP 1545-1
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• 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
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	118; 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
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V15.1 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes

Technical specifications

Article number	6GK7545-1GX00-0XE0
Product type designation	CP 1545-1
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
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
number of possible connections with VPN connection	16
product function	
• password protection 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

Article number	6GK7545-1GX00-0XE0
Product type designation	CP 1545-1
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

Overview

- TIM 1531 IRC communications module for telecontrol applications with four interfaces as a stand-alone device for SIMATIC S7-1500 for use in wide area networks (WANs)
- For universal use in a station, node station and control center
- Communication either via the SINAUT ST7, IEC 60870-5-101/104 or DNP3 telecontrol protocols
- Operation via VPN (IPsec/OpenVPN) with additional SIMATIC NET components
- Wireless communication via mobile wireless routers, modems or radio devices
- Wired communication via Ethernet, internet, 2-/4-wire cables (SHDSL), dial-up modems or dedicated line modem
- Frame buffer for seamless recording of data
- Support of redundant communication paths
- Simple configuration with STEP 7 Professional V15.1 (TIA Portal)

Ordering data

	Article No.
TIM 1531 IRC communications module TIM 1531 IRC communications module for SIMATIC S7-1500, S7-400, S7-300 with SINAUT ST7, DNP3 and IEC 60870-5-101/104 with three RJ45 interfaces for communication via IP-based networks (WAN/LAN) and an RS232/RS485 interface for communication via conventional WANs	**6GK7543-1MX00-0XE0**
STEP 7 Professional V18 engineering software	
• SIMATIC STEP 7 Professional V18 floating license	**6ES7822-1AA08-0YA5**
• Upgrade SIMATIC STEP 7 Basic V11 ... V17 → V18 floating license	**6ES7822-0AA08-0YE5**
Mounting rail SIMATIC S7-1500, 160 mm mounting rail; incl. grounding screw, integrated DIN rail for mounting small items, such as terminals, relays	**6ES7590-1AB60-0AA0**
SIMATIC Memory Card SIMATIC S7, Memory Card for S7-1x 00 CPU/SINAMICS, 3.3 V flash, 24 MB	**6ES7954-8LF03-0AA0**

	Article No.
SCALANCE M876-4 4G router; for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile wireless optimized for worldwide use, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals!	**6GK5876-4AA10-2BA2**
SCALANCE MUM853-1 5G router (EU), IP30, for wireless IP communication of Ethernet-based applications via public 3/4/5G mobile wireless networks and private 5G networks, VPN, firewall, NAT, IPv6, connection to SINEMA RC via CLP, 4 SMA connectors, 1 x micro SIM slot, 4 x 10/100/1000 Mbps RJ45 port, redundant 24 V DC, -30 … +60 °C, CLP slot, 1 x DI and 1 x DQ, note country approvals!	**6GK5853-2EA00-2DA1**
SCALANCE M826-2 SHDSL router For IP communication via the 2-wire and 4-wire cables of Ethernet-based programmable controllers; SHDSL topology: point-to-point, bonding, line bridge mode, routing mode with VPN, firewall, NAT; 4-port switch, 1 x digital input, 1 x digital output	**6GK5826-2AB00-2AB2**

TIM 1531 IRC (for S7-1500)

Ordering data

	Article No.
MD720 modem GSM/GPRS, 2G mobile wireless modem with RS232 interface; for GSM services CSD, GPRS, SMS; Quad-band GSM; AT command interface; note country approvals! Autom. GPRS connection setup; including gender changer for RS 232/PPI adapter	**6NH9720-3AA01-0XX0**
SITOP compact 24 V/0.6 A 1-phase power supply with wide-range input 85 ... 264 V AC/110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	**6EP1331-5BA00**
SIMATIC PM 1507 24 V/3 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	**6EP1333-4BA00**

Technical specifications

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
• at the 2nd interface	10 ... 100 Mbit/s
• at interface 3	10 ... 100 Mbit/s
• according to RS 232	300 ... 115 200 bit/s
interfaces	
number of interfaces according to Industrial Ethernet	3
number of electrical connections	
• for external data transmission according to RS 232	1
• for power supply	1
number of slots	
• for memory cards	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• for power supply	2-pole plugable terminal block
slot version	
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC
storage capacity of the memory card maximum	32 Gibyte

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
consumed current	
• from external supply voltage at DC at 24 V typical	0.15 A
• from external supply voltage at DC at 24 V maximum	0.3 A
power loss [W] with external supply voltage at 24 V DC	
• in update mode typical	3.9 W
• in communication mode typical	3.9 W
product extension optional backup battery	No

Technical specifications

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
ambient conditions	
ambient temperature	
• during operation	0 ... 70 °C
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 70 °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 weights	
module format	Compact module S7-1500 double-wide
width	70 mm
height	147 mm
depth	129 mm
net weight	0.525 kg
fastening method	
• 35 mm top hat DIN rail mounting	No
• S7-300 rail mounting	No
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
product function	
• DynDNS client	No
number of units	
• note	Number of TIM per S7-1500: 1
wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	132; only via LAN
• with PG connections maximum	4
• with PG/OP connections maximum	4
• with OP connections maximum	4
service	
• of SIMATIC communication as server	Yes
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
performance data IT functions	
number of possible connections	
• as server by means of HTTP maximum	2
• as server by means of HTTPS maximum	2; 2 per Ethernet interface
• as email client maximum	1
performance data telecontrol	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
control center connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
• by means of a permanent connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	Yes
• Modbus RTU	No
product function data buffering if connection is aborted	Yes; 100000 data telegrams (ST7) or 250000 events (IEC 60870-5 / DNP3)
number of data points per station maximum	3 000
number of DNP3 masters	
• for Ethernet maximum	4
• with RS 232 interface maximum	4
product feature buffered message frame memory	Yes
transmission format	
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST7 protocol	4
performance data teleservice	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
• remote configuration	Yes

Technical specifications

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 SP1 (TIA Portal) or higher
• for CPU configuring required SINAUT TD7 block library for CPU	No
• for PG configuring required SINAUT ST7 configuration software for PG	No
storage location of TIM configuration data	Flash or SD card of the TIM 1531 IRC
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
• I&M2 - installation date	Yes
• I&M3 - comment	Yes
product functions diagnostics	
product function web-based diagnostics	Yes
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	Yes
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
product functions security	
product function	
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	127
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
product component hardware real time clock	No
product feature hardware real time clock w. battery backup	No
time synchronization	
• from NTP-server	Yes
• from GPS-signal	No
• from control center	Yes
• from mobile network provider	No
• PC	No
• manual setting	No
product functions position detection	
product function	
• position detection with GPS	No
• pass on position data	No
standards, specifications, approvals hazardous environments	
certificate of suitability CCC for hazardous zone according to GB standard	Yes

Overview

- Access points in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

Ordering data

	Article No.
SCALANCE W774 access points IWLAN access points with built-in wireless interface for establishing radio connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; 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 24 V DC; manual on CD-ROM; German/English	
SCALANCE W774-1 RJ45 IWLAN access point with one built-in wireless interface	
• Country approvals for operation outside the USA	**6GK5774-1FX00-0AA0**
• Country approvals for operation within the USA[1)]	**6GK5774-1FX00-0AB0**
• Country approvals for operation in Israel[1)]	**6GK5774-1FX00-0AC0**
KEY-PLUG W780 iFeatures Removable data storage medium for enabling additional iFeatures, simple device replacement in the event of a fault and storage of configuration data; can be used in SCALANCE W access points with PLUG slot	**6GK5907-8PA00**
C-PLUG Removable data storage medium for simple device replacement in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG slot	**6GK1900-0AB10**

	Article No.
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 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 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet plug/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Antennas and additional IWLAN accessories	See Industrial Wireless LAN/ Accessories

[1)] Please note country approvals under http://www.siemens.com/wireless-approvals

SCALANCE W774 RJ45 for the control cabinet

Technical specifications

Article number	6GK5774-1FX00-0AA0	6GK5774-1FX00-0AB0	6GK5774-1FX00-0AC0
Product type designation [1]	W774-1 RJ45	W774-1 RJ45 (USA)	W774-1 RJ45 (ISR)
transfer rate			
transfer rate			
• with WLAN maximum	300 Mbit/s	300 Mbit/s	300 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet			
• minimum	10 Mbit/s	10 Mbit/s	10 Mbit/s
• maximum	100 Mbit/s	100 Mbit/s	100 Mbit/s
interfaces			
number of electrical connections			
• for network components or terminal equipment	2	2	2
• for power supply	1	1	1
• for redundant voltage supply	1	1	1
type of electrical connection			
• for network components or terminal equipment	RJ45 socket	RJ45 socket	RJ45 socket
• for power supply	4-pole screw terminal, PoE	4-pole screw terminal, PoE	4-pole screw terminal, PoE
design of the removable storage			
• C-PLUG	Yes	Yes	Yes
• KEY-PLUG	Yes	Yes	Yes
memory			
design of the removable storage			
• C-PLUG	Yes	Yes	Yes
• KEY-PLUG	Yes	Yes	Yes
interfaces wireless			
number of radio cards permanently installed	1	1	1
transmission mode for multiple input multiple output (MIMO)	2x2	2x2	2x2
number of spatial streams	2	2	2
number of electrical connections for external antenna(s)	2	2	2
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes	Yes
supply voltage, current consumption, power loss			
type of voltage of the supply voltage	DC	DC	DC
supply voltage			
• from Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	48 V	48 V	48 V
consumed current			
• at DC at 24 V typical	0.25 A	0.25 A	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A	0.125 A	0.125 A
power loss [W]			
• at DC at 24 V typical	6 W	6 W	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W	6 W	6 W
supply voltage 1			
• from terminal block	19.2 V	19.2 V	19.2 V
supply voltage 2			
• from terminal block	28.8 V	28.8 V	28.8 V

Technical specifications

Article number	**6GK5774-1FX00-0AA0**	**6GK5774-1FX00-0AB0**	**6GK5774-1FX00-0AC0**
Product type designation [1]	W774-1 RJ45	W774-1 RJ45 (USA)	W774-1 RJ45 (ISR)
ambient conditions			
ambient temperature			
• during operation	-20 ... +60 °C	-20 ... +60 °C	-20 ... +60 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	97 %	97 %	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.	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.	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	IP30	IP30
design, dimensions and weights			
width	26 mm	26 mm	26 mm
height	156 mm	156 mm	156 mm
depth	127 mm	127 mm	127 mm
width of the enclosure without antenna	26 mm	26 mm	26 mm
height of the enclosure without antenna	147 mm	147 mm	147 mm
depth of the enclosure without antenna	127 mm	127 mm	127 mm
net weight	0.52 kg	0.52 kg	0.52 kg
fastening method	wall mounting only if flat mounted	wall mounting only if flat mounted	wall mounting only if flat mounted
• S7-300 rail mounting	Yes	Yes	Yes
• S7-1500 rail mounting	Yes	Yes	Yes
• 35 mm top hat DIN rail mounting	Yes	Yes	Yes
• wall mounting	Yes	Yes	Yes
radio frequencies			
operating frequency			
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general			
product function Access Point Mode	Yes	Yes	Yes
product function client Mode	Yes	Yes	Yes
number of SSIDs	4	4	4
product function			
• iPCF Access Point	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No	No	No
• iPCF-MC client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
number of iPCF-capable radio modules	1	1	1
product function iREF	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
number of iREF-capable radio modules	1	1	1
product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only

Technical specifications

Article number	**6GK5774-1FX00-0AA0**	**6GK5774-1FX00-0AB0**	**6GK5774-1FX00-0AC0**
Product type designation [1]	W774-1 RJ45	W774-1 RJ45 (USA)	W774-1 RJ45 (ISR)
product functions management, configuration, engineering			
number of manageable IP addresses in client	8	8	8
product function			
• CLI	Yes	Yes	Yes
• web-based management	Yes	Yes	Yes
• MIB support	Yes	Yes	Yes
• TRAPs via email	Yes	Yes	Yes
• configuration with STEP 7	Yes	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes	Yes
• operation with IWLAN controller	No	No	No
• operation with Enterasys WLAN controller	No	No	No
• forced roaming on IP down with IWLAN	Yes	Yes	Yes
• forced roaming on link down with IWLAN	Yes	Yes	Yes
• WDS	Yes	Yes	Yes
protocol is supported			
• Address Resolution Protocol (ARP)	Yes	Yes	Yes
• ICMP	Yes	Yes	Yes
• Telnet	Yes	Yes	Yes
• HTTP	Yes	Yes	Yes
• HTTPS	Yes	Yes	Yes
• TFTP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
identification & maintenance function			
• I&M0 - device-specific information	Yes	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes	Yes
product functions diagnostics			
product function			
• PROFINET IO diagnosis	Yes	Yes	Yes
• link check	No	No	No
• connection monitoring IP-Alive	No	No	No
• localization via Aeroscout	Yes	Yes	Yes
• SysLog	Yes	Yes	Yes
protocol is supported			
• SNMP v1	Yes	Yes	Yes
• SNMP v2	Yes	Yes	Yes
• SNMP v3	Yes	Yes	Yes
product functions VLAN			
product function			
• function VLAN with IWLAN	Yes	Yes	Yes
product functions DHCP			
product function			
• DHCP client	Yes	Yes	Yes
• DHCP server	Yes	Yes	Yes
• DHCP Option 82	Yes	Yes	Yes
product functions redundancy			
protocol is supported			
• STP/RSTP	Yes	Yes	Yes
• MSTP	Yes	Yes	Yes
• RSTP	Yes	Yes	Yes

Technical specifications

Article number	**6GK5774-1FX00-0AA0**	**6GK5774-1FX00-0AB0**	**6GK5774-1FX00-0AC0**
Product type designation [1]	W774-1 RJ45	W774-1 RJ45 (USA)	W774-1 RJ45 (ISR)
product functions security			
product function			
• ACL - MAC-based	Yes	Yes	Yes
• management security, ACL-IP based	Yes	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes	Yes
• NAT/NAPT	Yes	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes	Yes
• WPA/WPA2	Yes	Yes	Yes
• TKIP/AES	Yes	Yes	Yes
protocol is supported			
• SSH	Yes	Yes	Yes
• RADIUS	Yes	Yes	Yes
product functions time			
protocol is supported			
• NTP	Yes	Yes	Yes
• SNTP	Yes	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes	Yes
standards, specifications, approvals			
certificate of suitability			
• EC Declaration of Conformity	Yes	Yes	No
• CE marking	Yes	Yes	No
• C-Tick	Yes	Yes	Yes
• E1 approval	No	No	No
• railway application in accordance with EN 50155	No	No	No
• railway application in accordance with EN 50121-4	No	No	No
• NEMA TS2	No	No	No
• IEC 61375	No	No	No
• IEC 61850-3	No	No	No
• NEMA4X	No	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes	Yes	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes	Yes
standard for wireless communication			
• IEEE 802.11a	Yes	Yes	Yes
• IEEE 802.11b	Yes	Yes	Yes
• IEEE 802.11e	Yes	Yes	Yes
• IEEE 802.11g	Yes	Yes	Yes
• IEEE 802.11h	Yes	Yes	Yes
• IEEE 802.11i	Yes	Yes	Yes
• IEEE 802.11n	Yes	Yes	Yes
wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals

Technical specifications

Article number	**6GK5774-1FX00-0AA0**	**6GK5774-1FX00-0AB0**	**6GK5774-1FX00-0AC0**
Product type designation [1]	W774-1 RJ45	W774-1 RJ45 (USA)	W774-1 RJ45 (ISR)
standards, specifications, approvals marine classification			
Marine classification association			
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes	Yes
• French marine classification society (BV)	Yes	Yes	Yes
• DNV GL	Yes	Yes	Yes
• Korean Register of Shipping (KRS)	Yes	Yes	Yes
• Lloyds Register of Shipping (LRS)	Yes	Yes	Yes
• Nippon Kaiji Kyokai (NK)	Yes	Yes	Yes
• Polski Rejestr Statkow (PRS)	Yes	Yes	Yes
• Royal Institution of Naval Architects (RINA)	Yes	Yes	Yes
standards, specifications, approvals hazardous environments			
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes	Yes
accessories			
accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery

[1] You will find the current list of countries at: http://www.siemens.com/wireless-approvals

Overview

ET 200MP station with SCALANCE W734 RJ45

- Client modules in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

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 Mbps; 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 24 V DC; manual on CD-ROM; German/English	
SCALANCE W734-1 RJ45 For managing the radio link of up to eight connected devices with Industrial Ethernet connections;	
• Country approvals for operation outside the USA	**6GK5734-1FX00-0AA0**
• Country approvals for operation within the USA[1)]	**6GK5734-1FX00-0AB0**
KEY-PLUG W740 iFeatures Removable data storage medium for enabling additional iFeatures, for simple device replacement in the event of a fault, and for storing configuration data; can be used in SCALANCE W client modules with a PLUG slot	**6GK5907-4PA00**
C-PLUG Removable data storage medium for simple device replacement in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG slot	**6GK1900-0AB10**

	Article No.
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 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 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet plug/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Antennas and additional IWLAN accessories	See Industrial Wireless LAN/ Accessories

1) Please note country approvals under http://www.siemens.com/wireless-approvals

SCALANCE W734 RJ45 for the control cabinet

Technical specifications

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

Technical specifications

Article number	**6GK5734-1FX00-0AA0**	**6GK5734-1FX00-0AB0**
Product type designation [1]	W734-1 RJ45	W734-1 RJ45 (USA)
ambient conditions		
ambient temperature		
• during operation	-20 ... +60 °C	-20 ... +60 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
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.	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	IP30
design, dimensions and weights		
width	26 mm	26 mm
height	156 mm	156 mm
depth	127 mm	127 mm
width of the enclosure without antenna	26 mm	26 mm
height of the enclosure without antenna	147 mm	147 mm
depth of the enclosure without antenna	127 mm	127 mm
net weight	0.52 kg	0.52 kg
fastening method	wall mounting only if flat mounted	wall mounting only if flat mounted
• S7-300 rail mounting	Yes	Yes
• S7-1500 rail mounting	Yes	Yes
• 35 mm top hat DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
radio frequencies		
operating frequency		
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general		
product function Access Point Mode	No	No
product function client Mode	Yes	Yes
product function		
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
• iPCF-MC client	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
number of iPCF-capable radio modules	1	1
product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures' only	Yes; In combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures' only
product functions management, configuration, engineering		
number of manageable IP addresses in client	8	8
product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• configuration with STEP 7	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes
• WDS	No	No
protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes
• Telnet	Yes	Yes

SCALANCE W734 RJ45 for the control cabinet

Technical specifications

Article number	**6GK5734-1FX00-0AA0**	**6GK5734-1FX00-0AB0**
Product type designation [1]	W734-1 RJ45	W734-1 RJ45 (USA)
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• DCP	Yes	Yes
• LLDP	No	No
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
product functions diagnostics		
product function		
• PROFINET IO diagnosis	Yes	Yes
• link check	No	No
• connection monitoring IP-Alive	No	No
• SysLog	Yes	Yes
protocol is supported		
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
product functions VLAN		
product function		
• function VLAN with IWLAN	No	No
product functions DHCP		
product function		
• DHCP client	Yes	Yes
• DHCP server	Yes	Yes
• DHCP Option 82	Yes	Yes
product functions redundancy		
protocol is supported		
• STP/RSTP	Yes	Yes
• MSTP	Yes	Yes
• RSTP	Yes	Yes
product functions security		
product function		
• ACL - MAC-based	Yes	Yes
• management security, ACL-IP based	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• TKIP/AES	Yes	Yes
protocol is supported		
• SSH	Yes	Yes
• RADIUS	Yes	Yes
product functions time		
protocol is supported		
• NTP	Yes	Yes
• SNTP	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes

Technical specifications

Article number	**6GK5734-1FX00-0AA0**	**6GK5734-1FX00-0AB0**
Product type designation [1]	W734-1 RJ45	W734-1 RJ45 (USA)
standards, specifications, approvals		
certificate of suitability		
• EC Declaration of Conformity	Yes	Yes
• CE marking	Yes	Yes
• C-Tick	Yes	Yes
• E1 approval	No	No
• railway application in accordance with EN 50155	No	No
• NEMA TS2	No	No
• IEC 61375	No	No
• IEC 61850-3	No	No
• NEMA4X	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes
standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals
standards, specifications, approvals marine classification		
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes
• French marine classification society (BV)	Yes	Yes
• DNV GL	Yes	Yes
• Korean Register of Shipping (KRS)	Yes	Yes
• Lloyds Register of Shipping (LRS)	Yes	Yes
• Nippon Kaiji Kyokai (NK)	Yes	Yes
• Polski Rejestr Statkow (PRS)	Yes	Yes
• Royal Institution of Naval Architects (RINA)	Yes	Yes
standards, specifications, approvals hazardous environments		
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes
accessories		
accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery

[1] You will find the current list of countries at:
http://www.siemens.com/wireless-approvals

SIPLUS 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 kbps
  - RS 232C, max. 115.2 kbps
  - RS 422/RS 485, max. 19.2 kbps
  - RS 422/RS 485, max. 115.2 kbps
- 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.

Ordering data

Ordering data	Article No.
SIPLUS CM PtP RS 232 BA communications module (Extended temperature range and exposure to environmental substances) Basic communications module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin D-sub connector, max. 19.2 Kbps	**6AG1540-1AD00-7AA0**
SIPLUS CM PtP RS 232 HF communications module (Extended temperature range and exposure to environmental substances) High Feature communications module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin D-sub connector, max. 115.2 Kbps	**6AG1541-1AD00-7AB0**
SIPLUS CM PtP RS 422/485 BA communications module (Extended temperature range and exposure to environmental substances) Basic communications module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbps	**6AG1540-1AB00-7AA0**
SIPLUS CM PtP RS 422/485 HF communications module (Extended temperature range and exposure to environmental substances) High Feature communications module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbps	**6AG1541-1AB00-7AB0**
Accessories	See SIMATIC S7-1500, CM PtP communications module, page 4/161

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 RS232 BA	SIPLUS S7-1500 CM PTP RS232 HF	SIPLUS S7-1500 CM PTP RS422/485 BA	SIPLUS S7-1500 CM PTP RS422/485 HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -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
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

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 RS232 BA	SIPLUS S7-1500 CM PTP RS232 HF	SIPLUS S7-1500 CM PTP RS422/485 BA	SIPLUS S7-1500 CM PTP RS422/485 HF
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				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

SIPLUS NET CM 1542-5

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	G_IK10_XX_10143

The CM 1542-5 communications module expands the SIMATIC S7-1500 Controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of 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 a SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communications 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 communications module (Extended temperature range and exposure to environmental substances) Communications 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 communications module, page 4/166

Overview

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

G_IK10_XX_10353

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 emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email 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 an 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
  - Email transfer with addressing by program block

Note

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

Ordering data

	Article No.
SIPLUS NET CP 1543-1 communications processor (Extended temperature range and exposure to environmental substances) 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 Mbps; electronic manual on DVD	**6AG1543-1AX00-2XE0**
Accessories	See SIMATIC S7-1500, CP 1543-1 communications processor, page 4/173

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Technical specifications

Article number	**6AG1543-1AX00-2XE0**
Based on	**6GK7543-1AX00-0XE0**
Product type designation	SIPLUS NET CP 1543-1
ambient conditions	
ambient temperature	
• for vertical installation during operation	-40 ... +40 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)

Article number	**6AG1543-1AX00-2XE0**
Based on	**6GK7543-1AX00-0XE0**
Product type designation	SIPLUS NET CP 1543-1
resistance to chemically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

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

Design

- 40 terminals, arranged in two rows, numbered consecutively from 1 to 40
- Direct assignment of terminal to LED and labeling simplifies wiring, commissioning, and troubleshooting
- Holders for four potential bridges for simple and flexible creation of potential groups;
  four units are supplied with the front connector (optionally available as spare parts in packs of 20)
- Integrated shielding concept for analog modules and technology modules;
  allows space-saving installation without tools and ensures high ruggedness and EMC stability;
  components supplied with analog modules
- Cable ties for mechanical fixing of the cable bundle and for strain relief;
  1 unit supplied with front connector

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 pieces; spare part	

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System cabling for SIMATIC S7-1500 and ET 200MP

Overview

With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500 (35 mm unit): 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.

More information is available on the internet at

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

Design

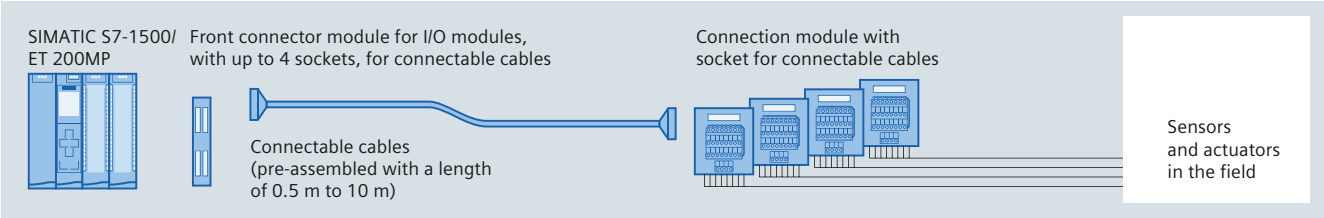
Two cabling variants are available for a wide range of control cabinet concepts:

Fully modular connection

The system consists of:

- Front connector module
- Connecting cable
- Connection 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 work for the connecting cables is drastically reduced thanks to the use of pre-assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ET 200MP, 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.

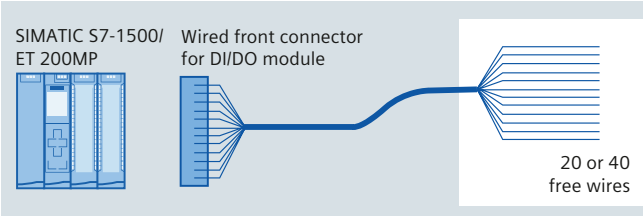
The single cores are available in different versions:

- Wire 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/ET 200MP, flexible connection

Overview

The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP (35 mm design) consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and connection modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The connection modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Front connector module, connecting cable and connection module are easy to plug in
- Fast, low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the connection module
- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-byte distribution of the signals in the case of digital signals
- Each component can be replaced individually
- Use of pre-assembled cables possible

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the I/O modules (35 mm design). 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

There are different versions of the connecting cable.

As a pre-assembled 16-pole or 50-pole round cable (shielded or unshielded) it is available in lengths up to 10 m.

When pre-assembled, there are one or two connectors in insulation displacement method (female ribbon connectors) at both ends of the cable.

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

As a pre-assembled round cable (unshielded) with a 40-pole plug on the side of the I/O module (64-channel) and a 50-pole plug for the connection to the connection module (4-byte version). The cable connectors are designed with the insulation displacement method.

Connection module

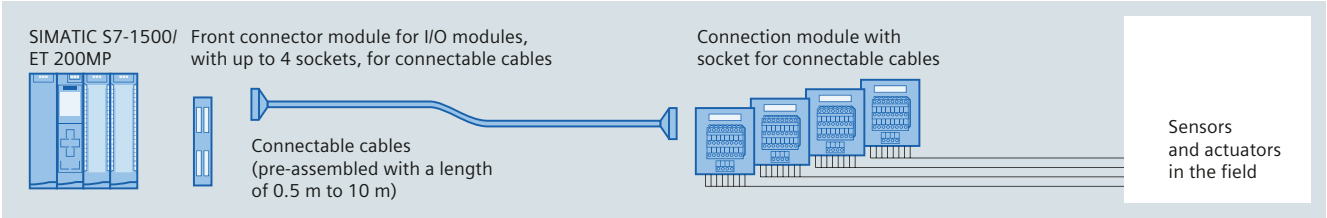
The system has both digital and analog connection modules for connecting the I/O signals. These are snapped onto the DIN rail. The connection modules with basic or signal functionality are available in 1-byte or 4-byte versions.

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

If other voltage or power levels are required in the field, the connection module for TPRo or TPOo output signals is used. For the TPRo connection module, relays are used for the implementation. For the TPOo connection module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the PLC 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.



SIMATIC TOP connect for S7-1500/ET 200MP, fully modular connection

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Ordering data

Front connector modules[1)]

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

1) The terminal assignment of these front connector modules is unique and the dimensional drawings are shown in the Equipment Manual of SIMATIC TOP connect for S7-1500 and ET 200MP. The equipment manual is available as a download from Customer Support with the following ID: 95924607.

Connecting cables

Connecting cables for SIMATIC S7-1500	
Pre-assembled round cable	
16-pin, 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**
Version 4 x 16 to 1 x 50-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0EB0**
• 1.0 m	**6ES7923-5BB00-0EB0**
• 1.5 m	**6ES7923-5BB50-0EB0**
• 2.0 m	**6ES7923-5BC00-0EB0**
• 2.5 m	**6ES7923-5BC50-0EB0**
• 3.0 m	**6ES7923-5BD00-0EB0**
• 4.0 m	**6ES7923-5BE00-0EB0**
• 5.0 m	**6ES7923-5BF00-0EB0**
• 6.5 m	**6ES7923-5BG50-0EB0**
• 8.0 m	**6ES7923-5BJ00-0EB0**
• 10.0 m	**6ES7923-5CB00-0EB0**

Connecting cables for S7-1500	
Pre-assembled round cable	
50-pin, 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**
Version 1 x 40-pin to 1 x 50-pin, 0.14 mm²	
Unshielded	
• 1.0 m	**6ES7923-5BB00-0GB0**
• 2.0 m	**6ES7923-5BC00-0GB0**
• 2.5 m	**6ES7923-5BC50-0GB0**
• 3.0 m	**6ES7923-5BD00-0GB0**

Ordering data

Connection modules

	Article No.
Connection module TP1	
For 1-wire connection, for 16-pin connecting cables	
• 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**
For 1-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2AA20-0BA0**
• Push-in terminals, sourcing input, with LEDs	**6ES7924-2AK20-0BC0**
• Screw-type terminals, sourcing input, with LEDs	**6ES7924-2AK20-0BA0**
• Push-in terminals, mid-point conductor signal, with LEDs	**6ES7924-2AM20-0BC0**
• Screw-type terminals, mid-point conductor signal, with LEDs	**6ES7924-2AM20-0BA0**
Connection module TP3	
For 3-wire connection, for 16-pin connecting cables	
• 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 LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
For 3-wire connection, for 50-pin connecting cables	
• 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**
Connection 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**
Connection module TPRi	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**

	Article No.
Connection module TPRi	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
Connection 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 module for digital output modules 2 A	
Connection module TP2	
• Push-in terminals without LEDs	**6ES7924-0BB20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0BB20-0AA0**
Connection module for analog modules	
Connection module TPA, 16-pin	
• Push-in terminals without LEDs	**6ES7924-0CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CC20-0AA0**
Connection module TPA, 50-pin	
• Push-in terminals without LEDs	**6ES7924-2CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CC20-0AA0**
Accessories	
Shield plate for analog connection module	
PU = 4 units (for connection of 15-pin connecting cable)	**6ES7928-1AA20-4AA0**
PU = 4 units (for connection of 15-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**

4

Technical specifications front connector modules

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. total 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

Overview

Flexible connection of the cabling system consists of a S7-1500 front connector which has the 20 or 40 single cores already in place and which directly connects the I/O modules (35 mm design) with the sensors and actuators inside the control cabinet. With a cross-section of 0.5 square mm, the single wires are also suitable for higher currents and are available in different lengths and versions: as H05V-K cores (PVC insulation), H05Z-K (halogen-free insulation) or with UL/CSA certified cores. The halogen-free version has a low smoke gas density in the event of a fire and is thus particularly well suited for use in buildings.

Can be used for SIMATIC S7-1500 and ET 200MP digital modules (24 V DC, 35 mm design)

The front connectors with single cores replace the SIMATIC standard connectors

- 6ES7592-1AM00-0XB0 and 6ES7592-1BM00-0XB0

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

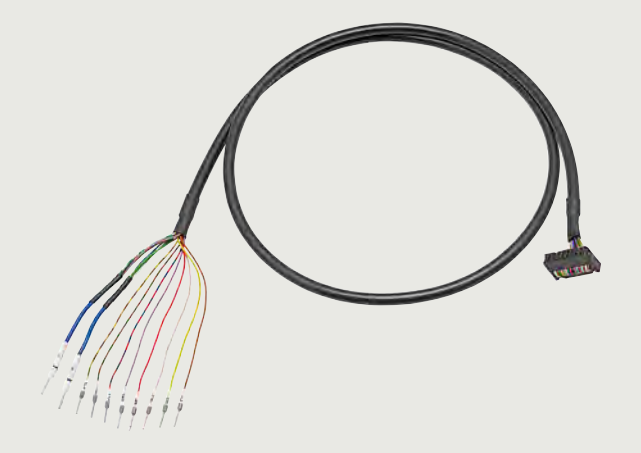
Front connector with single cores for 32 channels (pins 1-40)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
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 screw 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 screw 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 screw 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 screw 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**

System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

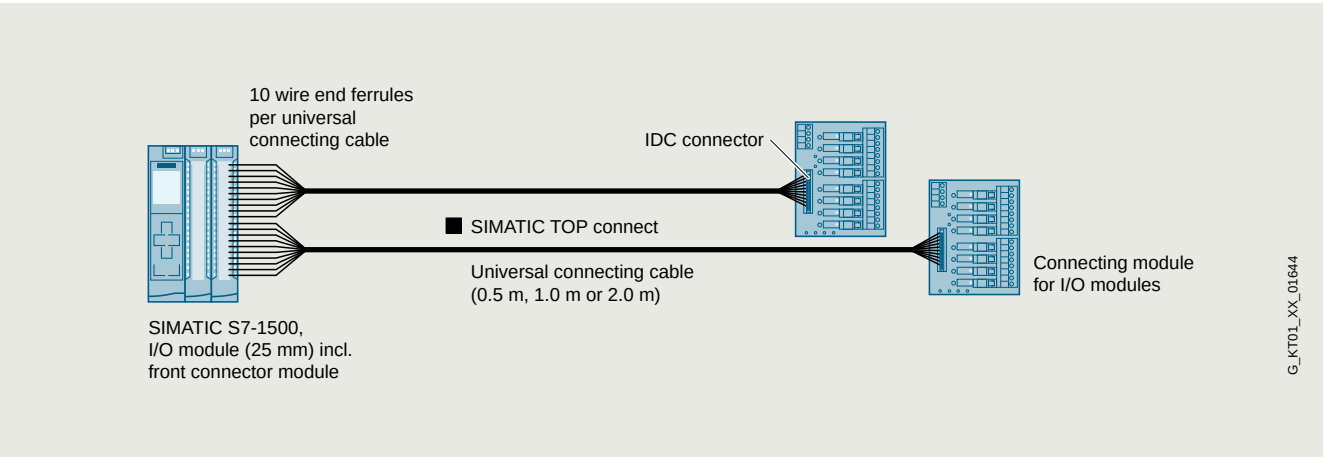
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

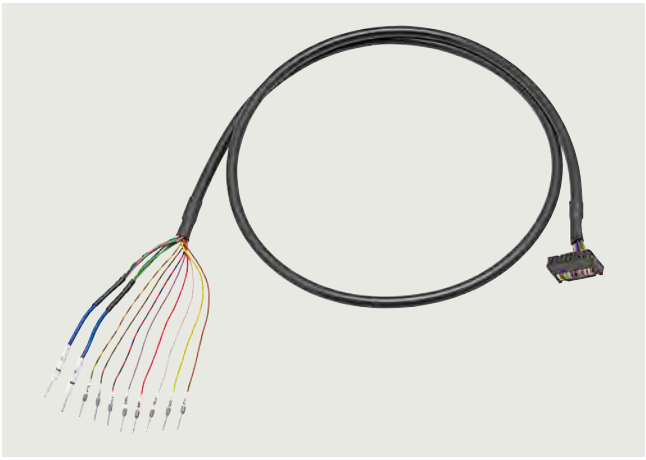
It comprises:

- 16-pin round cable with a core cross-section of 0.14 mm^2, pre-assembled with wire end ferrules for connection to the controller:
  - Labeled with "0" … "7" for the control inputs/outputs
  - Labeled with "M" for mass
  - Labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect connection modules for 8 I/Os:
  - 3-wire connection using the appropriate connection module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

Overview Universal connecting cables



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

Ordering data	Article No.
Universal connecting cables for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!	
16 x 0.14 mm² unshielded	
• 0.5 m	**6ES7923-0BA50-0FB0**
• 1.0 m	**6ES7923-0BB00-0FB0**
• 2.0 m	**6ES7923-0BC00-0FB0**

Overview connection modules

The connection modules are used instead of conventional terminal blocks and act as the interface between the PLC and signals from the field. All digital modules with 8 I/Os can be used.

Ordering data	Article No.
TP1 connection module	
For 1-conductor connection, for 16-pin connecting cables	
• 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**
TP3 connection module	
For 3-conductor connection, for 16-pin connecting cables	
• 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 LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
TPRo connection module	
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**
TPRi connection module	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
TPRi connection module	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
TPOo connection module	
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**

Digital F-input modules

Overview

Fail-safe digital input module: F-DI 16x24VDC PROFISAFE

Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Ordering data

	Article No.
F-digital input module	
16 inputs, 24 V DC, PROFIsafe	**6ES7526-1BH00-0AB0**
Accessories	
Coding elements	**6ES7592-6EF00-1AA0**
E-coding elements, type F for ET 200MP module F-DI/F-DQ; 5 units, spare part	
Front connectors	
Incl. 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	**6ES7592-2CX00-0AA0**
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Front door for F-I/O modules	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA10-7AA0**

	Article No.
STEP 7 Safety Advanced V18	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V18 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA18-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA18-0YH5**

Ordering data

	Article No.
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

Technical specifications

Article number	**6ES7526-1BH00-0AB0** ET 200MP, F-DI 16X24VDC
General information	
Product type designation	F-DI 16x24VDC
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 with HSP 0086
Operating mode	
• DI	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Max. 100 mA when mounted vertically
Digital inputs	
Number of digital inputs	16
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes

Article number	**6ES7526-1BH00-0AB0** ET 200MP, F-DI 16X24VDC
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	No
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g

Digital F-output modules

Overview

Digital fail-safe output module:
F-DQ 8x24VDC 2A PPM PROFISAFE

Important features:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Ordering data

	Article No.
F-digital output module	
8 outputs, 24 V DC, 2 A, PROFISAFE, switching to P/M potential	**6ES7526-2BF00-0AB0**
Accessories	
Coding elements	**6ES7592-6EF00-1AA0**
E-coding elements, type F for ET 200MP module F-DI/F-DQ; 5 units, spare part	
Front connectors	
Incl. 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	**6ES7592-2CX00-0AA0**
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Front door for F-I/O modules	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA10-7AA0**

	Article No.
STEP 7 Safety Advanced V18	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V18 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA18-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA18-0YH5**

Ordering data

	Article No.
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**

[1] Up-to-date information and download availability can be found under http://www.siemens.com/tia-online-software-delivery.

Technical specifications

Article number	**6ES7526-2BF00-0AB0** ET 200MP, F-DQ 8x24VDC 2A PPM
General information	
Product type designation	F-DQ 8x24VDC/2A PPM
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 with HSP 0086
Operating mode	
• DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
Total current of the outputs (per module)	
horizontal installation	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
vertical installation	
- up to 40 °C, max.	8 A
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

SIPLUS digital F-input modules

Overview

SIPLUS digital fail-safe input module:

F-DI 16x24 V DC

Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Note:

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

Ordering data

	Article No.
SIPLUS F-digital input module	
16 inputs, 24 V DC, PROFISAFE	**6AG1526-1BH00-2AB0**
Accessories	
Coding elements	**6AG1592-6EF00-2AA0**
E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part	
Other accessories	See SIMATIC S7-1500 F-digital input modules, page 4/208

Technical specifications

Article number	**6AG1526-1BH00-2AB0**
Based on	**6ES7526-1BH00-0AB0**
	SIPLUS S7-1500 F-DI 16x24VDC
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Overview

SIPLUS digital fail-safe output module:
F-DQ 8x24 V DC 2 A PPM

Important properties:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

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 F-digital output module	
8 outputs, 24 V DC, 2 A, PROFISAFE, switching to sourcing/sinking output	**6AG1526-2BF00-2AB0**
Accessories	
Coding elements	**6AG1592-6EF00-2AA0**
E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part	
Other accessories	See SIMATIC S7-1500 F-digital output modules, page 4/210

Technical specifications

Article number	**6AG1526-2BF00-2AB0**
Based on	**6ES7526-2BF00-0AB0**
	SIPLUS S7-1500 F-DQ 8x24VDC/2A
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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.

Ordering data

	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**
Accessories	
Power plug With coding element for power supply module; spare part, 10 units per packing unit	**6ES7590-8AA00-0AA0**
DIN rail adapter For adapting S7-1500 mounting rails on low or flat DIN rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be placed every 25 cm. Including mounting hardware. 10 units per packing unit	**6ES7590-6AA00-0AA0**

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		
type of the power supply network	1-phase AC	1-phase AC
supply voltage at AC		
• initial value	Automatic range selection	Automatic range selection
supply voltage		
• 1 at AC rated value	120 V	120 V
• 2 at AC rated value	230 V	230 V
input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
design of input wide range input	No	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
line frequency		
• 1 rated value	50 Hz	50 Hz
• 2 rated value	60 Hz	60 Hz
line frequency	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
current limitation of inrush current at 25 °C maximum	23 A	62 A
duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
I2t value maximum	1.3 $A^2 \cdot s$	12 $A^2 \cdot s$
fuse protection type	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)

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
• in the feeder	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
Output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V
output voltage		
• at output 1 at DC rated value	24 V	24 V
relative overall tolerance of the voltage	1 %	1 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %
residual ripple		
• maximum	50 mV	50 mV
voltage peak		
• maximum	150 mV	150 mV
product function output voltage adjustable	No	No
display version for normal operation	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
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)
response delay maximum	1.5 s	1.5 s
voltage increase time of the output voltage		
• typical	10 ms	10 ms
output current		
• rated value	3 A	8 A
• rated range	0 ... 3 A	0 ... 8 A
supplied active power 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
product feature		
• bridging of equipment	Yes	Yes
number of parallel-switched equipment resources for increasing the power	2	2
Efficiency		
efficiency in percent	87 %	90 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	11 W	21 W

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

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
Closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.1 %	0.1 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %	2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	3 %
setting time		
• load step 10 to 90% typical	5 ms	5 ms
• load step 90 to 10% typical	5 ms	5 ms
• maximum	5 ms	5 ms
Protection and monitoring		
design of the overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
response value current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
response value current limitation typical	3.4 A	9 A
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
display version for overload and short circuit	-	-
Safety		
galvanic isolation between input and output	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
operating resource protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA
protection class IP	IP20	IP20
Approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
• CSA approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
• cCSAus, Class 1, Division 2	No	No
• ATEX	Yes; ATEX (EX) II 3G Ex nA nC IIC T4 Gc	Yes; ATEX (EX) II 3G Ex nA nC IIC T3 Gc
certificate of suitability		
• relating to ATEX	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	IECEx Ex nA nC IIC T3 Gc; ATEX (EX) II 3G Ex nA nC IIC T3 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
• IECEx	Yes; IECEx Ex nA nC IIC T4 Gc	Yes; IECEx Ex nA nC IIC T3 Gc
• NEC Class 2	No	No
• ULhazloc approval	Yes	Yes
• FM registration	Yes; Class I, Div. 2, Group ABCD, T4	Yes; Class I, Div. 2, Group ABCD, T4
type of certification CB-certificate	Yes	Yes
certificate of suitability		
• EAC approval	Yes	Yes
certificate of suitability shipbuilding approval	Yes	Yes
shipbuilding approval	ABS, BV, DNV GL	ABS, BV, DNV GL
Marine classification association		

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
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes
• French marine classification society (BV)	Yes	Yes
• DNV GL	Yes	Yes
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
EMC		
standard		
• for emitted interference	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2
environmental conditions		
ambient temperature		
• during operation	0 ... 60 °C; with natural convection	0 ... 60 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 … 95% no condensation	Climate class 3K3, 5 … 95% no condensation
Mechanics		
type of electrical connection	Screw-/spring clamp connection	Screw-/spring clamp connection
• at 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
• at 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
required spacing		
• top	40 mm	40 mm
• bottom	40 mm	40 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
net weight	0.45 kg	0.74 kg
product feature of the enclosure housing can be lined up	Yes	Yes
fastening method	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
MTBF at 40 °C	1 611 993 h	1 362 918 h
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)

System power supplies

Overview

- System power supplies for 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
- Engineering and configuration via STEP 7 V12 and higher (PS 60W 24/48/60V DC HF: from STEP 7 V14 SP1)
- In addition with PS 60W 24/48/60V DC HF: Retentive storage of CPU work memory (data) for all S7-1500 CPUs

Ordering data

	Article No.
System power supply	
For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Accessories	
SIMATIC S7-1500 DIN 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	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for 2 000 mm DIN rail	**6ES7590-5AA00-0AA0**
Spare part, 20 units	
Power plug	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	

Technical specifications

Article number	**6ES7505-0KA00-0AB0**	**6ES7505-0RA00-0AB0**	**6ES7505-0RB00-0AB0**	**6ES7507-0RA00-0AB0**
	S7-1500, PS 25W 24V DC	S7-1500, PS 60W 24/48/60V DC	S7-1500, PS 60W 24/48/60V DC HF	S7-1500, PS 60W 120/230V AC/DC
General information				
Product type designation	PS 25W 24VDC	PS 60 W 24/48/60 V DC	PS 60 W 24/48/60 V DC HF	PS 60 W 120/230 V AC/DC
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V12 / V12	V12 / V12	V14 SP1	V12 / V12
• STEP 7 configurable/integrated from version	V5.5 SP3 or higher	V5.5 SP3 or higher		V5.5 SP3 or higher
Installation type/mounting				
Rail mounting		Yes		Yes
Supply voltage				
Rated value (DC)	24 V	24 V / 48 V / 60 V	24 V / 48 V / 60 V	120 V / 230 V
Rated value (AC)				120 V / 230 V
Reverse polarity protection	Yes	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes	Yes
Line frequency				
• Rated value 50 Hz				Yes
• permissible range, lower limit				47 Hz
• permissible range, upper limit				63 Hz
Mains buffering				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms

Technical specifications

Article number	**6ES7505-0KA00-0AB0** S7-1500, PS 25W 24V DC	**6ES7505-0RA00-0AB0** S7-1500, PS 60W 24/48/60V DC	**6ES7505-0RB00-0AB0** S7-1500, PS 60W 24/48/60V DC HF	**6ES7507-0RA00-0AB0** S7-1500, PS 60W 120/230V AC/DC
Input current				
Rated value at 24 V DC	1.3 A	3 A	3 A	
Rated value at 48 V DC		1.5 A	1.5 A	
Rated value at 60 V DC		1.2 A	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
Inrush current, max.			≤ 8 A for t ≤ 1 s	
Output current				
Short-circuit protection	Yes	Yes	Yes	Yes
Power				
Infeed power to the backplane bus	25 W	60 W	60 W	60 W
Power loss				
Power loss at nominal rating conditions	6.2 W	12 W	12 W	12 W
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Potential separation				
primary/secondary	Yes	Yes; Electrical isolation for 230 V AC (reinforced isolation)		Yes
EMC				
Interference immunity against voltage surge				
• Interference immunity on 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	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				
Equipment protection class	III, with protective conductor	I, with protective conductor	I, with protective conductor	I, with protective conductor
Ambient conditions				
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual			
Dimensions				
Width	35 mm	70 mm	105 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	600 g	865 g	600 g

1-phase, 24 V DC (for S7-1500 and ET200MP)

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.

Note:

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

Technical specifications

Article number	**6AG1332-4BA00-7AA0**	**6AG1333-4BA00-7AA0**
Based on	**6EP1332-4BA00**	**6EP1333-4BA00**
Product	SIPLUS S7-1500 PM1507	SIPLUS S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
environmental conditions		
ambient temperature		
• in horizontal mounting position during operation	-40 ... +70 °C; with natural convection	-40 ... +70 °C; with natural convection
• during storage and transport	-40 ... +85 °C	-40 ... +85 °C
installation altitude at height above sea level maximum	6 000 m	6 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m
relative humidity with condensation according to IEC 60068-2-38 maximum	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
resistance to biologically active substances conformity according to EN 60721-3-3	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request
resistance to chemically active substances conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
resistance to biologically active substances conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)
resistance to chemically active substances conformity according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
type of test of the coating according to MIL-I-46058C	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A

Ordering data	Article No.
SIPLUS S7-1500 PM 1507	
(Extended temperature range and exposure to environmental substances)	
Input 120/230 V AC, output 24 V DC, 3 A	**6AG1332-4BA00-7AA0**
Input 120/230 V AC, output 24 V DC, 8 A	**6AG1333-4BA00-7AA0**

	Article No.
Accessories	See SITOP in SIMATIC design, 1-phase, 24 V DC (for S7-1500 and ET200MP), page 4/214

SIPLUS system power supplies

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
- Engineering and 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.

Ordering data

	Article No.
SIPLUS S7-1500 system power supply	
(Extended temperature range and exposure to environmental substances)	
For supplying the backplane bus of the S7-1500 Controller	
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**
Accessories	See SIMATIC S7-1500, system power supplies, page 4/218

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 during operation			
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -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
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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)

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
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A