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S7-1500

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SIMATIC S7-1500 Advanced Controllers



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Introduction

Overview



With its extended ambient conditions, the SIMATIC S7-1500 can be used almost anywhere. Many PLCs can be operated in a temperature range from -25°C to +60°C and at altitudes up to 5,000 m as standard. A wide range of SIPLUS PLCs 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
- Powerful communication:
- PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation, 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-controlled 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 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.

Introduction

S7-1500

Overview

Redundant systems

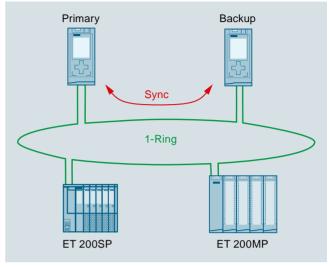


CPU 1513R-1 PN, CPU 1515R-2 PN

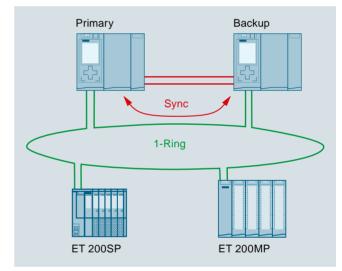


CPU 1517H-3 PN/FO

- 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.



SIMATIC S7-1500R mode of operation



SIMATIC S7-1500H mode of operation

Introduction

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Overview

the CPU

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
- 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 mounting rail: quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules: for flexible adaptation to any application
- System cabling for digital signal modules: for fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- · Power supply:
 - Load power supply modules (PMs) for supplying the module with 24 V $\,$
 - Power supply modules to supply power to the internal module electronics via the backplane bus
 - System power supply modules for retentively storing the entire work memory on the controller
- Distributed expansion:
 - Use of up to 30 signal modules, communication modules, and technology modules via the PROFINET interface module IM 155-5 for the ET 200MP I/O system
 - No difference in terms of handling and system functions in central and distributed operation

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.

Datalog (archives) and recipes

- SIMATIC Memory Card:
 - Plug-in load memory
 - Permits firmware updates
 - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv/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:

Approvals

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

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

You can find the marine approvals available for the S7-1500 on the Internet (SIMATIC Customer Support):

http://www.siemens.com/automation/support

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 here:

https://support.industry.siemens.com/cs/ww/en/view/109763260

⁻ Easy access to plant-relevant operating data and configuration data, Motion Control diagnostics and display of trace recordings via a web browser

S7-1500

General technical specifications SIMATIC S7-1500			
Degree of protection	IP20 acc. to IEC 60 529		
Ambient temperature • Horizontal installation • Vertical installation	060 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.) 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 • < 150 V • < 250 V	707 V DC test voltage (type test) 2200 V DC test voltage 2500 V DC test voltage		
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2		
 Pulse-shaped disturbance variables Sinusoidal 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, Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6		
Emission of radio frequency interference	Requirements of the EMC directive; interference emission according to EN 61000-6-4 Interference emission according to 61000-6-4 Interference emission of electromagnetic fields according to EN 61000-6-4		
Mechanical stress			
VibrationsShock	Testing according to EN 60068-2-6 Tested with: $5 \text{ Hz} \le f \le 8.4 \text{ Hz}$, constant amplitude 7 mm; $9 \text{ Hz} \le f \le 150 \text{ Hz}$, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes 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 \pm direction in each of the 3 mutually vertical axes		

General technical specifications SIPLUS S7-1500				
-40/-25/-20 +55/60/70 °C				
Coating of the printed circuit boards and the electronic components				
The technical data of the standard product applies except for the ambient conditions.				
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)				
0° C				
100 %; RH incl. bedewing/frost (no commissioning in bedewed state)				
Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.				
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.				
Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.				

Central processing units

Standard CPUs

Overview CPU 1511-1 PN

Overview CPU 1513-1 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET IO controller**
- · OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens 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 speedcontrolled 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



- 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA Server and Client as runtime option for the easy connection of 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
- Integrated Motion Control functionalities for controlling speedcontrolled 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:

Central processing units

Standard CPUs

Overview CPU 1515-2 PN

Overview CPU 1516-3 PN/DP



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- · Medium to high processing speed for binary and floatingpoint arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET 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 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
- Integrated Motion Control functionalities for controlling speedcontrolled and positioning axes, precise position gearing between axes, support for external encoders, output cams/cam tracks and measuring inputs
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU



- 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 and positioning axes, support for external encoders, output cams/cam tracks and measuring inputs
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

Central processing units

Standard CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET 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 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 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



- 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET 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 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 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:

Standard CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 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 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.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- 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. Control-independent applications, e.g. protocol converters, database applications 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, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500STM engineering package for Simulink®, it is also possible to integrated complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

Central processing units

Standard CPUs

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Ordering data	Article No.		Article No.
CPU 1511-1 PN	6ES7511-1AK02-0AB0	PE connection element for 2 000 mm DIN rail	6ES7590-5AA00-0AA0
150 KB work memory for program, 1 MB for data,		20 units	
PROFINET IRT interface with 2-port switch;		System power supply	
SIMATIC Memory Card required		For supplying the backplane bus of the S7-1500 Controller	
CPU 1513-1 PN 800 KB work memory for program,	6ES7513-1AL02-0AB0	24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
1.5 MB for data, PROFINET IRT interface with 2-port switch;		24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
SIMATIC Memory Card required CPU 1515-2 PN	6ES7515-2AM02-0AB0	24/48/60 V DC input voltage,	6ES7505-0RB00-0AB0
500 KB work memory for program, 3 MB for data,		power 60 W, buffering functionality 120/230 V AC input voltage,	6ES7507-0RA00-0AB0
PROFINET IRT interface with 2-port switch, PROFINET RT interface;		power 60 W Power plug With coding element for power	6ES7590-8AA00-0AA0
SIMATIC Memory Card required		supply module; spare part, 10 units	
CPU 1516-3 PN/DP	6ES7516-3AN02-0AB0	Load current supply	
1 MB work memory for program, 5 MB for data,		24 V DC/3 A	6EP1332-4BA00
PROFINET IRT interface with 2-port switch,		24 V DC/8 A	6EP1333-4BA00
PROFINET RT interface,		Power supply connector	
PROFIBUS interface; SIMATIC Memory Card required		Spare part; for connecting the 24 V DC supply voltage	
CPU 1517-3 PN/DP	6ES7517-3AP00-0AB0	With push-in terminals	6ES7193-4JB00-0AA0
2 MB work memory for program, 3 MB for data, PROFINET IRT interface		PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet	
with 2-port switch, PROFINET RT interface, PROFIBUS interface;		With insulation displacement, max. transmission rate 12 Mbps	
SIMATIC Memory Card required CPU 1518-4 PN/DP	6ES7518-4AP00-0AB0	Without programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BA70-0XA0
4 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch,		With programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BB70-0XA0
PROFINET RT interface, Ethernet interface,		PROFIBUS FC standard cable GP	6XV1830-0EH10
PROFIBUS interface; SIMATIC Memory Card required		Standard type with special design for quick mounting, 2-wire,	
CPU 1518-4 PN/DP MFP	6ES7518-4AX00-1AC0	shielded; sold by the meter;	
CPU 1518-4 PN/DP MFP, including C/C++ Runtime and		max. delivery unit 1 000 m, minimum order quantity 20 m	
OPC UA runtime license		PROFIBUS FC robust cable	6XV1830-0JH10
Accessories		2-wire, shielded; sold by the meter;	
SIMATIC Memory Card		max. delivery unit 1 000 m,	
4 MB	6ES7954-8LC03-0AA0	minimum order quantity 20 m	
12 MB	6ES7954-8LE03-0AA0	PROFIBUS FC flexible cable	6XV1831-2K
24 MB	6ES7954-8LF03-0AA0	2-wire, shielded; sold by the meter;	
256 MB	6ES7954-8LL03-0AA0	max. delivery unit 1 000 m, minimum order quantity 20 m	
2 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LP03-0AA0	PROFIBUS FC trailing cable	
32 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LT03-0AA0	2-wire, shielded; sold by the meter;	
SIMATIC S7-1500 DIN rail		max. delivery unit 1 000 m, minimum order quantity 20 m	
Fixed lengths, with grounding elements		Sheath color: Petrol	6XV1830-3EH10
• 160 mm	6ES7590-1AB60-0AA0	Sheath color: Violet	6XV1831-2L
• 245 mm	6ES7590-1AC40-0AA0	PROFIBUS FC food cable	6XV1830-0GH10
• 482 mm • 530 mm	6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0	2-wire, shielded;	
• 830 mm	6ES7590-1AJ30-0AA0	sold by the meter; max. delivery unit 1 000 m,	
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		minimum order quantity 20 m	
• 2 000 mm	6ES7590-1BC00-0AA0		

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Ordering data	Article No.		Article No.
PROFIBUS FC ground cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-3FH10	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
PROFIBUS FC FRNC cable GP 2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	GXV1830-0LH10 Display For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part		6ES7591-1BA02-0AA0
PROFIBUS FastConnect stripping tool Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	Cover 35 mm For CPU1511-1PN, CPU1513-1 PN, CPU1511F-1 PN, CPU1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	6ES7591-4AB00-0AA0
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		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
IE FC RJ45 plug 180 180° cable outlet 1 unit	6GK1901-1BB10-2AA0	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
10 units 50 units 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;	6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0 6XV1840-2AH10	SIMATIC S7-1500 Starter Kit Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	6ES7511-1CK03-4YB5
sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m 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 1 000 m, minimum order quantity 20 m	6XV1840-3AH10	STEP 7 Professional V17 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 1909, 2004, 20H2 • Windows 10 Enterprise Version 1909, 2004, 20H2 • Windows 10 IoT Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2019 LTSC	
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 1 000 m, minimum order quantity 20 m	6XV1840-4AH10	 Windows Server (64-bit) Windows Server 2016 Standard (full installation) Windows Server 2019 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download 	SEC7000 10 407 0/45
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables Display module 35 mm	6GK1901-1GA00 6ES7591-1AB00-0AA0	STEP 7 Professional V17, floating license STEP 7 Professional V17, floating license, software download including license key ¹⁾	6ES7822-1AA07-0YA5 6ES7822-1AE07-0YA5
For CPU1511-1PN, CPU1513-1PN, CPU1511F-1PN, CPU1513F-1PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part		Email address required for delivery	

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

Central processing units

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Ordering data	Article No.		Article No.
SIMATIC ODK 1500S		SIMATIC Target for Simulink V5.0	6ES7823-1BE04-0YA5
Open Development Kit V2.5 for	6ES7806-2CD03-0YA0	Download incl. license key 1)	
support in developing high-level language applications for		Email address required for delivery	
SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license)		Upgrade of SIMATIC Target 1500S for Simulink V2.0V4.0 to V5.0, download incl. license key ¹⁾	6ES7823-1BE04-0YE5
on USB flash drive		Email address required for delivery	
Open Development Kit V2.5 for support in developing high-level language applications for	6ES7806-2CD03-0YG0	SIMATIC Target + ODK 1500S bundle	6ES7823-1BE14-0YA0
SIMATIC S7-1500 Advanced		Download incl. license key 1)	
Controllers; software download including license key		Email address required for delivery	
(floating license) 1)		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Email address required for delivery Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) ¹⁾ Email address required for delivery	6ES7806-2CD03-0YK0	Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PC-5, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
		Current Manual Collection DVD and the three subsequent updates	

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

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 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	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1AK01-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1AL01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2AM01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
 integrated (for program) 	150 kbyte	300 kbyte	500 kbyte	1 Mbyte
 integrated (for data) 	1 Mbyte	1.5 Mbyte	3 Mbyte	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.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns

Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
Counters, timers and their retentivity				<u> </u>
S7 counter				
Number	2 048	2 048	2 048	2 048
IEC counter				
Number	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)			
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
			14	14
Web server	Yes	Yes	Yes	Yes

Central processing units

Standard CPUs

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 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
- PROFlenergy	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 256 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	for PROFINET IO, on the number of IO devices, and	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
- PROFlenergy	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

Central processing units

Standard CPUs

Technical specifications

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
PROFINET IO Controller				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFlenergy			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
- PROFlenergy			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

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Central processing units

Standard CPUs

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513-1 PN, 300KB Prog., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB Data	CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
Protocols				
Number of connections				
Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode				
Media redundancy				
- Media redundancy	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			
 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	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	Yes; Data access (read, write, subscribe), method call, 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	800	800	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			
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

Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

A						
Article number	6ES7511-1AK02-0AB0		-1AL02-0AB0	6ES7515-2AM02-0	AB0	6ES7516-3AN02-0AB0
	CPU 1511-1PN, 150KB Program, 1MB Data	CPU 1513 300KB Pr	og., 1,5MB Data	CPU 1515-2 PN, 500KB Prog., 3MB	Data	CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
Ambient conditions			- g., .,			
Ambient temperature during						
operation						
 horizontal installation, min. 	-25 °C; No condensation	,	o condensation	-25 °C; No condens		-25 °C; No condensation
 horizontal installation, max. 	60 °C; Display: 50 °C, at an operating temperature of		splay: 50 °C, at an temperature of	60 °C; Display: 50 ° operating temperat		60 °C; Display: 50 °C, at an operating temperature of
	typically 50 °C, the display is					
	switched off	switched	off	switched off		switched off
 vertical installation, min. 	-25 °C; No condensation	-25 °C; No	o condensation	-25 °C; No condens	sation	-25 °C; No condensation
 vertical installation, max. 	40 °C; Display: 40 °C, at an operating temperature of		splay: 40 °C, at an temperature of	40 °C; Display: 40 ° operating temperat		40 °C; Display: 40 °C, at an operating temperature of
	typically 40 °C, the display is	typically 4	0 °C, the display is	typically 40 °C, the		typically 40 °C, the display is
	switched off	switched	off	switched off		switched off
Altitude during operation relating to sea level						
 Installation altitude above 	5 000 m; Restrictions for		Restrictions for	5 000 m; Restriction		5 000 m; Restrictions for
sea level, max.	installation altitudes > 2 000 m, see manual	installation	n altitudes 1, see manual	> 2 000 m, see mail		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
- 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	N .					N.
 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: 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	105	405		000		0.45
Weight, approx.	405 g	405 g		830 g		845 g
Article number	6ES7517-3AP00-0AB0		6ES7518-4AP00-0	AB0	6ES7518	3-4AX00-1AC0
	CPU 1517-3 PN/DP, 2MB Pro Data	g./8MB	CPU 1518-4 PN/DF Data	, 4 MB Prog., 20MB	CPU 151 + OPC U	8-4 PN/DP MFP + C/C++ RT
General information						
Product type designation	CPU 1517-3 PN/DP		CPU 1518-4 PN/DF		CPU 151	8-4 PN/DP MFP
Engineering with						
 STEP 7 TIA Portal configurable/ integrated from version 	V17 (FW V2.9) / V13 Update (FW V1.6) or higher	3	V17 (FW V2.9) / V1 higher	3 (FW V1.5) or	V17 (FW higher	V2.9) / V15 (FW V2.5) or
Display						
Screen diagonal [cm]	6.1 cm		6.1 cm		6.1 cm	
Supply voltage						
Type of supply voltage	24 V DC		24 V DC		24 V DC	

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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, 4 MB Prog., 20MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
lemory	Data	Dala	+ OFC BA
Vork 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++ Duptime application)			1 024 Mbyte
(for C/C++ Runtime application)			
	20 Objeta	22 Obuto	22 Chute, The memory cord must have
 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	0.040		
• 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	0.040	0.040	0.040
Number	2 048	2 048	2 048
IEC timer			
Number Data areas and their retentivity	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory,
Flag			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
Address area	TO REVIE	TO KDyte	10 KByte
I/O address area			
Inputs	32 kbyte; All inputs are in the process	32 kbyte; All inputs are in the process	32 kbyte; All inputs are in the process
- inputs	image	image	image
Outputs		32 kbyte; All outputs are in the process	
Time of day	image	image	image
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock
1. Interface		Tardware clock	
Interface types			
RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Number of ports	2	2	2
	Yes	Yes	Yes
integrated switch Protocols	100	100	100
IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
PROFINET IO Controller	Yes	Yes	Yes
PROFINET IO Controller PROFINET IO Device	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes Vac: Optionally also approvated
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

Central processing units

Standard CPUs

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, 4 MB Prog., 20MB Data	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
- PROFlenergy	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	also depends on communication share	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	5	5	5
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
- PROFlenergy	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

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Central processing units

Standard CPUs

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, 4 MB Prog., 20MB Data	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
- PROFlenergy	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	also depends on communication share	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	also depends on communication share
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFlenergy	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		

125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

Central processing units

Standard CPUs

CPU 1013-3 FNUPR 2MB Prog.2MB CPU 1013-4 FNUPR 4MB Prog. 2MB CPU 2MA CPU FV CR A.Interface Interface problem +ORCUA +ORCUA Interface problem +ORCUA Yes; X4 Manager of ports 1 1 Protocols Yes; X4 Yes; X4 Protocols Yes; X4 Yes; X4 Protocols Yes; X4 Yes; X4 Protocols No No Number of connections, max. Yes; No Yes; No Protocols 125; In total, up to 1000 distributed IO devices can be connected Via; Protocols 280; via integrated interfaces of the CPU and connected CP ₄ / CMs Protocols 280; via integrated interfaces of the CPU and connected CP ₄ / CMs 284; via integrated interfaces of the CPU and connected CP ₄ / CMs I - MRP ority via 1st interface (X1) Yes; RMP Automanager according to EC 62439 2 Edition 3.0 Yes; Requirement INT - MRP D Yes; Requirement INT Yes; Requirement INT Yes; Requirement INT - MRP D Yes; Requirement INT Yes; Requirement INT Yes; Requirement INT - Structurg Yes Yes Yes Yes	Article number	6ES7517-3AP00-0AB0	6ES7518-4AP00-0AB0	6ES7518-4AX00-1AC0
4. Interface Interface Yes: X4 Yes: X4 Yes: X4 • Number of ports 1 1 • FROFIBUS DP master Yes Yes Yes • FROFIBUS DP master Yes Yes Yes • Number of DP slaves No No No • Number of DP slaves, max. 125. In total, up to 1000 distributed UU 126. In total, up to 1000 distributed UU 12		CPU 1517-3 PN/DP, 2MB Prog./8MB	CPU 1518-4 PN/DP, 4 MB Prog., 20MB	CPU 1518-4 PN/DP MFP + C/C++ F
+ SS as				
Aurhor of ports Aurhor of DP slaves Aurhor of DP slaves, max. Aurhor of DP slaves, max. Solution Aurhor of DP slaves, max. Solution Aurhor of Connections Aurhor of contor of connections Aurhor of connections			Yes: X4	Yes: X4
Protocols Ves Ves Ves Ves Ves • PROFIBUS DP mater No No No No • SIMATIC communication Yes Yes Yes Yes • Number of DP slaves, max. 125; In total, up to 1000 distributed ID devices are be connected AAS, PROFIBUS DP master 125; In total, up to 1000 distributed ID devices are be connected AAS, PROFIBUS or PROFINET 125; In total, up to 1000 distributed ID devices are be connected AAS, PROFIBUS or PROFINET Protocols Number of connections, max. 230; via integrated interfaces of the CPU and connected CPs / CMs 284; via integrated interfaces of the CPU and connected CPs / CMs 294; Via Tel interface (X1) • Med a redundancy only via 1st interface (X1) vis: MPP Automanager according to IEC 62439-2 Edition 3.0 Vis: Requiment: IRT Vis: Data access (read, write, subscrite/p, method cal, custon Vis Vis: Note: The number of technology Vis • OPC UA Yes Vis: Note: The number of technology Vis<			,	,
PROFIBUS DP slave SMATIC communication PROFIBUS DP master Aumber of DP slaves, max. PROFIBUS DP master Aumber of connections, max. Sub, with regrated interfaces of the CPU and connected CPs / CMs PROFIBUS or PROFINET PROFIBUS or PROFINET PROFIBUS or PROFINET SMATHCOMMENT Sub, with regrated interfaces of the CPU and connected CPs / CMs SMATHCOMMENT SMATHCOMMENT SMATHCOMMENT Yes, MPP Alaternameter, and with a same provided interfaces of the CPU and connected CPs / CMs SMATHCOMMENT Yes, SPEQUENCE Yes, MPP Alaternameter, and with a same provided interfaces of the CPU and connected CPs / CMs SMATHCOMMENT Yes, SPEQUENCE Yes, MPP Alaternameter, and with a same provided interfaces of the CPU and connected CPs / CMs Yes, MPP Alaternameter, and with a same provided interfaces Yes, SPEQUENCE Yes, MPP Alaternameter, and with a same provided interfaces Yes, SPEQUENCE Yes,				
SiMATIC communication Yes Yes Yes PROFIBUS DP master Number of DP staves, max. Table in total, up to 1 000 distributed U0 devices can be connected via A51, PROFIBUS or PROFINET Protocols Number of connections, max. 320, via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces of the CPU and connected CPs / CMs Set via integrated interfaces (X1) only via 1st interface (X1) only via 1st interface (X1) Ves: MRP Automanager according to IEC 62439-2 Edition 3.0 Wes MRP hing node according to IEC 62439-2 Edition 3.0 Wes MRP hing node according to IEC 62439-2 Edition 3.0 Ves: Requirement: IRT Ves: Requirement: IRT Ves: Requirement: IRT Ves: Requirement: IRT Ves: Data access (read, write, subscribe), method call, custom address pace Ves	 PROFIBUS DP master 		Yes	Yes
PROFIBUS DP master 125 In total, up to 1,000 distributed U0 devices can be connected via AS-i, PROFIBUS or PROFINET 125 In total, up to 1,000 distributed U0 devices can be connected via AS-i, PROFIBUS or PROFINET 125 In total, up to 1,000 distributed U0 devices can be connected via PROFIBUS or PROFINET Protecols Number of connections, max. 320, via integrated interfaces of the CPU and connected CP2 / CMs 384, via integrated interfaces of the CPU and connected CP2 / CMs 384, via integrated interfaces of the CPU and connected CP2 / CMs Redundancy mode 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 3.0 IEC 62439-2 Edition 3.0 IEC 62439-2 Edition 3.0 - MRPD Yes, RMP Ing node according to IEC 62439-2 Edition 3.0 IEC 62439-2 Edition 3.0 IEC 62439-2 Edition 3.0 - MRPD Yes, RMP ing node according to IEC 62439-2 Edition 3.0 Yes, Requirement: IRT Yes, Requirement: IRT - Strouting Yes, Netherment, IRT Yes, Netherment, IRT Yes, Netherment, IRT Yes: Coult accees (read, write, subscribe), method call, custon address space Yes • OPC UA Client Yes Yes Yes Yes Yes • OPC UA Client Yes Yes Y	 PROFIBUS DP slave 		No	No
Number of DP slaves, max. 125: In total, up to 1 000 distribution 27: In total, up to 1 000 distribution 28: In total, up to 1 000 distribution 29: In total, up to 1 000 distri	 SIMATIC communication 		Yes	Yes
devices can be connected via AS-i, Protocols devices can be connected via AS-i, PROFIBUS or PROFINET devices can be connected via AS-i, PROFIBUS or PROFINET Number of connections 320, via integrated interfaces of the CPU and connected CPs / CMs 384, via integrated interfaces of CPU and connected CPs / CMs 384, via integrated interfaces of CPU and connected CPs / CMs Redundancy mode - Media redundancy only via 1st interface (X1) only via 1st interface (X1) only via 1st interface (X1) - MRP Yes: MPP Automanager according to IEC 62439-2 Edition 2.0 Yes: MPP Automanager according to IEC 62439-2 Edition 2.0 Yes: MPP Automanager according to IEC 62439-2 Edition 2.0 Yes: Requirement: IRT - MRPD Yes: Requirement: IRT Yes: Requirement: IRT Yes: Requirement: IRT Yes: Requirement: IRT - Switchover time on line break, yp. 200 ms: For MRP, bumpless for MPD Yes Yes Yes - OPC UA Yes: Net: The number of technology objects affects the cycle line of the poblect affects the cycle l	PROFIBUS DP master			
Number of connections 320; via integrated interfaces of the CPU and connected CPs / CMs 384; via integrated interfaces of CPU and connected CPs / CMs 384; via integrated interfaces of CPU and connected CPs / CMs Redundarcy mode Media redundancy only via 1st interface (X1) Ves: MRP Automanager accorr (interface (X1) Ves: MRP Automanager accorr (interface (X1) Ves: MRP Automanager accorr (interface (X1) Ves: Namager, MRP Client Ves: Namager, MRP Client <td>Number of DP slaves, max.</td> <td></td> <td>devices can be connected via AS-i,</td> <td>devices can be connected via AS-</td>	Number of DP slaves, max.		devices can be connected via AS-i,	devices can be connected via AS-
Number of connections, max. 200 via integrated interfaces of the GPU and connected CPs / CMs GPU and connecte	Protocols			
CPU and connected CPs / CMs Redundancy only via 1st interface (X1) Set (X1)	Number of connections			
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- Media redundancy only via 1st interface (X1) - MRP Ves: MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager: MRP Client Ves: MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager: MRP Client Ves: MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager: MRP Client Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: BMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0 Ves: SMRP ing node according to IEC 62439-2 Edition 3.0	-			
- MRP Key: MIP Automanager according to EG 624393-Edition 2.0, MRP Manager; MRP Client Key: MIP Automanager according to EG 624393-Edition 2.0, MRP Manager; MRP Client Key: MIP Automanager according to EG 62439-Edition 2.0, MRP Manager; MRP Client Key: MIP Automanager according to EG 62439-Edition 3.0 Key: Add according to EG 62439-Edition 3.0 Key: Data acces for edition 3.0 Key: Data acces for edition 3.0 Key: Data acces for editions according to editions	•			
IEC 62439-2 Edition 2,0, IEC 62439-2 Edition 2,0, IEC 62439-2 Edition 2,0, IEC 62439-2 Edition 3,0, - 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; Aequirement: IRT Yes; Requirement: IRT - MRPD Yes; Requirement: IRT Yes; Requirement: IRT Yes; Requirement: IRT Yes; Requirement: IRT - Number of stations in the ring, max, 50 50 50 50 SMMATIC communication Yes Yes Yes • S7 routing Yes Yes Yes • OPC UA Client Yes Yes Yes • OPC UA Client Yes Yes Yes • OPC UA Server Yes Yes Yes • Stations Yes Yes Yes Supported technology objects Yes Yes Yes Motion Control Yes Yes Yes Yes • Per oparam. selection guide via the PLC program. selection guide via the PLC program. selection guide via the the PLC program. selection guide via the the PLC program. selection guide via the the the PLC program. selection guide via the the the PLC program. selection guide via the	,	· · · ·		•
IEC 62439-2 Edition 3.0IEC 62439-2 Edition 3.0IEC 62439-2 Edition 3.0- MRPDYes; Requirement: IRTYes; Requirement: IRTYes; Requirement: IRT- Switchover time on line break, typ.200 ms; For MRP, bumpless for MRPD200 ms; For MRP, bumpless for MRP200 ms; For MRP, bumpless for MRP- Number of stations in the ring, max.505050SMATIC communicationYesYesYes- OPC UAYesYesYes- OPC UA ClientYesYesYes- OPC UA ServerYes; Data access (read, write, subscribe), method call, custon address spaceYes; Data access (read, write, subscribe), method call, custon address spaceYes; Note: The number of technology address space- Alarms and ConditionsYes; Note: The number of technology objectsYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the PLC program; selection guide	- MRP	IEC 62439-2 Edition 2.0,	IEC 62439-2 Edition 2.0,	
- 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 S0 SIMATIC communication 50 50 50 SY routing Yes Yes Yes OPC UA - 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; Note: The number of technology add	- MRP interconnection, supported			Yes; as MRP ring node according IEC 62439-2 Edition 3.0
- Number of stations in the ring, max. 50 50 50 SIMATIC communication - - • S7 routing Yes Yes Yes • OPC UA - - Yes Yes • OPC UA Client 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 Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selection Tool Yes: Note: The number of technology objects affects the cycle time of the TLA Selecti	- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
SIMATIC communication Yes Yes Yes • 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 • Alarms and Conditions Yes; Note: The number of technology objects 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 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 • Per speed-controlled axis 40 40 40 90 • per spinchronous axis 160 160 160 90 90 90			200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MF
• \$7 routingYesYesYesYesOPC UAYesYesYesYes• OPC UA ClientYesSetYesYes• OPC UA ServerYesData access (read, write, subscribe), method call, custom address spaceYes: Data access (read, write, subscribe), method call, custom address spaceYes• Alarms and ConditionsYesYesYesYes• Alarms and ConditionsYesYesYesYes• Motion ControlYes: Note: The number of technology objects affects the cycle time of the cycle time of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycle time of the CP corgram; selection roolYes; Note: The number of technology objects affects the cycl	- Number of stations in the ring, max.	50	50	50
OPC UA Yes Yes Yes Yes Yes Yes Yes Yes Data access (read, write, subscribe), method call, custom address space Yes Yes Data access (read, write, subscribe), method call, custom address space Yes Yes Subscribe), method call, custom address space Yes Yes Subscribe), method call, custom address space Yes Yes <td>SIMATIC communication</td> <td></td> <td></td> <td></td>	SIMATIC communication			
• OPC UA ClientYesYesYesYes• OPC UA ServerYes: Data access (read, write, subscribe), method call, custom address spaceYes: Data access (read, write, subscribe), method call, custom address spaceYes: Data access (read, write, subscribe), method call, custom address spaceYes: Data access (read, write, subscribe), method call, custom address spaceYes: Data access (read, write, subscribe), method call, custom address space• Alarms and ConditionsYesYesYesYesSupported technology objectsYes: Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the PLC program; selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the ThA Selection ToolYes: Note: The number of technology objects affects the cycle time of the ThA Selection ToolYes: Note: The number of technology objects affects the cycle time of the ThA Selection ToolYes: Note: The number of technology objects affects the cycle time of the ThA Selection ToolYes: Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the PLC program; selection ToolYes: Note: The number of technology objects affects the cycle time of the Note: Note: The Selection ToolYes: Note: The Net: Note: The Selection T		Yes	Yes	Yes
• OPC UA ServerYes; Data access (read, write, subscribe), method call, custom address spaceYes; Data access (read, write, subscribe), method call, custom address spaceYes;* Jarms and ConditionsYes; Note: The number of technology objects affects the cycle time of tech PLC program; selection guide via the PLC program; selection guide via the Selection ToolYes; Note: The number of technology objects affects the cycle time of PLC program; selection guide via the Selection ToolYes; Note: The number of technology objects affects the cycle time of PLC program; selection guide via the <b< td=""><td></td><td></td><td></td><td></td></b<>				
subscribe), method call, custom address spacesubscribe), method call, custom address spacesubscribe), method call, custom address space• Alarms and ConditionsYesYesYesSupported technology objectsYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection ToolYes; Note: The number of technology objects affects the cycle time of the TIA Selection ToolYes; Note: The number of technology objects affects the cycle time of the TIA Selection ToolYes; Note: The number of technology objects affects the cycle time of the Selection guide via the TIA Selection ToolYes; Note: The number of technology objects affects the cycle time of the Selection Tool• Number of available Motion Control resources • per speed-controlled axis404040• per positioning axis808080• per synchronous axis160160160• per output cam • per cam track202020• per cam track160160160• per probe404040• PID_CompactYes; Universal PID controller with integrated optimizationYes; Universal PID controller with integrated optimization• PID_CompactYes; PID controller with integrated optimization for valvesYes; PID controller with integrated optimization for valvesYes; PID controller with integrated optimization for valves• PID-TempYes; PID controller with inte				
Supported technology objectsMotion ControlYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection ToolYes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TA Selection Tool• Number of available Motion Control resources for technology objects10 24015 36015 360• per speed-controlled axis404040• per positioning axis808080• per output cam202020• per output cam204040• per probe404040• PID_CompactYes; Universal PID controller with integrated optimizationYes; PID controller with integrated opt	OPC UA Server	subscribe), method call, custom	subscribe), method call, custom	subscribe), method call, custom
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 PID_3Step Yes; PID controller with integrated optimization for valves PID-Temp Yes; PID controller with integrated 				Yes; Universal PID controller with integrated optimization
PID-Temp Yes; PID controller with integrated Yes; PID control	PID_3Step	Yes; PID controller with integrated	Yes; PID controller with integrated	Yes; PID controller with integrated
	PID-Temp	Yes; PID controller with integrated	Yes; PID controller with integrated	Yes; PID controller with integrated
Counting and measuring	Counting and measuring			

Central processing units

Standard CPUs

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, 4 MB Prog., 20MB Data	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

Central processing units

SIPLUS standard CPUs

Overview SIPLUS CPU 1511-1 PN

Overview SIPLUS CPU 1513-1 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET I/O controller**
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
 - OPC UA Data Access
 - OPC UA Security
 - OPC UA Methods Call, Support
- OPC UA Companion Specifications
- · Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speedcontrolled 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
- SIMATIC Memory Card required for operation of the CPU

Note:

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



- The CPU for applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on • PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET I/O controller**
- OPC UA server and client as runtime option for the easy connection of SIPLUS S7-1500 to non-Siemens devices/systems with the functions:
- OPC UA Data Access
- OPC UA Security
 OPC UA Methods Call, Support
- OPC UA Companion Specifications
- · Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speedcontrolled 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
- SIMATIC Memory Card required for operation of the CPU

Note:

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

Central processing units

SIPLUS standard CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- SIMATIC Memory Card required for operation of the CPU

Note:

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

Overview SIPLUS CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

SIMATIC Memory Card required for operation of the CPU

Note:

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

SIPLUS standard CPUs

Overview SIPLUS CPU 1518-4 PN/DP MFP



- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding applications with demanding 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 (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, and continues to meet the high demands of the S7-1500 in respect of ease of maintenance and ruggedness.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- 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. Control-independent applications, e.g. protocol converters, database applications 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, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500STM 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 corresponding standard products. SIPLUS extreme-specific information was added.

Central processing units

SIPLUS standard CPUs

Ordering data	Article No.		Article No.
SIPLUS CPU 1511-1 PN		SIPLUS CPU 1518-4 PN/DP MFP	6AG1518-4AX00-4AC0
(extended temperature range and exposure to media)		(Exposure to media)	
150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required		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,	
Temperature range -40 +60 °C	6AG1511-1AK02-2AB0	PROFINET IRT interface with 2-port switch,	
Temperature range -40 +70 °C	6AG1511-1AK02-7AB0	PROFINET RT interface, Ethernet interface.	
SIPLUS CPU 1513-1 PN		PROFIBUS interface;	
(extended temperature range and exposure to media)		C/C++ runtime and OPC UA runtime license included; SIMATIC Memory Card required	
300 KB work memory for program, 1.5 MB for data, PROFINET IRT		Accessories	
interface with 2-port switch;		System power supply	
SIMATIC Memory Card required Temperature range -40 +60 °C	6AG1513-1AL02-2AB0	(extended temperature range and exposure to media)	
Temperature range -40 +70 °C	6AG1513-1AL02-7AB0	24 V DC input voltage, power 25 W	6AG1505-0KA00-7AB0
SIPLUS CPU 1516-3 PN/DP		24/48/60 V DC input voltage, power 60 W	6AG1505-0RA00-7AB0
(extended temperature range and exposure to media)		120/230 V AC input voltage, power 60 W	6AG1507-0RA00-7AB0
1 MB work memory for program, 5 MB for data,		Load current supply	
PROFINET IRT interface with 2-port switch, PROFINET RT interface,		(extended temperature range and exposure to media)	
PROFIBUS interface; SIMATIC Memory Card required		24 V DC/3 A	6AG1332-4BA00-7AA0
Temperature range -40 +60 °C	6AG1516-3AN01-2AB0	24 V DC/8 A	6AG1333-4BA00-7AA0
(startup -20 °C)	UAG 1310-3ANU I-2ABU	Display	
Temperature range -40 +70 °C	6AG1516-3AN02-7AB0	(extended temperature range and exposure to media)	
SIPLUS CPU 1518-4 PN/DP (Exposure to media)	6AG1518-4AP00-4AB0	For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	6AG1591-1AB00-2AA0
3 MB work memory for program, 10 MB for data,		For SIPLUS CPU 1516-3 PN/DP, 6AG1516-3AN01-2AB0; spare part	6AG1591-1BA01-2AA0
PROFINET IRT interface with 2-port switch, PROFINET RT interface,		For SIPLUS CPU 1516-3 PN/DP, 6AG1516-3AN02-7AB0; spare part	6AG1591-1BB00-2AA0
Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required		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 4/10

Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

SIPLUS standard CPUs

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)			
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)			
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, *			
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; *			

Central processing units

SIPLUS standard CPUs

Article number Based on	6AG1511-1AK02-2AB0 6ES7511-1AK02-0AB0	6AG1511-1AK02-7AB0 6ES7511-1AK02-0AB0	6AG1513-1AL02-2AB0 6ES7513-1AL02-0AB0	6AG1513-1AL02-7AB0 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)			
 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 Protection against fouling acc. to 	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection	Yes; Class 2 for high reliability Yes; Type 1 protection
EN 60664-3				
 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Performance of 	Yes; Discoloration of coating possible during service life Yes; Conformal coating,	Yes; Discoloration of coating possible during service life Yes; Conformal coating,	Yes; Discoloration of coating possible during service life Yes; Conformal coating,	Yes; Discoloration of coating possible during service life Yes; Conformal coating,
Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Class A	Class A	Class A	Class A
Article number	6AG1516-3AN01-2AB0	6AG1516-3AN02-7AB0	6AG1518-4AP00-4AB0	6AG1518-4AX00-4AC0
Based on	6ES7516-3AN01-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7516-3AN02-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7518-4AP00-0AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP	6ES7518-4AX00-1AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
Ambient conditions		,		
Ambient temperature during operation				
horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	-40 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)	0 °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; = 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; Startup @ -20 °C	-40 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
vertical installation, max.	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; 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	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 bei 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) bei 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) bei 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 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)

Central processing units

SIPLUS standard CPUs

Article number	6AG1516-3AN01-2AB0	6AG1516-3AN02-7AB0	6AG1518-4AP00-4AB0	6AG1518-4AX00-4AC0
Based on	6ES7516-3AN01-0AB0	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 faun 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, 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 requ
 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 ^o 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 trichlorethylem harmful gas concentratior 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 cover must remain in place over the unused interfaces duri 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 coati 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

Central processing units

Compact CPUs

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, period 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET IO controller**
- · OPC UA Server and Client as runtime option for the easy connection of 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
- Isochronous mode (distributed)
- 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, period 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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET IO controller**
- OPC UA Server and Client as runtime option for the easy connection of 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
- Isochronous mode (distributed)
- 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:

Central processing units

Compact CPUs

Ordering data	Article No.		Article No.
CPU 1511C-1 PN	6ES7511-1CK01-0AB0	System power supply	
175 KB work memory for program, 1 MB for data, 16 digital inputs,		For supplying the backplane bus of the S7-1500 Controller	
16 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed		24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required		24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
CPU 1512C-1 PN	6ES7512-1CK01-0AB0	24/48/60 V DC input voltage, power 60 W, buffering functionality	6ES7505-0RB00-0AB0
250 KB work memory for program, 1 MB for data, 32 digital inputs,		120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0
32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed		Power plug	6ES7590-8AA00-0AA0
counters, PROFINET IRT interface with 2-port switch, SIMATIC Memory Card required		With coding element for power supply module; spare part, 10 units	
Accessories		Load current supply	
SIMATIC Memory Card		24 V DC/3 A	6EP1332-4BA00
4 MB	6ES7954-8LC03-0AA0	24 V DC/8 A	6EP1333-4BA00
12 MB	6ES7954-8LE03-0AA0	Power supply connector	
		Spare part; for connecting the	
24 MB	6ES7954-8LF03-0AA0	24 V DC supply voltage	
256 MB	6ES7954-8LL03-0AA0	With push-in terminals	6ES7193-4JB00-0AA0
2 GB	6ES7954-8LP03-0AA0	IE FC RJ45 plugs	
32 GB	6ES7954-8LT03-0AA0	RJ45 plug connector for Industrial Ethernet with a rugged metal	
Front connector For 25 mm modules; including cable ties and individual labeling strips;	6ES7592-1BM00-0XA0	enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
push-in terminal 40-pin;		IE FC RJ45 plug 180	
spare part		180° cable outlet	
Shielding set I/O			CCK1001 10010 00 00
For 25 mm modules;	6ES7590-5CA10-0XA0	1 unit	6GK1901-1BB10-2AA0
infeed element, shield bracket, and shield terminal;		10 units	6GK1901-1BB10-2AB0
4 units, spare part (one shield set supplied with the module).		50 units	6GK1901-1BB10-2AE0
Shield terminal element	6ES7590-5BA00-0AA0	IE FC TP standard cable GP 2x2	6XV1840-2AH10
	6ES/390-3BA00-0AA0	4-wire, shielded TP installation cable for connection to IE FC RJ45	
10 units; spare part		outlet/IE FC RJ45 plug;	
SIMATIC S7-1500 DIN rail Fixed lengths, with grounding elements • 160 mm • 245 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0	PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• 482 mm • 530 mm	6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0	IE FC TP trailing cable 2 x 2 (type C)	6XV1840-3AH10
• 830 mm	6ES7590-1AJ30-0AA0	4-wire, shielded TP installation cable for connection to IE FC RJ45	
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval;	
• 2 000 mm	6ES7590-1BC00-0AA0	sold by the meter; max. delivery unit 1 000 m,	
PE connection element for 2 000 mm DIN rail	6ES7590-5AA00-0AA0	IE FC TP marine cable 2 x 2	6XV1840-4AH10
20 units		(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 1 000 m, minimum order quantity 20 m	
		IE FC stripping tool	6GK1901-1GA00
		Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

Central processing units

Compact CPUs

Ordering data	Article No.		Article No.
Display module 35 mm	6ES7591-1AB00-0AA0	STEP 7 Professional V17	
For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part		Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement:	
Cover 35 mm	6ES7591-4AB00-0AA0	Windows 10 (64-bit)	
For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part		 Windows 10 Professional Version 1909, 2004, 20H2 Windows 10 Enterprise Version 1909, 2004, 20H2 Windows 10 IoT Enterprise 2016 	
SIMATIC S7-1500 Starter Kit	6ES7511-1CK03-4YB5	LTSB • Windows 10 IoT Enterprise 2019	
Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day icense, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, 201102 V V/2 A power supply		LTSC Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation)	
PM 1507 24 V/3 A power supply, Ethernet cable, documentation		Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download	
		STEP 7 Professional V17, floating license	6ES7822-1AA06-0YA5
		STEP 7 Professional V17, floating license, software download including license key ¹⁾	6ES7822-1AE06-0YA5
		Email address required for delivery	
		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
		Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC HMI, SIMATIC PC-based Automation, SIMATIC PC57, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
		Current Manual Collection DVD and the three subsequent updates	

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
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		
Type of supply voltage	24 V DC	24 V DC
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

Central processing units

Compact CPUs

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
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		
• Туре	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
	Yes	Yes
 PROFINET IO Device 	163	
PROFINET IO DeviceSIMATIC communication	Yes	Yes
		Yes Yes; Optionally also encrypted
SIMATIC communication	Yes	

Central processing units

Compact CPUs

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
- PROFlenergy	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
- PROFlenergy	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

Central processing units

Compact CPUs

Technical specifications	
Article number	

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_3StepPID-Temp	Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Counting and measuring		
High-speed counter Ambient conditions	Yes	Yes
Ambient temperature during		
operation		
 horizontal installation, min. horizontal installation, max. 	-25 °C; No condensation 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	-25 °C; No condensation 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		
•	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 Know-how protection	Yes	Yes
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	4.050	4.000
Weight, approx.	1 050 g	1 360 g

Central processing units

Fail-safe CPUs

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 PLe according to ISO 13849
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1513F-1 PN



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode

Note:

Central processing units

Fail-safe CPUs

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 PLe according to ISO 13849
- Medium to high processing speed for binary and floatingpoint arithmetic
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speedcontrolled 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



- 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 failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- · High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated web server with the option of creating user-defined web pages.

Note:

Central processing units

Fail-safe CPUs

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 PLe according to ISO 13849
- · High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 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 failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages.

Note:

Central processing units

Fail-safe CPUs

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 machines, special machines 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 under 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 (data access) as runtime option for easy connection of the SIMATIC S7-1500 to non-Siemens 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.

This means that, in addition to the control function, it is also possible to process typical PC applications on the multifunctional platform, e.g. tasks that:

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

Besides the option of running C/C++ code in the standard STEP 7 program, the multi-functional platform CPU 1518F-4 PN/DP MFP thus provides an additional second independent runtime environment which facilitates execution of C/C++ applications in parallel to the STEP 7 program if required. Control-independent applications, e.g. protocol converters, database applications 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 part. 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, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500STM 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:

Central processing units

Fail-safe CPUs

Ordering data	Article No.		Article No.
CPU 1511F-1 PN	6ES7511-1FK02-0AB0	Accessories	
Fail-safe CPU,		SIMATIC Memory Card	
230 KB work memory for program, 1 MB for data,		4 MB	6ES7954-8LC03-0AA0
PROFINET IRT interface		12 MB	6ES7954-8LE03-0AA0
with 2-port switch; SIMATIC Memory Card required		24 MB	6ES7954-8LF03-0AA0
CPU 1513F-1 PN	6ES7513-1FL02-0AB0	256 MB	6ES7954-8LL03-0AA0
Fail-safe CPU, 450 KB work memory for program,		2 GB, also for CPU 1518F-4 PN/DP MFP	6ES7954-8LP03-0AA0
1.5 MB for data, PROFINET IRT interface with 2-port switch;		32 GB, also for CPU 1518F-4 PN/DP MFP	6ES7954-8LT03-0AA0
SIMATIC Memory Card required		SIMATIC S7-1500 DIN rail	
CPU 1515F-2 PN 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	6ES7515-2FM02-0AB0	Fixed lengths, with grounding elements • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0
CPU 1516F-3 PN/DP	6ES7516-3FN02-0AB0	For cutting to length by customer, without drill holes; grounding	
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;		elements must be ordered separately • 2 000 mm PE connection element for 2 000 mm DIN rail 20 units	6ES7590-1BC00-0AA0 6ES7590-5AA00-0AA0
SIMATIC Memory Card required		System power supply	
CPU 1517F-3 PN/DP Fail-safe CPU, 3 MB work memory for program,	6ES7517-3FP00-0AB0	For supplying the backplane bus of the S7-1500 Controller	
8 MB for data,		24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
PROFINET IRT interface with 2-port switch, PROFINET RT interface,		24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
PROFIBUS interface; SIMATIC Memory Card required		24/48/60 V DC input voltage, power 60 W, buffering functionality	6ES7505-0RB00-0AB0
CPU 1518F-4 PN/DP Fail-safe CPU,	6ES7518-4FP00-0AB0	120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0
6 MB work memory for program, 20 MB for data,		Power plug	6ES7590-8AA00-0AA0
PROFINET IRT interface with 2-port switch,		With coding element for power supply module; spare part, 10 units	
PROFINET RT interface, Ethernet interface.		Load current supply	
PROFIBUS interface;		24 V DC/3 A	6EP1332-4BA00
SIMATIC Memory Card required	6567519 45V00 1400	24 V DC/8 A	6EP1333-4BA00
CPU 1518F-4 PN/DP MFP	6ES7518-4FX00-1AC0	Power supply connector	
CPU 1518F-4 PN/DP MFP, including C/C++ Runtime and OPC UA runtime license		Spare part; for connecting the 24 V DC supply voltage	
		With push-in terminals	6ES7193-4JB00-0AA0

Central processing units

Fail-safe CPUs

Ordering data	Article No.		Article No.
PROFIBUS FastConnect		IE FC TP standard cable GP 2x2	6XV1840-2AH10
RS 485 bus connector with 90° cable outlet		4-wire, shielded TP installation	
With insulation displacement, max. transmission rate 12 Mbps		cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible;	
Without programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BA70-0XA0	with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
With programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BB70-0XA0	IE FC TP trailing cable 2 x 2 (type C)	6XV1840-3AH10
PROFIBUS FC standard cable GP	6XV1830-0EH10	4-wire, shielded TP installation cable for connection to IE FC RJ45	
Standard type with special design for quick mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC robust cable 2-wire, shielded;	6XV1830-0JH10	IE FC TP marine cable 2 x 2	6XV1840-4AH10
sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		(type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with	
PROFIBUS FC flexible cable	6XV1831-2K	marine approval;	
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m,		sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
minimum order quantity 20 m		IE FC stripping tool	6GK1901-1GA00
PROFIBUS FC trailing cable 2-wire, shielded;		Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		Display module 35 mm	6ES7591-1AB00-0AA0
Sheath color: Petrol	6XV1830-3EH10	For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN,	
Sheath color: Violet	6XV1831-2L	CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	
PROFIBUS FC food cable	6XV1830-0GH10	Display module 70 mm	6ES7591-1BB00-0AA0
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
PROFIBUS FC ground cable	6XV1830-3FH10	Display	6ES7591-1BA02-0AA0
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP,	
PROFIBUS FC FRNC cable GP	6XV1830-0LH10	CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	
2-wire, shielded, flame-retardant, with copolymer		Cover 35 mm	6ES7591-4AB00-0AA0
protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		For CPU 1511-1PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	
PROFIBUS FastConnect stripping tool	6GK1905-6AA00	Cover 70 mm	6ES7591-4BB00-0AA0
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables		For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
IE FC RJ45 plugs		Front cover for PROFIBUS DP	6ES7591-8AA00-0AA0
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		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	
IE FC RJ45 plug 180			
180° cable outlet			
1 unit	6GK1901-1BB10-2AA0		
10 units	6GK1901-1BB10-2AB0		
50 units	6GK1901-1BB10-2AE0		

Central processing units

Fail-safe CPUs

4

Ordering data	Article No.		Article No.
SIMATIC S7-1500 Starter Kit	6ES7511-1CK03-4YB5	SIMATIC ODK 1500S	
Comprising: CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day icense, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation		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
STEP 7 Professional V17 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement:		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
Windows 10 (64-bit)		Email address required for delivery	
 Windows 10 Professional Version 1909, 2004, 20H2 Windows 10 Enterprise Version 1909, 2004, 20H2 Windows 10 IoT Enterprise 2016 LTSB Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) 		Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade to V2.5 for existing installations as of V1.0; software download including license key (floating license) ¹⁾	6ES7806-2CD03-0YK0
 Windows Server 2016 Standard 		Email address required for delivery	
(full installation) • Windows Server 2019 Standard		SIMATIC Target for Simulink V5.0	
(full installation)		Download incl. license key ¹⁾	6ES7823-1BE04-0YA5
Type of delivery: 9 languages: de, en, zh included, fr,		Email address required for delivery	
sp, it, ru, jp, kr as download STEP 7 Professional V17,	6ES7822-1AA07-0YA5	Upgrade of SIMATIC Target 1500S for Simulink V2.0V4.0 to V5.0, download incl. license key ¹⁾	6ES7823-1BE04-0YE5
loating license		Email address required for delivery	
STEP 7 Professional V17, iloating license, software download including icense key ¹⁾	6ES7822-1AE07-0YA5	SIMATIC Target + ODK 1500S bundle	6ES7823-1BE14-0YA0
Email address required for delivery		Download incl. license key ¹⁾	
STEP 7 Safety Advanced V17		Email address required for delivery	0507000 0¥004 0¥50
Task: Engineering tool for configuring and orogramming fail-safe user orograms 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 200SP, ET 200pro and		SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HII, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	6ES7998-8XC01-8YE0
ET 200eco Requirement:		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
STEP 7 Professional V17		Current Manual Collection DVD and	
Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software s an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the icense key supplied in each case.		the three subsequent updates	
Floating license for 1 user; icense key on USB flash drive	6ES7833-1FA17-0YA5		
Floating license for 1 user, icense key for download ¹⁾ ;	6ES7833-1FA17-0YH5		

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

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Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

Fail-safe CPUs

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog.,3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
General information	225KB plog, TNIB data	450KB FIOU., 1,51VIB UALA	750KB FIOU.,SIVIB Dala	1,51VIB FIOY, 51VIB Data
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	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1AK01-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1AL01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2AM01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage	241100	241100	041100	041100
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory	005 like to	450 lubu ta	750 lub. 4-	1 C Minute
integrated (for program)	225 kbyte	450 kbyte	750 kbyte	1.5 Mbyte
integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte
		00 OL 1		00 OL 1
Plug-in (SIMATIC Memory Card), max	. 32 GDYIE	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times	60 pp	10 pp	20 pg	10 pp
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 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)			
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
Number	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 Outputs	32 kbyte; All inputs are in the process image 32 kbyte; All outputs are in	32 kbyte; All inputs are in the process image 32 kbyte; All outputs are in	32 kbyte; All inputs are in the process image 32 kbyte; All outputs are in	32 kbyte; All inputs are in the process image 32 kbyte; All outputs are in
Calpalo	the process image	the process image	the process image	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; MRP Automanager according to IEC 62439-2 Edition 2.0			

Central processing units

Fail-safe CPUs

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog.,3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
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
- PROFlenergy	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 256 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	for PROFINET IO, on the number of IO devices, and	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	for PROFINET IO, on the number of IO devices, and
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFlenergy	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	Yes; Optionally also
• Open le communication			encrypted	encrypted
Web server			encrypted Yes	encrypted Yes

Central processing units

Fail-safe CPUs

Services Yes Ves - PG/OP communication No No - Incret data exchange No No - Intre data exchange No No - PROFInergy Yes; per user program Yes; per user program - Number of connectable No No - Number of connectable S2, in total, up to 100 distributed (I/0 devices connectable) - Number of connectable S2, in total, up to 32, in total across all - Number of connectable S2 S2 - Obvices for RT, max. S2 S2 - All secons all S1, in total across all S1, in total across all - Number of IO Devices that can be simultaneously acrossed to the update time also depends on onthe also depends on other also depends on othe also depends on othe also depends on othe	Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
Services Yes Ves - PG/OP communication No No - Incret data exchange No No - Intre data exchange No No - PROFInergy Yes; per user program Yes; per user program - Number of connectable No No - Number of connectable S2, in total, up to 100 distributed (I/0 devices connectable) - Number of connectable S2, in total, up to 32, in total across all - Number of connectable S2 S2 - Obvices for RT, max. S2 S2 - All secons all S1, in total across all S1, in total across all - Number of IO Devices that can be simultaneously acrossed to the update time also depends on onthe also depends on other also depends on othe also depends on othe also depends on othe					
PGQ0P communication Yes Yes Isochronous mode No No Isochronous mode No No Image: PROFInergy No No PROFInergy Yes; per user program Yes; per user program No No No No Number of connectable 32; In total, up to 100 distributed UO devices, rank are be connectable with AS-1; PROFIBUS or PROFINET 32 ID Devices for RT, max. 32 32 are be connectable with AS-1; PROFIBUS or PROFINET ID Devices for RT, max. 32 32 are be simulaterously or PROFINET Author of ID Devices for RT, max. 32 32 32 ID Devices for RT, max. 32 32 32 ID Devices for RT, max. 32 32 32 ID Mumber of ID Devices per tool, max. 8 8 7 Vunder of Devices per tool, max. 8 9 7 Vidating times Vidation share set for PROFINET IO, on the use of the updatic vidation share set for PROFINET IO, on the updatic vidation share set for PROFINET IO, on the updatic vidation share set for PROFINET IO, on the updatic vidation share set for PROFINET IO, on the updatic vidation share set for PROFINET IO, on the updatic vidat	PROFINET IO Controller				
- Isochronous mode - Direct data exchange - IRT - ROCPENENT - ROCPENENT - ROCPENENT - Number of connectable - Number of connectable - Number of connectable - Obvices, max. - of which in line, max. - of which in line	Services				
 Direct data exchange IRT No <l< td=""><td>- PG/OP communication</td><td></td><td></td><td>Yes</td><td>Yes</td></l<>	- PG/OP communication			Yes	Yes
IRT No No PROFINET IO Devices services program Yes; per user program Yes; per user program Number of connectable 32: In total, up to 32: In total, up to 32: In total, up to Number of connectable 32: In total, up to Number of connectable 32: In total, up to IND Devices of RT, max. 32 32: In total across all interfaces 32: In total across all interfaces IN Updating times 32: In total across all interfaces 8 8 Updating times Yes; per user program Yes; per user program Yes; per user program PROFINET IO Devices per tool, max. Second across all interfaces The minimum value of the updat time also depends on the quantity of configured user data PROFINET IO Device Yes Yes Yes Yes PROFINET IO Device Yes<	- Isochronous mode			No	No
 PROFilenergy Worldrized startup Number of connectable Devices, max. Number of connectable Doevices, max. Number of connectable Doevices (ref. max. of which in line, max. Number of IO Devices that can be simulatory of the mainteneous of the theorem of the theorem	- Direct data exchange			No	No
 Prioritized startup Number of connectable ID Devices, max. Number of connectable ID Devices, max. Number of connectable ID Devices for RT, max. of which in line, max. Aurmber of IO Devices for RT, max. of which in line, max. Number of IO Devices per tool, max. Lipdaling times Updaling times Updaling times PROFINET IO Devices per tool, max. Lipdaling times Updaler time also depends on the quantity of configured user data PROFINET IO Devices per tool, max. Services PROFINET IO Devices per tool, max. Updaling times Updaling times Version PROFINET IO Devices per tool, max. Services PROFINET IO Device services all interfaces PROFINET IO Device services Protomous mode IRT Protomous mode IRT Protomous mode Protomous mode Protomous mode Protomous mode Shared device Shared device Protomous mode Shared device Protomous mode Protomous mode	- IRT			No	No
Number of connectable ID Devices, max.32: In total, up to 1000 distinued I/O devices can be connected via AS-i, PROFIBUS or PROFIBUS or PROFIBUS or PROFINET3232Number of connectable ID Devices for RT, max.323232of which in line, max.323232- Number of IO Devices tor RT, max.323232- Number of IO Devices per tool, max.888- Number of IO Devices per tool, max.888- Number of IO Devices per tool, max.888- Number of IO Devices per tool, max.7888- Number of IO Devices per tool, max.8877- Number of IO Devices per tool, max.7888- Number of IO Devices per tool, max.8877- Number of IO Devices per tool, max.7888- Number of IO Devices per tool, max.8877- PGOFINET IO Device Services77777- PGOFINET IO Device Services77777	- PROFlenergy			Yes; per user program	Yes; per user program
IO Devices, max. 100 distributed I/O devices, can be connected via AS-1, PROFINET 100 distributed I/O devices, can be connected via AS-1, PROFINET - Number of connectable 32 32 - of which in line, max. 32 32 - of which in line, max. 32 32 - Number of IO Devices per tool, max. 8; in total across all interfaces 8; in total across all interfaces - Number of IO Devices per tool, max. 8 8 - Updating times 8 8 - Updating times 100 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 update time also depends on the quantity of configured user data PROFINET IO Device Yes Yes Yes Services Yes Yes Yes - IRT No No No - IRT No No No No - Shared device Yes Yes Yes Yes - Shared device Yes Yes Yes Yes Yes - Number of IO Controllers with shared device, max. Yes Yes Yes Yes Yes Yes <td>- Prioritized startup</td> <td></td> <td></td> <td>No</td> <td>No</td>	- Prioritized startup			No	No
IO Devices for RT, max. 32 32 - of which in line, max. 32 32 Number of IO Devices that can be simultaneously activitate/deativided. 8, in total across all interfaces interfaces - Number of IO Devices per tool, max. 8 8 - Updating times 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 onthe quantity of configured user data PROFINET IO Device Yes Yes Yes Services Yes Yes Yes - FQOPO communication Yes Yes Yes - IBIT No No No No - FROFINET IO Device Yes Yes Yes Yes - FROFINET IO Device Yes Yes Yes Yes - FROFINET IO Device Yes Yes Yes Yes - FROFINET IO Device Yes Yes Yes Yes Yes - FROFINET IO Device Yes Yes Yes Yes Yes Yes </td <td></td> <td></td> <td></td> <td>1 000 distributed I/O devices can be connected via AS-i,</td> <td>1 000 distributed I/O devices can be connected via AS-i,</td>				1 000 distributed I/O devices can be connected via AS-i,	1 000 distributed I/O devices can be connected via AS-i,
- Number of IO Devices that can be simultaneously activited(deat(vided, max. - Vumber of IO Devices per tool, max. - Updating times - PROFINET IO Device - Stard device - Advective - No - No - No - PROFINET IO Device - Stard device - Advective - Advecti				32	32
activitad/(max.) interfaces 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 unmber of IO devices, and on the quantity of configured user data Interminimum value of the update time also depends on the quantity of configured user data PROFINET IO Device Yes Yes Yes Services No No No - IRT No No No - PROFINET IO Levice Yes; per user program Yes; per user program - PROFINET IO Device Yes; per user program Yes; per user program - PROFINET IO Device Yes; per user program Yes; per user program - IRT No No No - PROFINET IO Lotorloulers with shared device, max. Yes; per user program Yes; per user program - Retritor of IO Controllers with shared device Yes; per user program Yes; per user program - Asset management record Yes; per user program Yes; yes; yes user program - RS 485 - RS 485 Yes; X3 Yes; X3 - Number of Io Controllers with shared device, max. - RS 485 Yes; X3	- of which in line, max.			32	32
maxImaxImaxImax- Updating timesUpdating timesThe minimum value of the update time also depends on communication share set for PROFINET 10, on the number of 10 devices, and on the quantity of configured user dataImaxPROFINET 10 DeviceServicesImaxImaxServicesImaxYesYes- PG/0P communicationYesYes- Sec/roous modeYesYes- Isochronous modeNoNo- IRTNoNo- PROFINET 20 on the runner of 10 devicesYes- Proficited starupNoNo- Proficited starupYesYes- Astronous modeYesYes- Proficited starupNoNo- Shared deviceYesYes- Astronous of 10 devicesYesYes- Shared deviceYesYes- Shared deviceYesYes- Stared for the controllers with shared device, maxYes- Astronous of 10 devicesYesYes- Stared for the controllers with shared device, maxYes- Stared for the controllers with shared device, maxYes- Stared for the controllers with shared device, maxYes- Rof BUS DP masterYes- PROFIBUS DP masterYes- PROFIBUS DP slaveYes	can be simultaneously				
PROFINET IO Device update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quanity of configured user data umber of IO devices, and on the quanity of configured user data PROFINET IO Device -				8	8
ServicesImage: services<	- Opdaling limes			update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured	update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured
 PG/OP communication PG/OP communication Isochronous mode Isochronous mode No No No No PROFIenergy Prioritized startup Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record Shared activation of I-devices Asset management record Shared texpes PROFIBUS DP master PROFIBUS DP master PROFIBUS DP slave 	PROFINET IO Device				
 Isochronous mode IRT No No No No PROFlenergy Prioritized startup Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record Shared device Asset management record Shared tevice PROFIBUS DP master PROFIBUS DP master PROFIBUS DP slave 	Services				
IRT No No PROFlenergy 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 Yes; per user program Yes; per user program Interface types Yes Yes; per user program Yes; X3 Number of ports 1 Yes Yes PROFIBUS DP master Yes Yes Yes PROFIBUS DP slave No Yes No	- PG/OP communication			Yes	Yes
 PROFlenergy Prioritized startup No Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record Asset management record Asset management record Shared device Number of ports Number of ports PROFIBUS DP master PROFIBUS DP slave Ves per user program Proor in the proor in the proor	- Isochronous mode			No	No
 Prioritized startup Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record Yes; per user program Asset management record Yes; per user program Yes; X3 Number of ports PROFIBUS DP master PROFIBUS DP slave 	- IRT			No	No
- Shared device - Number of IO Controllers with shared device, max. - activation/deactivation of I-devices - Asset management record 3. Interface Interface types - RS 485 - Number of ports - RS 485 -	- PROFlenergy			Yes; per user program	Yes; per user program
Number of IO Controllers with shared device, max.44- activation/deactivation of I-devicesYes; per user programYes; per user program- Asset management recordYes; per user programYes; per user program3. Interface Interface typesInterface typesYes; per user program• RS 485YesYes; Yas• Number of portsYes; YasYes; Yas• PROFIBUS DP master • PROFIBUS DP slaveYesYes• RS 485YesYes• RS 485YesYes• RS 485YesYes• RS 485YesYes• Number of portsYesYes• PROFIBUS DP master • PROFIBUS DP slaveYes• RS 485YesYes• RS 485Yes• RS 485Yes<	- Prioritized startup			No	No
shared device, max. - activation/deactivation of I-devices - Asset management record 3. Interface Interface types - RS 485 - Number of ports Procols - PROFIBUS DP master - PROFIBUS DP slave	- Shared device			Yes	Yes
- Asset management record Yes; per user program Yes; per user program 3. Interface Interface types • RS 485 · · · · · · · · · · · · · · · · · · ·				4	4
3. Interface Interface Interface types Yes; X3 • RS 485 Yes; X3 • Number of ports 1 Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave No	- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
Interface types Yes; X3 • RS 485 Yes; X3 • Number of ports 1 Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave No	- Asset management record			Yes; per user program	Yes; per user program
• RS 485Yes; X3• Number of ports1ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP slaveNo	3. Interface				
• RS 485Yes; X3• Number of ports1ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP slaveNo	Interface types				
Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave No					Yes; X3
PROFIBUS DP master Yes No	Number of ports				1
PROFIBUS DP slave No	Protocols				
PROFIBUS DP slave No	PROFIBUS DP master				Yes
	 SIMATIC communication 				Yes

Central processing units

Fail-safe CPUs

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog.,3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
Protocols				
Number of connections				
Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode				
Media redundancy				
- Media redundancy	only via 1st interface (X1)	Yes; only via 1st interface (X1)	only via 1st interface (X1)	Yes; 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	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	Yes; Data access (read, write, subscribe), method call, custom address space
 Alarms and Conditions 		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	800	800	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	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

Technical specifications

Central processing units

Fail-safe CPUs

Article number	6ES7511-1FK02-0AB0	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB Prog., 1,5MB data	CPU 1515F-2 PN, 750KB Prog.,3MB Data	CPU 1516F-3 PN/DP, 1,5MB Prog, 5MB Data
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. 	-25 °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. 	-25 °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				
 Password for display 	Yes	Yes	Yes	Yes
Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe
 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.	405 g	405 g	830 g	845 g

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB Data	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			
Type of supply voltage	24 V DC	24 V DC	24 V DC
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
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
Time of day			
Clock			

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB 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 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 optiona
- IRT	Yes	Yes	Yes
- PROFlenergy	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 devices can be connected via AS- 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	also depends on communication share	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	also depends on communication sh
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
- PROFlenergy	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

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB Data	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
- PROFlenergy	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	also depends on communication share	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	also depends on communication share
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFlenergy	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

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB Data	CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
3. Interface			
nterface 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
		Yes	Yes
Web server		res	res
 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	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
4. Interface			
nterface 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 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 MR
 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

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB Data	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

Central processing units

Fail-safe CPUs

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, 6 MB Prog, 20MB Data	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	

Central processing units

SIPLUS fail-safe CPUs

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 PLC in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 corresponding standard products. SIPLUS extreme-specific information was added.

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 failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed $\ensuremath{\text{I/O}}$
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- · 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.

Central processing units

SIPLUS fail-safe CPUs

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 failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- · High processing speed for binary and floating-point arithmetic
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speedcontrolled 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 corresponding 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 failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speedcontrolled 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 corresponding standard products. SIPLUS extreme-specific information was added.

Article No.

6AG1513-1FL02-2AB0

6AG1515-2FM02-2AB0

6AG1516-3FN02-2AB0

Central processing units

SIPLUS fail-safe CPUs

(extended temperature range and

SIPLUS CPU 1513F-1 PN

Ordering data

exposure to media)
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 (extended temperature range and exposure to media) 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 (extended temperature range and exposure to media)

Fail-safe CPU, 1.5 MB work memory for program,

6AG1518-4FP00-4AB0

5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required CPU 1518F-4 PN/DP (Exposure to media)

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

AccessoriesSystem power supply (extended temperature range and exposure to media)For supplying the backplane bus of the S7-1500 PLC24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W20/230 V AC input voltage, power 60 WLoad current supply (extended temperature range and exposure to media)24 V DC/3 A24 V DC/3 A24 V DC/8 ADisplay (extended temperature range and exposure to media)24 V DC/3 A6AG1503-4BA00-7AA024 V DC/3 A6AG1332-4BA00-7AA06AG1333-4BA00-7AA0CPU 1513F-1 PN; spare partFor SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1513F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare	AccessoriesSystem power supply (extended temperature range and exposure to media)For supplying the backplane bus of the S7-1500 PLC24 V DC input voltage, power 25 W24/48/60 V DC input voltage, power 60 W120/230 V AC input voltage, power 60 WLoad current supply (extended temperature range and exposure to media)24 V DC/3 A24 V DC/3 A24 V DC/3 A6AG1332-4BA00-7AA024 V DC/3 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)24 V DC/8 A6AG1591-1AB00-2AA0 spare partFor SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1513F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP;6AG1591-1BB00-2AA06AG1591-1BA02-2AA0
System power supply (extended temperature range and exposure to media)6AG1505-0KA00-7AB024 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W6AG1505-0KA00-7AB022/30 V AC input voltage, power 60 W6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB024 V DC/30 V AC input voltage, power 60 W6AG1507-0RA00-7AB024 V DC/30 V AC input voltage, power 60 W6AG1507-0RA00-7AB024 V DC/3 A6AG1332-4BA00-7AA024 V DC/3 A6AG1333-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0	System power supply (extended temperature range and exposure to media)Gamma StatusFor supplying the backplane bus of the S7-1500 PLCGAG1505-0KA00-7AB0 GAG1505-0KA00-7AB0 GAG1505-0RA00-7AB0 GAG1505-0RA00-7AB0 GAG1507-0RA00-7AB0 power 60 W24/48/60 V DC input voltage, power 60 WGAG1507-0RA00-7AB0 GAG1507-0RA00-7AB0120/230 V AC input voltage, power 60 WGAG1507-0RA00-7AB024 V D2/30 V AC input voltage, power 60 WGAG1332-4BA00-7AA024 V DC/3 AGAG1333-4BA00-7AA0 GAG1333-4BA00-7AA024 V DC/3 AGAG1333-4BA00-7AA024 V DC/8 AGAG1591-1AB00-2AA0Display (extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare partGAG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1518-4F PN/DP; spare partGAG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare partGAG1591-1BA02-2AA0CPU 1518-4F PN/DP; spare partGAG1591-1BA02-2AA0Cher accessoriesSee SIMATIC S7-1500,
(extended temperature range and exposure to media)6AG1505-0KA00-7AB024 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W6AG1505-0KA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0Load current supply (extended temperature range and exposure to media)6AG1332-4BA00-7AA024 V DC/3 A6AG1333-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	(extended temperature range and exposure to media)Additional For supplying the backplane bus of the S7-1500 PLC24 V DC input voltage, power 25 W6AG1505-0KA00-7AB0 6AG1505-0RA00-7AB0 power 60 W120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0 6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0 6AG1507-0RA00-7AB0Load current supply (extended temperature range and exposure to media)6AG1332-4BA00-7AA0 6AG1333-4BA00-7AA024 V DC/3 A6AG1333-4BA00-7AA024 V DC/8 A6AG1533-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0Cother accessoriesSee SIMATIC S7-1500,
exposure to media)For supplying the backplane bus of the S7-1500 PLC24 V DC input voltage, power 25 W6AG1505-0KA00-7AB024/48/60 V DC input voltage, power 60 W120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB024 V DC/3 A24 V DC/3 A24 V DC/3 A6AG1332-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA024 V DC/8 A6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	exposure to media)For supplying the backplane bus of the S7-1500 PLC24 V DC input voltage, power 25 W24/48/60 V DC input voltage, power 60 W120/230 V AC input voltage, power 60 WLoad current supply (extended temperature range and exposure to media)24 V DC/3 A24 V DC/8 ADisplay (extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1515F-2 PN, CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partCother accessoriesSee SIMATIC S7-1500,
the S7-1500 PLC24 V DC input voltage, power 25 W6AG1505-0KA00-7AB024/48/60 V DC input voltage, power 60 W6AG1505-0RA00-7AB0120/230 V AC input voltage, power 60 W6AG1507-0RA00-7AB0Load current supply (extended temperature range and exposure to media)6AG1332-4BA00-7AA024 V DC/3 A6AG1332-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	the S7-1500 PLC24 V DC input voltage, power 25 W24/48/60 V DC input voltage, power 60 W120/230 V AC input voltage, power 60 WLoad current supply(extended temperature range and exposure to media)24 V DC/3 A24 V DC/8 ADisplay (extended temperature range and exposure to media)24 V DC/8 AFor SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1515F-2 PN, CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partCharacteria ConstructionCharacteria See SIMATIC S7-1500,
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exposure to media)624 V DC/3 A6AG1332-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA0Display(extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	exposure to media)624 V DC/3 A6AG1332-4BA00-7AA024 V DC/8 A6AG1333-4BA00-7AA0Display(extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0Cher accessoriesSee SIMATIC S7-1500,
24 V DC/8 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	24 V DC/8 A6AG1333-4BA00-7AA0Display (extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0Cother accessoriesSee SIMATIC S7-1500,
Display(extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare part	Display(extended temperature range and exposure to media)For SIPLUS CPU 1513F-1 PN; spare partFor SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partFor SIPLUS CPU 1518-4F PN/DP; spare partGAG1591-1BA02-2AA0 See SIMATIC S7-1500,
(extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	(extended temperature range and exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0Spare part6AG1591-1BA02-2AA0Other accessoriesSee SIMATIC S7-1500,
exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	exposure to media)6AG1591-1AB00-2AA0For SIPLUS CPU 1513F-1 PN; spare part6AG1591-1AB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0Other accessoriesSee SIMATIC S7-1500,
spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0	spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part6AG1591-1BB00-2AA0For SIPLUS CPU 1518-4F PN/DP; spare part6AG1591-1BA02-2AA0Other accessoriesSee SIMATIC S7-1500,
CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part For SIPLUS CPU 1518-4F PN/DP; spare part GAG1591-1BA02-2AA0	CPU 1516F-3 PN/DP and 6AG1591-1BA02-2AA0 For SIPLUS CPU 1518-4F PN/DP; 6AG1591-1BA02-2AA0 Spare part See SIMATIC S7-1500,
spare part	spare part Other accessories See SIMATIC S7-1500,

Article number	6AG1513-1FL02-2AB0	6AG1515-2FM02-2AB0	6AG1516-3FN02-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0	6ES7518-4FP00-0AB0
	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)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	O°C
horizontal installation, max.	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)	-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; = 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	3 000 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

Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

SIPLUS fail-safe CPUs

Article number	6AG1513-1FL02-2AB0	6AG1515-2FM02-2AB0	6AG1516-3FN02-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7513-1FL02-0AB0	6ES7515-2FM02-0AB0	6ES7516-3FN02-0AB0	6ES7518-4FP00-0AB0
	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
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 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, 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 reques
 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)
 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!	* 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

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Central processing units

Redundant CPUs

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 controller 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 controller 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:

Central processing units

Redundant CPUs

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 PLe 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:

Drdering data	Article No.		Article No.
CPU 1513R-1 PN	6ES7513-1RL00-0AB0	Accessories	
SIMATIC S7-1500R CPU, 300 KB work memory for program, 1.5 MB for data, PROFINET RT interface with 2-port switch; SIMATIC Memory Card required		Synchronization modules For patch cable FOC up to 10 m For routing cable FOC up to 10 km Synchronization connecting	6ES7960-1CB00-0AA5 6ES7960-1FB00-0AA5
CPU 1515R-2 PN	6ES7515-2RM00-0AB0	cables FOC for S7-1500H	
SIMATIC S7-1500R CPU,	0E37515-2RM00-0AB0	Length 1 m	6ES7960-1BB00-5AA5
150 KB work memory for program,		Length 2 m	6ES7960-1BC00-5AA5
B MB for data, PROFINET RT interface		Length 10 m	6ES7960-1CB00-5AA5
vith 2-port switch,		SIMATIC Memory Card	
PROFINET interface; SIMATIC Memory Card required		4 MB	6ES7954-8LC03-0AA0
CPU 1517H-3 PN	6ES7517-3HP00-0AB0	12 MB	6ES7954-8LE03-0AA0
SIMATIC S7-1500H CPU,		24 MB	6ES7954-8LF03-0AA0
2 MB work memory for program, 3 MB for data,		256 MB	6ES7954-8LL03-0AA0
st PROFINET RT interface		2 GB	6ES7954-8LP03-0AA0
vith 2-port switch, 2nd PROFINET interface,		32 GB	6ES7954-8LT03-0AA0
Brd interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required		SIMATIC S7-1500 DIN rail Fixed lengths, with grounding elements	
SIMATIC S7-1500H CPU 1517H System Bundle Comprising 2 CPUs 517H-3 PN, I synchronization modules up to 0 m, 2 FOC synchronization ables (1 m)	6ES7500-0HP00-0AB0	 160 mm 245 mm 482 mm 530 mm 830 mm For cutting to length by customer, 	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0
CPU 1518HF-4 PN SIMATIC S7-1500H CPU, 9 MB work memory for program, 00 MB for data.	6ES7518-4JP00-0AB0	without drill holes; grounding elements must be ordered separately • 2 000 mm	6ES7590-1BC00-0AA0
Ist PROFINET RT interface vith 2-port switch, 2nd PROFINET interface, 3rd PROFINET interface, 1th/5th interface synchronization, command times for bit operations 4 ns;		PE connection element for 2 000 mm DIN rail 20 units	6ES7590-5AA00-0AA0
SIMÁTIC Memory Card required SIMATIC S7-1500HF CPU 1518HF System Bundle Comprising 2 CPUs 518HF-4 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization	6ES7 500-0JP00-0AB0		

Central processing units

Redundant CPUs

Ordering data	Article No.		Article No.
System power supply		IE FC stripping tool	6GK1901-1GA00
For supplying the backplane bus of the S7-1500 Controller		Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC	
24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0	cables	
24/48/60 V DC input voltage,	6ES7505-0RA00-0AB0		
power 60 W		For CPU 1513R-1 PN; spare part	6ES7591-1AA01-0AA0
24/48/60 V DC input voltage, power 60 W, buffering functionality	6ES7505-0RB00-0AB0	For CPU 1515R-2 PN, CPU 1517H-3 PN, CPU 1518HF-4 PN; spare part	6ES7591-1BA02-0AA0
120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0	STEP 7 Professional V17	
Power plug	6ES7590-8AA00-0AA0	(required for S7-1500R/H)	
With coding element for power supply module; spare part, 10 units		Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Load current supply		Requirement:	
24 V DC/3 A	6EP1332-4BA00	Windows 10 (64-bit) • Windows 10 Professional Version	
24 V DC/8 A	6EP1333-4BA00	1909, 2004, 20H2	
Power supply connector		Windows 10 Enterprise Version 1909, 2004, 20H2	
Spare part; for connecting the 24 V DC supply voltage	6ES7193-4JB00-0AA0	 Windows 10 IoT Enterprise 2016 LTSB Windows 10 IoT Enterprise 2019 	
With push-in terminals IE FC RJ45 plugs	0201130-10000-0AAU		
RJ45 plug connector for Industrial		Windows Server (64-bit) • Windows Server 2016 Standard	
Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC		(full installation) • Windows Server 2019 Standard (full installation) Type of delivery:	
installation cables		9 languages: de, en, zh included, fr,	
IE FC RJ45 plug 180		sp, it, ru, jp, kr as download	
180° cable outlet		STEP 7 Professional V17, floating license	6ES7822-1AA07-0YA5
1 unit	6GK1901-1BB10-2AA0	STEP 7 Professional V17,	6ES7822-1AE07-0YA5
10 units	6GK1901-1BB10-2AB0	floating license, software download including	
50 units	6GK1901-1BB10-2AE0	license key ¹⁾	
IE FC TP standard cable GP 2x2	6XV1840-2AH10	Email address required for delivery	
4-wire, shielded TP installation cable for connection to IE FC RJ45 outet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC HMI, SIMATIC Sensord	6ES7998-8XC01-8YE0
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation	6XV1840-3AH10	SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
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;		SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
max. delivery unit 1 000 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 1 000 m, minimum order quantity 20 m			
. ,		¹⁾ For up-to-date information and dov	wnload availability, see:

http://www.siemens.com/tia-online-software-delivery

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Central processing units

Redundant CPUs

Technical	specifications

Article number	6ES7513-1RL00-0AB0	6ES7515-2RM00-0AB0	6ES7517-3HP00-0AB0	6ES7518-4JP00-0AB0
	CPU 1513R-1 PN, 300KB program/1,5MB data	CPU 1515R-2 PN, 500KB program/ 3MB data	CPU 1517H-3 PN, 2MB program/8MB data	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	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)	V17
Display				
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
 integrated (for program) 	300 kbyte	500 kbyte	2 Mbyte	9 Mbyte
 integrated (for data) 	1.5 Mbyte	3 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.	80 ns	60 ns	4 ns	4 ns
for word operations, typ.	96 ns	72 ns	6 ns	6 ns
for fixed point arithmetic, typ.	128 ns	96 ns	6 ns	6 ns
for floating point arithmetic, typ.	512 ns	384 ns	24 ns	24 ns
Counters, timers and their retentivity			21110	21110
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 mair 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		32 kbyte; All outputs are in the process image
	the process image	the process image	the process image	
Time of day	the process image	the process image	the process image	
Time of day Clock	the process image	the process image	the process image	
•	Hardware clock	the process image Hardware clock	Hardware clock	Hardware clock
Clock				
Clock • Type				
Clock • Type 1. Interface				
Clock • Type 1. Interface Interface types	Hardware clock	Hardware clock	Hardware clock	Hardware clock
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports	Hardware clock Yes; X1 2	Hardware clock Yes; X1 2	Hardware clock Yes; X1 2	Hardware clock Yes; X1 2
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch	Hardware clock Yes; X1	Hardware clock Yes; X1	Hardware clock Yes; X1	Hardware clock Yes; X1
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	Hardware clock Yes; X1 2 Yes	Hardware clock Yes; X1 2 Yes	Hardware clock Yes; X1 2 Yes	Hardware clock Yes; X1 2 Yes
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • IP protocol	Hardware clock Yes; X1 2 Yes Yes; IPv4	Hardware clock Yes; X1 2 Yes Yes; IPv4	Hardware clock Yes; X1 2 Yes Yes; IPv4	Hardware clock Yes; X1 2 Yes Yes; IPv4
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • IP protocol • PROFINET IO Controller	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • IP protocol • PROFINET IO Controller • PROFINET IO Device	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • IP protocol • PROFINET IO Controller	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No Yes; Only Server Yes; Optionally also
Clock • Type 1. Interface Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • IP protocol • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication	Hardware clock Yes; X1 2 Yes Yes Yes; IPv4 Yes No Yes; Only Server	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No Yes; Only Server	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No Yes; Only Server	Hardware clock Yes; X1 2 Yes Yes; IPv4 Yes No Yes; Only Server

Central processing units

Redundant CPUs

Article number	6ES7513-1RL00-0AB0	6ES7515-2RM00-0AB0	6ES7517-3HP00-0AB0	6ES7518-4JP00-0AB0
	CPU 1513R-1 PN, 300KB program/1,5MB data	CPU 1515R-2 PN, 500KB program/ 3MB data	CPU 1517H-3 PN, 2MB program/8MB data	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
- PROFlenergy	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		
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; Optionally also encrypted
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 or 6ES7960-1FB00-0AA5	
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
4. Interface				
Interface type			Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5	Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5

Technical specifications

SIMATIC S7-1500 Advanced Controllers

Central processing units

Redundant CPUs

Article number	6ES7513-1RL00-0AB0	6ES7515-2RM00-0AB0	6ES7517-3HP00-0AB0	6ES7518-4JP00-0AB0
	CPU 1513R-1 PN, 300KB program/1,5MB data	CPU 1515R-2 PN, 500KB program/ 3MB data	CPU 1517H-3 PN, 2MB program/8MB data	CPU 1518HF-4 PN, 9MB program/60MB data
Protocols				
Number of connections				
 Number of connections, max. 	88	108	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			
- 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			
- Number of stations in the ring,	50; Only 16 are	50; Only 16 are	50	50
	recommended, however	recommended, however		
SIMATIC communication	No	Voo	Voo	Voo
S7 routing	No	Yes	Yes	Yes
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				< 2.00E-05
in accordance with SIL3 - High demand/continuous mode:				< 1.00E-09
PFH in accordance with SIL3				
Ambient conditions				
Ambient temperature during operation				
	0 °C	0 °C	0 °C	0 °C
 horizontal installation, min. horizontal installation, max 				
 horizontal installation, max. 	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	is switched off
 vertical installation, min. 	0 °C	0 °C	0 °C	0 °C
vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
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	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual

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Central processing units

Redundant CPUs

Article number	6ES7513-1RL00-0AB0	6ES7515-2RM00-0AB0	6ES7517-3HP00-0AB0	6ES7518-4JP00-0AB0
	CPU 1513R-1 PN, 300KB program/1,5MB data	CPU 1515R-2 PN, 500KB program/ 3MB data	CPU 1517H-3 PN, 2MB program/8MB data	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
- CFC	No	No	No	
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
 User program protection/ password protection 	Yes	Yes	Yes	Yes
 Copy protection 	No	No	No	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
 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.	430 g	830 g	2 119 g; Interface modules: 2x 18 g	

Central processing units

SIPLUS redundant CPUs

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Ordering data	Article No.
SIPLUS CPU 1515R-2 PN	6AG1515-2RM00-7AB0
(extended temperature range and exposure to media)	
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	
SIPLUS CPU 1517H-3 PN	6AG1517-3HP00-4AB0
(extended temperature range and exposure to media)	
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	
SIPLUS S7-1500 CPU 1517H System Bundle	6AG1500-0HP00-4AB0
(extended temperature range and exposure to media)	
Comprising 2 SIPLUS CPU 1517H-3 PN, 4 SIPLUS synchronization modules up to 10 m, 2 FOC synchronization cables (1 m); without memory card	
Accessories	
Synchronization modules	
(extended temperature range and exposure to media)For patch cable FOC up to 10 mFor routing cable FOC up to 10 km	6AG1960-1CB00-4AA5 6AG1960-1FB00-4AA5
System power supply	
(extended temperature range and exposure to media)	
For supplying the backplane bus of the S7-1500 PLC	
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 media)	
24 V DC/3 A	6AG1332-4BA00-7AA0
24 V DC/8 A	6AG1333-4BA00-7AA0
Display (extended temperature range and	6AG1591-1BA02-2AA0
exposure to media)	
For SIPLUS CPU 1515R-2 PN/DP and CPU 1517H-3 PN; spare part	
Other accessories	See SIMATIC S7-1500, CPU 1515R-2 PN, page 4/59

	Overview	SIPLUS	CPU	1515R-2	ΡN
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- 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 corresponding 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.

Central processing units

SIPLUS redundant CPUs

Article number	6AG1515-2RM00-7AB0	6AG1517-3HP00-4AB0
Based on	6ES7515-2RM00-0AB0 SIPLUS S7-1500 CPU 1515R-2 PN	6ES7517-3HP00-0AB0 SIPLUS S7-1500 CPU 1517H-3 PN
Ambient conditions		
Ambient temperature during		
operation		
horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	
horizontal installation, max.vertical installation, min.	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off -40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
 vertical installation, max. 	40 °C; Display: 40 °C, at an operating temperature of	40 °C; Display: 40 °C, at an operating temperature of
	typically 40 °C, the display is switched off	typically 40 °C, the display is switched off
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)	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
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 to mechanically active substances 	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
according to EN 60721-3-3	Tes, Class 334 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)
 to chemically active substances according to EN 60721-3-6 to mechanically active substances 	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
according to EN 60721-3-6		
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!	* 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

Central processing units

Technology CPUs

Overview CPU 1511T-1 PN

Overview CPU 1511TF-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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET IO controller**
- · OPC UA Server and Client as runtime option for the easy connection of 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.
- · 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. User-defined kinematics are also supported.

- Cross-PLC synchronous operation for synchronization of multiple SÍMATIC 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



- 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 PLC 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 PLe 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 under 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 non-Siemens 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, 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:

Central processing units

Technology CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens **PROFINET 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 non-Siemens 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, 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 SÍMATIC 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 PLC 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 PLe 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 under 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 non-Siemens devices/systems with the functions:
 - OPC UA Data Access

 - OPC UA Security OPC UA Methods Call
 - Support of OPC UA Companion specifications.
- · Isochronous mode centrally and distributed
- 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 SÍMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

Central processing units

Technology CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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 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 PLe according to ISO 13849
- · High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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:

Central processing units

Technology CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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 PLe according to ISO 13849
- · High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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:

Central processing units

Technology CPUs

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 PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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 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 PLe according to ISO 13849
- · High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central PLC in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 non-Siemens 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:

Central processing units

Technology CPUs

Ordering data	Article No.		Article No.
CPU 1511T-1 PN	6ES7511-1TK01-0AB0	Accessories	
225 KB work memory for program,		SIMATIC Memory Card	
1 MB for data, PROFINET IRT interface		4 MB	6ES7954-8LC03-0AA0
with 2-port switch;		12 MB	6ES7954-8LE03-0AA0
SIMATIC Memory Card required		24 MB	6ES7954-8LF03-0AA0
CPU 1511TF-1 PN	6ES7511-1UK01-0AB0	256 MB	6ES7954-8LL03-0AA0
225 KB work memory for program, 1 MB for data,		2 GB	6ES7954-8LP03-0AA0
PROFINET IRT interface with 2-port switch;		32 GB	6ES7954-8LT03-0AA0
SIMATIC Memory Card required		SIMATIC S7-1500 DIN rail	
CPU 1515T-2 PN	6ES7515-2TM01-0AB0	Fixed lengths, with grounding	
750 KB work memory for program, 3 MB for data,		elements 160 mm 	6ES7590-1AB60-0AA0
PROFINET IRT interface		• 245 mm	6ES7590-1AC40-0AA0
with 2-port switch, Ethernet interface;		• 482 mm	6ES7590-1AE80-0AA0
SIMATIC Memory Card required		• 530 mm • 830 mm	6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0
CPU 1515TF-2 PN	6ES7515-2UM01-0AB0	For cutting to length by customer,	
750 KB work memory for program,		without drill holes; grounding elements must be ordered	
3 MB for data, PROFINET IRT interface		separately	
with 2-port switch, Ethernet interface;		• 2 000 mm	6ES7590-1BC00-0AA0
SIMATIC Memory Card required		PE connection element for 2 000 mm DIN rail	6ES7590-5AA00-0AA0
CPU 1516T-3 PN/DP	6ES7516-3TN00-0AB0	20 units	
1.5 MB work memory for program, 5 MB for data.		System power supply	
PROFINET IRT interface		For supplying the backplane	
with 2-port switch, Ethernet interface,		bus of the S7-1500 Controller	
PROFIBUS interface; SIMATIC Memory Card required		24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
CPU 1516TF-3 PN/DP	6ES7516-3UN00-0AB0	24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
1.5 MB work memory for program,		24/48/60 V DC input voltage,	6ES7505-0RB00-0AB0
5 MB for data, PROFINET IRT interface		power 60 W, buffering functionality	
with 2-port switch,		120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0
Ethernet interface, PROFIBUS interface;		Power plug	6ES7590-8AA00-0AA0
SIMATIC Memory Card required		With coding element for power	
CPU 1517T-3 PN/DP	6ES7517-3TP00-0AB0	supply module; spare part, 10 units	
3 MB work memory for program, 8 MB for data,		Load current supply	
PROFINET IRT interface with 2-port switch,		24 V DC/3 A	6EP1332-4BA00
Ethernet interface,		24 V DC/8 A	6EP1333-4BA00
PROFIBUS interface; SIMATIC Memory Card required		Power supply connector	
CPU 1517TF-3 PN/DP	6ES7517-3UP00-0AB0	Spare part; for connecting the 24 V DC supply voltage	
3 MB work memory for program,		With push-in terminals	6ES7193-4JB00-0AA0
8 MB for data, PROFINET IRT interface		PROFIBUS FastConnect RS 485	
with 2-port switch,		bus connector with 90° cable outlet	
Ethernet interface, PROFIBUS interface;		With insulation displacement, max.	
SIMATIC Memory Card required		transmission rate 12 Mbps	
CPU 1518T-4 PN/DP	6ES7518-4TP00-0AB0	Without programming device interface, grounding via control	6ES7972-0BA70-0XA0
9 MB work memory for program, 60 MB for data.		cabinet contact surface; 1 unit	
PROFINET IRT interface		With programming device interface,	6ES7972-0BB70-0XA0
with 2-port switch, Ethernet interface,		grounding via control cabinet contact surface; 1 unit	
PROFIBUS interface; SIMATIC Memory Card required		PROFIBUS FC standard cable GP	6XV1830-0EH10
CPU 1518TF-4 PN/DP	6ES7518-4UP00-0AB0	Standard type with special design	
9 MB work memory for program,		for quick mounting, 2-wire, shielded;	
60 MB for data,		sold by the meter; max. delivery unit 1 000 m,	
PROFINET IRT interface with 2-port switch,		max. delivery unit 1 000 m, minimum order quantity 20 m	
Ethernet interface, PROFIBUS interface;			
SIMATIC Memory Card required			

Central processing units

Technology CPUs

Ordering data	Article No.		Article No.
PROFIBUS FC robust cable	6XV1830-0JH10	IE FC TP trailing cable 2 x 2	6XV1840-3AH10
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		(type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug	
PROFIBUS FC flexible cable 2-wire, shielded;	6XV1831-2K	180/90 for use as trailing cable; PROFINET-compatible; with UL approval;	
sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC trailing cable		IE FC TP marine cable 2 x 2 (type B)	6XV1840-4AH10
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m		4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval;	
Sheath color: Petrol	6XV1830-3EH10	sold by the meter;	
Sheath color: Violet	6XV1831-2L	max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC food cable	6XV1830-0GH10	IE FC stripping tool	6GK1901-1GA00
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order guantity 20 m		Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
PROFIBUS FC ground cable	6XV1830-3FH10	Display	
2-wire, shielded; sold by the meter;		For CPU 1511T-1 PN and CPU 1511TF-1 PN; spare part	6ES7591-1AA01-0AA0
max. delivery unit 1 000 m, minimum order quantity 20 m		For CPU 1515T-2 PN, CPU 515TF-2 PN,	6ES7591-1BA02-0AA0
PROFIBUS FC FRNC cable GP	6XV1830-0LH10	CPU 1516T-3 PN/DP, CPU 1516TF-3 PN/DP,	
2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter;		CPU 1517T-3 PN/DP, CPU 1517T-3 PN/DP, CPU 1517TF-3 PN/DP and CPU 1518TF-4 PN/DP; spare part	
max. delivery unit 1 000 m, minimum order quantity 20 m		Front cover for PROFIBUS DP interface	6ES7591-8AA00-0AA0
PROFIBUS FastConnect stripping tool	6GK1905-6AA00	For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP,	
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables		CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	
IE FC RJ45 plugs		SIMATIC S7-1500T Starter Kit	6ES7511-1TK02-4YB5
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		Comprising: CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	
IE FC RJ45 plug 180			
180° cable outlet			
1 unit	6GK1901-1BB10-2AA0		
10 units 50 units	6GK1901-1BB10-2AB0 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 1 000 m, minimum order quantity 20 m			

Central processing units

Technology CPUs

	Article No.
STEP 7 Safety Advanced V17	
STEP 7 Safety Advanced V17 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 200INP, ET 200S, ET 200M, ET 200ISP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V17 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 for download ¹⁹ ; Email address required for delivery SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bistributed I/O, SIMATIC Distributed I/O, SIMATIC Distributed I/O, SIMATIC PC, SIMATIC Sensors, SIMATIC NET, SIMATIC PC -based Automation, SIMATIC PC 57, SIMATIC PG/PC, SIMATIC S7, SIMATIC Goftware, SIMATIC TDC SIMATIC Manual Collection update service for 1 year	6ES7833-1FA17-0YA5 6ES7833-1FA17-0YH5 6ES7998-8XC01-8YE0 6ES7998-8XC01-8YE2
	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 2005P, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V17 <u>Note:</u> 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 for download ¹ 9; Email address required for delivery SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO1, SIMADYN, SIMATIC Distributed I/O, SIMATIC DIStributed I/O, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PC57, SIMATIC PG/PC, SIMATIC S7, SIMATIC PG/PC, SIMATIC TDC

http://www.siemens.com/tia-online-software-delivery

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
General information					
Product type designation	CPU 1511T-1 PN	CPU 1515T-2 PN	CPU 1516T-3 PN/DP	CPU 1517T-3 PN/DP	CPU 1518T-4 PN/DP
Engineering with					
 STEP 7 TIA Portal configurable/ integrated from version 	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / 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					
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Memory					
Work memory					
 integrated (for program) 	225 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte	9 Mbyte
 integrated (for data) 	1 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte	60 Mbyte
Load memory					
 Plug-in (SIMATIC Memory Card), max. 	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte

Central processing units

Technology CPUs

4

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
CPU processing times					
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 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)				
S7 times					
Number	2 048	2 048	2 048	2 048	2 048
IEC timer					
Number	Any (only limited by the main memory)				
Data areas and their retentivity					
Flag					
• Size, max.	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					
• Туре	Hardware clock				
1. Interface					
Interface types					
 RJ 45 (Ethernet) 	Yes; X1				
 Number of ports 	2	2	2	2	2
 integrated switch 	Yes	Yes	Yes	Yes	Yes
Protocols					
IP protocol	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

Central processing units

Technology CPUs

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB 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)
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFlenergy	Yes; per user program				
- Prioritized startup	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	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
- PROFlenergy	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 					
- Asset management record	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		V 15 (V 15 (
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			
Web server		Yes	Yes	Yes	Yes
 Media redundancy 		No	No	No	No

Central processing units

Technology CPUs

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB 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
- PROFlenergy		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 update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the	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 update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the	
PROFINET IO Device					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		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	6		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					¥ ¥2
RJ 45 (Ethernet)					Yes; X3
• RS 485			Yes; X3	Yes; X3	
Number of ports			1	1	1
 integrated switch 					No

Central processing units

Technology CPUs

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
Protocols IP protocol PROFINET IO Controller 					Yes; IPv4 No
 PROFINET IO Device PROFIBUS DP master PROFIBUS DP slave 			Yes No	Yes No	No
SIMATIC communication Open IE communication Web server			Yes	Yes	Yes Yes Yes
PROFIBUS DP master					100
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 • Number of ports					Yes; X4 1
Protocols					
PROFIBUS DP masterPROFIBUS DP slave					Yes 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.	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode					
Media redundancy					
- Media redundancy	only via 1st interface (X1) Yes; MRP	only via 1st interface (X1) Yes; MRP	only via 1st interface (X1) Yes; MRP	only via 1st interface (X1) Yes; MRP	only via 1st interface (X1) Yes; MRP
- MRP	Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	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
	Voo	Vee	Vee	Vee	Vee
S7 routing	Yes	Yes	Yes	Yes	Yes

Central processing units

Technology CPUs

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
OPC UA					
OPC UA Client	Yes	Yes	Yes	Yes	Yes
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	method call, custom address space	method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	method call, custom address space
Alarms and Conditions	Yes	Yes	Yes	Yes	Yes
Supported technology objects					
Motion Control	of technology objects affects the cycle time of the PLC program;	of technology objects affects the cycle time of the PLC program;	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	of technology objects affects the cycle time of the PLC program;	of technology objects affects the cycle time of the PLC program;
Number of available Motion Control resources for technology objects	800	2 400	6 400	10 240	15 360
Required Motion Control resources	40	10	10	10	10
- 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 	40	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 Controller 	3	3	3	3	3
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
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					
operationhorizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
horizontal installation, max.	60 °C; Display: 50 °C,	60 °C; Display: 50 °C,	60 °C; Display: 50 °C,	60 °C; Display: 50 °C,	60 °C; Display: 50 °C,
	at an operating temperature of typically 50 °C, the display is switched off	at an operating temperature of typically 50 °C, the display is switched off	at an operating temperature of typically 50 °C, the display is switched off	at an operating temperature of typically 50 °C, the display is switched off	at an operating temperature of typically 50 °C, the display is switched off
vertical installation, min.	0 °C	0°C	0°C	0°C	0°C
 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

Central processing units

Technology CPUs

Article number	6ES7511-1TK01- 0AB0	6ES7515-2TM01- 0AB0	6ES7516-3TN00- 0AB0	6ES7517-3TP00- 0AB0	6ES7518-4TP00- 0AB0
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data	CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
Altitude during operation relating to sea level					
Installation altitude above sea level, max.	for installation altitudes	for installation altitudes	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	for installation altitudes	
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: 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.	430 g	830 g	1 978 g	1 978 g	1 988 g
Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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
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 	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / V14 (FW V2.1) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher	V17 (FW V2.9) / V14 (FW V2.0) or higher	V17 (FW V2.9) / 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					
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Memory					
Work memory					
 integrated (for program) 	225 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte	9 Mbyte
 integrated (for data) 	1 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte	60 Mbyte
Load memory					
 Plug-in (SIMATIC Memory Card), max. 	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte

Central processing units

Technology CPUs

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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
CPU processing times					
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 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)				
S7 times					
Number	2 048	2 048	2 048	2 048	2 048
IEC timer					
• Number	Any (only limited by the main memory)				
Data areas and their retentivity					
Flag					
• Size, max.	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				
1. Interface					
Interface types					
 RJ 45 (Ethernet) 	Yes; X1				
 Number of ports 	2	2	2	2	2
 integrated switch 	Yes	Yes	Yes	Yes	Yes
Protocols					
IP protocol	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

Central processing units

Technology CPUs

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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)		
- IRT	Yes	Yes	Yes	Yes	Yes
- PROFlenergy	Yes; per user program				
- Prioritized startup	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	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
- PROFlenergy	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					
- Asset management record	res; per user program	res; per user program	Yes; per user program	res; per user program	res; per user program
2. Interface					
Interface types		V V0	X X0	V V0	X X0
• 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		Vee Dut	Veer IDu 4	Vee IDu 4	Vacul Du 4
		Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
PROFINET IO Controller		Yes	Yes	Yes	Yes
PROFINET IO Device		Yes	Yes	Yes	Yes
SIMATIC communicationOpen IE communication		Yes Yes; Optionally also	Yes Yes; Optionally also	Yes Yes; Optionally also	Yes Yes; Optionally also
• Web conver		encrypted	encrypted	encrypted	encrypted
Web serverMedia redundancy		Yes No	Yes No	Yes No	Yes No

Central processing units

Technology CPUs

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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
- PROFlenergy		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 update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the	the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the	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 update time also depends on communication share set for PROFINET IO, on the number of
PROFINET IO Device					
Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Isochronous mode		No	No	No	No
- IRT		No	No	No	No
- PROFlenergy		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	
 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

Central processing units

Technology CPUs

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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.	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
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.
- 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	Yes	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	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	Yes	Yes

Central processing units

Technology CPUs

Technical	specifications

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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	of technology objects affects the cycle time of the PLC program;	of technology objects affects the cycle time of the PLC program;	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	of technology objects affects the cycle time of the PLC program;	of technology objects affects the cycle time of the PLC program;
Number of available Motion Control resources for technology objects	800	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 	40	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
PID_3Step	integrated optimization for valves	integrated optimization for valves	Yes; PID controller with integrated optimization for valves	integrated optimization for valves	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	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/h	< 1.00E-09 1/h	< 1.00E-09
Ambient conditions					
Ambient temperature during operation					
 horizontal installation, min. 	0 °C	0°C	0 °C	0 °C	0 °C
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the	at an operating temperature of typically 50 °C, the	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the		60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the
 vertical installation, min. 	0 °C	0°C	0 °C	0 °C	0 °C
 vertical installation, max. 	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

Central processing units

Technology CPUs

Article number	6ES7511-1UK01- 0AB0	6ES7515-2UM01- 0AB0	6ES7516-3UN00- 0AB0	6ES7517-3UP00- 0AB0	6ES7518-4UP00- 0AB0
	CPU 1511TF-1PN, 225KB progr., 1MB data	CPU 1515TF-2 PN, 750KB progr, 3MB 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
Altitude during operation relating to sea level					
Installation altitude above sea level, max.	Restrictions for installation altitudes	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 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; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe
 Protection level: Read/write protection 	Yes	Yes	Yes	Yes	Yes
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.	430 g	830 g	1 978 g	1 978 g	1 988 g

SM 521 digital input modules

Overview



- 16, 32 and 64-channel digital input modules
- Sinking and sourcing input versions available
- 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.		Article No.
SM 521 digital input modules		Potential bridges for front connectors	6ES7592-3AA00-0AA0
Module width 35 mm			
16 inputs, 24 V DC High Feature, isolated, parameterizable	6ES7521-1BH00-0AB0	For 35 mm modules; 20 pieces; spare part	
diagnostics and hardware interrupts		DIN A4 labeling sheets	
32 inputs, 24 V DC High Feature, isolated, parameterizable diagnostics and hardware interrupts	6ES7521-1BL00-0AB0	For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	6ES7592-2AX00-0AA0
64 inputs, 24 V DC Basic, sinking/sourcing, input delay 3.2 ms; cables and terminal blocks can be ordered separately	6ES7521-1BP00-0AA0	For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	6ES7592-1AX00-0AA0
(SIMATIC TOP connect)		U connector	6ES7590-0AA00-0AA0
16 inputs, 24 V DC basic, isolated, input delay 3.2 ms	6ES7521-1BH50-0AA0	5 units; spare part	
16 inputs, 230 V AC basic,	6ES7521-1FH00-0AA0	Universal front door for I/O modules	
isolated, input delay 20 ms 16 inputs, 24 125 V UC High Feature, input delay 0.05 20 ms, parameterizable diagnostics and	6ES7521-7EH00-0AB0	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
hardware interrupts Module width 25 mm; front connector (push-in) included in scope of delivery		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
16 inputs, 24 V DC basic, isolated	6ES7521-1BH10-0AA0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
32 inputs, 24 V DC basic, isolated	6ES7521-1BL10-0AA0	Electronic manuals on DVD,	
Accessories		 multi-language: LOGO!, SIMADYN, 	
Front connectors		SIMATIC bus components,	
For 35 mm modules (not 64-channel); including four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals	6ES7592-1AM00-0XB0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
 Push-in For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part 	6ES7592-1BM00-0XB0 6ES7592-1BM00-0XA0	SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2

SIMATIC S7-1500 Advanced Controllers I/O modules Digital modules

SM 521 digital input modules

Article number	6ES7521-1BH00- 0AB0	6ES7521-1BL00- 0AB0	6ES7521-1BH50- 0AA0	6ES7521-1FH00- 0AA0	6ES7521-7EH00- 0AB0
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 16 x 24125V UC HF
General information	DITOXETUDOTI	DIOZAZAVDOTI	D1 10/24700 0110 D/1	DI TOX200 VI O DI	241207 0011
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 16x24 125 V UC HF
Product function					
 Isochronous mode 	Yes	Yes	No	No	No
 Prioritized startup 	Yes	Yes	Yes	Yes	Yes
Engineering with					
 STEP 7 TIA Portal configurable/ integrated from version 	V13 SP1 / -	V13 SP1 / -	V12/V12	V12 / V12	V13 SP1 / -
 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					
• DI	Yes	Yes	Yes	Yes	Yes
Counter	Yes	Yes	No	No	No
Oversampling	No	No			No
• MSI	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V	24 V			
Reverse polarity protection	Yes	Yes			
Digital inputs					
Number of digital inputs	16	32	16	16	16
Digital inputs, parameterizable	Yes	Yes	No	No	Yes
Source/sink input	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 3	Yes	Yes	Yes		Yes; At 24 V DC
Digital input functions, parameterizable					
 Gate start/stop 	Yes	Yes			
 Freely usable digital input 	Yes	Yes			
Input voltage					
 Rated value (DC) 	24 V	24 V	24 V		24 V; 48 V, 125 V
- 24 V DC	Yes	Yes	Yes		Yes
Rated value (AC)				230 V; 120/230 V AC, 50/60 Hz	24 V; 48 V, 125 V (50 - 60 Hz)
• for signal "0"	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 +5 V
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	+11 +146 V
Input current					
 for signal "1", typ. 	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	3 mA; At 24 V DC
Input delay (for rated value of input voltage)					
for standard inputs					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC
for interrupt inputs					
- parameterizable	Yes	Yes	No	No	Yes
for technological functions					
- parameterizable	Yes	Yes	No	No	No
Encoder					
Connectable encoders					
2-wire sensor	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current	1.5 mA	1.5 mA	1.5 mA	2 mA	1.5 mA
(2-wire sensor), max.					

I/O modules Digital modules

SM 521 digital input modules

Article number	6ES7521-1BH00- 0AB0	6ES7521-1BL00- 0AB0	6ES7521-1BH50- 0AA0	6ES7521-1FH00- 0AA0	6ES7521-7EH00- 0AB0
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 16 x 24125V UC HF
sochronous mode					
Filtering and processing time (TCI), min.	80 μs; At 50 μs filter time	80 μs; At 50 μs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs			
nterrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	No	No	Yes
Alarms					
 Diagnostic alarm 	Yes	Yes	No	No	Yes
Hardware interrupt	Yes	Yes	No	No	Yes
Diagnoses					
 Monitoring the supply voltage 	Yes	Yes	No	No	No
Wire-break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	Yes; To I < 550 µA
Short-circuit	No	No	No	No	No
Diagnostics indication LED					
RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
 Monitoring of the supply voltage (PWR-LED) 	Yes; green LED	Yes; green LED	No	No	No
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	No	No	Yes; red LED
 for module diagnostics 	Yes; red LED	Yes; red LED	No	Yes; red LED	Yes; red LED
Potential separation					
Potential separation channels					
 between the channels and backplane bus 	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
 horizontal installation, min. 	-30 °C; From FS05	-30 °C; From FS05	0 °C	0 °C	0 °C
 horizontal installation, max. 	60 °C	60 °C	60 °C	60 °C	60 °C
 vertical installation, min. 	-30 °C; From FS05	-30 °C; From FS05	0 °C	0 °C	0 °C
 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. 	for installation altitudes	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	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.	240 g	260 g	230 g	300 g	240 g

SIMATIC S7-1500 Advanced Controllers I/O modules Digital modules

SM 521 digital input modules

Article number	6ES7521-1BP00-0AA0
Concretinformation	S7-1500, DI 64x24VDC SNK/SRC BA
General information	
Product type designation	DI 64x24VDC BA
Product function	N-
Isochronous mode	No
Prioritized startup	No
Engineering with	
STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0319 / V17
 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 	V2.35 / -
Operating mode	
• DI	Yes
Counter	No
 Oversampling 	No
• MSI	Yes
Digital inputs	
Number of digital inputs	64
Digital inputs, parameterizable	No
Source/sink input	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
 Number of simultaneously controllable inputs 	64; see additional description in the manual
Input voltage	
 Rated value (DC) 	24 V
- 24 V DC	Yes
• for signal "0"	-5 +5 V (reference potential is COM)
• for signal "1"	-1130 V; +11 +30 V (reference potential is COM)
Input current	
• for signal "1", typ.	2.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	No
for interrupt inputs	
- parameterizable	No
for technological functions	
- parameterizable	No
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
 permissible quiescent current (2-wire sensor), max. 	1.5 mA

Article number	6ES7521-1BP00-0AA0
	S7-1500, DI 64x24VDC SNK/SRC BA
Interrupts/diagnostics/ status information	
Diagnostics function	No
Alarms	
 Diagnostic alarm 	No
 Hardware interrupt 	No
Diagnoses	
 Monitoring the supply voltage 	No
Wire-break	No
Short-circuit	No
Group error	No
Diagnostics indication LED	
RUN LED	Yes; green LED
ERROR LED	Yes; red LED
MAINT LED	No
 Monitoring of the supply voltage (PWR-LED) 	Yes; via SIMATIC TOP connect connection module
Channel status display	Yes; via SIMATIC TOP connect connection module
 for channel diagnostics 	No
 for module diagnostics 	No
Potential separation	
Potential separation channels	
 between the channels and backplane bus 	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-30 °C
 horizontal installation, max. 	60 °C
 vertical installation, min. 	-30 °C
 vertical installation, max. 	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g
Other	
Note:	Please order cable and connection modules separately

I/O modules Digital modules

SM 521 digital input modules

specifications

Article number	6ES7521-1BH10-0AA0	6ES7521-1BL10-0AA0
	S7-1500, DI 16x24VDC BA	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 / -
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
- 24 V DC	Yes	Yes
 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

SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 521 digital input modules

Article number	6ES7521-1BH10-0AA0	6ES7521-1BL10-0AA0
	S7-1500, DI 16x24VDC BA	S7-1500, DI 32x24VDC BA
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. 	0°C	0°C
 horizontal installation, max. 	60 °C	60 °C
 vertical installation, min. 	0°C	0°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	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

Digital modules

Overview

spare part



- 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.		Article No.
SM 522 digital output modules		Potential bridges for front connectors	6ES7592-3AA00-0AA0
Module width 35 mm		For 35 mm modules;	
8 outputs, 24 V DC, 2 A High Feature, isolated	6ES7522-1BF00-0AB0	20 pieces; spare part	
16 outputs, 24 V DC,	6ES7522-1BH01-0AB0	DIN A4 labeling sheets	
0.5 A High Feature, isolated		For 35 mm modules; 10 sheets with 10 labeling strips	6ES7592-2AX00-0AA0
32 outputs, 24 V DC, 0.5 A High Feature, isolated	6ES7522-1BL01-0AB0	each for I/O modules; perforated, Al gray	
64 outputs, 24 V DC; 0.3A Basic; sinking output; cables and terminal blocks can be ordered separately (SIMATIC TOP connect)	6ES7522-1BP00-0AA0	For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	6ES7592-1AX00-0AA0
64 outputs, 24 V DC;	6ES7522-1BP50-0AA0	U connector	6ES7590-0AA00-0AA0
0.3A Basic; sourcing; cables and terminal blocks		5 units; spare part	
can be ordered separately (SIMATIC TOP connect)		Universal front door for I/O modules	
3 relay outputs, 230 V AC, 5 A Standard	6ES7522-5HF00-0AB0	For 35 mm modules; 5 front doors; with 5 labeling strips on the front and 5 cabling diagrams	6ES7528-0AA00-7AA0
16 relay outputs, 230 V AC, 2 A Standard	6ES7522-5HH00-0AB0	per front door; spare part	
8 outputs (triac), 230 V AC, 2 A Standard	6ES7522-5FF00-0AB0	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
16 outputs (triac), 230 V AC, 1 A Standard	6ES7522-5FH00-0AB0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
16 outputs, 24 48 V UC, 125 V DC, 0.5 A Standard, isolated	6ES7522-5EH00-0AB0	Electronic manuals on DVD, multi-language:	
Module width 25 mm; ront connector (push-in) ncluded in scope of delivery		LOGOI, ŠIMĀDYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O,	
16 outputs, 24 V DC, D.5 A Basic, isolated	6ES7 522-1BH10-0AA0	SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7,	
32 outputs, 24 V DC, 0.5 A Basic, isolated	6ES7 522-1BL10-0AA0	SIMATIC PG/PC, SIMATIC ST, SIMATIC Software, SIMATIC TDC	
Accessories		SIMATIC Manual Collection	6ES7998-8XC01-8YE2
Front connectors		update service for 1 year	
For 35 mm modules (not 64-channel); ncluding four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in	6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0	Current "Manual Collection" DVD and the three subsequent updates	
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin;	6ES7592-1BM00-0XA0		

SIMATIC S7-1500 Advanced Controllers I/O modules Digital modules

SM 522 digital output modules

Article number	6ES7522-1BH01-0AB0	6ES7522-1BL01-0AB0	6ES7522-1BF00-0AB0	6ES7522-5EH00-0AB0
	S7-1500, DQ 16x24V DC/0.5A HF	S7-1500, DQ 32x24VDC/0.5A HF	S7-1500, DQ 8x24VDC/2A HF	S7-1500, DQ 16x2448VUC/ 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	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	Yes; through internal protection with 7 A per group	Yes; through internal	
Digital outputs	p	P	<u>1 </u>	
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	
- 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				
Type of output voltage	DC	DC	DC	UC
• 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	
- ioi signal o residual current, max.	0.0 111A	0.0 MA	0.0 11A	

I/O modules Digital modules

SM 522 digital output modules

Article number	6ES7522-1BH01-0AB0	6ES7522-1BL01-0AB0	6ES7522-1BF00-0AB0	6ES7522-5EH00-0AB0
	S7-1500, DQ 16x24V DC/0.5A HF	S7-1500, DQ 32x24VDC/0.5A HF	S7-1500, DQ 8x24VDC/2A HF	S7-1500, DQ 16x2448VUC/ 125VDC/0.5A ST
Dutput 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
otal 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
sochronous mode				
Execution and activation time (TCO), nin.	70 µs	70 µs		
Bus cycle time (TDP), min.	250 µs	250 µs		
nterrupts/diagnostics/ tatus information				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
larms				
Diagnostic alarm	Yes	Yes	Yes	No
Maintenance interrupt	Yes	Yes	Yes	No
iagnoses				
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	,	,		
•				
otential separation channels				

SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 522 digital output modules

Article number	6ES7522-1BH01-0AB0	6ES7522-1BL01-0AB0	6ES7522-1BF00-0AB0	6ES7522-5EH00-0AB0
	S7-1500, DQ 16x24V DC/0.5A HF	S7-1500, DQ 32x24VDC/0.5A HF	S7-1500, DQ 8x24VDC/2A HF	S7-1500, DQ 16x2448VUC/ 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
SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 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		0.0		0.01
 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
Veights				
-	220 a	280 a	240 a	220 a
Weight, approx.	230 g	280 g	240 g	230 g
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)
General information				
	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 type designation				
Product type designation Product function				
Product type designation Product function • Isochronous mode	(relay)	(relay)	(triac)	(Triac)
Product type designation Product function • Isochronous mode • Prioritized startup	(relay) No	(relay) No	(triac) No	(Triac) No
Product type designation Product function Isochronous mode Prioritized startup	(relay) No	(relay) No	(triac) No	(Triac) No
Product type designation Product function • Isochronous mode • Prioritized startup Engineering with • STEP 7 TIA Portal configurable/ integrated from version	(relay) No Yes	(relay) No Yes	(triac) No Yes	(Triac) No Yes
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/	(relay) No Yes V12 / V12	(relay) No Yes V13 SP1 / -	(triac) No Yes V12 / V12	(Triac) No Yes V13 SP1 / -
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision	(relay) No Yes V12 / V12 V5.5 SP3 / -	(relay) No Yes V13 SP1 / - V5.5 SP3 / -	(triac) No Yes V12 / V12 V5.5 SP3 / -	(Triac) No Yes V13 SP1 / - V5.5 SP3 / -
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Dperating mode	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Dperating mode DQ	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes	(triac) No Yes V12 / V12 V5.5 SP3 /- V1.0 / V5.1 V2.3 /- Yes	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Dperating mode DQ DQ with energy-saving function	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Derating mode DQ DQ with energy-saving function PWM	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Derating mode DQ DQ with energy-saving function PWM Oversampling	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Derating mode DQ DQ with energy-saving function PWM Oversampling MSO	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No Yes	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No Yes	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Derating mode DQ DQ with energy-saving function PWM Oversampling MSO Integrated operating cycle counter	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/ GSD revision Derating mode DQ DQ with energy-saving function PWM Oversampling MSO Integrated operating cycle counter	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No Yes	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No Yes	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No
Product type designation Product function Isochronous mode Prioritized startup Engineering with STEP 7 TIA Portal configurable/ integrated from version STEP 7 configurable/ integrated from version PROFIBUS from GSD version/ GSD revision PROFINET from GSD version/	(relay) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No Yes	(relay) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No Yes	(triac) No Yes V12 / V12 V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No No	(Triac) No Yes V13 SP1 / - V5.5 SP3 / - V1.0 / V5.1 V2.3 / - Yes No No No

I/O modules Digital modules

4

SM 522 digital output modules

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)
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		
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				
 Type of output voltage 			AC	AC
• 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 redistrive 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

SIMATIC S7-1500 Advanced Controllers I/O modules Digital modules

SM 522 digital output modules

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: $\cos \phi \ 1.0: 600 \ A$ $\cos \phi \ 0.5 \ \ 0.7: 900 \ A$ 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	No	No
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	PLc		
Category according to ISO 13849-1	Cat. 2	Cat. 2		
 SILCL according to IEC 62061 	SILCL 1	SILCL 1		

I/O modules Digital modules

SM 522 digital output modules

Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST
	(Relay)	(Relay)	(Triac)	(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	40 0	40 0	40 0	40 C
Width	35 mm	35 mm	35 mm	35 mm
	147 mm	147 mm	147 mm	147 mm
Height Depth	129 mm	129 mm	129 mm	129 mm
Weights	12311111	12311111	12911111	12311111
-	250 g	2E0 a	200 a	210 c
Weight, approx.	350 g	350 g	290 g	310 g
Article number	6ES7522-1BP00-0AA0		6ES7522-1BP50-0AA0	
Anicie number		24 84		24 CNIK DA
Conorol information	S7-1500, DQ 64x24VDC/0	JA DA	S7-1500, DQ 64x24VDC/0	.SA SINK BA
General information				2 4
Product type designation	DQ 64x24VDC/0.3A BA		DQ 64x24VDC/0.3A SNK	DA
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 prote	ction with 7 A per group	Yes; Through internal prote	ection 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				
	90.0		<u></u>	
lower limit	80 Ω		80 Ω	

SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 522 digital output modules

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		
 Type of output voltage 	DC	DC
• 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	077	0/1
(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	Yes	Yes
backplane bus		

I/O modules Digital modules

SM 522 digital output modules

Technical specific

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 nodules		
Performance level according to ISO 13849-1	PL d	
Category according to ISO 13849-1	Cat. 3	
SILCL according to IEC 62061	SILCL 2	
mbient conditions		
Minimized management and the second s		
 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 elating to sea level		
 Installation altitude above sea level, max. 	5 000 m	5 000 m
Dimensions		
Nidth	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Veights		
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 / -
Dperating mode		
• DQ	Yes	Yes
DO with operate equipa function	No	No
· DQ with energy-saving function		
<i>o,</i> o	No	No
• PWM	No No	No No
• PWM • Oversampling • MSO		
PWM Oversampling MSO upply voltage	No	No
 DQ with energy-saving function PWM Oversampling MSO Supply voltage Rated value (DC) 	No	No

SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 522 digital output modules

Article number	6ES7522-1BH10-0AA0	6ES7522-1BL10-0AA0
	S7-1500, DQ 16x24VDC/0.5A BA	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	L+ (-53 V)	L+ (-53 V)
voltage to		
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
 with resistive load, max. 	0.5 A	0.5 A
 on lamp load, max. 	5 W	5 W
Load resistance range		
lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
 Type of output voltage 	DC	DC
 for signal "1", min. 	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
 for signal "1" rated value 	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of 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	10112	
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/	o A, see additional description in the mandal	To A, see additional description in the manual
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
RON LED ERROR LED	Yes; green LED Yes; red LED	Yes; red LED
	Yes; green LED	
 Monitoring of the supply voltage (PWR-LED) 	IES, GIERILED	Yes; green LED
 Channel status display 	Yes; green LED	Yes; green LED
· Onanner status uispiay		
for channel diagnostics	No	No

I/O modules Digital modules

SM 522 digital output modules

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
 SILCL according to IEC 62061 	SILCL 2	SILCL 2
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

I/O modules Digital 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.		Article No.
SM 523 digital input/output module		U connector	6ES7590-0AA00-0AA0
Module width 35 mm		5 units; spare part	
32 inputs, 24 V DC Basic, sinking/sourcing,	6ES7523-1BP50-0AA0	Universal front door for I/O modules	
input delay 3.2 ms, input type 3 (IEC 61131); 32 outputs, 24 V DC / 0.3 A Basic, sourcing		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
Module width 25 mm; front connector (push-in) included		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
in scope of delivery		Electronic manuals on DVD,	
16 inputs, 24 V DC, isolated; 16 outputs, 24 V DC; 0.5 A, isolated	6ES7523-1BL00-0AA0	23-1BL00-0AA0 multi-language: LOGO!, SIMADYN, SIMATIC bus components,	
Accessories		SIMATIC C7,	
Front connectors		SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors,	
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin;	6ES7592-1BM00-0XA0	SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
spare part		SIMATIC Manual Collection	6ES7998-8XC01-8YE2
DIN A4 labeling sheets		update service for 1 year	
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	6ES7592-1AX00-0AA0	Current "Manual Collection" DVD and the three subsequent updates	

Technical specifications

SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 523 digital input/output modules

Article number	6ES7523-1BL00-0AA0	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA		
	S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A 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				
I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3		
 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	-1130 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		
1				

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SIMATIC S7-1500 Advanced Controllers I/O modules

Digital modules

SM 523 digital input/output modules

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				
 Type of output voltage 	DC	DC		
 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	1.5 mA	1.5 mA		
(2-wire sensor), max.				

I/O modules Digital modules

SM 523 digital input/output modules

Article number	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		
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			
 SILCL according to IEC 62061 	SILCL 2			
Ambient conditions				
Ambient temperature during operation				
 horizontal installation, min. 		-30 °C		
 horizontal installation, max. 		0° C		
 vertical installation, min. 		-30 °C		
 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	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				

SIMATIC S7-1500 Advanced Controllers I/O modules

SIPLUS digital modules

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	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 4/87

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 16X48VUC/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 BasedOr (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	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	// Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa)/ Tmin (Tmax - 10 K) at 795 hPa 658 hPa	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

SIPLUS digital modules

SIPLUS SM 521 digital input modules

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 16X48VUC/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 in bedewed state), horizontal installation			
Resistance					
Coolants and lubricants					
 Resistant to commercially available coolants and lubricants 	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; *				

SIMATIC S7-1500 Advanced Controllers I/O modules SIPLUS digital modules

SIPLUS SM 521 digital input modules

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 16X48VUC/125VDC HF
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)	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				
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	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

modules

substances)

SIPLUS SM 522 digital output

(Extended temperature range and exposure to environmental

8 outputs, 24 V DC; 2 A, isolated

8 relay outputs, 230 V AC, 5 A 16 relay outputs, 230 V AC, 2 A

8 outputs (triac), 230 V AC, 2 A

16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A, isolated

Accessories

16 outputs (triac), 230 V AC, 1 A

16 outputs, 24 V DC; 0.5 A, isolated

32 outputs, 24 V DC; 0.5 A, isolated

SIMATIC S7-1500 Advanced Controllers

Article No.

I/O modules SIPLUS digital modules

SIPLUS SM 522 digital output modules

6AG1522-1BF00-7AB0

6AG1522-1BH01-7AB0

6AG1522-1BL01-7AB0

6AG1522-5HF00-2AB0

6AG1522-5HH00-7AB0

6AG1522-5FF00-7AB0

6AG1522-5FH00-7AB0

6AG1522-5EH00-7AB0

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See SIMATIC S7-1500 SM 522 digital output modules,

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.

information has been added.				
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
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

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SIMATIC S7-1500 Advanced Controllers I/O modules SIPLUS digital modules

SIPLUS SM 522 digital output modules

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
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, *			
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; *			
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)	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 LC3 (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			
 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	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			

Technical specifications

SIPLUS digital modules

SIPLUS SM 522 digital output modules

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 	<i>//</i>	<i>//</i>	<i>//</i>	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; *
<u> </u>				

SIMATIC S7-1500 Advanced Controllers I/O modules SIPLUS digital modules

SIPLUS SM 522 digital output modules

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)			
 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 LC3 (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 LC3 (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			
 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			

SIMATIC S7-1500 Advanced Controllers I/O modules

Analog modules

Overview



Ordering data

4 x U/I/RTD/TC 4 analog inputs ±1 V, ±500 mV, ±50 mV, 1 ... 5 0/4 ... 20 mA, ± thermocouples type B, E, J, K, resistance there Ni 1000, LG-Ni Pt1000, Pt250, resistors 0 ... 150/300/60 16 bits; incl. infeed elen shield terminal, U connector, pr

8 x U/I/RTD/TC

incl. infeed elen shield terminal, labeling strips, U connector, printed front door

Ordering data	Article No.		Article No.
SM 531 analog input modules <u>4 × U/I/RTD/TC</u> <u>4 analog inputs</u> , ±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	6ES7531-7QD00-0AB0	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, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7NF00-0AB0
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, shield bracket, shield terminal, labeling strips, U connector, printed front door		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 400, Ni 500	6ES7531-7PF00-0AB0
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;	6ES7531-7QF00-0AB0	Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000; resistors 0150/300/600/6000 ohms, PTC; 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	
16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door		<u>16 x U BA</u> <u>16 analog</u> inputs 1 5 V, ±1 V, ±5 V, ±10 V, 16-bit resolution, accuracy 0.5%,	6ES7531-7LH00-0AB0
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, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7NF10-0AB0	16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shield bracket and shield terminal: Order front connectors (screw terminals or push-in) separately	
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, shield bracket,	6ES7531-7KF00-0AB0	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, shield bracket and shield terminal: Order front connectors (screw terminals or push-in) separately	6ES7531-7MH00-0AB0

• 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

I/O modules Analog modules

SM 531 analog input modules

Ordering data	Article No.		Article No.
Accessories		Shielding set I/O	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin		For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	6ES7590-5CA00-0AA0
Screw terminals Push-in	6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0	For 25 mm modules; infeed element, shield bracket, and shield terminal;	6ES7590-5CA10-0XA0
For 25 mm modules; including cable ties and	6ES7592-1BM00-0XA0	4 units, spare part (one shield set supplied with the module).	
individual labeling strips; push-in terminal 40-pin;		Shield terminal element	6ES7590-5BA00-0AA0
spare part		10 units; spare part	
DIN A4 labeling sheets		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, AI gray	6ES7592-2AX00-0AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components,	
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	6ES7592-1AX00-0AA0	SIMATIC C7, SIMATIC distributed I/O, SIMATIC HII, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based automation, SIMATIC PCS 7,	
U connector	6ES7590-0AA00-0AA0	SIMATIC PG/PC, SIMATIC S7,	
5 units; spare part		SIMATIC software, SIMATIC TDC	
Universal front door for I/O modules		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	6ES7528-0AA00-7AA0	Current Manual Collection DVD and the three subsequent updates	
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	6ES7528-0AA00-0AA0		

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					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
 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/inte- grated 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

I/O modules Analog modules

SM 531 analog input modules

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
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	5				
• 0 to 10 mA	Vee	No	Vee	Vaa	Vee
 0 to 20 mA -20 mA to +20 mA 	Yes	Yes	Yes	Yes	Yes
	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
• Туре К	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

SIMATIC S7-1500 Advanced Controllers I/O modules Analog modules

SM 531 analog input modules

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
nput 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
nput ranges (rated values), esistors					
 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

I/O modules Analog modules

SM 531 analog input modules

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
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 wire-break monitoring	9 ms (to be considered in R/RTD/TC measurement)	4 ms (to be considered in R/RTD/U 1 to 5 V measurement)	9 ms (to be considered in R/RTD/TC measurement)		
 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)					Corresponds to the channel with the highest basic conversion time
Basic execution time of the module (all channels released)				62.5 µs; independent of number of activated channels	
Smoothing of measured values					
 parameterizable 	Yes	Yes	Yes	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 	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 	Yes; All measuring		Yes; All measuring	No	No

Analog modules

SM 531 analog input modules

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
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, (+/-)	Ptxxx climate: ±0.2 K,	Ptxxx Standard: ±1.0 K, Ptxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K	Nixxx standard: ±0.3 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 B: > 0 °C ± 1.9 K, type S: > 0 °C ± 1.9 K, type S: > 0 °C		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 B: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		
Interference voltage suppression for $f = p \times (f + 1) \times (f + 1)$					
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
	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
 Channel status display 	ies, green LLD	ICS, GICCIT LLD	, g		, 0
Channel status displayfor channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED

I/O modules Analog modules

SM 531 analog input modules

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, Al 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. 	0 °C	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. 	0 °C	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. 	for installation altitudes	for installation altitudes	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	for installation altitudes	
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
Veights					
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%), ±50 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 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, Ni100 climate: ±0.08 K, type B, R, S: ±3 K, type B, J, K, N, T: ±1 K		

SIMATIC S7-1500 Advanced Controllers I/O modules

Analog modules

SM 531 analog input modules

Article number	6ES7531-7LH00-0AB0	6ES7531-7MH00-0AB0
	S7-1500, AI 16xU BA	S7-1500, AI 16xI BA
General information		
Product type designation	AI 16xU BA	AI 16xI BA
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
 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	No	
• 0 to +5 V	No No	
• 0 to + 10 V		
• 1 V to 5 V	Yes	
 -1 V to +1 V -10 V to +10 V 	Yes Yes	
• -2.5 V to +2.5 V	No	
 -2.5 v to +2.5 v -25 mV to +25 mV 	No	
 -25 mV to +25 mV -250 mV to +250 mV 	No	
• -5 V to +5 V	Yes	
• -5 v to +5 v • -50 mV to +50 mV	No	
 -500 mV to +500 mV -80 mV to +80 mV 	No	
Input ranges (rated values), currents	No	
O to 10 mA		No
• 0 to 20 mA		No Yes
		Yes
 -20 mA to +20 mA 4 mA to 20 mA 		
• 4 mA to 20 mA Cable length		Yes
shielded, max.	200 m	800 m
- Smelueu, max.	200 111	000 111

I/O modules Analog modules

SM 531 analog input modules

Technical	chaoifications
Technical	specifications

Article number	6ES7531-7LH00-0AB0	6ES7531-7MH00-0AB0		
	S7-1500, AI 16xU BA	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		
 Basic conversion time, including integration time (ms) 	10 / 24 / 27 / 107 ms	10 / 24 / 27 / 107 ms		
 additional conversion time for wire-break monitoring 	4 ms (to be considered for 1 to 5 V measurement)			
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 	40 dB	40 dB		
(peak value of interference < rated value of input range), min.				
 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 	No	No		
(PWR-LED)				
	Yes; green LED	Yes; green LED		
(PWR-LED)	Yes; green LED Yes; red LED	Yes; green LED Yes; red LED		

I/O modules Analog modules

SM 531 analog input modules

Article number	6ES7531-7LH00-0AB0		6ES7531-7MH00-0	AB0	
	S7-1500, AI 16xU BA		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 see manual	altitudes > 2 000 m,	5 000 m; Restriction see manual	s for installation altitudes > 2 000 m,	
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	Article number		6ES7531-7PF00-0AB0	
	S7-1500, AI 8 X U/R/RTD/TC HF			S7-1500, AI 8 X U/R/RTD/TC HF	
General information		Constant measu	rement current for	150 Ohm, 300 Ohm, 600 Ohm, Cu10,	
Product type designation	AI 8xU/R/RTD/TC HF	resistance-type	transmitter, typ.	Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200 climate: 1 mA; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200 standard,	
Product function					
• I&M data	Yes; I&M0 to I&M3				
Isochronous mode	No			Pt500, Pt1000, PTC: 0.25 mA	
Prioritized startup	Yes	Technical unit fo		Yes; °C/°F/K	
Measuring range scalable	Van				
Scalable measured values	No	input ranges (rated values),			
Adjustment of measuring range	No	• 0 to +5 V		No	
Engineering with		• 0 to +10 V		No	
STEP 7 TIA Portal configurable/ integrated from version	V14 / -	 1 V to 5 V -1 V to +1 V 		No Yes	
 STEP 7 configurable/ integrated from version 	V5.5 SP3 / -	• -10 V to +10 V		No	
 PROFIBUS from GSD version/ GSD revision 	V1.0 / V5.1	 -2.5 V to +2.5 -25 mV to +25 	mV	No Yes	
PROFINET from GSD version/	V2.3 / -	• -250 mV to +2	50 mV	Yes	
GSD revision		• -5 V to +5 V		No	
Operating mode		• -50 mV to +50		Yes	
Oversampling	No	• -500 mV to +5		Yes	
• MSI	Yes	• -80 mV to +80		Yes	
Supply voltage	24.1/		ated values), current		
Rated value (DC)	24 V	• 0 to 20 mA		No	
Reverse polarity protection	Yes	• -20 mA to +20		No	
Analog inputs		• 4 mA to 20 mA		No	
Number of analog inputs	8; Plus one additional RTD (reference) channel	Input ranges (rated values), thermocouples			
 For voltage measurement 	8; Plus one additional RTD (reference) channel	ce) channel		Yes	
• For resistance/resistance	Flus one additional BTD			Yes	
thermometer measurement	(reference) channel	(reference) channel		Yes	
 For thermocouple measurement 	8; Plus one additional RTD	• Type J		Yes	
	(reference) channel	• Type K		Yes	
permissible input voltage for voltage input (destruction limit), max.	20 V	• Type L		No	
mpar (accounces in intry, max.		• Type N		Yes	
				Yes	
		• Type R			
		• Type S		Yes	

I/O modules Analog modules

SM 531 analog input modules

Article number	6ES7531-7PF00-0AB0	Article number	6ES7531-7PF00-0AB0
	S7-1500, AI 8 X U/R/RTD/TC HF	Analog value concretion	S7-1500, AI 8 X U/R/RTD/TC HF
Input ranges (rated values), resistance thermometer		Analog value generation for the inputs	
• Cu 10	Yes; Standard/climate	Integration and conversion	
 Cu 10 according to GOST 	Yes; Standard/climate	time/resolution per channel	
• Cu 50	Yes; Standard/climate	Resolution with overrange (bit including gign), may	21 bit; For measuring mode RTC and
 Cu 50 according to GOST 	Yes; Standard/climate	(bit including sign), max.	TC when using the function "Scalable temperature measuring range"
• Cu 100	Yes; Standard/climate		(32 bit REAL format);
 Cu 100 according to GOST 	Yes; Standard/climate		16 bit for measuring mode R and U; 16 bit for all measuring modes when
• Ni 10	Yes; Standard/climate		using the S7 format (16 bit INTEGEF
 Ni 10 according to GOST 	Yes; Standard/climate	 Integration time, parameterizable 	Yes
• Ni 100	Yes; Standard/climate	 Integration time (ms) 	Fast mode: 2.5 / 16.67 / 20 / 100 ms
 Ni 100 according to GOST 	Yes; Standard/climate		standard mode: 7.5 / 50 / 60 / 300 m
• Ni 1000	Yes; Standard/climate	 Basic conversion time, including integration time (ms) 	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
 Ni 1000 according to GOST 	Yes; Standard/climate	- additional conversion time	Thermocouples, 150 Ohm, 300 Ohm
• LG-Ni 1000	Yes; Standard/climate	for wire-break monitoring	600 Ohm, Cu10, Cu50, Cu100, Ni10
• Ni 120	Yes; Standard/climate		Ni100, Ni120, Ni200, Pt10, Pt50, Pt100: 4 ms; 6 kOhm, Ni500, Ni1000
 Ni 120 according to GOST 	Yes; Standard/climate		LG-Ni1000, Pt200, Pt500, Pt1000:
• Ni 200	Yes; Standard/climate		13 ms
 Ni 200 according to GOST 	Yes; Standard/climate	 Interference voltage suppression for 	400 / 60 / 50 / 10 Hz
• Ni 500	Yes; Standard/climate	interference frequency f1 in Hz	
 Ni 500 according to GOST 	Yes; Standard/climate	 Basic execution time of the module (all channels released) 	Corresponds to the channel with the highest basic conversion time
• Pt 10	Yes; Standard/climate	Smoothing of measured values	5
 Pt 10 according to GOST 	Yes; Standard/climate	parameterizable	Yes
• Pt 50	Yes; Standard/climate	Encoder	
 Pt 50 according to GOST 	Yes; Standard/climate	Connection of signal encoders	
• Pt 100	Yes; Standard/climate	 for voltage measurement 	Yes
 Pt 100 according to GOST 	Yes; Standard/climate	 for current measurement as 	No
• Pt 1000	Yes; Standard/climate	2-wire transducer	
 Pt 1000 according to GOST 	Yes; Standard/climate	 for current measurement as 	No
• Pt 200	Yes; Standard/climate	4-wire transducer	Yes
 Pt 200 according to GOST 	Yes; Standard/climate	 for resistance measurement with two-wire connection 	165
• Pt 500	Yes; Standard/climate	 for resistance measurement with 	Yes; All measuring ranges except
Pt 500 according to GOST	Yes; Standard/climate	three-wire connection	PTC; internal compensation of the
Input ranges (rated values), resistors		 for resistance measurement with 	cable resistances Yes: All measuring ranges
• 0 to 150 ohms	Yes	four-wire connection	except PTC
0 to 300 ohms	Yes	Errors/accuracies	
• 0 to 600 ohms	Yes	Basic error limit (operational limit at	
• 0 to 3000 ohms	No	25 °C)	
• 0 to 6000 ohms	Yes	 Voltage, relative to input range, (+/-) 	0.05 %
• PTC	Yes	 Resistance, relative to input range, 	0.05 %
Thermocouple (TC)		 (+/-) Resistance thermometer, relative to 	Cuxxx Standard: ±0.3 K,
Temperature compensation		input range, (+/-)	Cuxxx Klima: ±0.2 K,
- parameterizable	Yes		Ptxxx Standard: ±0.5 K,
Cable length			Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K,
 shielded, max. 	800 m; at U; 200 m at R/RTD/TC		Nixxx Klima: ±0.15 K
		 Thermocouple, relative to input range, (+/-) 	$\begin{array}{l} \label{eq:constraint} Type B: > 600 \ ^{\circ}C \ \pm 1 \ K, \ Type E: \\ > -200 \ ^{\circ}C \ \pm 0.5 \ K, \ Type J: > -210 \ ^{\circ}C \\ \pm 0.5 \ K, \ Type K: > -200 \ ^{\circ}C \ \pm 1 \ K, \\ \ Type N: > -200 \ ^{\circ}C \ \pm 1 \ K, \ Type B: > 0 \ ^{\circ}C \\ \pm 1 \ K, \ Type S: > 0 \ ^{\circ}C \ \pm 1 \ K, \ Type TXK/TXK(L): \ \pm 0.5 \ K \end{array}$
		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. Common mode voltage, max. 	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode 60 V DC/30 V AC
		Common mode interference, min.	80 dB

SIMATIC S7-1500 Advanced Controllers I/O modules Analog modules

SM 531 analog input modules

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° 0	
 horizontal installation, max. 	60 °C	
 vertical installation, min. 	0° 0	
 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	

SIMATIC S7-1500 Advanced Controllers I/O modules

Analog modules

SM 532 analog output modules

Overview



• 2, 4 and 8-channel analog output modules

- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers

Article No.

• Even solves more complex automation tasks

Article No.

SM 532 analog output modules		DIN A4 labeling sheets	
Module width 25 mm		For 35 mm modules;	6ES7592-2AX00-0AA0
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;	6ES7532-5NB00-0AB0	10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	
incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door		For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	6ES7592-1AX00-0AA0
Module width 35 mm		U connector	6ES7590-0AA00-0AA0
4 x U/I ST; 4 analog outputs, ±10 V, 1 5 V, 0 10 V or	6ES7532-5HD00-0AB0	5 units; spare part	
±20 mA, 0/4 20 mA, 16-bit; incl. infeed element, shield bracket,		Universal front door for I/O modules	
shield terminal, labeling strips, U connector, printed front door		For 35 mm modules; 5 front doors; with 5 labeling	6ES7528-0AA00-7AA0
8 x U/I HF; 8 analog outputs, ±10 V, 1 5 V, 0 10 V or	6ES7532-5HF00-0AB0	strips (front) and 5 cabling diagrams per front door; spare part	
±20 mA, 0/4 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door		For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	6ES7528-0AA00-0AA0
4 x U/I HF; 4 analog outputs,	6ES7532-5ND00-0AB0	Shielding set I/O	
±10 V, 1 5 V, 0 10 V or ±20 mA, 0/4 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door		For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	6ES7590-5CA00-0AA0
Accessories		For 25 mm modules:	6ES7590-5CA10-0XA0
Front connectors		infeed element, shield bracket,	
For 35 mm modules; including four potential bridges, cable ties and individual labeling		and shield terminal; 4 units, spare part (one shield set supplied with the module).	
strips, 40-pin Screw terminals 	6ES7592-1AM00-0XB0	Shield terminal element	6ES7590-5BA00-0AA0
Push-in	6ES7592-1BM00-0XB0	10 units; spare part	
For 25 mm modules;	6ES7592-1BM00-0XA0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
including cable ties and individual labeling strips; push-in terminal 40-pin; spare part		Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
		Current "Manual Collection" DVD and the three subsequent updates	

SIMATIC S7-1500 Advanced Controllers I/O modules

Analog modules

SM 532 analog output modules

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
General information				
Product type designation	AQ 2xU/I ST	AQ 4xU/I ST	AQ 8xU/I HS	AQ 4xU/I HF
Product function				
 I&M data 	Yes; I&M0 to I&M3			
 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 / -			
 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 k $\Omega;$ 0.5 kOhm at 1 to 5 V	1 k $\Omega;$ 0.5 kOhm at 1 to 5 V	1 kΩ	1 k $\Omega;$ 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

Analog modules

SM 532 analog output modules

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

SIMATIC S7-1500 Advanced Controllers I/O modules Analog modules

SM 532 analog output modules

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
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
SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2
Ambient conditions				
Ambient temperature during operation				
 horizontal installation, min. 		-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02
 horizontal installation, max. 		60 °C	60 °C	60 °C
 vertical installation, min. 		-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02
 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	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 controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

Article No.		Article No.
	Universal front door for I/O modules	
6ES7534-7QE00-0AB0	For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	6ES7528-0AA00-0AA0
	Shielding set I/O	
	For 25 mm modules; infeed element, shield 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, multi-language: LOGO!, SIMADYN,	
	SIMATIC distributed I/O,	
6ES7592-1BM00-0XA0	SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
		6ES7998-8XC01-8YE2
6ES7592-1AX00-0AA0	Current "Manual Collection" DVD and the three subsequent updates	
6ES7590-0AA00-0AA0		
	6ES7534-7QE00-0AB0 6ES7592-1BM00-0XA0 6ES7592-1AX00-0AA0	GES7534-7QE00-0AB0 Universal front door for I/O modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part Shielding set I/O For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module). Shield terminal element 10 units; spare part 10 units; spare part SiMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO1, SIMADYN, SIMATIC bus components, SIMATIC C view components, SIMATIC C7, SIMATIC VIET, SIMATIC PC-based Automation, SIMATIC PC-based Automation, SIMATIC PC-cased Automation, SIMATIC PC, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PC, SIMATIC Collection GES7592-1AX00-0AA0 SIMATIC Manual Collection ^o DVD and the three subsequent updates

SIMATIC S7-1500 Advanced Controllers I/O modules Analog modules

SM 534 analog input/output modules

Article number	6ES7534-7QE00-0AB0	Article number	6ES7534-7QE00-0AB0
	S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST		S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
General information		Input ranges (rated values), curre	
Product type designation	AI 4xU/I/RTD/TC /AQ 2xU/I ST	• 0 to 20 mA	Yes
Product function		• -20 mA to +20 mA	Yes
• I&M data	Yes: I&M0 to I&M3	• 4 mA to 20 mA	Yes
Isochronous mode	No	Input ranges (rated values),	
Prioritized startup	No	thermocouples	
Measuring range scalable	No	• Туре В	Yes
Scalable measured values	No	• Туре С	No
Adjustment of measuring range	No	• Туре Е	Yes
Output range scalable	No	• Туре Ј	Yes
Engineering with		• Туре К	Yes
STEP 7 TIA Portal configurable/	V13 / V13.0.2	• Type L	No
integrated from version	10, 10.0.2	• Type N	Yes
STEP 7 configurable/	V5.5 SP3 / -	• Type R	Yes
integrated from version		• Type S	Yes
PROFIBUS from GSD version/	V1.0 / V5.1	• Type T	Yes
GSD revision		• Type U	No
 PROFINET from GSD version/ GSD revision 	V2.3 / -	Type TXK/TXK(L) to GOST	No
Operating mode		Input ranges (rated values),	
Oversampling	No	resistance thermometer	
• MSI	Yes	• Cu 10	No
• MSO	Yes	 Cu 10 according to GOST 	No
Supply voltage	100	• Cu 50	No
Rated value (DC)	24 V	 Cu 50 according to GOST 	No
Reverse polarity protection	Yes	• Cu 100	No
Analog inputs		 Cu 100 according to GOST 	No
Number of analog inputs	4	• Ni 10	No
For current measurement	4	 Ni 10 according to GOST 	No
For voltage measurement	4	• Ni 100	Yes; Standard/climate
For resistance/resistance	2	 Ni 100 according to GOST 	No
thermometer measurement	_	• Ni 1000	Yes; Standard/climate
 For thermocouple measurement 	4	 Ni 1000 according to GOST 	No
permissible input voltage for voltage	28.8 V	• LG-Ni 1000	Yes; Standard/climate
input (destruction limit), max.		• Ni 120	No
permissible input current for current input (destruction limit), max.	40 mA	 Ni 120 according to GOST 	No
Constant measurement current for	150 Ohm, 300 Ohm, 600 Ohm,	• Ni 200	No
resistance-type transmitter, typ.	Pt100, Pt200, Ni100: 1.25 mA;	 Ni 200 according to GOST 	No
	6 000 Ohm, Pt500, Pt1000, Ni1000,	• Ni 500	No
	LG-Ni1000: 0.625 mA; PTC: 0.472 mA	 Ni 500 according to GOST 	No
Technical unit for temperature	Yes; °C/°F/K	• Pt 10	No
measurement adjustable	, ., .,	 Pt 10 according to GOST 	No
Analog input with oversampling	No	• Pt 50	No
Standardization of measured values	No	 Pt 50 according to GOST 	No
Input ranges (rated values),		• Pt 100	Yes; Standard/climate
voltages		 Pt 100 according to GOST 	No
• 0 to +5 V	No	• Pt 1000	Yes; Standard/climate
• 0 to +10 V	No	 Pt 1000 according to GOST 	No
• 1 V to 5 V	Yes	• Pt 200	Yes; Standard/climate
• -1 V to +1 V	Yes	 Pt 200 according to GOST 	No
• -10 V to +10 V	Yes	• Pt 500	Yes; Standard/climate
• -2.5 V to +2.5 V	Yes	 Pt 500 according to GOST 	No
• -25 mV to +25 mV	No		
 -250 mV to +250 mV 	Yes		
• -5 V to +5 V	Yes		
• -50 mV to +50 mV	Yes		

Article number

I/O modules Analog modules

SM 534 analog input/output modules

6ES7534-7QE00-0AB0

Article number	6ES7534-7QE00-0AB0
	S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Input ranges (rated values),	AI 42 0/1/11D/10/AQ 22 0/131
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 k Ω ; 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

S7-1500, AI 4x U///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. Integration time, parameterizable Basic conversion time, including integration time (ms) - additional conversion time for wire-break monitoring - additional conversion time for resistance measurement 150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni1000, Pt200, Ni1000, Ni1000, LG-Ni1000, Pt200, Ni1000, Pt2: 4 ms - Interference voltage suppression for interference frequency 11 in Hz Smoothing of measured values • parameterizable • parameterizable Yes Analog value generation for time/resolution per channel Resolution with overrange (bit including sign), max. • Conversion time (per channel) 0.5 ms Setting time • for resistive load • for resistive load • for ourge measurement as 2-wire transducer • Gor current measurement as 2-wire transducer • for current measurement as 4-wire transducer	Anticle number	0E5/334-/QE00-0AD0
for the inputs Integration and conversion time/resolution per channel Presolution with overrange (bit including sign), max. 16 bit Integration time, parameterizable Yes Basic conversion time, including integration time (ms) 9 / 23 / 27 / 107 ms - additional conversion time for wire-break monitoring 9 ms - additional conversion time for resistance measurement 9 ms - additional conversion time for resistance measurement 9 ms - Interference voltage suppression for interference frequency f1 in Hz 900 / 60 / 50 / 10 Smoothing of measured values Yes - parameterizable Yes Analog value generation for the outputs 16 bit Integration and conversion time (bit including sign), max. 16 bit - Conversion time (per channel) 0.5 ms Settling time 15 ms • for capacitive load 2.5 ms • for voltage measurement sequences Yes • for voltage measurement as 2-wire transducer Yes • for current measurement as 2-wire transducer Yes • for current measurement as 2-wire transducer Yes; Only for PTC • for resistance measurement with three-wire connection Yes; All measuring ranges except		
Integration and conversion time/resolution per channel 16 bit • Resolution with overrange (bit including sign), max. 16 bit • Integration time, parameterizable Yes • Basic conversion time, including integration time (ms) 9 / 23 / 27 / 107 ms • additional conversion time for wire-break monitoring 9 ms • additional conversion time for resistance measurement 150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni1000, EG-Ni1000, Ni1000, LG-Ni1000, Pt2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, Pt2 4 ms • Interference voltage suppression for interference frequency f1 in Hz 400 / 60 / 50 / 10 Smoothing of measured values Yes • parameterizable Yes Analog value generation for time/resolution per channel 16 bit • Resolution with overrange (bit including sign), max. 0.5 ms • Conversion time (per channel) 0.5 ms Settling time 1.5 ms • for capacitive load 2.5 ms • for outrent measurement as 2-wire transducer Yes • for current measurement as 4-wire transducer Yes • for current measurement as 4-wire connection Yes; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances	Analog value generation	
time/resolution per channel If bit • Resolution with overrange (bit including sign), max. 16 bit • Integration time, parameterizable Yes Basic conversion time, including integration time (ms) 9 / 23 / 27 / 107 ms - additional conversion time for wire-break monitoring 9 ms - additional conversion time for resistance measurement 9 / 50 ohm, 300 ohm, 600 ohm, Pt 500, Pt 1000, Nt 1000, LG-Nt 1000, PTC: 4 ms • Interference voltage suppression for interference frequency 11 in Hz 400 / 60 / 50 / 10 Smoothing of measured values 9 res • parameterizable Yes Analog value generation for the outputs 16 bit Integration and conversion time (per channel) 0.5 ms Setting time 15 ohm S • for resistive load 1.5 ms • for capacitive load 2.5 ms • for current measurement as 2-wire transmitter, max. 820 Ω • for current measurement as 4-wire transducer Yes; Only for PTC • for current measurement as 4-wire transducer Yes; Only for PTC • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC	•	
(bit including sign), max. Yes Integration time, parameterizable Yes Basic conversion time, including integration time (ms) 9 / 23 / 27 / 107 ms - additional conversion time for vire-break monitoring 9 ms - additional conversion time for resistance measurement 150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni1000, 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 yes • parameterizable Yes Analog value generation for the outputs 16 bit Integration and conversion time/resolution per channel 0.5 ms Settling time 1.5 ms • for resistive load 1.5 ms • for capacitive load 2.5 ms • for voltage measurement Yes • for voltage measurement as 2-wire transducer Yes • for current measurement as 2-wire transducer Yes • for resistance measurement with three-wire connection Yes; Only for PTC • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC <td></td> <td></td>		
 Basic conversion time, including integration time (ms) additional conversion time for wire-break monitoring additional conversion time for resistance measurement additional conversion time for resistance measurement additional conversion time for resistance measurement 150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni1000, LG-Ni1000, PTC: 4 ms Interference voltage suppression for the outputs Integration and conversion time (per channel) Resolution with overrange (bit including sign), max. Conversion time (per channel) For capacitive load for capacitive load for current measurement as 2-wire transducer For current measurement as 4-wire transducer For current measurement as 4-wire transducer For resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with three-wire connection for resistance measurement with three-wire connection 		16 bit
integration time (ms) 9 ms - additional conversion time for wire-break monitoring 9 ms - additional conversion time for resistance measurement 150 ohm, 300 ohm, 600 ohm, pt1000, Ni1000, LG-Ni1000, PTC: 4 ms - Interference voltage suppression for interference frequency 11 in Hz 400 / 60 / 50 / 10 Smoothing of measured values Yes - parameterizable Yes Analog value generation for the outputs 16 bit Integration and conversion time (per channel) 0.5 ms Settling time 1.5 ms - for resistive load 1.5 ms - for capacitive load 2.5 ms - for current measurement as 2-wire transducer Yes - Burden of 2-wire transmitter, max. 820 Ω - for resistance measurement twith two-wire connection Yes; Only for PTC - for resistance measurement twith two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances - for resistance measurement with three-wire connection Yes; All measuring ranges except PTC	 Integration time, parameterizable 	Yes
for wire-break monitoring- additional conversion time for resistance measurement150 ohm, 300 ohm, 600 ohm, P1100, P1200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms• Interference voltage suppression for interference frequency f1 in Hz400 / 60 / 50 / 10Smoothing of measured values400 / 60 / 50 / 10• parameterizableYesAnalog value generation for the outputsYesIntegration and conversion time/resolution per channel (bit including sign), max.16 bit• Conversion time (per channel) of resistive load0.5 ms• for resistive load1.5 ms• for capacitive load2.5 ms• for voltage measurement of or urrent measurement as 2-wire transducerYes• Burden of 2-wire transmitter, max.820 Ω• for current measurement as 4-wire transducerYes; Only for PTC• for resistance measurement with three-wire connectionYes; All measuring ranges except PTC internal compensation of the cable resistances• for resistance measurement with three-wire connectionYes; All measuring ranges except PTC	 Basic conversion time, including integration time (ms) 	9 / 23 / 27 / 107 ms
for resistance measurementPt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms• Interference voltage suppression for interference frequency f1 in Hz400 / 60 / 50 / 10Smoothing of measured valuesYes• parameterizableYesAnalog value generation for the outputsYesIntegration and conversion time/resolution per channel16 bit• Resolution with overrange (bit including sign), max.16 bit• Conversion time (per channel)0.5 msSettling time2.5 ms• for resistive load1.5 ms• for capacitive load2.5 ms• for voltage measurement • for voltage measurementYes• for current measurement as 2-wire transducerYes• Burden of 2-wire transmitter, max.820 Ω• for current measurement as 4-wire transducerYes; Only for PTC• for resistance measurement with three-wire connectionYes; All measuring ranges except PTC internal compensation of the cable resistances• for resistance measurement with three-wire connectionYes; All measuring ranges except PTC		9 ms
interference frequency f1 in Hz Smoothing of measured values • parameterizable Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • for resistive load • for resistive load • for resistive load • for resistive load • for voltage measurement • for current measurement as 2-vire transducer • Burden of 2-wire transmitter, max. • for current measurement as 4-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with three-wire connection • for resistance measurement with three-wire connection • for resistance measurement with three-wire connection		Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000,
• parameterizable Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Integration and conversion time/resolution per channel 16 bit • Resolution with overrange (bit including sign), max. 16 bit • Conversion time (per channel) 0.5 ms Settling time 0.5 ms • for resistive load 1.5 ms • for capacitive load 2.5 ms • for capacitive load 2.5 ms • for outres on signal encoders • • for voltage measurement Yes • for current measurement as 2-wire transducer Yes • for current measurement as 2-wire transducer Yes • for current measurement as 4-wire transducer Yes; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC		400 / 60 / 50 / 10
Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel) 0.5 ms Settling time • for resistive load • for capacitive load • for capacitive load • for inductive load 2.5 ms Encoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • Burden of 2-wire transmitter, max. 820 Ω • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection	Smoothing of measured values	
the outputs Integration and conversion time/resolution per channel Integration and conversion time/resolution per channel 16 bit • Resolution with overrange (bit including sign), max. 16 bit • Conversion time (per channel) 0.5 ms • Conversion time (per channel) 0.5 ms Settling time 1.5 ms • for resistive load 1.5 ms • for capacitive load 2.5 ms • for inductive load 2.5 ms Encoder 2.5 ms Connection of signal encoders • • for voltage measurement Yes • for current measurement as 2-wire transducer Yes • for current measurement as 4-wire transducer Yes • for current measurement as 4-wire transducer Yes; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with three-wire connection Yes; All measuring ranges except PTC	 parameterizable 	Yes
Integration and conversion 16 bit Image: Resolution with overrange (bit including sign), max. 16 bit Conversion time (per channel) 0.5 ms Settling time 0.5 ms for resistive load 1.5 ms of or capacitive load 2.5 ms for inductive load 2.5 ms effor inductive load 2.5 ms Encoder 2.5 ms Connection of signal encoders 16 bit of or current measurement Yes effor current measurement as 2-wire transducer Yes Burden of 2-wire transmitter, max. 820 Ω effor current measurement as 4-wire transducer Yes; Only for PTC of or resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances of or resistance measurement with Yes; All measuring ranges except PTC		
(bit including sign), max. 0.5 ms • Conversion time (per channel) 0.5 ms Settling time 1.5 ms • for resistive load 2.5 ms • for capacitive load 2.5 ms • for inductive load 2.5 ms • for voltage measurement Yes • for voltage measurement as 2-wire transducer Yes • Burden of 2-wire transmitter, max. 820 Ω • for current measurement as 4-wire transducer Yes; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internation of the cable resistances • for resistance measurement with Yes; All measuring ranges except PTC	Integration and conversion	
Settling time 1.5 ms • for resistive load 2.5 ms • for capacitive load 2.5 ms • for inductive load 2.5 ms • for outure load 2.5 ms Encoder 2.5 ms 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; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with Yes; All measuring ranges except PTC		16 bit
• for resistive load 1.5 ms • for capacitive load 2.5 ms • for inductive load 2.5 ms • for inductive load 2.5 ms • for outure load 2.5 ms Encoder	 Conversion time (per channel) 	0.5 ms
• for capacitive load 2.5 ms • for inductive load 2.5 ms Encoder 2.5 ms 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; Only for PTC • for resistance measurement with two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with Yes; All measuring ranges except PTC	Settling time	
• 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 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 Yes; All measuring ranges except PTC	 for resistive load 	1.5 ms
Encoder Connection of signal encoders • for voltage measurement Yes • for current measurement as Yes 2-wire transducer 820 Ω • for current measurement as Yes 2-wire transducer 820 Ω • for current measurement as Yes 4-wire transducer Yes • for current measurement as Yes 4-wire transducer 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 Yes; All measuring ranges except PTC	 for capacitive load 	2.5 ms
Connection of signal encoders Yes • for voltage measurement Yes • for current measurement as Yes 2-wire transducer 820 Ω • for current measurement as Yes 4-wire transducer 820 Ω • for current measurement as Yes 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 Yes; All measuring ranges except PTC	for inductive load	2.5 ms
 for voltage measurement Yes for current measurement as 2-wire transducer Burden of 2-wire transmitter, max. 820 Ω for current measurement as 4-wire transducer Yes Yes	Encoder	
 for voltage measurement Yes for current measurement as 2-wire transducer Burden of 2-wire transmitter, max. 820 Ω for current measurement as 4-wire transducer Yes Yes	Connection of signal encoders	
2-wire transducer 820 Ω - 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 Yes; All measuring ranges except PTC	=	Yes
 for current measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances for resistance measurement with Yes; All measuring ranges except PTC 		Yes
 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances for resistance measurement with Yes; All measuring ranges except PTC 	- Burden of 2-wire transmitter, max.	820 Ω
two-wire connection Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with Yes; All measuring ranges except PTC internal compensation of the cable resistances • for resistance measurement with Yes; All measuring ranges except PTC		Yes
 three-wire connection internal compensation of the cable resistances for resistance measurement with Yes; All measuring ranges except PTC 		Yes; Only for PTC
		internal compensation of the cable
		Yes; All measuring ranges except PTC

SIMATIC S7-1500 Advanced Controllers I/O modules Analog modules

SM 534 analog input/output modules

Article number GES7534-7GE0-OABD S7-1500, Al 4x UI//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 %; Pbxx standard: ±0.7 K, Nixxx standard: ±0.3 K, Nixx standard: ±0.4 K, Nixe S, S N K, Series mode interference (pak value of input range, Nontoring the supply voltage, Yes Diagnostic function Yes Short-circuit Yes; only for input type 1 5 V, 4 20 mA, TC, R, RTD and output type current Ves; only for output type voltage" Yes; red LED Diagnostis dialcation LED <t< th=""><th></th><th></th></t<>		
AI 4x U/I/RTD/TC/AQ 2x U/I ST Errors/accuracies Basic error limit (opperational limit at 25 °C) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) • Thermocouple, relative to input range, (+/-) • Thermocouple, relative to input range, (+/-) • O.1 %; Ptxxx standard: ±0.7 K, Pbxxx climate: ±0.15 K • Thermocouple, relative to input range, (+/-) • Voltage, relative to output range, (+/-) • Current, relative to output range, (+/-) • Current, relative to output range, (+/-) • Common mode voltage max. • Common mode voltage, max. • Common mode voltage, max. • Common mode voltage, max. • Diagnostic s function Yes • Substitute value alarm Yes • Diagnostic s function Yes • Diagnostic alarm Yes • Diagnostic alarm Yes • Monitoring the supply voltage Yes; ronup	Article number	6ES7534-7QE00-0AB0
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: ±0.15 K • Thermocouple, relative to input range, (+/-) 0.1 %; Type B: > 600 °C ±1.7 K, Vixx standard: ±0.3 K, Nixxx standard: ±0.3 K, Vixe E: > -200 °C ±1.2 K, Vipe K: > -200 °C ±1.2 K, Vipe K: > -200 °C ±1.2 K, Vipe K: > -200 °C ±1.2 K, Vipe R: > 0 °C ±1.9 K, Vipe R: > -200 °C ±0.8 K • Voltage, relative to output range, (+/-) 0.2 % • Voltage, relative to output range, (+/-) 0.2 % • Voltage, relative to output range, (+/-) 0.2 % • Interference voltage suppression for f = n x (fl +/-1 %), f1 = interference frequency 40 dB • Series mode interference < rated value of input range, min. 40 dB • Common mode voltage, max. 10 V • Common mode voltage, ma		
(operational limit at 25 °C)• Voltage, relative to input range, (+/-)0.1 %• Current, relative to input range, (+/-)• Resistance, relative to input range, (+/-)• Resistance thermometer, relative to input range, (+/-)• Resistance thermometer, relative to input range, (+/-)• Thermocouple, relative to input range, (+/-)• Thermocouple, relative to input range, (+/-)• Thermocouple, relative to input range, (+/-)• U1 %: Type B: > 600 °C ±1.7 K, type B: > 200 °C ±0.7 K, type B: > 200 °C ±1.2 K, type B: > 200 °C ±0.8 K• Voltage, relative to output range, (+/-)• Current, relative to output range, (+/-)• Common mode vol	Errors/accuracies	
 Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) Resistance thermometer, relative to input range, (+/-) Resistance thermometer, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to output range, (+/-) Voltage, relative to output range, (+/-) Voltage, relative to output range, (+/-) Voltage, relative to output range, (+/-) Current, relative to output range, (+/-) Current, relative to output range, (+/-) Current, relative to output range, (+/-) Common mode voltage max. Common mode voltage, max. Ves 's settus information Diagnostics function Yes Limit values alarm Ves 'two upper and two lower limit values in each case Diagnostic alarm Limit value alarm Ves 'noly for input type 1 5 V, 4 20 mA, TC, R, RTD and output type output type 'ves; only for input type 'voltage' Wire-break Yes; only for output type 'voltage' Verelfow/underflow Yes Channel status display Yes; green LED Yes; red LED Yes; red LED 		
 Resistance, relative to input range, (+/-) Resistance thermometer, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to output range, (+/-) Voltage, relative to output range, (+/-) Voltage, relative to output range, (+/-) Voltage, relative to output range, (+/-) Currrent, relative to output range, (+/-) Current, relative to output range, (+/-) Therference voltage suppression for f = n x (f1 +/-1 %), Therference requency Series mode interference (peak value of interference, min. Common mode voltage, max. Common mode voltage, max. Common mode voltage, max. Common mode voltage max. Common mode voltage, max. Common mode voltage max. Ves Substitute values connectable Yes Alarms Diagnostics function Yes Monitoring the supply voltage Wire-break Short-circuit Short-circuit Short-circuit Ves; green LED Yes; green LED 	• Voltage, relative to input range, (+/-)	0.1 %
 (+/-) Resistance thermometer, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) Thermocouple, relative to output range, (+/-) Voltage, relative to output range, (+/-) Current, relative to output range, (-(-) Series mode interference, min. Common mode voltage, max. 10 V Common mode voltage, max. 10 V Common mode voltage, max. 10 V Common mode voltage, max. Ves Substitute values connectable Yes Alarms Monitoring the supply voltage Wire-break Nonitoring of the supply voltage Yes; green LED Nonitoring of the supply voltage Yes; green LED Yes; red LED Yes; red LED 		
relative to input range, (+/-) 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 K; > -200 °C ±1.2 K, Type K; > -200 °C ±1.2 K, Type S; > 0 °C ±1.9 K, Type S; > 0 °C ±1.2 K, Type S; > 0 °C ±1.9 K, Type S; > 0 °C ±1.2 K, Type S; > 0 °C ±1.		0.1 %
relative to input range, (+/-) type E: > -200 °C ±0.7 K, type K: > -200 °C ±1.2 K, type K: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K 0.2 % • Voltage, relative to output range, (+/-) Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency • Series mode interference < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min. • Common mode interference, min. • Common mode voltage, max. • Common mode voltage, max. • Diagnostics function Diagnostics function • Limit value alarm • Limit value alarm • Diagnostic alarm • Limit value alarm • Short-circuit • Short-circuit • Short-circuit • RUN LED • Channel status display • for channel diagnostics • Yes; green LED • Channel status display • Yes; green LED • Yes; green LED		Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K,
(+/-) O.2 % • Current, relative to output range, (+/-) 0.2 % Interference voltage suppression for f = n x (f1 +/- 1%), f1 = interference frequency 40 dB • Series mode interference (peak value of interference < rated value of input range), min.		type E: > -200 °C \pm 0.7 K, type J: > -210 °C \pm 0.8 K, type K: > -200 °C \pm 1.2 K, type N: > -200 °C \pm 1.2 K, type R: > 0 °C \pm 1.9 K, type S: > 0 °C \pm 1.9 K,
(+/-)Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency40 dB• Series mode interference (peak value of input range), min.40 dB• Common mode voltage, max.10 V• Common mode interference, min.60 dBInterrupts/diagnostics/ status information10 VDiagnostics function Substitute values connectable • Diagnostic alarmYes• Diagnostic alarm • Diagnostic alarmYes• Limit value alarmYes; two upper and two lower limit values in each caseDiagnoses • Monitoring the supply voltage • Overflow/underflowYes; only for input type 1 5 V, 4 20 mA, TC, R, RTD and output type current• Short-circuit • Short-circuitYes; green LED• RUN LED • ERROR LEDYes; green LED• Monitoring of the supply voltage • (PWR-LED)Yes; green LED• Channel status display • for channel diagnosticsYes; red LED• Channel diagnosticsYes; green LED• For channel diagnosticsYes; red LED		0.2 %
f = n x (f1 +/- 1 %), 40 dB • Series mode interference (peak value of input range), min. 40 dB • Common mode voltage, max. 10 V • Common mode voltage, max. 60 dB Interrupts/diagnostics/ status information 60 dB Diagnostics function Yes Substitute values connectable Yes Alarms - • Diagnostic alarm Yes; two upper and two lower limit values in each case Diagnoses - • Monitoring the supply voltage 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; green LED • RUN LED Yes; red LED • RUN LED Yes; green LED • ERROR LED Yes; green LED • Monitoring of the supply voltage (PWR-LED) Yes; green LED • Channel status display Yes; green LED • for channel diagnostics Yes; red LED		0.2 %
(peak value of interference < rated value of input range), min.10 V• Common mode voltage, max.10 V• Common mode interference, min.60 dBInterrupts/diagnostics/ status informationYesDiagnostics functionYesSubstitute values connectableYesAlarms• Diagnostic alarmYes• Limit value alarmYes; two upper and two lower limit values in each caseDiagnoses• Monitoring the supply voltageYes• Wire-breakYes; only for input type 1 5 V, 4 20 mA, TC, R, RTD and output type current• Short-circuitYes; Only for output type "voltage"• Overflow/underflowYesDiagnostics indication LEDYes; green LED• RUN LEDYes; red LED• Monitoring of the supply voltage (PWR-LED)Yes; green LED• Channel status display (For channel diagnosticsYes; red LED	f = n x (f1 +/- 1 %),	
Common mode interference, min. 60 dB Interrupts/diagnostics/ status information Diagnostics function Substitute values connectable Yes Alarms Diagnostic alarm Yes; two upper and two lower limit values in each case Diagnoses Monitoring the supply voltage Wire-break Short-circuit Short-circuit Yes; Only for output 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 RUN LED RUN LED Karnon LED Yes; green LED Monitoring of the supply voltage Yes; green LED	(peak value of interference < rated	40 dB
Interrupts/diagnostics/ status information Diagnostics function Yes Substitute values connectable Yes Alarms Diagnostic alarm Limit value alarm Yes; two upper and two lower limit values in each case Diagnoses Monitoring the supply voltage Wire-break Short-circuit Short-circuit Yes; Only for output 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 Tagnostics indication LED RUN LED Yes; green LED ERROR LED Yes; green LED Monitoring of the supply voltage (PWR-LED) Channel status display Yes; green LED Yes; green	 Common mode voltage, max. 	10 V
status informationDiagnostics functionYesSubstitute values connectableYesAlarmsYes• Diagnostic alarmYes; two upper and two lower limit values in each caseDiagnosesYes• Monitoring the supply voltageYes• Wire-breakYes; only for input type 1 5 V, 4 20 mA, TC, R, RTD and output type current• Short-circuitYes; Only for output type "voltage"• Overflow/underflowYesDiagnostics indication LED • RUN LEDYes; green LED Yes; red LED• Monitoring of the supply voltage (PWR-LED)Yes; green LED Yes; green LED Yes; green LED Yes; green LED Yes; green LED Yes; green LED Yes; green LED• Channel status display • for channel diagnosticsYes; red LED Yes; red LED	 Common mode interference, min. 	60 dB
Substitute values connectable Yes Alarms Yes • 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 Yes; green LED • RUN 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		
Alarms Yes • Diagnostic alarm Yes • Limit value alarm Yes; two upper and two lower limit values in each case Diagnoses ************************************	Diagnostics function	Yes
 Diagnostic alarm Limit value alarm Yes Limit value alarm Yes; two upper and two lower limit values in each case Diagnoses Monitoring the supply voltage Wire-break 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 RUN LED Yes; green LED ERROR LED Yes; green LED Monitoring of the supply voltage (PWR-LED) Channel status display Yes; red LED Yes; green LED<td>Substitute values connectable</td><td>Yes</td>	Substitute values connectable	Yes
 Limit value alarm Yes; two upper and two lower limit values in each case Diagnoses Monitoring the supply voltage Wire-break Wire-break Short-circuit Short-circuit Yes; Only for output 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 FROR LED Yes; green LED ERROR LED Yes; green LED Monitoring of the supply voltage (PWR-LED) Channel status display Yes; red LED Yes; green LED Yes; green	Alarms	
values in each case Diagnoses • Monitoring the supply voltage • 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	Diagnostic alarm	Yes
 Monitoring the supply voltage Wire-break 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 RUN LED Yes; green LED ERROR LED Yes; green LED Monitoring of the supply voltage (PWR-LED) Channel status display Yes; red LED Yes; green LED Y	Limit value alarm	
 Wire-break 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 RUN LED Yes; green LED ERROR LED Yes; red LED Monitoring of the supply voltage (PWR-LED) Channel status display Yes; red LED Yes; green LED<td>Diagnoses</td><td></td>	Diagnoses	
• Overflow/underflow Yes Diagnostics indication LED Full 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		Yes; only for input type 1 5 V, 4 20 mA, TC, R, RTD and
• Overflow/underflowYesDiagnostics indication LED• RUN LEDYes; green LED• REROR LEDYes; red LED• Monitoring of the supply voltage (PWR-LED)Yes; green LED• Channel status displayYes; green LED• for channel diagnosticsYes; red LED	Short-circuit	
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	 Overflow/underflow 	Yes
RUN LEDYes; green LEDERROR LEDYes; red LEDMonitoring of the supply voltage (PWR-LED)Yes; green LEDChannel status displayYes; green LEDfor channel diagnosticsYes; red LED		
• ERROR LEDYes; red LED• Monitoring of the supply voltage (PWR-LED)Yes; green LED• Channel status displayYes; green LED• for channel diagnosticsYes; red LED	-	Yes; green LED
 Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics Yes; red LED 		-
for channel diagnostics Yes; red LED		
		Yes; green LED
for module 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. 	0°C
 horizontal installation, max. 	60 °C
 vertical installation, min. 	0 °C
 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 ($\pm 0.02\%$), ± 80 mV ($\pm 0.02\%$), ± 50 mV ($\pm 0.05\%$); r esistance: 150 Ohms ($\pm 0.02\%$); r 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

I/O modules SIPLUS analog modules

SIPLUS SM 531 analog input modules

SIPLUS SM 531 analog input modules (Extended temperature range and exposure to media) 8 analog inputs, ±10 V, ±5 V, 1 5 V or 0/4 20 mA, ±20 mA, 16-bit + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door 8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 5 V,	6AG1531-7NF10-7AB0 6AG1531-7KF00-7AB0
 exposure to media) 8 analog inputs, ±10 V, ±5 V, 1 5 V or 0/4 20 mA, ±20 mA, 16-bit + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door 8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, 	
±10 V, ±5 V, 1 5 V or 0/4 20 mA, ±20 mA, 16-bit + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door 8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV,	
±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV,	6AG1531-7KF00-7AB0
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	
0150/300/600/6000 ohms, 16-bit 8 analog inputs, ±10 V, ±5 V, 1 5 V or 0/4 20 mA, ±20 mA, 16-bit + 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 0150/300/600/6 000 ohms, PTC; 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6AG1531-7PF00-4AB0
	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 0150/300/600/6000 ohms, 16-bit 8 analog inputs, ± 10 V, ± 5 V, 1 5 V or 0/4 20 mA, ± 20 mA, 16-bit + sign; including infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door 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 0150/300/600/6 000 ohms, PTC; 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector,

See SIMATIC S7-1500 SM 531 analog input modules, page 4/116

Article number	6AG1531-7NF10-7AB0	6AG1531-7KF00-7AB0	6AG1531-7NF00-7AB0	6AG1531-7PF00-4AB0
Based on	6ES7531-7NF10-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF00-0AB0	6ES7531-7PF00-0AB0
	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
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)
 horizontal installation, max. 	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
 vertical installation, min. 	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	0 °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	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)

SIMATIC S7-1500 Advanced Controllers I/O modules SIPLUS analog modules

SIPLUS SM 531 analog input modules

Article number	6AG1531-7NF10-7AB0	6AG1531-7KF00-7AB0	6AG1531-7NF00-7AB0	6AG1531-7PF00-4AB0
Based on	6ES7531-7NF10-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF00-0AB0	6ES7531-7PF00-0AB0
	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
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
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, *			
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 reques
- 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; *			
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)	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			
 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			

I/O modules SIPLUS analog modules

SIPLUS SM 532 analog output modules

Overview



Ordering data	Article No.
SIPLUS SM 532 analog output modules	
(Extended temperature range and exposure to media)	
4 analog outputs, ±10 V, 1 5 V, 0 10 V or ±20 mA, 0/4 20 mA, 16-bit	6AG1532-5HD00-7AB0
8 analog outputs, ±10 V, 1 5 V, 0 10 V or ±20 mA, 0/4 20 mA, 16-bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	6AG1532-5HF00-7AB0
Accessories	See SIMATIC S7-1500 SM 532 analog output modules, page 4/127

- 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.

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 accor-	100 %; RH incl. condensation/frost (no commissioning	100 %; RH incl. condensation/frost (no commissioning

dance with IEC 60068-2-38, max. under condensation conditions) under condensation conditions)

SIPLUS SM 532 analog output modules

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

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.		Article No.
TM Count 2x24V counter module	6ES7550-1AA01-0AB0	Shielding set I/O	6ES7590-5CA00-0AA0
With 2 channels, max. 200 kHz; for 24 V encoder		Infeed element, shield clamp, and shield terminal;	
Accessories		5 units, spare part	
Front connector		Shield terminal element	6ES7590-5BA00-0AA0
For 35 mm modules:		10 units; spare part	
including four potential bridges,		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
cable ties and individual labeling strips, 40-pin		Electronic manuals on DVD,	
Screw terminals	6ES7592-1AM00-0XB0	multi-language:	
Push-in	6ES7592-1BM00-0XB0	LOGO!, ŠIMĀDYN, SIMATIC bus components,	
DIN A4 labeling sheets	6ES7592-2AX00-0AA0	SIMATIC C7, SIMATIC distributed I/O.	
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey		SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based automation, SIMATIC PCS 7,	
U connector	6ES7590-0AA00-0AA0	SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
5 units; spare part		SIMATIC Manual Collection	6ES7998-8XC01-8YE2
Universal front door	6ES7528-0AA00-7AA0	update service for 1 year	
for I/O modules		Current Manual Collection DVD and	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part		the three subsequent updates	

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

SIMATIC S7-1500 Advanced Controllers I/O modules

Technology modules

TM Count 2x24V counter module

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	100
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	50 V
 for signal "1", typ. 	2.5 mA
Input delay	2.0 11/
(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	
for teenhological functions	
- parameterizable	Yes
- parameterizable Digital outputs	
- parameterizable Digital outputs Type of digital output	Transistor
- parameterizable Digital outputs Type of digital output Number of digital outputs	Transistor 4; 2 per channel
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable	Transistor 4; 2 per channel Yes
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection	Transistor 4; 2 per channel Yes Yes; electronic/thermal
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to	Transistor 4; 2 per channel Yes
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input	Transistor 4; 2 per channel Yes Yes; electronic/thermal
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V)
- parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions,	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V)
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes Yes 0.5 A; Per digital output
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes Yes 0.5 A; Per digital output
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes Yes 0.5 A; Per digital output 5 W
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. lower limit 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes Yes 0.5 A; Per digital output 5 W 48 Ω
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. lower limit upper limit 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes Yes 0.5 A; Per digital output 5 W 48 Ω
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. Iower limit upper limit Output voltage 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 kΩ
 parameterizable Digital outputs Type of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. Load resistance range lower limit upper limit Output voltage Type of output voltage for signal "1", min. Output current 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 kΩ DC
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. lower limit upper limit Output voltage Type of output voltage for signal "1", min. 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 kΩ DC
 parameterizable Digital outputs Type of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. Load resistance range lower limit upper limit Output voltage Type of output voltage for signal "1", min. Output current 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 k Ω DC 23.2 V; L+ (-0.8 V)
 parameterizable Digital outputs Type of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. Iower limit upper limit Output voltage for signal "1" rated value 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 k Ω DC 23.2 V; L+ (-0.8 V) 0.5 A; Per digital output
 parameterizable Digital outputs Type of digital output Number of digital outputs Digital outputs, parameterizable Short-circuit protection Limitation of inductive shutdown voltage to Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. Iower limit upper limit Output voltage for signal "1" rated value for signal "0" residual current, max. 	Transistor 4; 2 per channel Yes Yes; electronic/thermal L+ (-53 V) Yes Yes 0.5 A; Per digital output 5 W 48 Ω 12 k Ω DC 23.2 V; L+ (-0.8 V) 0.5 A; Per digital output

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	10112		
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 frequency, max. 	200 kHz		
Counting frequency, max.	800 kHz; with guadruple 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		
Encoder signal 24 V			
- permissible voltage at input, min.	-30 V		
- permissible voltage at input, max.	30 V		
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		

I/O modules Technology modules

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.	n. 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

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I/O modules Technology modules

TM PosInput 2 counter and position detection module

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

Ordering data	Article No.		Article No.
TM PosInput 2 counter and	6ES7551-1AB00-0AB0	Shielding set I/O	6ES7590-5CA00-0AA0
position detection module With 2-channels, max. 1 MHz counting frequency;		Infeed element, shield bracket, and shield terminal; 5 units, spare part	
for SSI encoders and incremental encoders with RS 422 or		Shield terminal element	6ES7590-5BA00-0AA0
5V TTL interface		10 units; spare part	
Accessories		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0 6ES7592-2AX00-0AA0	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC PC-based Automation, SIMATIC PC-based Automation, SIMATIC PC-57, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
U connector	6ES7590-0AA00-0AA0	Current "Manual Collection" DVD and the three subsequent updates	
5 units; spare part		and the three subsequent updates	
Universal front door for I/O modules	6ES7528-0AA00-7AA0		
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part			

Article number	6ES7551-1AB00-0AB0
	S7-1500, TM Posinput 2
General information	
Product type designation	TM PosInput 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 	V12 (FW V1.0) V15 (FW V1.3)/ V12 (FW V1.0), V13 (FW V1.1)
 PROFIBUS from GSD version/ GSD revision 	GSD Revision 5
 PROFINET from GSD version/ GSD revision 	V2.3 / -

Article number	6ES7551-1AB00-0AB0
	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

I/O modules Technology modules

TM PosInput 2 counter and position detection module

Article number	6ES7551-1AB00-0AB0	
Article Humber	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	Yes	
accordance with IEC 61131, type 3		
Digital input functions, parameterizable		
Gate start/stop	Yes; only for pulse and incremental	
	encoders	
Capture	Yes	
 Synchronization 	Yes; only for pulse and incremental	
- English and the all statistics of	encoders	
Freely usable digital input	Yes	
Input voltage	DC	
Type of input voltageRated value (DC)	DC 24 V	
 for signal "0" 		
for signal "1"	-5 +5 V +11 to +30V	
0	-30 V; -5 V continuous,	
 permissible voltage at input, min. 	-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	6ES7551-1AB00-0AB0	
	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 signals, incremental encoder (symmetrical)		
 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 guadruple 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.; 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	

SIMATIC S7-1500 Advanced Controllers I/O modules

Technology modules

TM PosInput 2 counter and position detection module

Article number	6ES7551-1AB00-0AB0	Article number	6ES7551-1AB00-0AB0
	S7-1500, TM Posinput 2		S7-1500, TM Posinput 2
sochronous mode		Measuring functions	
Filtering and processing time (TCI),	130 µs;	 Measuring time, parameterizable 	Yes
min.	only for pulse and incremental encoders	 Dynamic measurement period adjustment 	Yes
Bus cycle time (TDP), min.	250 µs	 Number of thresholds, 	2
nterrupts/diagnostics/ status information		parameterizable	
larms		Measuring range	
Diagnostic alarm	Yes	- Frequency measurement, min.	0.04 Hz
Hardware interrupt	Yes	- Frequency measurement, max.	4 MHz
Diagnoses	100	- Cycle duration measurement, min.	0.25 µs
 Monitoring the supply voltage 	Yes	- Cycle duration measurement, max.	25 s
 Wire-break 	Yes	Accuracy	
Short-circuit	Yes	 Frequency measurement 	100 ppm; depending on measuring interval and signal evaluation
 A/B transition error at incremental 	Yes	- Cycle duration measurement	100 ppm; depending on measuring
encoder	165	- Cycle duration measurement	interval and signal evaluation
 Telegram error at SSI encoder 	Yes	- Velocity measurement	100 ppm; depending on measuring
Diagnostics indication LED			interval and signal evaluation
• RUN LED	Yes; green LED	Potential separation	
ERROR LED	Yes; red LED	Potential separation channels	
MAINT LED	Yes; Yellow LED	 between the channels and backplane bus 	Yes
Monitoring of the supply voltage	Yes; green LED	Ambient conditions	
(PWR-LED)		Ambient temperature during	
Channel status display	Yes; green LED	operation	
for channel diagnostics	Yes; red LED	 horizontal installation, min. 	0 °C
ntegrated Functions		 horizontal installation, max. 	60 °C; Please note derating for
Counter	Yes		inductive loads
Number of counters	2	 vertical installation, min. 	0°C
Counting frequency, max.	4 MHz; with quadruple evaluation	 vertical installation, max. 	40 °C; Please note derating for inductive loads
Counting functions	Vac. only for pulse and incremental	Altitude during operation relating to	
 Can be used with TO High_Speed_Counter 	Yes; only for pulse and incremental encoders	sea level	
Continuous counting	Yes	 Installation altitude above sea level, 	
Counter response parameterizable	Yes	max.	altitudes > 2 000 m, see ET 200MF system manual
 Hardware gate via digital input 	Yes	Decentralized operation	systemmanual
Software gate	Yes	to SIMATIC S7-300	Yes
 Event-controlled stop 	Yes	to SIMATIC S7-400	Yes
 Synchronization via digital input 	Yes	to SIMATIC S7-1200	Yes
Counting range, parameterizable	Yes	to SIMATIC S7-1200	Yes
Comparator		to standard PROFIBUS master	
- Number of comparators	2: Per channel		Yes; FW V1.1 and higher
- Direction dependency	Yes	to standard PROFINET controller	Yes
- Can be changed from user	Yes	Dimensions	05
program		Width	35 mm
Position detection		Height	147 mm
 Incremental acquisition 	Yes	Depth	129 mm
Absolute acquisition	Yes	Weights	
Suitable for S7-1500 Motion Control		Weight, approx.	325 g

I/O modules Technology modules

TM Timer DIDQ 16x24V time-based IO module



- 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.
Time-based IO module TM Timer DIDQ 16x24V	6ES7552-1AA00-0AB0
Max. 16 time-controlled inputs or outputs	
Accessories	
Front connector	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in	6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0
DIN A4 labeling sheets	6ES7592-2AX00-0AA0
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	
U connector	6ES7590-0AA00-0AA0
5 units; spare part	
Universal front door for I/O modules	6ES7528-0AA00-7AA0
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
Shielding set I/O	6ES7590-5CA00-0AA0
Infeed element, shield bracket, and shield terminal; 5 units, spare part:	
Note: Only shield bracket and shield terminal are required for the TM Timer DIDQ 16x24V	
Shield terminal element	6ES7590-5BA00-0AA0
10 units; spare part	
SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC distributed I/O, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PC7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates	

SIMATIC S7-1500 Advanced Controllers I/O modules

Technology modules

TM Timer DIDQ 16x24V time-based IO module

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/	V13 Update 3
integrated from version Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Load voltage 1L+	Tes, 37-1000 mounting fail
Rated value (DC)	24 V
Reverse polarity protection	
Load voltage 2L+	Yes; against destruction
-	24 V
Rated value (DC) Beverse polarity protection	
Reverse polarity protection Encoder supply	Yes; against destruction
Number of outputs	8; max. depending on
Number of outputs	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	3 µs for parameterization "none"
reactions	- F F
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

I/O modules Technology modules

TM Timer DIDQ 16x24V time-based IO module

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	1.5 mA
(2-wire sensor), max.	1.5 MA
Encoder signals, incremental encoder (asymmetrical)	
 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
Encoder signal 24 V	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
Interface types	
 Input characteristic curve in accordance with IEC 61131, type 3 	Yes
Isochronous mode	
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	
 Number of counters 	4
 Counting frequency, max. 	200 kHz; with quadruple evaluation
Counting functions	
 Continuous counting 	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
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	320 g

I/O modules Technology modules

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

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
 - RS 422, 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 (\$7-1500, \$7-1500T)
- Positioning axis (S7-1200, S7-1500, S7-1500T)
 Synchronous axis (S7-1500, S7-1500T)
- Probe (S7-1500, S7-1500T)

Ordering data	Article No.		Article No.
Interface module for TM PTO 4 stepper drives	6ES7553-1AA00-0AB0	Universal front door for I/O modules	6ES7528-0AA00-7AA0
4 Pulse Train Output PTO channels; PTO: 24 V or RS422; 2 DQ PTO, 2 DI 24 V, 1 DIQ 24 V per channel		5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
Accessories		Shielding set I/O	6ES7590-5CA00-0AA0
Front connectors		Infeed element, shield clamp,	
For 35 mm modules;		and shield terminal; 5 units, spare part	
including four potential bridges, cable ties and individual labeling		Shield terminal element	6ES7590-5BA00-0AA0
strips, 40-pinScrew terminals	6ES7592-1AM00-0XB0	10 units; spare part	
Push-in	6ES7592-1BM00-0XB0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
DIN A4 labeling sheets	6ES7592-2AX00-0AA0	SIMATIC Manual Collection	
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey		on DVD in 5 languages, all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG,	
U connector	6ES7590-0AA00-0AA0	STEP 7, Engineering SW, Runtime SW, PCS7, SIMATIC HMI,	
5 units; spare part		SIMATIC NET, SIMATIC IDENT	
		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
		Current "Manual Collection" DVD and the three subsequent updates	

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
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
Rated value (DC)	24 V
 Reverse polarity protection 	Yes

Article number	6ES7553-1AA00-0AB0
	S7-1500, TM PTO4
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
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

I/O modules Technology modules

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

Article number	6ES7553-1AA00-0AB0
	S7-1500, TM PTO4
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	10: 2 per channel of which 1 DIO
Number of digital outputs	12; 3 per channel, of which 1 DIQ Yes
Digital outputs, parameterizable	Yes; electronic/thermal
Short-circuit protection	Yes
Controlling a digital input Digital output functions,	165
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
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

Article number	6ES7553-1AA00-0AB0
	S7-1500, TM PTO4
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

SIMATIC S7-1500 Advanced Controllers I/O modules

Technology modules

SIWAREX WP521 ST / WP522 ST

Overview





SIWAREX WP521 ST

SIWAREX WP521 ST / 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.

SIWAREX WP522 ST

Ordering data	Article No.		Article No.
Weighing module TM SIWAREX WP521 ST	7MH4980-1AA01	Ethernet cable patch cord 2 m (7 ft)	6XV1850-2GH20
Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 x LC, 4 \times DQ, 3 \times DI, 1 \times RS 485,		For connecting SIWAREX WP52x ST to a PC (SIWATOOL V7 or Modbus TCP/IP)	
Ethernet port, including shielding set.		Remote display (optional)	
Weighing module TM SIWAREX WP522 ST	7MH4980-2AA01	The digital remote displays can be connected directly to the SIWAREX WP231 via the	
Two-channel, for two separate platform scales or hopper scales		RS 485 interface. Suitable remote display: S102	
with analog load cells (1 - 4 mV/V), per channel 1 × LC, 4 × DQ, 3 × DI, 1 × RS 485, Ethernet port, including shielding set.		Siebert Industrieelektronik GmbH PO Box 1180 D-66565 Eppelborn	
SIMATIC S7-1500, front connector	6ES7592-1AM00-0XB0	Tel.: +49 6806/980-0 Fax: +49 6806/980-999	
with screw-type terminals		https://www.siebert-group.com/en/	
40-pin, for 35 mm wide modules, including 4 jumper links and cable ties		Detailed information is available from the manufacturer.	
SIMATIC S7-1500, front connector with push-in technology	6ES7592-1BM00-0XB0		
40-pin, for 35 mm wide modules, including 4 jumper links and cable ties			
SIWATOOL V4 & V7	7MH4900-1AK01		
Service and commissioning software for SIWAREX weighing modules			

I/O modules Technology modules

SIWAREX WP521 / WP522 ST

Ordering data	Article No.		Article No.
Accessories		Commissioning	
SIWAREX JB junction box, aluminum housing	7MH5001-0AA20	Commissioning charge for one static scale with SIWAREX module	9LA1110-8SN50-0AA0
For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.		(Flat charge for travel and setup must be ordered separately)	
SIWAREX JB junction box, stainless steel housing	7MH5001-0AA00	Scope: • Recording of data • Checking of mechanical	
For connecting up to 4 load cells in parallel.		installation of the scale Checking of electrical wiring 	
SIWAREX JB junction box, stainless steel housing (ATEX)	7MH5001-0AA01	and function Static adjustment of the scale 	
For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).		Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available	
SIWAREX IS Ex interface		Free access to scale	
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 • Short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA	Flat charge for travel and setup in Germany	9LA1110-8RA10-0AA0
Cable (optional)			
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY			
For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. 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 For hazardous atmospheres. Sheath color: blue. 	7MH4702-8AG 7MH4702-8AF		

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 		

SIWAREX WP521 ST / WP522 ST		
SIWAREA WF321 51 / WP322 51		
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 \pm 10 K (68 °F \pm 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 	

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SIMATIC S7-1500 Advanced Controllers I/O modules Technology modules

SIWAREX WP521 / WP522 ST

SIWAREX WP521 ST / WP522 ST			
Weighing functions			
Weight values	• Gross • Net • Tare		
Limit values	 2 × min/max 1 × empty 		
Zeroing	Per command		
Tare	Per command		
Tare specification	Per command		
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} • R _{Lmax}	> 40 Ω < 4 100 Ω		
With SIWAREX IS Ex interface • R _{Lmin} • R _{Lmax}	> 50 Ω < 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		

SIWAREX WP521 ST / WP522 ST		
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 x 147 x 129 mm (1.38 x 5.79 x 5.08 inch)	

I/O modules SIPLUS technology modules

SIPLUS 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

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	6AG1550-1AA00-7AB0
(Extended temperature range and exposure to media)	
With 2-channels, max. 200 kHz; for 24 V encoder	
Accessories	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/139

Technical specifications

Article number	6AG1550-1AA00-7AB0
Based on	6ES7550-1AA00-0AB0
	SIPLUS S7-1500 TM Count 2X24V
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
 horizontal installation, max. 	70 °C; = Tmax; note derating for inductive loads; > +60 °C total current of the encoder supply max. 0.5 A, total current of the outputs max. 1 A
 vertical installation, min. 	-40 °C; = Tmin; Startup @ -25 °C
 vertical installation, max. 	40 °C; Please note derating for inductive loads

Article number	6AG1550-1AA00-7AB0		
Based on	6ES7550-1AA00-0AB0		
	SIPLUS S7-1500 TM Count 2X24V		
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		

Yes; Conformal coating, Class A

• Qualification and Performance of

Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

SIMATIC S7-1500 Advanced Controllers I/O modules SIPLUS technology modules

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

5	
SIPLUS TM PosInput 2 counter and positioning module	6AG1551-1AB00-7AB0
(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	
Accessories	See SIMATIC S7-1500, TM PosInput 2 counter and positioning module, page 4/142

Article No.

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	<i>·</i> ·	
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 Military testing according to 	Yes; Type 1 protection	
 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Parformance of 	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	

I/O modules Communication

CM PtP

4

Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
 RS 232C, max. 19.2 Kbit/s
 RS 232C, max.115.2 Kbit/s

 - RS 422/RS 485, max. 19.2 Kbit/s RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
 Freeport: User-parameterizable telegram format for universal communication
 - 3964(R) for improved transmission reliability
 Modbus RTU Master

 - Modbus RTU Slave
 - USS, implemented through instructions

Ordering data	Article No.		Article No.
CM PtP RS 232 BA	6ES7540-1AD00-0AA0	Accessories	
communication module		RS 232 connecting cable	
Basic communication module with one RS 232 interface,		For linking to SIMATIC S7	
Freeport, 3964(R) and USS protocols, 9-pin sub D connector,		5 m	6ES7902-1AB00-0AA0
max. 19.2 kbit/s		10 m	6ES7902-1AC00-0AA0
CM PtP RS 232 HF	6ES7541-1AD00-0AB0	15 m	6ES7902-1AD00-0AA0
communication module		RS 422/485 connecting cable	
High Feature communication module with one RS 232 interface.		For linking to SIMATIC S7	
Freeport, 3964(R),		5 m	6ES7902-3AB00-0AA0
USS and Modbus RTU protocols, 9-pin sub D connector,		10 m	6ES7902-3AC00-0AA0
max. 115.2 kbit/s		50 m	6ES7902-3AG00-0AA0
CM PtP RS 422/485 BA communication module	6ES7540-1AB00-0AA0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Basic communication module with one RS 422/485 interface, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 kbit/s		Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O,	
CM PtP RS 422/485 HF communication module	6ES7541-1AB00-0AB0	SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7,	
High Feature communication module with one		SIMATIC PC/PC, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
RS 422/485 interface, Freeport, 3964(R), USS and Modbus RTU protocols,		SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
15-pin sub D socket, max. 115.2 kbit/s		Current "Manual Collection" DVD and the three subsequent updates	

I/O modules Communication

CM PtP

Article number	6ES7540-1AD00-0AA0	6ES7541-1AD00-0AB0	6ES7540-1AB00-0AA0	6ES7541-1AB00-0AB0
	S7-1500, CM PTP RS232 BA	S7-1500, CM PTP RS232 HF	S7-1500, CM PTP RS422/485 BA	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
 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,	None, even, odd, always 1,	None, even, odd, always 1,	
T anty	always 0, any	always 0, any	always 0, any	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	,	255	255	255
buffered				

I/O modules Communication

CM PtP

Article number	6ES7540-1AD00-0AA0	6ES7541-1AD00-0AB0	6ES7540-1AB00-0AA0	6ES7541-1AB00-0AB0
	S7-1500, CM PTP RS232 BA	S7-1500, CM PTP RS232 HF	S7-1500, CM PTP RS422/485 BA	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

I/O modules Communication

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 communication module	6ES7547-1JF00-0AB0
Communication module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors	
SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC HI, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
Current "Manual Collection" DVD and the three subsequent updates	

Article number	6ES7547-1JF00-0AB0	
	S7-1500, CM 8xIO-Link	
General information		
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	
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	

I/O modules Communication

CM 8xIO-Link

Technical specifications

6ES7547-1JF00-0AB0
S7-1500, CM 8xIO-Link
Yes; The port diagnosis is available in the IO-Link mode only.
Yes
Yes
Yes
Yes
Yes; green LED
Yes; green LED
Yes; red LED
Yes; red LED
Yes

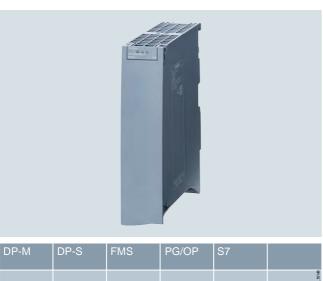
Article number	6ES7547-1JF00-0AB0
	S7-1500, CM 8xIO-Link
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	0° 0
 horizontal installation, max. 	60 °C; Observe derating
 vertical installation, min. 	0° 0
 vertical installation, max. 	40 °C; Observe derating
Altitude 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

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I/O modules Communication

CM 1542-5

Overview



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 Controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for Technical specifications connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communication 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

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	
Accessories		
PROFIBUS FastConnect RS 485 connection plug		
 With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps Without PG interface With programming device interface 	6ES7972-0BA52-0XA0 6ES7972-0BB52-0XA0	
PROFIBUS FC Standard Cable		
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter	6XV1830-0EH10	
PROFIBUS FastConnect Stripping Tool		
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	6GK1905-6AA00	
PROFIBUS bus terminal 12M		
Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	6GK1500-0AA10	

Note:

You can find order information for software for communication with PC systems in the Industry Mall.

6GK7542-5DX00-0XE0	
CM 1542-5	
9.6 kbit/s 12 Mbit/s	
0	
1	
9-pin Sub-D socket (RS485)	
DC	
15 V	
3 %	
0.2 A	
3 W	

I/O modules Communication

CM 1542-5

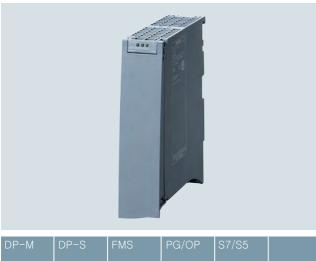
Article number	6GK7542-5DX00-0XE0
product type designation	CM 1542-5
ambient conditions ambient temperature	
for vertical installation during operation	0 40 °C
 for horizontally arranged busbars during operation 	0 60 °C
 during storage 	-40 +70 °C
 during transport 	-40 +70 °C
relative humidity	
 at 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
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	6GK7542-5DX00-0XE0
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	
configuration software	
required	STEP 7 Professional V12 (TIA Portal) or higher
identification & maintenance function	×
I&M0 - device-specific information	Yes
 I&M1 – higher level designation/location designation 	Yes
product functions 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

I/O modules Communication

CP 1542-5

Overview



		1 0/01	07700	
•	•	•		G.K10,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 processor 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)

Communication services:

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

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
Accessories	
PROFIBUS FastConnect RS 485 connection plug	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	CE07070 00450 0740
 Without programming device interface 	6ES7972-0BA52-0XA0
 With programming device interface 	6ES7972-0BB52-0XA0
PROFIBUS FC Standard Cable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter	6XV1830-0EH10
PROFIBUS FastConnect Stripping Tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	6GK1905-6AA00
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS stations for up to 12 Mbps with connecting cable	6GK1500-0AA10

Note:

You can find order information for software for communication with PC systems in the Industry Mall.

I/O modules Communication

CP 1542-5

Article number	6GK7542-5FX00-0XE0	
product type designation	CP 1542-5	
transfer rate		
transfer rate		
at the 1st interface acc. to PROFIBUS	9.6 kbit/s 12 Mbit/s	
interfaces		
number of interfaces acc. to Industrial Ethernet	0	
number of electrical connections		
 at the 1st interface acc. to PROFIBUS 	1	
type of electrical connection		
 at the 1st interface acc. to PROFIBUS 	9-pin Sub-D socket (RS485)	
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	
supply voltage 1 from backplane bus	15 V	
relative symmetrical tolerance at DC		
• at 15 V	3 %	
consumed current		
 from backplane bus at DC at 15 V typical 	0.1 A	
power loss [W]	1.5 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	0.27 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	6GK7542-5FX00-0XE0
product type designation	CP 1542-5
performance data PROFIBUS DP	
service as DP master	
DPV1	Yes
number of DP slaves	
 on DP master 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	
configuration software	
• required	STEP 7 Professional V12 SP1 (TIA Portal) or higher
identification & maintenance function	
 I&M0 - device-specific information 	Yes
 I&M1 – higher level designation/location designation 	Yes
product functions 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

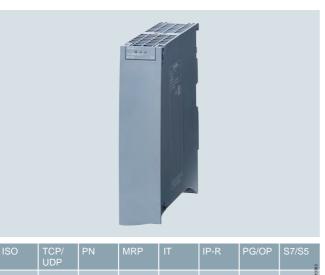
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SIMATIC S7-1500 Advanced Controllers

I/O modules Communication

CM 1542-1

Overview



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 communication 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 CM 1543-1 / CM 1542-1 units in an S7-1500 station, e.g., for web server accesses without real-time capability.

Ordering data	Article No.
CM 1542-1 communications module	6GK7542-1AX00-0XE0
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	
Accessories	
IE FC RJ45 Plug 4 x 2	
RJ45 plug-in connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0 6GK1901-1BB11-2AE0
IE FC TP Standard Cable GP 4 x 2	
8-wire, 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 1 000 m, minimum order quantity 20 m • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2	6XV1870-2E 6XV1878-2A
SCALANCE X204-2 Industrial Ethernet Switch	6GK5204-2BB10-2AA3
Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	
SCALANCE X308-2 Industrial Ethernet Switch	6GK5308-2FL10-2AA3
2 x 1000 Mbps SC ports, optical (multimode, glass), up to 750 m, 1 x 10/100/1 000 Mbps RJ45 port, electrical 7 x 10/100 Mbps RJ45 ports, electrical	

I/O modules Communication

CM 1542-1

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 acc. to Industrial Ethernet	1	
number of electrical connections		
 at the 1st interface acc. to Industrial Ethernet 	2	
type of electrical connection		
 at the 1st interface acc. to Industrial Ethernet 	RJ45 port	
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	
supply voltage 1 from backplane bus	15 V	
relative symmetrical tolerance 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	64
multi-protocol mode	04
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

SIMATIC S7-1500 Advanced Controllers I/O modules

Communication

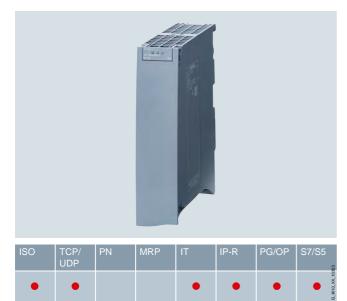
CM 1542-1

Article number	6GK7542-1AX00-0XE0	Article number	6GK7542-1AX00-0XE0
product type designation	CM 1542-1	product type designation	CM 1542-1
performance data PROFINET		product functions routing	
communication as PN IO device		service routing note	IP routing up to 1 Mbps
product function PROFINET IO device	Yes	product function	
data volume		 static IP routing 	Yes
 as user data for input variables as PROFINET IO device maximum 	8 192 byte	static IP routing IPv6	No
as user data for output variables as	8 192 byte	 dynamic IP routing 	No
PROFINET IO device maximum	0.02.0910	 dynamic IP routing IPv6 	No
 as user data for input variables for 	256 byte	protocol is supported	
each sub-module as PROFINET IO device		• RIP v1	No
	256 byte	RIPv2	No
 as user data for output variables for each sub-module as 	256 Dyte	 RIPnG for IPv6 	No
PROFINET IO device		OSPFv2	No
 as user data for the consistency area 	256 byte	OSPFv3 for IPv6	No
for each sub-module		• VRRP	No
number of submodules per PROFINET IO-Device	32	VRRP for IPv6	No
performance data telecontrol		• BGP	No
protocol is supported		• PPP	No
TCP/IP	Yes	 PPoE via DSL 	No
product functions management,		product functions redundancy	
configuration, engineering		product function	
product function MIB support	Yes	 ring redundancy 	Yes
protocol is supported		 redundancy manager 	Yes
SNMP v1	Yes	protocol is supported Media	Yes
• DCP	Yes	Redundancy Protocol (MRP)	
• LLDP	Yes	product functions security	
configuration software		product function	
 required 	STEP 7 Professional V14 (TIA Portal)	switch-off of non-required services	Yes
identification & maintenance function	or higher	 blocking of communication via physical ports 	No
 I&M0 – device-specific information 	Yes	 log file for unauthorized access 	No
• I&M1 – higher level	Yes	product functions time	
designation/location designation		product function SICLOCK support	Yes
product functions diagnostics		product function pass on time synchronization	Yes
product function web-based diagnostics	Yes; via S7-1500 CPU	protocol is supported	
product functions switch		• NTP	Yes
product feature switch	Yes	standards, specifications, approvals	
product function		hazardous environments	
 switch-managed 	No	certificate of suitability CCC for	Yes
with IRT PROFINET IO switch	Yes	hazardous zone according to GB standard	
 configuration with STEP 7 	Yes		
0			

I/O modules Communication

CP 1543-1

Overview



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 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 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.

Ordering data	Article No.	
CP 1543-1	6GK7543-1AX00-0XE0	IE FC RJ45 plug 4 x 2
communications processor For connecting SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and security functions (VPN, firewall); 1 x RJ45 interface with 10/100/1 000 Mbps; SNMPv1/V3; time synchronization via NTP, FTP, email, IPv4/IPv6		RJ45 plug connector for Industria Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure an integrated insulation displacemer contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface
Accessories		 1 pack = 1 unit 1 pack = 10 units
IE FC RJ45 plug 180 2 x 2		 1 pack = 10 units 1 pack = 50 units
RJ45 plug 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 • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	IE FC TP Standard Cable GP 2 x (Type A) 4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m

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 accesses without real-time capability
- Security Integrated
 - Stateful Packet Inspection Firewall
 - Secure communication via VPN (IPsec)
- · Protocols for secure communication
 - 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
 - Encrypted email communication via SMTPS (Port 587) - 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 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

Article No.

IE FC RJ45 plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0
 1 pack = 10 units 1 pack = 50 units 	6GK1901-1BB11-2AE0
IE FC TP Standard Cable GP 2 x 2 (Type A)	6XV1840-2AH10
4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter;	

I/O modules Communication

CP 1543-1

Ordering data	Article No.		Article No.
IE FC TP Standard Cable GP 4 x 2		Industrial Ethernet Switch	6GK5204-2BB10-2AA3
B-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 1 000 m, minimum order quantity 20 m • AWG22, for connection to	SCALANCE X204-2Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics of OPROFINET diagnostics four 10/100 Mbps RJ45 ports and two FO ports6XV1870-2EIndustrial Ethernet Switch SCALANCE X308-26C	Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports	
IE FC RJ45 Modular Outlet AWG24, for connection to IE FC RJ45 plug 4 x 2		6GK5308-2FL00-2AA3	
E FC Stripping Tool	6GK1901-1GA00	2 x 1000 Mbps multimode fiber-optic cable ports	
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables (SC sockets), 1 × 10/100/1 000 Mbps RJ45 ports for glass fiber-optic cable	(SC sockets), 1 x 10/100/1 000 Mbps RJ45 port, 7 x 10/100 Mbps RJ45 ports;		
		Note:	

Note:

You can find order information for software for communication with PC systems in the Industry Mall.

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 acc. to Industrial Ethernet	1
number of electrical connections	
 at the 1st interface acc. to Industrial Ethernet 	1
type of electrical connection	
 at the 1st interface acc. to Industrial Ethernet 	RJ45 port
supply voltage, current	
consumption, power loss	50
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	0.07
• at 15 V	3 %
consumed current	0.05 A
 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

6GK7543-1AX00-0XE0
CP 1543-1
Compact module S7-1500 single width
35 mm
142 mm
129 mm
0.35 kg
Yes
8
depending on CPU type
118; depending on the system upper limit
65 536 byte
118
118; depending on the system upper limit
118

I/O modules Communication

CP 1543-1

Article number	6GK7543-1AX00-0XE0	Article number	6GK7543-1AX00-0XE0
product type designation	CP 1543-1	product type designation	CP 1543-1
performance data IT functions		product functions security	
number of possible connections		firewall version	stateful inspection
 as client by means of FTP maximum 	32	product function with VPN connection	IPSec
• as server by means of FTP maximum number of possible connections	16	type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
 as server by means of HTTP maximum 	4	type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
 as email client maximum 	1	type of hashing algorithms with	MD5, SHA-1
data volume as user data for email maximum	64 Kibyte	VPN connection number of possible connections with	16
performance data telecontrol		VPN connection	
protocol is supported		product function	
• TCP/IP	Yes	 password protection for Web applications 	No
product functions management,		ACL - IP-based	No
configuration, engineering		 ACL - IP-based for PLC/routing 	No
product function MIB support	Yes	 switch-off of non-required services 	Yes
protocol is supported		 blocking of communication via 	No
• SNMP v1	Yes	physical ports	
• DCP	Yes	 log file for unauthorized access 	Yes
• LLDP	No	product functions time	
configuration software		product function SICLOCK support	Yes
• required	STEP 7 Professional V14 (TIA Portal) or higher	product function pass on time synchronization	Yes
identification & maintenance function		protocol is supported	
 I&M0 - device-specific information 	Yes	• NTP	Yes
 I&M1 – higher level designation/location designation 	Yes	standards, specifications, approvals hazardous environments	
product functions diagnostics		certificate of suitability CCC for	Yes
product function web-based diagnostics	Yes; via S7-1500 CPU	hazardous zone according to GB standard	
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		
- I I UL VIA DOL	NO		

I/O modules Communication

CP 1545-1

Overview



The SIMATIC CP 1545-1 communications processor securely connects the SIMATIC S7-1500 Controller 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.

 Ordering data
 Article No.

 CP 1545-1
 6GK7545-1GX00-0XE0

 CP 1545-1 communications processor
 6GK7545-1GX00-0XE0

 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 (10/100/1 000 Mbps)
 Image: 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 (10/100/1 000 Mbps)
 Image: Connecting the SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, UDP, S7 communication via NTP, connection to cloud systems via MQTT, 1x RJ45 (10/100/1 000 Mbps)

Note:

You can find order information for software for communication with PC systems in the Industry Mall under System connections – Software overview

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 to 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

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 acc. to Industrial Ethernet	1
number of electrical connections	
 at the 1st interface acc. to Industrial Ethernet 	1
type of electrical connection	
 at the 1st interface acc. to Industrial Ethernet 	RJ45 port

I/O modules Communication

CP 1545-1

4

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	0 /0
 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	Yes
designation/location designation	

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Communication

CP 1545-1

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	
 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
	N/

Yes

log file for unauthorized access	
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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

Communication

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), dialup 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.		Article No.
TIM 1531 IRC communications module	6GK7543-1MX00-0XE0	SCALANCE M876-3	6GK5876-3AA02-2BA2
TIM 1531 IRC 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		3G router; for wireless IP communication of Ethernet-based programmable controllers via 3G mobile wireless HSPA+/EV-DO, VPN, firewall, NAT 4-port switch; antenna diversity; 1 x digital input, 1 x digital output; note country approvals. Note provider approvals!	
WANs		SCALANCE M876-4 (EU)	6GK5876-4AA00-2BA2
Engineering Software STEP 7 Professional V17 • SIMATIC STEP 7 Professional V17 floating license • Upgrade SIMATIC STEP 7 Basic V11 V16 → V17 floating license	6ES7822-1AA07-0YA5 6ES7822-0AA07-0YE5	4G router; for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile wireless optimized for use in Europe, VPN, firewall, NAT; 4-port switch;	
Accessories		2 x SMA antenna, MIMO technology;	
DIN rail	6ES7590-1AB60-0AA0	1 x digital input, 1 x digital output;	
SIMATIC S7-1500, 160 mm DIN rail;		note country approvals.	
incl. grounding screw, integrated DIN rail for mounting small items, such as terminals, relays		SCALANCE M876-4 (NAM) 4G router (NAM); for wireless	6GK5876-4AA00-2DA2
SIMATIC Memory Card	6ES7954-8LF03-0AA0	IP communication of Ethernet-based programmable	
SIMATIC S7, Memory Card for S7-1x 00 CPU/SINAMICS, 3.3 V flash, 24 MB	c w N	controllers via LTE (4G) mobile wireless optimized for use in North America, VPN, firewall,	
SCALANCE M874-2	6GK5874-2AA00-2AA2	 NAT; 4-port switch; 2 x SMA antenna, 	
2G mobile wireless routers (GPRS/EDGE); 2 RJ45 ports, firewall, VPN, NAT		MIMO technology; 1 x digital input, 1 x digital output; note country approvals.	
SCALANCE M874-3	6GK5874-3AA00-2AA2	SCALANCE M812-1 ADSL router	6GK5812-1BA00-2AA2
3G mobile wireless routers (GPRS/EDGE/HSPA+); 2 RJ45 ports, firewall, VPN, NAT		For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 1x Ethernet RJ45 port, 1x digital input, 1x digital output; ADSL2+, Annex B	

I/O modules Communication

TIM 1531 IRC (for S7-1500)

Ordering data	Article No.		Article No.
SCALANCE M812-1 ADSL router	6GK5812-1BA00-2AA2	Connecting cable	6NH7701-4BN
For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 4-port switch;		With one end open for connecting a TIM (RS232) to a third-party modem or radio unit (RS232); cable length 2.5 m	
1x digital input, 1x digital output; ADSL2+, Annex A		Connecting cable	6NH7701-0AR
SCALANCE M816-1 ADSL router	6GK5816-1BA00-2AA2	For connecting two TIMs via their RS232 interfaces without modems	
For wired IP communication of Ethernet-based automation devices		(null modem); cable length 6 m	
via Internet Service Providers; VPN,		SITOP compact 24 V/0.6 A	6EP1331-5BA00
firewall, NAT; 4-port switch; 1x digital input, 1x digital output; ADSL2+, Annex B, J		Single-phase power supply with wide range input 85 264 V AC/110 300 V DC,	
SCALANCE M826-2 SHDSL router	6GK5826-2AB00-2AB2	24 V stabilized output voltage, 0.6 A nominal value of output	
For IP communication via the		current, slim design	
2-wire and 4-wire cables of Ethernet-based automation		SIMATIC PM 1507 24 V/3 A	6EP1332-4BA00
devices; SHDSL topology: point-to-point, bonding, line bridge mode, routing mode with VPN,		Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/3 A	
firewall, NAT; 4-port switch, 1x digital input, 1x digital output		SIMATIC PM 1507 24 V/8 A	6EP1333-4BA00
MD720 modem GSM/GPRS, 2G mobile wireless modem with RS232 interface; for GSM services CSD, GPRS, SMS;	6NH9720-3AA01-0XX0	Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/8 A • Output current 3 A	
Quadband GSM; AT command		 Output current 8 A 	6EP1333-4BA00
interface; note country-specific approvals! Autom. GPRS		Note:	
connection; including gender		You will find ordering data for s	oftware for communicating with
changer for RS232/PPI adapter		PC systems in the Industry Ma Software overview	

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
• acc. to RS 232	300 115 200 bit/s
interfaces	
number of interfaces acc. to Industrial Ethernet	3
number of electrical connections	
 for external data transmission acc. 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

I/O modules Communication

TIM 1531 IRC (for S7-1500)

Article number	6GK7543-1MX00-0XE0	
	TIM 1531 IRC	
product type designation ambient conditions	TIVI ISTING	
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) o 250000 events (IEC 60870-5 / DNP
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
	Yes

SIMATIC S7-1500 Advanced Controllers I/O modules Communication

TIM 1531 IRC (for S7-1500)

rticle number	6GK7543-1MX00-0XE0	Article number	6GK7543-1MX00-0XE0
roduct type designation	TIM 1531 IRC	product type designation	TIM 1531 IRC
roduct functions management,		product functions security	
onfiguration, engineering		product function	
product function MIB support	Yes	MSC client via GPRS modem with	Yes
protocol is supported		MSC capability	
SNMP v1	Yes	protocol	
SNMP v3	Yes	 is supported MSC protocol 	Yes
DCP	Yes	with Virtual Private Network MSC is	TCP/IP
LLDP	Yes	supported	10011
configuration software		key length for MSC with Virtual Private Network	128 bit
required	STEP 7 Professional V14 SP1	number of possible connections	
for CPLL configuring required	(TIA Portal) or higher	as MSC client with VPN connection	1
for CPU configuring required SINAUT TD7 block library for CPU	No	as MSC server with VPN connection	
for PG configuring required	No	product functions time	
SINAUT ST7 configuration software		product function SICLOCK support	No
for PG		product function pass on time	Yes
torage location of TIM configuration	Flash or SD card of the TIM 1531 IRC	synchronization	
dentification & maintenance function		protocol is supported	
I&M0 - device-specific information	Yes	• NTP	Yes
I&M1 – higher level	Yes	 NTP (secure) 	Yes
designation/location designation		product component hardware real time clock	No
I&M2 - installation date	Yes	product feature hardware real time	No
I&M3 - comment	Yes	clock w. battery backup	
oduct functions diagnostics		time synchronization	
oduct function web-based agnostics	Yes	 from NTP-server 	Yes
oduct functions routing		 from GPS-signal 	No
ervice routing note	IP routing up to 1 Mbps	 from control center 	Yes
roduct function		 from mobile network provider 	No
static IP routing	Yes	• PC	No
static IP routing IPv6	Yes	manual setting	No
dynamic IP routing	No	product functions position detection	
dynamic IP routing IPv6	No	product function	
rotocol is supported		position detection with GPS	No
RIP v1	No	pass on position data	No
RIPv2	No	standards, specifications, approvals	110
RIPnG for IPv6	No	hazardous environments	
OSPFv2	No	certificate of suitability CCC for	Yes
OSPFv3 for IPv6	No	hazardous zone according to GB standard	
VRRP	No	Stariuaru	
VRRP for IPv6	No		
BGP	No		
PPP	No		
PPoE via DSL	No		

SCALANCE W774 RJ45 for the control cabinet

Article No.

 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.

Access Points SCALANCE W774		IE FC RJ45 plug 180 2 x 2	
IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM:		RJ45 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 • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
English/German		IE FC Standard Cable GP 2 x 2	6XV1840-2AH10
 SCALANCE W774-1 RJ45 IWLAN Access Point with one built-in wireless interface Country approvals for operation outside the USA Country approvals for operation within the USA ¹) Country approvals for operation is built approvals for operation 	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0 6GK5774-1FX00-0AC0	4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
in Israel ¹⁾		IE FC Stripping Tool	6GK1901-1GA00
Accessories		Pre-adjusted stripping tool for fast	
KEY-PLUG W780 iFeatures	6GK5907-8PA00	stripping of Industrial Ethernet FC cables	
Removable data storage medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment		Antennas and miscellaneous IWLAN accessories	See Industry Mall, Industrial Wireless LAN/accessories
C-PLUG	6GK1900-0AB10		
Removable data storage medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment			

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

SIMATIC S7-1500 Advanced Controllers I/O modules Communication

SCALANCE W774 RJ45 for the control cabinet

-		
Article number	6GK5774-1FX00-0AA0	
	6GK5774-1FX00-0AB0 ¹⁾	
	6GK5774-1FX00-0AC0 ²⁾	
Product type designation	W774-1 RJ45	
Transfer rate		
Transfer rate		
 with WLAN maximum 	300 Mbit/s	
 for Industrial Ethernet 	10 Mbit/s, 100 Mbit/s	
Transfer rate for Industrial Ethernet		
• minimum	10 Mbit/s	
• maximum	100 Mbit/s	
Interfaces		
Number of electrical connections		
 for network components or terminal equipment 	2	
 for power supply 	1	
 for redundant voltage supply Type of electrical connection 	1	
 for network components or terminal equipment 	RJ45 socket	
 for power supply 	4-pole screw terminal, PoE	
Design of the removable storage		
• C-PLUG	Yes	
• KEY-PLUG	Yes	
Interfaces wireless		
Number of radio cards permanently installed	1	
Transmission mode for multiple input multiple output (MIMO)	2x2	
Number of spatial streams	2	
Number of electrical connections for external antenna(s)	2	
Type of electrical connection for external antenna(s)	R-SMA (socket)	
Product feature external antenna can be mounted directly on device	Yes	
Supply voltage, current consumption, power loss		
Type of voltage of the supply voltage	DC	
Supply voltage 1		
from terminal block	19.2 V	
Supply voltage 2	10.2 V	
from terminal block	28.8 V	
Supply voltage	2010	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V	
Consumed current		
 at DC at 24 V typical 	0.25 A	
 with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical 	0.125 A	
Power loss [W]		
• at DC at 24 V typical	6 W	
with Power-over-Ethernet	6 W	
according to IEEE802.3at for type 1 and IEEE802.3af typical		

Article number	6GK5774-1FX00-0AA0	
	6GK5774-1FX00-0AB0 1)	
	6GK5774-1FX00-0AC0 ²⁾	
Product type designation	W774-1 RJ45	
ambient conditions		
Ambient temperature		
during operation	-20 +60 °C	
during storage	-40 +85 °C	
during transport	-40 +85 °C	
relative humidity at 25 °C without	97 %	
condensation during operation maximum		
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.	
Protection class IP	IP30	
Design, dimensions and weights		
Width	26 mm	
Height	156 mm	
Depth	127 mm	
Width of the enclosure without antenna	26 mm	
Height of the enclosure without antenna	ເ 147 mm	
Depth of the enclosure without antenna	127 mm	
Net weight	0.52 kg	
Fastening method	wall mounting only if flat mounted	
 S7-300 rail mounting 	Yes	
 S7-1500 rail mounting 	Yes	
 35 mm top hat DIN rail mounting 	Yes	
wall mounting	Yes	
Radio frequencies		
Operating frequency		
for WLAN in 2.4 GHz frequency band	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	
Product features, product functions,		
product components general Product function Access Point Mode	Yes	
Product function client Mode Number of SSIDs	Yes 4	
Product function	-	
iPCF Access Point	Yoo: Only in combination with the	
iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'	
iPCF-MC Access Point	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures' No	
iPCF-MC Access Form iPCF-MC client		
	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	
Number of iPCF-capable radio modules		
Product function iREF	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	
Number of iREF-capable radio modules	1	
Product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only	
 Wireless approval in the USA Wireless approval in the Israel 		

I/O modules Communication

SCALANCE W774 RJ45 for the control cabinet

Technical specifications

Article number	6GK5774-1FX00-0AA0	
	6GK5774-1FX00-0AB0 1)	
	6GK5774-1FX00-0AC0 2)	
Product type designation	W774-1 RJ45	
Product functions management, configuration, engineering		
Number of manageable IP addresses in client	8	
Product function		
• CLI	Yes	
 web-based management 	Yes	
MIB support	Yes	
TRAPs via email	Yes	
 configuration with STEP 7 	Yes	
 configuration with STEP 7 in the TIA Portal 	Yes	
 operation with IWLAN controller 	No	
 operation with Enterasys WLAN controller 	No	
 forced roaming on IP down with IWLAN 	Yes	
 forced roaming on link down with IWLAN 	Yes	
• WDS	Yes	
protocol is supported		
Address Resolution Protocol (ARP)	Yes	
• ICMP	Yes	
• Telnet	Yes	
• HTTP	Yes	
• HTTPS	Yes	
• TFTP	Yes	
• DCP	Yes	
• LLDP	Yes	
Identification & maintenance function		
I&M0 - device-specific information	Yes	
 I&M1 – higher level designation/location designation 	Yes	
Product functions diagnostics		
Product function		
 PROFINET IO diagnosis 	Yes	
link check	No	
 connection monitoring IP-Alive 	No	
 localization via Aeroscout 	Yes	
• SysLog	Yes	
Protocol is supported		
SNMP v1	Yes	
• SNMP v2	Yes	
SNMP v3	Yes	

Article number	6GK5774-1FX00-0AA0	
	6GK5774-1FX00-0AB0 1)	
	6GK5774-1FX00-0AC0 ²⁾	
Product type designation	W774-1 RJ45	
Product functions VLAN		
Product function		
 function VLAN with IWLAN 	Yes	
Product functions DHCP		
Product function		
DHCP client	Yes	
DHCP server	Yes	
DHCP Option 82	Yes	
Product functions redundancy		
Protocol is supported		
STP/RSTP	Yes	
• MSTP	Yes	
• RSTP	Yes	
Product functions security		
Product function		
 ACL - MAC-based 	Yes	
 management security, ACL-IP based 	Yes	
 IEEE 802.1x (radius) 	Yes	
NAT/NAPT	No	
 access protection according to IEEE802.11i 	Yes	
WPA/WPA2	Yes	
TKIP/AES	Yes	
protocol is supported		
• SSH	Yes	
RADIUS	Yes	
Product functions time		
Protocol is supported		
• NTP	Yes	
• SNTP	Yes	
SIMATIC time synchronization	Yes	
(SIMATIC Time)		

1) Wireless approval in the USA

2) Wireless approval in the Israel

SIMATIC S7-1500 Advanced Controllers I/O modules Communication

SCALANCE W774 RJ45 for the control cabinet

Technical specifications

Article number	6GK5774-1FX00-0AA0	Article number	6GK5774-1FX00-0AA0
	6GK5774-1FX00-0AB0 1)		6GK5774-1FX00-0AB0 1)
	6GK5774-1FX00-0AC0 2)		6GK5774-1FX00-0AC0 ²⁾
Product type designation	W774-1 RJ45	Product type designation	W774-1 RJ45
Standards, specifications, approvals Standard		Wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4	Marine classification association	approvals
 for safety from CSA and UL 	UL 60950-1, CSA C22.2 No. 60950-1	 American Bureau of Shipping Europe Ltd. (ABS) 	Yes
Certificate of suitability		French marine classification society	Vec
 EC Declaration of Conformity 	Yes	(BV)	163
CE marking	Yes	DNV GL	Yes
C-Tick	Yes	 Korean Register of Shipping (KRS) 	Yes
 E1 approval 	No	 Lloyds Register of Shipping (LRS) 	Yes
Railway application in accordance	No	 Nippon Kaiji Kyokai (NK) 	Yes
with EN 50155		 Polski Rejestr Statkow (PRS) 	Yes
Railway application in accordance with EN 50121-4	No	 Royal Institution of Naval Architects (RINA) 	Yes
NEMA TS2	No	Accessories	
• IEC 61375	No	Accessories	24 V DC screw terminal included in
• IEC 61850-3	No	/ 10000001100	scope of delivery
NEMA4X	No		
Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes		
Power-over-Ethernet according to IEEE802.3at for type 2	Yes		
Standard for wireless communication			
• IEEE 802.11a	Yes		
• IEEE 802.11b	Yes		
• IEEE 802.11e	Yes		
• IEEE 802.11g	Yes		
• IEEE 802.11h	Yes		
• IEEE 802.11i	Yes		
• IEEE 802.11n	Yes		
		¹⁾ Wireless approval in the USA	

¹⁾ Wireless approval in the USA

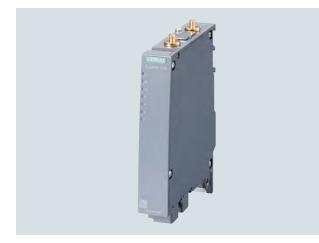
²⁾ Wireless approval in the Israel

SIMATIC S7-1500 Advanced Controllers I/O modules

Communication

SCALANCE W734 RJ45 for the control cabinet

Overview



 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.

	ALLOCIA
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 supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM; English/German	
SCALANCE W734-1 RJ45	
For managing the radio link of up to	

S

outside the USA

For managing the radio link of up to
eight devices with Industrial
Ethernet connections;

· Country approvals for operation 6GK5734-1FX00-0AA0

 Country approvals for operation within the USA ¹) 6GK5734-1FX00-0AB0

6GK1900-0AB10

Accessories **KEY-PLUG W740 iFeatures** 6GK5907-4PA00 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

a PLUG slot. 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 a PLUG slot

SCALANCE W client modules with



ET 200MP station with SCALANCE W734 RJ45

	Article No.
IE FC RJ45 plug 180 2 x 2	
RJ45 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 1 pack = 50 units 	6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
IE FC standard cable GP 2 x 2	6XV1840-2AH10
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; package item max. 1 000 m, minimum order quantity 20 m	
IE FC stripping tool	6GK1901-1GA00
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See: Industryl Mall, Industrial Wireless LAN/accessories

¹⁾ Please note country approvals under:

http://www.siemens.com/wireless-approvals

SIMATIC S7-1500 Advanced Controllers I/O modules Communication

SCALANCE W734 RJ45 for the control cabinet

Technical specifications

Article number	6GK5734-1FX00-0AA0
	6GK5734-1FX00-0AB0 ¹⁾
product type designation	W734-1 RJ45
ransfer rate	
ransfer rate	000 M 11/
• with WLAN maximum	300 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
ransfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
maximum	100 Mbit/s
nterfaces	
 humber of electrical connections for network components or terminal equipment 	2
 for power supply 	1
 for redundant voltage supply 	1
ype of electrical connection	
 for network components or terminal equipment 	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
nterfaces wireless	
number of radio cards permanently nstalled	1
ransmission mode for multiple input multiple output (MIMO)	2x2
number of spatial streams	2
number of electrical connections for external antenna(s)	2
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
supply voltage, current consumption, power loss	
ype of voltage of the supply voltage	DC
supply voltage 1	
from terminal block	19.2 V
supply voltage 2	
from terminal block	28.8 V
supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
consumed current	
• at DC at 24 V typical	0.25 A
 with Power-over-Ethernet 	0.125 A
according to IEEE802.3at for type 1 and IEEE802.3af typical	
oower loss [W]	
• at DC at 24 V typical	6 W
 with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical 	6 W

Article number	6GK5734-1FX00-0AA0
	6GK5734-1FX00-0AB0 ¹⁾
product type designation	W734-1 RJ45
ambient conditions	
ambient temperature	
 during operation 	-20 +60 °C
 during storage 	-40 +85 °C
 during transport 	-40 +85 °C
relative humidity at 25 °C without condensation during operation maximum	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.
protection class IP	IP30
design, dimensions and weights	
width	26 mm
height	156 mm
depth	127 mm
width of the enclosure without antenna	26 mm
height of the enclosure without antenna	147 mm
depth of the enclosure without antenna	127 mm
net weight	0.52 kg
fastening method	wall mounting only if flat mounted
S7-300 rail mounting	Yes
S7-1500 rail mounting	Yes
• 35 mm top hat DIN rail mounting	Yes
wall mounting	Yes
radio frequencies	
 operating frequency for WLAN in 2.4 GHz frequency band 	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
product features, product functions,	
product components general	
product function Access Point Mode	No
product function client Mode	Yes
product function	
iPCF client	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'
number of iPCF-capable radio modules	1
product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures' only

1) Wireless approval in the USA

I/O modules Communication

SCALANCE W734 RJ45 for the control cabinet

Technical specifications

Technical specifications			
Article number	6GK5734-1FX00-0AA0	Article number	6GK5734-1FX00-0AA0
product type designation	6GK5734-1FX00-0AB0 ¹⁾ W734-1 BJ45	product type designation	6GK5734-1FX00-0AB0 ¹⁾ W734-1 RJ45
product type designation product functions management,	W734-1 NJ43	product type designation protocol is supported	W754-1 hJ45
configuration, engineering		SSH	Yes
number of manageable IP addresses	8	RADIUS	Yes
in client		product functions time	
product function		protocol is supported	
• CLI	Yes	• NTP	Yes
web-based management	Yes	• SNTP	Yes
MIB support	Yes	 SIMATIC time synchronization 	Yes
TRAPs via email	Yes	(SIMATIC Time)	
configuration with STEP 7	Yes	standards, specifications, approvals	
 configuration with STEP 7 in the TIA Portal 	Yes	standard	
• WDS	No	• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1,
protocol is supported			Zone 2, Group IIC, T4
Address Resolution Protocol (ARP)	Yes	 for safety from CSA and UL 	UL 60950-1, CSA C22.2 No. 60950-1
• ICMP	Yes	certificate of suitability	
• Telnet	Yes	 EC Declaration of Conformity 	Yes
• HTTP	Yes	CE marking	Yes
• HTTPS	Yes	• C-Tick	Yes
• TFTP	Yes	 E1 approval 	No
• DCP	Yes	 railway application in accordance 	No
• LLDP	No	with EN 50155	
identification & maintenance function		NEMA TS2	No
 I&M0 - device-specific information 	Yes	• IEC 61375	No
 I&M1 – higher level 	Yes	• IEC 61850-3	No
designation/location designation		NEMA4X	No
product functions diagnostics		 Power-over-Ethernet according IEEE802.3at for type 1 and 	Yes
product function		IEEE802.3af	
PROFINET IO diagnosis	Yes	 Power-over-Ethernet according to 	Yes
Ink check	No	IEEE802.3at for type 2	
connection monitoring IP-Alive	No	standard for wireless communication	
• SysLog	Yes	• IEEE 802.11a	Yes
protocol is supported		• IEEE 802.11b	Yes
• SNMP v1	Yes	• IEEE 802.11e	Yes
• SNMP v2	Yes	• IEEE 802.11g	Yes
• SNMP v3	Yes	• IEEE 802.11h	Yes
product functions VLAN		• IEEE 802.11i	Yes
product function	Ne	• IEEE 802.11n	Yes
function VLAN with IWLAN	No	wireless approval	You will find the current list of countries at:
product functions DHCP			http://www.siemens.com/wireless-
product functionDHCP client	Vee		approvals
DHCP client DHCP server	Yes Yes	Marine classification association	
DHCP Server DHCP Option 82	Yes	 American Bureau of Shipping Europe Ltd. (ABS) 	Yes
product functions redundancy		French marine classification	Yes
protocol is supported		society (BV)	
• STP/RSTP	Yes	DNV GL	Yes
• MSTP	Yes	 Korean Register of Shipping (KRS) 	Yes
• RSTP	Yes	 Lloyds Register of Shipping (LRS) 	Yes
product functions security		 Nippon Kaiji Kyokai (NK) 	Yes
product function		 Polski Rejestr Statkow (PRS) 	Yes
ACL - MAC-based	Yes		Yes
management security, ACL-IP based	Yes	(RINA)	
• IEEE 802.1x (radius)	Yes	accessories	
NAT/NAPT	Yes	accessories	24 V DC screw terminal included in scope of delivery
 access protection according to 	Yes		
IEEE802.11i			
• WPA/WPA2	Yes		
• TKIP/AES	Yes		
		1) Mireless approval in the LISA	

4

¹⁾ Wireless approval in the USA

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SIMATIC S7-1500 Advanced Controllers

I/O modules SIPLUS communication

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	Article No.
SIPLUS CM PtP RS 232 BA communication module	6AG1540-1AD00-7AA0
(Extended temperature range and exposure to media)	
Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbps	
SIPLUS CM PtP RS 232 HF communication module	6AG1541-1AD00-7AB0
(Extended temperature range and exposure to media)	
High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbps	
SIPLUS CM PtP RS 422/485 BA communication module	6AG1540-1AB00-7AA0
(Extended temperature range and exposure to media)	
Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbps	
SIPLUS CM PtP RS 422/485 HF communication module	6AG1541-1AB00-7AB0
(Extended temperature range and exposure to media)	
High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbps	
Accessories	See SIMATIC S7-1500, CM PtP communication module, page 4/155

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			
 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)

I/O modules SIPLUS communication

SIPLUS CM PtP

Article number	6AG1540-1AD00-7AA0	6AG1541-1AD00-7AB0	6AG1540-1AB00-7AA0	6AG1541-1AB00-7AB0
Based on	6ES7540-1AD00-0AA0 SIPLUS S7-1500 CM PtP RS232 BA	6ES7541-1AD00-0AB0 SIPLUS S7-1500 CM PtP RS232 HF	6ES7540-1AB00-0AA0 SIPLUS S7-1500 CM PtP RS422/485 BA	6ES7541-1AB00-0AB0 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 faur 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 requ
 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 trichlorethylen harmful gas concentratio 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!	must remain in place over	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug cove must remain in place ove the unused interfaces dur 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	possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coat possible during service li
 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

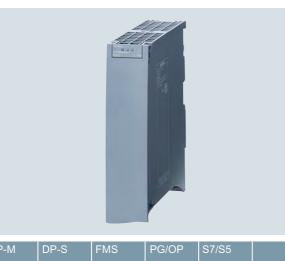
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SIMATIC S7-1500 Advanced Controllers

I/O modules SIPLUS communication

SIPLUS NET CM 1542-5

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
•	•		•	•	G_K10,XX,10443

The CM 1542-5 communication 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 communication module	
(extended temperature range and medial exposure)	
Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave	6AG1542-5DX00-7XE0
Accessories	See SIMATIC S7-1500, CM 1542-5 communication module, page 4/160

SIMATIC S7-1500 Advanced Controllers I/O modules

SIPLUS communication

SIPLUS NET CP 1543-1

Overview



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 respective standard products. SIPLUS extreme-specific information was added.

Ordering data	Article No.
SIPLUS NET CP 1543-1 communications processor	6AG1543-1AX00-2XE0
(Extended temperature range and exposure to media)	
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	
Accessories	See SIMATIC S7-1500, SIMATIC CP 1543-1 communications processor, page 4/167

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SIMATIC S7-1500 Advanced Controllers

I/O modules Connection system

Front connectors

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 mm² to 1.5 mm² (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 • Push-in	6ES7592-1AM00-0XB0 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

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.

Further information can be found on the Internet at

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

Design

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

Fully modular connection

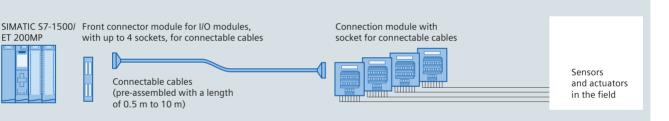
The system consists of:

- Front connector module
- Connecting cable

FT 200MP

Terminal modules in the following versions: Basic module, signal module and function module

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



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

Connectable cables

of 0.5 m to 10 m)

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.

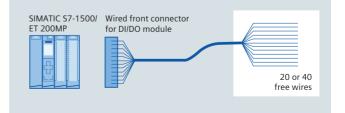
The single cores are available in different versions:

- 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

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SIMATIC S7-1500 Advanced Controllers

I/O modules Connection system

System cabling for SIMATIC S7-1500 and ET 200MP > Fully modular 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 terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Front connector module, connecting cable and terminal 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 terminal module

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-pin or 50-pin round cable (shielded or unshielded) it is available in lengths up to 10 m.

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

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

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

- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-bye distribution of the signals in the case of digital signals
- Each component can be replaced individually
- · Use of pre-assembled cables possible

Terminal module

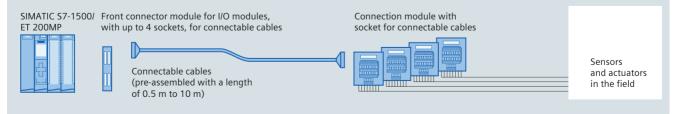
The system has both digital and analog terminal modules for connecting the I/O signals. These are snapped onto the DIN rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

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

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

I/O modules Connection system

Ordering data	Article No.		Article No.
Front connector modules	1)		
Front connector module for digital modules for the connection of 16-pin connecting cables		Front connector module for 2 A digital modules for the connection of 16-pin connecting cables	
Power supply via • Push-in • Screw terminals	6ES7921-5AH20-0AA0 6ES7921-5AB20-0AA0	Power supply via • Push-in • Screw terminals	6ES7921-5AJ00-0AA0 6ES7921-5AD00-0AA0
Front connector module for digital modules for the connection of 50-pin connecting cables		Front connector module for analog modules for the connection of 16-pin connecting cables	6ES7921-5AK20-0AA0
Power supply via • Push-in • Screw terminals	6ES7921-5CH20-0AA0 6ES7921-5CB20-0AA0	Front connector module for analog modules for the connection of 50-pin 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		<u>50-pin, 0.14 mm²</u>	
		Unshielded	
Pre-assembled round cable		• 0.5 m	6ES7923-5BA50-0CB0
<u>16-pin, 0.14 mm²</u>		• 1.0 m	6ES7923-5BB00-0CB0
Unshielded		• 1.5 m	6ES7923-5BB50-0CB0
• 0.5 m	6ES7923-0BA50-0CB0	• 2.0 m	6ES7923-5BC00-0CB0
• 1.0 m	6ES7923-0BB00-0CB0	• 2.5 m	6ES7923-5BC50-0CB0
• 1.5 m	6ES7923-0BB50-0CB0	• 3.0 m	6ES7923-5BD00-0CB0
• 2.0 m	6ES7923-0BC00-0CB0	• 4.0 m	6ES7923-5BE00-0CB0
• 2.5 m	6ES7923-0BC50-0CB0	• 5.0 m	6ES7923-5BF00-0CB0
• 3.0 m	6ES7923-0BD00-0CB0	• 6.5 m	6ES7923-5BG50-0CB0
• 4.0 m	6ES7923-0BE00-0CB0	• 8.0 m	6ES7923-5BJ00-0CB0
• 5.0 m	6ES7923-0BF00-0CB0	• 10.0 m	6ES7923-5CB00-0CB0
• 6.5 m	6ES7923-0BG50-0CB0	Shielded	
• 8.0 m	6ES7923-0BJ00-0CB0	• 1.0 m	6ES7923-5BB00-0DB0
• 10.0 m	6ES7923-0CB00-0CB0	• 2.0 m	6ES7923-5BC00-0DB0
Shielded		• 2.5 m	6ES7923-5BC50-0DB0
• 1.0 m	6ES7923-0BB00-0DB0	• 3.0 m	6ES7923-5BD00-0DB0
• 2.0 m	6ES7923-0BC00-0DB0	• 4.0 m	6ES7923-5BE00-0DB0
• 2.5 m	6ES7923-0BC50-0DB0	• 5.0 m	6ES7923-5BF00-0DB0
• 3.0 m	6ES7923-0BD00-0DB0	• 6.5 m	6ES7923-5BG50-0DB0
• 4.0 m	6ES7923-0BE00-0DB0	• 8.0 m	6ES7923-5BJ00-0DB0
• 5.0 m	6ES7923-0BF00-0DB0	• 10.0 m	6ES7923-5CB00-0DB0
• 6.5 m	6ES7923-0BG50-0DB0	Version 1 x 40-pin to 1 x 50-pin,	
• 8.0 m	6ES7923-0BJ00-0DB0	0.14 mm ²	
• 10.0 m	6ES7923-0CB00-0DB0	Unshielded	
Version 4 × 16 to 1 × 50 pin		• 1.0 m	6ES7923-5BB00-0GB0
Version 4 x 16 to 1 x 50-pin, 0.14 mm ²		• 2.0 m	6ES7923-5BC00-0GB0
<u> </u>		• 2.5 m	6ES7923-5BC50-0GB0
Unshielded		• 3.0 m	6ES7923-5BD00-0GB0
• 0.5 m	6ES7923-5BA50-0EB0		
• 1.0 m	6ES7923-5BB00-0EB0		
• 1.5 m	6ES7923-5BB50-0EB0		
• 2.0 m • 2.5 m	6ES7923-5BC00-0EB0		
• 3.0 m	6ES7923-5BC50-0EB0 6ES7923-5BD00-0EB0		
• 4.0 m	6ES7923-5BE00-0EB0 6ES7923-5BE00-0EB0		
• 4.0 m • 5.0 m	6ES7923-5BE00-0EB0		
• 6.5 m	6ES7923-5BG50-0EB0		
• 6.5 m	6ES7923-5BJ00-0EB0		
• 10.0 m	6ES7923-5CB00-0EB0		
• 10.0111	0E37923-30D00-0ED0		

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I/O modules Connection system

System cabling for SIMATIC S7-1500 and ET 200MP > Fully modular connection

Ordering data	Article No.		Article No.
Terminal modules			
Terminal module TP1		Terminal module TPRi	
For 1-wire connection, for 16-pin connecting cables • Push-in terminals without LEDs • Screw-type terminals without LEDs • Push-in terminals with LEDs	6ES7924-0AA20-0AC0 6ES7924-0AA20-0AA0 6ES7924-0AA20-0BC0	Relay module for 8 outputs (230 V AC), relay as normally open contact • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BE20-0BC0 6ES7924-0BE20-0BA0
 Screw-type terminals with LEDs 	6ES7924-0AA20-0BA0	Terminal module TPOo	
For 1-wire connection, for 50-pin connecting cables • Push-in terminals without LEDs • Screw-type terminals without LEDs	6ES7924-2AA20-0AC0 6ES7924-2AA20-0AA0	Optocoupler module for 8 outputs (max. 24 V DC/4 A) • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BF20-0BC0 6ES7924-0BF20-0BA0
 Push-in terminals with LEDs Screw-type terminals with LEDs Push-in terminals, sourcing input, with LEDs Screw-type terminals, sourcing input, with LEDs 	6ES7924-2AA20-0BC0 6ES7924-2AA20-0BA0 6ES7924-2AK20-0BC0 6ES7924-2AK20-0BA0	Terminal module for digital output modules 2 A Terminal module TP2 • Push-in terminals without LEDs • Screw-type terminals without LEDs	6ES7924-0BB20-0AC0 6ES7924-0BB20-0AA0
 Push-in terminals, mid-point conductor signal, with LEDs Screw-type terminals, mid-point conductor signal, with LEDs 	6ES7924-2AM20-0BC0 6ES7924-2AM20-0BA0	Terminal module for analog modules Terminal module TPA, 16-pin	0101324000200000
Ferminal module TP3		 Push-in terminals without LEDs Screw-type terminals without LEDs 	6ES7924-0CC20-0AC0 6ES7924-0CC20-0AA0
For 3-wire connection, for 16-pin connecting cables • Push-in terminals without LEDs • Screw-type terminals without LEDs	6ES7924-0CA20-0AC0 6ES7924-0CA20-0AA0	 Screw-type terminals without LEDs Terminal module TPA, 50-pin Push-in terminals without LEDs Screw-type terminals without LEDs 	6ES7924-2CC20-0AC0 6ES7924-2CC20-0AC0
Push-in terminals with LEDs	6ES7924-0CA20-0BC0 6ES7924-0CA20-0BA0	Accessories	
 Screw-type terminals with LEDs Push-in terminals with LEDs and one isolating terminal per channel 	6ES7924-0CH20-0BC0	Equipment labeling plates for terminal modules in S7-1500 design	
• Screw-type terminals with LEDs and one isolating terminal per channel	6ES7924-0CH20-0BA0	Equipment labeling plates, insertable P. unit = 340 units	3RT1900-1SB20
 Push-in terminals with LEDs and fuse per channel 	6ES7924-0CL20-0BC0	Shield plate for analog terminal	
• Screw-type terminals with LEDs and one fuse per channel	6ES7924-0CL20-0BA0	module P. unit = 4 units (for connection of 15-pin connecting cable)	6ES7928-1AA20-4AA0
For 3-wire connection, for 50-pin connecting cables • Push-in terminals without LEDs	6ES7924-2CA20-0AC0	P. unit = 4 units (for connection of 15-pin connecting cable)	6ES7928-1BA20-4AA0
 Screw-type terminals without LEDs Push-in terminals with LEDs 	6ES7924-2CA20-0AA0 6ES7924-2CA20-0BC0	Shield connection clamp	
Screw-type terminals with LEDs	6ES7924-2CA20-0BA0	For shield plate at SIMATIC end, P. unit = 10 units	6ES7590-5BA00-0AA0
Terminal module TPRo		For shield plate at field end,	6ES7390-5AB00-0AA0
Relay module for 8 outputs, relay as normally open contact • Push-in terminals with LEDs	6ES7924-0BD20-0BC0	2 x 2 6 mm For shield plate at field end,	6ES7390-5BA00-0AA0
 Screw-type terminals with LEDs 	6ES7924-0BD20-0BA0	3 8 mm	
Terminal module TPRi		 For shield plate at field end, 4 13 mm 	6ES7390-5CA00-0AA0
Relay module for 8 outputs (110 V AC), relay as normally open contact			
 Push-in terminals with LEDs Screw-type terminals with LEDs 	6ES7924-0BG20-0BC0 6ES7924-0BG20-0BA0		

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I/O modules Connection system

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

	Push-in	Screw terminals
	Modules up to 4 c	onnections
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 1.5 mm ² (total) in a end ferrule	of 2 wires up to common wire
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 coller 1.5 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 Nr

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	

I/O modules Connection system

System cabling for SIMATIC S7-1500 and ET 200MP > Front connector with single wires

Overview



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	

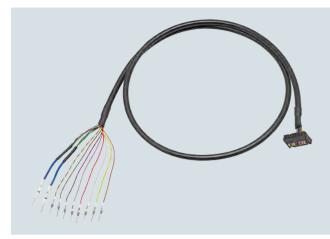
Front connector with single cores for 32 channels (pins 1-40)

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

Design

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

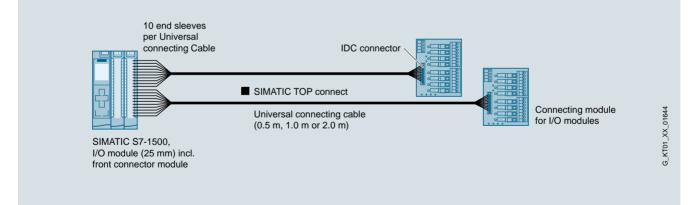
It comprises:

- 16-pin round cable with a core diameter of 0.14 mm², 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

- 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.

- 16-pin ID connector (insulation displacement) for connection to the SIMATIC TOP connect terminal modules for 8 I/Os:
 - 3-wire connection using the appropriate terminal 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

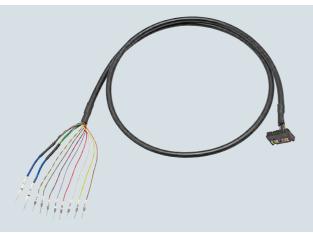


SIMATIC TOP connect universal connection cable

I/O modules Connection system

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

Overview Universal connecting cable



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.

Article No.
6ES7923-0BA50-0FB0
6ES7923-0BB00-0FB0
6ES7923-0BC00-0FB0

Overview Terminal modules

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

Ordering data	Article No.
Terminal module TP1	
For 1-wire connection, for 16-pin connecting cables • Push-in terminals without LEDs • Screw-type terminals without LEDs • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0AA20-0AC0 6ES7924-0AA20-0AA0 6ES7924-0AA20-0BC0 6ES7924-0AA20-0BA0
Terminal module TP3	
For 3-wire connection, for 16-pin connecting cables • Push-in terminals without LEDs • Screw-type terminals with LEDs • Push-in terminals with LEDs • Screw-type terminals with LEDs • Push-in terminals with LEDs and one isolating terminal per channel • Screw-type terminals with LEDs and one isolating terminal per channel • Push-in terminals with LEDs and fuse per channel • Screw-type terminals with LEDs and fuse per channel	6ES7924-0CA20-0AC0 6ES7924-0CA20-0AA0 6ES7924-0CA20-0BC0 6ES7924-0CA20-0BA0 6ES7924-0CH20-0BC0 6ES7924-0CH20-0BA0 6ES7924-0CL20-0BC0 6ES7924-0CL20-0BA0
Terminal module TPRo	
Relay module for 8 outputs, relay as normally open contact • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BD20-0BC0 6ES7924-0BD20-0BA0
Terminal module TPRi	
Relay module for 8 inputs (1230 V AC), relay as normally open contact • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BE20-0BC0 6ES7924-0BE20-0BA0
Terminal module TPRi	
Relay module for 8 inputs (110 V AC), relay as normally open contact • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BG20-0BC0 6ES7924-0BG20-0BA0
Terminal module TPOo	
Optocoupler module for 8 outputs (max. 24 V DC/4 A) • Push-in terminals with LEDs • Screw-type terminals with LEDs	6ES7924-0BF20-0BC0 6ES7924-0BF20-0BA0

Fail-safe I/O modules

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 (article 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.		Article No.
F-digital input module		STEP 7 Safety Advanced V17	
16 inputs, 24 V DC, PROFISAFE	6ES7526-1BH00-0AB0	Task:	
Accessories		Engineering tool for configuring and programming fail-safe user	
Coding elements	6ES7592-6EF00-1AA0	programs for SIMATIC S7-1200 FC,	
E-coding element type F for ET 200MP module F-DI/F-DQ; 5 units, spare part		S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O	
Front connector		ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and	
Incl. four potential bridges, cable ties and individual labeling strips, 40-pin		ET 2000co Requirement: STEP 7 Professional V17	
Screw terminals	6ES7592-1AM00-0XB0	ES7592-1BM00-0XB0 As of TIA Portal V16,	
• Push-in	6ES7592-1BM00-0XB0		
DIN A4 labeling sheets	6ES7592-2CX00-0AA0	the SIMATIC STEP 7 Safety software is an integral component of the	
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow		SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
U connector	6ES7590-0AA00-0AA0	Floating license for 1 user;	6ES7833-1FA17-0YA5
5 units; spare part		license key on USB flash drive	
Front door for F-I/O modules		Floating license for 1 user; license key for download ¹⁾ ;	6ES7833-1FA17-0YH5
5 front doors; with 5 labeling strips	6ES7528-0AA10-7AA0	Email address required for delivery	
(front) and 5 cabling diagrams per front door; spare part		¹⁾ For up-to-date information and dow http://www.siemens.com/tia-online-	vnload availability, see: ·software-delivery

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I/O modules Fail-safe I/O modules

Digital F-input modules

Ordering data	Article No.	Article number	6ES7526-1BH00-0AB0
or doring data			ET 200MP, F-DI 16X24VDC
S7 Distributed Safety V5.4 SP5 Update 2 programming tool		Interrupts/diagnostics/ status information	
Task:		Diagnostics function	Yes
Configuration software for configuring fail-safe user programs		Alarms	
for SIMATIC S7-300F, S7-400F,		Diagnostic alarm	Yes
WinAC RTX F, ET 200S, ET 200M,		 Hardware interrupt 	No
ET 200iSP, ET 200pro, ET 200eco, ET 200SP		Diagnoses	
Requirement:		 Monitoring the supply voltage 	Yes
Windows 7 SP1 (64-bit),		Wire-break	No
Windows 10 Professional/Enterprise (64-bit),		 Short-circuit 	Yes
Windows Server 2008 R2 SP1		Group error	Yes
(64-bit), Windows Server 2012 R2 (64-bit),		Diagnostics indication LED	
Windows Server 2016 (64-bit);		RUN LED	Yes; green LED
STEP 7 as of V5.5 SP1;		ERROR LED	Yes; red LED
Please also consider the operating systems that have been released		 Channel status display 	Yes; green LED
for the used STEP 7 version		 for channel diagnostics 	Yes; red LED
Floating license for 1 user; software	6ES7833-1FC02-0YA5	 for module diagnostics 	Yes; red LED
and documentation on DVD; license key on USB flash drive		Potential separation	
Floating license for 1 user; software, documentation and license key for download ¹ ; Email address required for delivery	6ES7833-1FC02-0YH5	Potential separation channels	
	025/035-1002-0105	 between the channels and backplane bus 	Yes
		Standards, approvals, certificates	
1) For up to data information and day	upland availability analy	Suitable for safety functions	Yes

1) For up-to-date information and download availability, see: 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

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

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Fail-safe I/O modules

Overview



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

Ordering data	Article No.		Article No.
F-digital output module		STEP 7 Safety Advanced V17	
8 outputs, 24 V DC, 2 A, PROFISAFE, p/m-switching	6ES7526-2BF00-0AB0	Task: Engineering tool for configuring	
Accessories		and programming fail-safe user programs for SIMATIC S7-1200 FC,	
Coding elements	6ES7592-6EF00-1AA0	S7-1500F, S7-1500F Software Controller.	
E-coding element type F for ET 200MP module F-DI/F-DQ; 5 units, spare part		S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP,	
Front connector		ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco	
Incl. four potential bridges, cable ties and individual labeling strips,		Requirement: STEP 7 Professional V17	
40-pin • Screw terminals • Push-in	6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0	<u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software	
DIN A4 labeling sheets	6ES7592-2CX00-0AA0	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.	
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated,			
yellow		Floating license for 1 user;	6ES7833-1FA17-0YA5
U connector	6ES7590-0AA00-0AA0	license key on USB flash drive	
5 units; spare part		Floating license for 1 user; license key for download ¹ ;	6ES7833-1FA17-0YH5
Front door for F-I/O modules		Email address required for delivery	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	6ES7528-0AA10-7AA0		
		1) For up-to-date information and dow	wnload availability, see:

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

I/O modules Fail-safe I/O modules

Digital F-output modules

Ordering data	Article No.	Article number	6ES7526-2BF00-0AB0
eraeinig aata			ET 200MP, F-DQ 8x24VDC 2A PPM
S7 Distributed Safety V5.4 SP5		Switching frequency	
Update 2 programming tool		 with resistive load, max. 	30 Hz
Task:		 with inductive load, max. 	0.1 Hz
Configuration software for configuring fail-safe user programs		• on lamp load, max.	10 Hz
for SIMATIC S7-300F, S7-400F,		Total current of the outputs	
WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco,		Current per channel, max.	2 A
ET 200SP Requirement:		Total current of the outputs (per module)	
Windows 7 SP1 (64-bit),		horizontal installation	
Windows 10 Professional/Enterprise (64-bit).		- up to 40 °C, max.	16 A
Windows Server 2008 R2 SP1		- up to 60 °C, max.	8 A
(64-bit), Windows Server 2012 R2 (64-bit),		vertical installation	
Windows Server 2016 (64-bit);		- up to 40 °C, max.	8 A
STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released		Interrupts/diagnostics/ status information	
for the used STEP 7 version		Diagnostics function	Yes
Floating license for 1 user;	6ES7833-1FC02-0YA5	Substitute values connectable	No
software and documentation on DVD;		Alarms	
license key on USB flash drive		 Diagnostic alarm 	Yes
Floating license for 1 user;	6ES7833-1FC02-0YH5	Diagnoses	
software, documentation and license key for download ¹⁾ ;		Monitoring the supply voltage	Yes
Email address required for delivery		Wire-break	Yes
1) For up-to-date information and d	availability see:	Short-circuit	Yes
 For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery 		Group error	Yes

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	
 Type of output voltage 	DC
 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

Article number	6ES7526-2BF00-0AB0
	ET 200MP, F-DQ 8x24VDC 2A PPM
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
State the state	

I/O modules

SIPLUS F-digital/analog modules

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 (article 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 respective 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 4/197

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/fros (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 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. s 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. s spray acc. to EN 60068-2-52 (severity degree 3); *
 to mechanically active substances according to EN 60721-3-6 	
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 	* 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
- Protection against fouling acc. to EN 60664-3
- Military testing according to MIL-I-46058C, Amendment 7
- Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

Yes; Class 2 for high reliability

Yes; Discoloration of coating possible during service life

Yes; Conformal coating, Class A

Yes; Type 1 protection

I/O modules SIPLUS F-digital/analog modules

SIPLUS digital F-output modules

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 diagramHardware 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, p/m-switching	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 4/199	

Articlo number	6AG1526-2BF00-2AB0
Article number Based on	6ES7526-2BF00-0AB0
Dased on	SIPLUS S7-1500 F-DQ 8x24VDC/2A
General information	
Product type designation	F-DQ 8x24VDC/2A PPM
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	20
Type of output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
• for signal "1" rated value	2 A
 for signal "0" residual current, max. 	
• for signal o 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. Interrupts/diagnostics/	8 A
status information	Yes
Diagnostics function	res No
Substitute values connectable	
	Yes
Diagnostic alarm	165
• Monitoring the supply voltage	Yes
Wiontoning the supply voltage Wire-break	Yes
Short-circuit	Yes
Group error	Yes

Article number

Use on ships/at sea

- to biologically active substances

- to chemically active substances according to EN 60721-3-6

Usage in industrial process

according to EN 60721-3-6

Based on

I/O modules SIPLUS F-digital/analog modules

6AG1526-2BF00-2AB0

6ES7526-2BF00-0AB0

SIPLUS digital F-output modules

SIPLUS S7-1500 F-DQ 8x24VDC/2A

Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

Yes; Class 6B2 mold and fungal

spores (excluding fauna); Class 6B3 on request

Technical specifications

Article number	6AG1526-2BF00-2AB0	
Based on	6ES7526-2BF00-0AB0	
	SIPLUS S7-1500 F-DQ 8x24VDC/2A	
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. 	-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	c 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): *	

(severity degree 3); *

- to mechanically active substances Yes; Class 3S4 incl. sand, dust, * according to EN 60721-3-3

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
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

- to mechanically active substances Yes; Class 6S3 incl. sand, dust; * according to EN 60721-3-6

4

Power supplies

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

Overview



The design and functionality of the SIMATIC PM 1507 singlephase 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	6EP1332-4BA00
Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	
SIMATIC PM 1507	6EP1333-4BA00
Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	
Accessories	
Power plug	6ES7590-8AA00-0AA0
With coding element for power supply module; spare part, 10 units per packing unit	
Top hat DIN rail adapter	6ES7590-6AA00-0AA0
For adapting S7-1500 DIN rails on low or flat top hat DIN rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be positioned every 25 cm. Including mounting hardware. 10 units per packing unit	

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Input		
Input	1-phase AC	1-phase AC
Note	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
Wide-range input	No	No
Overvoltage resistance	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
Mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
Mains buffering at lout rated, min.	20 ms; at Vin = 93/187 V	20 ms; at Vin = 93/187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	45 65 Hz	45 65 Hz
input current		
 at rated input voltage 120 V 	1.4 A	3.7 A
 at rated input voltage 230 V 	0.8 A	1.7 A
Switch-on current limiting (+25 °C), max.	23 A	62 A
duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
l²t, max.	1.3 A ² ·s	12 A ² ·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

Power supplies

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

Article number	6EP1332-4BA00	6EP1333-4BA00	
Product	S7-1500 PM1507	S7-1500 PM1507	
Power supply, type	24 V/3 A	24 V/8 A	
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	
Rated voltage Uout DC	24 V	24 V	
 output voltage at output 1 at DC rated value 	24 V	24 V	
Total tolerance, static \pm	1 %	1 %	
Static mains compensation, approx.	0.1 %	0.1 %	
Static load balancing, approx.	0.1 %	0.1 %	
Residual ripple peak-peak, max.	50 mV	50 mV	
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	150 mV	
product function output voltage adjustable	No	No	
Status display	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by	
On/off behavior	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	
Startup delay, max.	1.5 s	1.5 s	
Voltage rise, typ.	10 ms	10 ms	
Rated current value Iout rated	3 A	8 A	
Current range	0 3 A	0 8 A	
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	
Parallel switching for enhanced performance	Yes	Yes	
Numbers of parallel switchable units for enhanced performance	2	2	
Efficiency			
Efficiency at U _{out} rated, I _{out} rated, approx.	87 %	90 %	
Power loss at U _{out} rated, I _{out} rated, approx.	11 W	21 W	
Closed-loop control			
Dynamic mains compensation (<i>U</i> _{in} rated ±15 %), max.	0.1 %	0.1 %	
Dynamic load smoothing (<i>I</i> _{out} : 50/100/50 %), <i>U</i> _{out} ± typ.	1 %	2 %	
Dynamic load smoothing (I_{out} : 10/90/10 %), $U_{out} \pm$ typ.	3 %	3 %	
Load step setting time 10 to 90%, typ.	5 ms	5 ms	
Load step setting time 90 to 10%, typ.		5 ms	
setting time maximum	5 ms	5 ms	
Protection and monitoring			
Output overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V $$	
Current limitation	3.15 3.6 A	8.4 9.6 A	
Current limitation, typ.	3.4 A	9 A	
property of the output short-circuit proof	Yes	Yes	
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	
Overload/short-circuit indicator	-	-	

Power supplies

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

Article number	6EP1332-4BA00	6EP1333-4BA00	
Product	S7-1500 PM1507	S7-1500 PM1507	
Power supply, type	24 V/3 A	24 V/8 A	
Safety			
Primary/secondary isolation	Yes	Yes	
galvanic isolation	Safety extra-low output voltage $U_{\rm out}$ acc. to EN 60950-1 and EN 50178 and EN 61131-2		
Protection class	Class I	Class I	
leakage current			
• maximum	3.5 mA	3.5 mA	
• typical	0.4 mA	1.3 mA	
Degree of protection (EN 60529)	IP20	IP20	
Approvals			
CE mark	Yes	Yes	
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	
Explosion protection	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	
certificate of suitability NEC Class 2	No	No	
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	
CB approval	Yes	Yes	
certificate of suitability EAC approval	Yes	Yes	
Marine approval	ABS, BV, DNV GL	ABS, BV, DNV GL	
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2	
Noise immunity	EN 61000-6-2	EN 61000-6-2	
environmental conditions			
ambient temperature			
 during operation 	0 60 °C	0 60 °C	
- Note	with natural convection	with natural convection	
 during transport 	-40 +85 °C	-40 +85 °C	
during storage	-40 +85 °C	-40 +85 °C	
Humidity class according to EN 60721	Climate class 3K3, 5 95% no condensation	Climate class 3K3, 5 95% no condensation	
Mechanics			
Connection technology	Screw-/spring clamp connection	Screw-/spring clamp connection	
Connections			
 Supply input 	L, N, PE: 1 screw terminal each for 0.5 2.5 mm ²	L, N, PE: 1 screw terminal each for 0.5 2.5 mm ²	
Output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm ²	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm ²	
product function			
 removable terminal at input 	Yes	Yes	
 removable terminal at output 	Yes	Yes	
width of the enclosure	50 mm	75 mm	
height of the enclosure	147 mm	147 mm	
depth of the enclosure	129 mm	129 mm	
required spacing			
• top	40 mm	40 mm	
 bottom 	40 mm	40 mm	
• left	0 mm	0 mm	
• right	0 mm	0 mm	
Weight, approx.	0.45 kg	0.74 kg	
product feature of the enclosure housing can be lined up	Yes	Yes	
Installation	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)	

Power supplies

System power supplies



- 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.
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 • 245 mm • 482 mm • 530 mm • 830 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 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	6ES7590-5AA00-0AA0
DIN rail 2000 mm	0207030-0AA0-0AA0
Spare part, 20 units	
Power connector	6ES7590-8AA00-0AA0
With coding element for power supply module; spare part, 10 units	

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

Power supplies

System power supplies

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
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.			\leq 8 A for t \leq 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	1995; surge symm.),	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	1995; surge symm.),	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
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 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.

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.

SIPLUS S7-1500 PM 1507		
Article No.	6AG1332-4BA00-7AA0	6AG1333-4BA00-7AA0
Article number based on	6EP1332-4BA00	6EP1333-4BA00
Ambient temperature range	-40 +70 °C	
Conformal coating	Coating of the printed circuit boards	and the electronic components
Technical specifications	The technical specifications of the sta	andard product apply, except for the ambient conditions.
Ambient conditions		
 Extended range of environmental conditions with reference to ambient temperature, air pressure and altitude 	rre Tmin Tmax at 1080 hPa 795 hPa (-1000 m +2000 m) // Tmin (Tmax - 10K) at 795 hPa 658 hPa (+2000 m +3500 m) // Tmin (Tmax - 20K) at 658 hPa 540 hPa (+3500 m +5000 m)	
Relative humidity with condensation, max. 	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)	
 Resistance to biologically active substances/compliance with EN 60721-3-3 to chemically active substances/compliance with EN 60721-3-3 to mechanically active substances, compliance with EN 60721-3-3 	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in p the unused interfaces during operation. Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the su plug covers must remain in place on the unused interfaces during operation. Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interface during operation.	

Ordering data	Article No.		Article No.
SIPLUS S7-1500 PM 1507		Accessories	See PM 1507 power supply,
(Extended temperature range and exposure to media)			page 4/204
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		

SIPLUS power supplies

SIPLUS system power supplies

Overview



Article No.
6AG1505-0KA00-7AB0
6AG1505-0RA00-7AB0
6AG1507-0RA00-7AB0
See SIMATIC S7-1500, system power supplies, page 4/207

- 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.

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 1505 25W 24VDC	SIPLUS S7-1500 PS 1505 60W 24VDC	SIPLUS S7-1500 PS 1507 60W 230VAC
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)

SIPLUS power supplies

SIPLUS system power supplies

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 1505 25W 24VDC	SIPLUS S7-1500 PS 1505 60W 24VDC	SIPLUS S7-1500 PS 1507 60W 230VAC
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

Operator control and monitoring Basic Panels

Overview



Basic Panels (2nd Generation)

SIMATIC HMI Basic Panels (2nd Generation) with their fully developed HMI basic functions are the ideal entry-level series for simple HMI applications.

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

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

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

http://www.siemens.com/basic-panels

Ordering data	Article No.
SIMATIC HMI Basic Panels (2 nd Generation)	
Key and touch devices	
SIMATIC HMI KTP400 Basic	6AV2123-2DB03-0AX0
Key/touch-screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	
SIMATIC HMI TP400 Basic Keyless	6AV2143-6DB00-0AA0
Touch screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	
SIMATIC HMI KTP700 Basic Key/touch-screen operation; 7" TFT display, 65 536 colors, PROFINET interface	6AV2123-2GB03-0AX0
SIMATIC HMI KTP700 Basic DP Key/touch-screen operation; 7" TFT display, 65 536 colors, PROFIBUS interface	6AV2123-2GA03-0AX0
SIMATIC HMI TP700 Basic Keyless	6AV2143-6GB00-0AA0
Touch screen operation; 7" TFT display, 65 536 colors, PROFINET interface	
SIMATIC HMI KTP900 Basic	6AV2123-2JB03-0AX0
Key/touch-screen operation; 9" TFT display, 65 536 colors, PROFINET interface	
SIMATIC HMI TP900 Basic Keyless	6AV2143-6JB00-0AA0
Touch screen operation; 9" TFT display, 65 536 colors, PROFINET interface	
SIMATIC HMI KTP1200 Basic	6AV2123-2MB03-0AX0
Key/touch-screen operation; 12" TFT display, 65 536 colors, PROFINET interface	
SIMATIC HMI KTP1200 Basic DP Key/touch-screen operation; 12" TFT display, 65 536 colors, PROFIBUS interface	6AV2123-2MA03-0AX0
Starter kits	
Starter kit LOGO! + KP300 Basic mono PN	6AV2132-0HA00-0AA1
Starter kit LOGO! + KTP400 Basic	6AV2132-0KA00-0AA1
Starter kit LOGO! + KTP700 Basic	6AV2132-3GB00-0AA1
Starter kits with a LOGO! consist of: • the respective SIMATIC HMI Basic Panel	
SIMATIC HMI KP300 Basic mono PN SIMATIC HMI KTP400 Basic	
SIMATIC HMI KTP700 Basic LOGO! 12/24 RCE LOGO! POWER 24 V 1.3 A LOGO! SOFT COMFORT V7 WINCC BASIC (TIA Portal) Ethernet CAT5 cable, 2 m	
Documentation	
Additional information on the manual for the Basic Panels is available on the Internet at:	http://support.automation. siemens.com
Accessories	See catalog ST 80 / ST PC or
	Industry Mall

Operator control and monitoring Comfort Panels

SIMATIC HMI Unified Comfort Panels Standard

Overview



SIMATIC HMI MTP2200 Unified Comfort Panel Standard design front view

SIMATIC HMI Unified Comfort Panels - standard devices

The SIMATIC HMI Unified Comfort Panels consist of six different devices with varying display sizes.

All devices come with the same number of hardware interfaces and the same functionality – just select the perfect device for your needs based on the screen size.

Each Unified Comfort Panel is available in the standard design with Siemens and SIMATIC HMI branding and a silver-colored aluminum frame.

All Unified Comfort Panels come with integrated Edge functionality.

Siemens Industrial Edge can be used in two different ways:

- Device-managed Edge
- Centrally-managed Edge (planned)

SIMATIC HMI Unified Comfort Panels can also be ordered with a neutral design. Starter kits are available for standard design devices.

Note:

The technical specifications of the neutral design devices correspond to the technical specifications of the devices with standard design.

Ordering data	Article No.	
SIMATIC HMI Unified Comfort Panels Touch Devices		5
Standard design		
SIMATIC HMI MTP700 Unified Comfort Touch operation:	6AV2128-3GB06-0AX0	
7" widescreen display		2
SIMATIC HMI MTP1000 Unified Comfort	6AV2128-3KB06-0AX0	
Touch operation; 10" widescreen display		;
SIMATIC HMI MTP1200 Unified Comfort	6AV2128-3MB06-0AX0	•
Touch operation; 12" widescreen display		
SIMATIC HMI MTP1500 Unified Comfort	6AV2128-3QB06-0AX0	
Touch operation; 15" widescreen display		-
SIMATIC HMI MTP1900 Unified Comfort	6AV2128-3UB06-0AX0	
Touch operation; 19" widescreen display		(
SIMATIC HMI MTP2200 Unified Comfort	6AV2128-3XB06-0AX0	(
Touch operation; 22" widescreen display		(
Neutral design		
SIMATIC HMI MTP700 Unified Comfort	6AV2128-3GB36-0AX0	
Touch operation; 7" widescreen display		
SIMATIC HMI MTP1000 Unified Comfort	6AV2128-3KB36-0AX0	I
Touch operation; 10" widescreen display		l
SIMATIC HMI MTP1200 Unified Comfort	6AV2128-3MB36-0AX0	1
Touch operation; 12" widescreen display		(
SIMATIC HMI MTP1500 Unified Comfort	6AV2128-3QB36-0AX0	
Touch operation; 15" widescreen display		

Article No.
6AV2128-3UB36-0AX0
6AV2128-3XB36-0AX0
6AV2128-3GB06-0AP0
6AV2128-3KB06-0AP0
6AV2128-3MB06-0AP0
6AV2128-3QB06-0AP0
6AV2128-3UB06-0AP0
6AV2128-3XB06-0AP0
6AV2170-2BA00-0AA0

Operator control and monitoring Comfort Panels

Overview



SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

Note:

A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.

For more information, please go to:

http://www.siemens.com/comfort-panels

Ordering data	Article No.	
SIMATIC HMI Comfort Panels		
Key and touch devices		
SIMATIC HMI KTP400 Comfort Key/touch-screen operation; 4" widescreen display	6AV2124-2DC01-0AX0	
Touch devices		
SIMATIC HMI TP700 Comfort Touch-screen operation; 7" widescreen display	6AV2124-0GC01-0AX0	
SIMATIC HMI TP900 Comfort Touch-screen operation; 9" widescreen display	6AV2124-0JC01-0AX0	
SIMATIC HMI TP1200 Comfort Touch-screen operation; 12" widescreen display	6AV2124-0MC01-0AX0	
SIMATIC HMI TP1500 Comfort Touch-screen operation; 15" widescreen display	6AV2124-0QC02-0AX1	
SIMATIC HMI TP1900 Comfort Touch-screen operation; 19" widescreen display	6AV2124-0UC02-0AX1	
SIMATIC HMI TP2200 Comfort Touch-screen operation; 22" widescreen display	6AV2124-0XC02-0AX1	
Key devices		
SIMATIC HMI KP400 Comfort Key operation; 4" widescreen display	6AV2124-1DC01-0AX0	
SIMATIC HMI KP700 Comfort Key operation; 7" widescreen display	6AV2124-1GC01-0AX0	
SIMATIC HMI KP900 Comfort Key operation; 9" widescreen display	6AV2124-1JC01-0AX0	
SIMATIC HMI KP1200 Comfort Key operation; 12" widescreen display	6AV2124-1MC01-0AX0	
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display	6AV2124-1QC02-0AX1	
Accessories	See catalog ST 80 / ST PC or Industry Mall	

SIPLUS Operator control and monitoring

SIPLUS Basic Panels (2nd Generation)

Οv	erv	vie	w



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

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

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

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

Note:

Technical specifications

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

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

Ordering data	Article No.
SIPLUS HMI Basic Panels, Key and Touch	
SIPLUS HMI KTP400 Basic	6AG1123-2DB03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 +60 °C	
SIPLUS HMI KTP700 Basic	6AG1123-2GB03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 +50 °C	
SIPLUS HMI KTP700 Basic DP	6AG1123-2GA03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 +50 °C	
SIPLUS HMI KTP900 Basic	6AG1123-2JB03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 +50 °C	
SIPLUS HMI KTP1200 Basic	6AG1123-2MB03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 +50 °C	
SIPLUS HMI KTP1200 Basic DP	6AG1123-2MA03-2AX0
For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 +50 °C	
Accessories	See catalog ST 80 / ST PC or Industry Mall

Article number	6AG1123-2DB03-2AX0	6AG1123-2GB03-2AX0	6AG1123-2GA03-2AX0
Based on	6AV2123-2DB03-0AX0	6AV2123-2GB03-0AX0	6AV2123-2GA03-0AX0
	SIPLUS HMI KTP400 BASIC	SIPLUS HMI KTP700 BASIC	SIPLUS HMI KTP700 BASIC DP
Ambient conditions			
Suited for indoor use		Yes	Yes
Suited for outdoor use		No	No
Ambient temperature during operation			
 Operation (vertical installation) 			
- For vertical installation, min.	-20 °C; = Tmin	-20 °C	-20 °C; = Tmin
- For vertical installation, max.	60 °C; = Tmax	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	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)
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 when condensatio present), vertical mounting position

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SIPLUS Operator control and monitoring

SIPLUS Basic Panels (2nd Generation)

Article number	6AG1123-2DB03-2AX0	6AG1123-2GB03-2AX0	6AG1123-2GA03-2AX0
Based on	6AV2123-2DB03-0AX0	6AV2123-2GB03-0AX0	6AV2123-2GA03-0AX0
	SIPLUS HMI KTP400 BASIC	SIPLUS HMI KTP700 BASIC	SIPLUS HMI KTP700 BASIC DP
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 a
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
Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0

Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0
Based on	6AV2123-2JB03-0AX0	6AV2123-2MB03-0AX0	6AV2123-2MA03-0AX0
	SIPLUS HMI KTP900 BASIC	SIPLUS HMI KTP1200 BASIC	SIPLUS HMI KTP1200 BASIC DP
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
 Operation (vertical installation) 			
- For vertical installation, min.	-20 °C	-10 °C; = Tmin	-10 °C; = Tmin
- For vertical installation, max.	50 °C	50 °C	50 °C

SIPLUS Operator control and monitoring

SIPLUS Basic Panels (2nd Generation)

Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0	
Based on	6AV2123-2JB03-0AX0 SIPLUS HMI KTP900 BASIC	6AV2123-2MB03-0AX0 SIPLUS HMI KTP1200 BASIC	6AV2123-2MA03-0AX0 SIPLUS HMI KTP1200 BASIC DP	
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	
Ambient air temperature-barometric pressure-altitude	t air temperature-barometric e-altitude Timin 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 in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position	
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	
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. sal 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	Yes; Class 6B2 mold and fungal spore (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. sal 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 o 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-1-46058C, Amendment 7 Qualification and Parformance of 	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possibl 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	

Siemens ST 70 · 2021 4/217

SIMATIC S7-1500 Advanced Controllers

SIPLUS Operator control and monitoring

Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS 485/422

Note:

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

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

Article number	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0		
Based on	6AV6647-0AH11-3AX0	6AV6647-0AA11-3AX0		
	SIPLUS HMI KP300 BASIC MONO PN 3,6"	SIPLUS KTP400 BASIC MONO PN 3,8"		
Ambient conditions				
Suited for indoor use	Yes	Yes		
Suited for outdoor use	No	No		
Ambient temperature during operation				
 Operation (vertical installation) 				
- For vertical installation, min.	-25 °C	-10 °C		
- For vertical installation, max.	60 °C	60 °C		
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)		

Ordering data	Article No.
SIPLUS HMI KP300 Basic mono PN	6AG1647-0AH11-2AX0
For areas with extreme exposure to media (conformal coating); ambient temperature -25 +60 °C	
SIPLUS HMI KTP400 Basic mono PN	6AG1647-0AA11-2AX0
For areas with extreme exposure to media (conformal coating); ambient temperature -10 +60 °C	
Accessories	See catalog ST 80 / ST PC or Industry Mall

SIPLUS Operator control and monitoring

SIPLUS Basic Panels (1st Generation)

Article number	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0
Based on	6AV6647-0AH11-3AX0	6AV6647-0AA11-3AX0
	SIPLUS HMI KP300 BASIC MONO PN 3,6"	SIPLUS KTP400 BASIC MONO PN 3,8"
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)	
 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!	* 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

SIPLUS Operator control and monitoring

SIPLUS Comfort Panels Standard

Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available

- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- · All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

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 HMI Comfort Panels, Keys and Touch	
SIPLUS HMI KTP400 Comfort	6AG1124-2DC01-4AX0
SIPLUS HMI Comfort Panels, Touch	
SIPLUS HMI TP700 Comfort	6AG1124-0GC01-4AX0
SIPLUS HMI TP900 Comfort	6AG1124-0JC01-4AX0
SIPLUS HMI TP1200 Comfort	6AG1124-0MC01-4AX0
SIPLUS HMI TP1500 Comfort	6AG1124-0QC02-4AX1
SIPLUS HMI TP1900 Comfort	6AG1124-0UC02-4AX1
SIPLUS HMI TP2200 Comfort	6AG1124-0XC02-4AX1

	Article No.
SIPLUS HMI Comfort Panels, Keys	
SIPLUS HMI KP400 Comfort	6AG1124-1DC01-4AX0
SIPLUS HMI KP700 Comfort	6AG1124-1GC01-4AX0
SIPLUS HMI KP900 Comfort	6AG1124-1JC01-4AX0
SIPLUS HMI KP1200 Comfort	6AG1124-1MC01-4AX0
SIPLUS HMI KP1500 Comfort	6AG1124-1QC02-4AX1
Accessories	See catalog ST 80 / ST PC or Industry Mall

SIPLUS Operator control and monitoring

SIPLUS Comfort Panels Standard

Article number	6AG1124-2DC01-4AX0	6AG1124-0GC01-4AX0	6AG1124-0JC01-4AX0	6AG1124-0MC01-4AX0
Based on	6AV2124-2DC01-0AX0 SIPLUS HMI KTP400 COMFORT	6AV2124-0GC01-0AX0 SIPLUS HMI TP700 COMFORT	6AV2124-0JC01-0AX0 SIPLUS HMI TP900 COMFORT	6AV2124-0MC01-0AX0 SIPLUS HMI TP1200 COMFORT
Ambient conditions				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
Ambient temperature during operation				
Operation (vertical installation)				
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max. Altitude during operation relating to sea level	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
 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)
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 spore (with the exception of fau 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. san dust, *
Jse on ships/at sea	Vac. Class CD2 mold and	Vest Class CD0 mold and	Yes; Class 6B2 mold and	Vac. Class CD0 mold on
- to biologically active substances according to EN 60721-3-6	fungal spores (excluding	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	fungal spores (excluding	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on red
 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/E (excluding trichlorethyle harmful gas concentration 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 cover must remain in place over the unused interfaces du operation!

SIPLUS Operator control and monitoring

SIPLUS Comfort Panels Standard

Article number Based on	6AG1124-2DC01-4AX0 6AV2124-2DC01-0AX0 SIPLUS HMI KTP400 COMFORT		6AV2124-0GC01-0AX0 6 SIPLUS HMI TP700 S		6AG1124-0JC01-4AX0 6AV2124-0JC01-0AX0 SIPLUS HMI TP900 COMFORT		6AG1124-0MC01-4AX0 6AV2124-0MC01-0AX0 SIPLUS HMI TP1200 COMFORT		
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 prote	ction	Yes; Type 1	protection	Yes;	Type 1 protection	
Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of co possible during service	life	Yes; Discoloration possible during s	ervice life	possible du	oration of coating iring service life	poss	Discoloration of coating ible 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 c Class A	oating, Yes; Confor Class A		ormal coating, Yes; Class		Conformal coating, s A	
Article number	6AG1124-1DC01- 4AX0	6AG1 4AX0	1124-1GC01-	6AG1124-1 4AX0	JC01-	6AG1124-1MC01 4AX0	-	6AG1124-1QC02- 4AX1	
Based on	6AV2124-1DC01- 0AX0		124-1GC01-		JC01-0AX0	6AV2124-1MC01 0AX0	-	6AV2124-1QC02- 0AX1	
	SIPLUS HMI KP400 COMFORT		JS HMI KP700 FORT	SIPLUS HM COMFORT	11 KP900	SIPLUS HMI KP1 COMFORT	200	SIPLUS HMI KP1500 Comfort	
Ambient conditions									
Suited for indoor use	Yes	Yes		Yes		Yes		Yes	
Suited for outdoor use	No	No		No		No		No	
Ambient temperature during operation									
Operation (vertical installation)	0.00 Tasia	0.00	Tracia	0.00 Test	_	0.00 Train		0.00	
 For vertical installation, min. For vertical installation, max. 	0 °C; = Tmin 50 °C; = Tmax		= Tmin	$0 ^{\circ}\text{C}; = \text{Tmin}$		0 °C; = Tmin 50 °C: = Tmax		0 °C 50 °C; (55 °C, see	
- For ventical installation, max.	50°C, = 111ax	50 °C; = Tmax		50 °C; = Tmax		50°C, = max		entry ID: 64847814)	
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	
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (- 1 000 m +2 000 m) //	1 140	Tmax at) hPa 795 hPa)0 m +2 000 m)	Tmin Tma 1 140 hPa (-1 000 m //	. 795 hPa	Tmin Tmax at 1 140 hPa 795 ł (-1 000 m +2 00 //		Tmin Tmax at 1 080 hPa 795 hPa (-1 000 m +2 000 m) //	
	Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m)	at 79	(Tmax - 10 K) 5 hPa 658 hPa 00 m +3 500 m)	Tmin (Tm at 795 hPa (+2 000 m.	658 hPa	Tmin (Tmax - 10 at 795 hPa 658 (+2 000 m +3 5 //	hPa	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)	at 658	(Tmax -20 K) 8 hPa 540 hPa 00 m +5 000 m)	,, Tmin (Tm at 658 hPa (+3 500 m .	540 hÉa	Tmin (Tmax -20 at 658 hPa 540 (+3 500 m +5 0	hÝa	 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)	cond (no c unde	%; RH incl. ensation/frost ommissioning r condensation itions)	100 %; RH condensati (no commis under cond conditions)	on/frost ssioning	100 %; RH incl. condensation/fros (no commissionin under condensat conditions)	ig	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
Resistance									
Coolants and lubricants									
- Resistant to commercially available coolants and lubricants	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 a droplets in the air		Yes; Incl. diesel and oil droplets in the air	
Use in stationary industrial systems		Var		Vac. Olar		Vac. Class ODC		Van Olana ODO mel l	
 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	fungu spore exce Class	Class 3B2 mold, us and dry rot es (with the ption of fauna); s 3B3 on request	Yes; Class fungus and spores (with exception of Class 3B3 of	dry rot n the of fauna); on request	Yes; Class 3B2 m fungus and dry ro spores (with the exception of faun Class 3B3 on req	ot a);	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); *	(RH spray EN 6 (seve	Class 3C4 < 75 %) incl. salt / acc. to 0068-2-52 prity degree 3); *	Yes; Class (RH < 75 % spray acc. EN 60068-2 (severity de) incl. salt to 2-52 egree 3); *	Yes; Class 3C4 (RH < 75 %) incl. spray acc. to EN 60068-2-52 (severity degree 5	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, *		Class 3S4 incl. , dust, *	Yes; Class sand, dust,		Yes; Class 3S4 in sand, dust, *	cl.	Yes; Class 3S4 incl. sand, dust, *	

SIPLUS Operator control and monitoring

SIPLUS Comfort Panels Standard

Article number	6AG1124-1DC01- 4AX0	6AG1124-1GC 4AX0	01-	6AG1124-1JC01- 4AX0	6AG1124-1MC01- 4AX0	6AG1124-1QC02- 4AX1
Based on	4AX0 6AV2124-1DC01- 0AX0	6AV2124-1GC01- 0AX0		6AV2124-1JC01-0AX0		6AV2124-1QC02- 0AX1
	SIPLUS HMI KP400 COMFORT	SIPLUS HMI KP700 COMFORT		SIPLUS HMI KP900 COMFORT	SIPLUS HMI KP1200 COMFORT	SIPLUS HMI KP1500 Comfort
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 %) ind spray acc. to EN 60068-2-52 (severity degre	cl. salt	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 sand, dust; *	incl.	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)
 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!	
Conformal coating						
 Coatings for printed circuit board assemblies acc. to EN 61086 	Yes; Class 2 for high reliability	Yes; Class 2 for reliability	r high	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 pro	otection	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
Article number	6AG1124-0QC02-4AX	1	64G11	24-0UC02-4AX1	6AG1124-0XC	02-4 4 ¥1
Based on				24-0UC02-0AX1	6AV2124-0XC	
Daseu 011				S HMI TP1900 Comfort	SIPLUS HMI T	
Ambient conditions						
Suited for indeer use	Voc		Voc		Vac	

Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
 Operation (vertical installation) 			
- For vertical installation, min.	0° 0	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; (55 °C, see entry ID: 64847814)	45 °C; = Tmax	45 °C; = Tmax

SIPLUS Operator control and monitoring

SIPLUS Comfort Panels Standard

Article number	6AG1124-0QC02-4AX1	6AG1124-0UC02-4AX1	6AG1124-0XC02-4AX1	
Based on	6AV2124-0QC02-0AX1 6AV2124-0UC02-0AX1		6AV2124-0XC02-0AX1	
	SIPLUS HMI TP1500 Comfort	SIPLUS HMI TP1900 Comfort	SIPLUS HMI TP2200 Comfort	
Altitude during operation relating to sea level				
 Installation altitude above sea level, max. 	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)	140 hPa 795 hPa 1 140 hPa 795 hPa 1 1 000 m +2 000 m) // (-1 000 m +2 000 m) // ((-1 000 m +2 000 m) // min (Tmax - 10 K) at Tmin (Tmax - 10 K) at T 95 hPa 658 hPa 795 hPa 658 hPa 7 -2 000 m +3 500 m) // (+2 000 m +3 500 m) // (1 200 m +3 500 m) // min (Tmax -20 K) at Tmin (Tmax -20 K) at T 58 hPa 540 hPa 658 hPa 658 hPa		
Relative humidity				
 With condensation, tested in accordance with IEC 60068-2-38, max. 	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
Resistance				
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			Yes; Class 3B2 mold, fungus and dry	
 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	(with the exception of rot spores (with the exception of		
 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	

Starter Kits

-					
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Overview	Ordering data	Article No.
Everything for a simple way to get started: SIMATIC S7-1500 Starter Kits enable you to configure, mount,	SIMATIC S7-1500 Starter Kit	6ES7511-1CK03-4YB5
wire and use the PLC in quick and easy steps.	Consisting of CPU 1511C-1 PN, SIMATIC Memory Card 4 MB,	
The following starter kits are available:	160 mm DIN rail, front connector, STEP 7 Professional 365-day	
 SIMATIC S7-1500 Starter Kit; Consisting of CPU 1511C-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 	license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	
 documentation SIMATIC S7-1500T Starter Kit; Consisting of CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation 	Consisting of CPU 1511T-1 PN, SIMATIC Memory Card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	

Current anniversary edition 60 years of SIMATIC

In 2018, Siemens celebrated 60 years of SIMATIC. To mark this occasion, every SIMATIC S7-1500 Starter Kit is expanded by TIA Portal options. In addition to STEP 7 Professional, the licenses for the option packages SIMATIC ProDiag S7-1500 for 250 supervisions and SIMATIC OPC UA S7-1500 Small for secure, reliable, manufacturer-and platform-independent communication are included.

Accessories

DIN rail

Overview



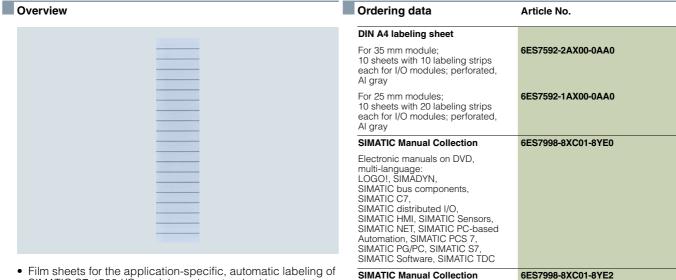
- Aluminum DIN rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated top hat DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used
- Can also be mounted on low or flat top hat DIN rails, e.g. in control cabinets and terminals boxes, using top hat DIN rail adapter

Ordering data	Article No.
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 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 DIN rail 2 000 mm	6ES7590-5AA00-0AA0
20 units	
Top hat DIN rail adapter	6ES7590-6AA00-0AA0
For adapting S7-1500 DIN rails on low or flat top hat 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 packaging unit	
SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PC5 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
Current Manual Collection DVD and the three subsequent updates	

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Accessories

Labeling sheets



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

SIMATIC Manual Collection	6E
update service for 1 year	

Current "Manual Collection" DVD and the three subsequent updates

Accessories

Spare parts

Overview



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

U connector



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

Shielding



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

Accessories

Spare parts

Ordering data	Article No.		Article No.
Universal front door for IM 155-5 PN ST	6ES7528-0AA70-7AA0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
5 front doors; spare part		Electronic manuals on DVD, multi-language:	
Universal front door for I/O modules		LOGO!, ŠIMĂDYN, SIMATIC bus components, SIMATIC C7,	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part • For 35 mm modules • For 25 mm modules	6ES7528-0AA00-7AA0 6ES7528-0AA00-0AA0	SIMATIC distributed I/O, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
U connector	6ES7590-0AA00-0AA0	SIMATIC Manual Collection	6ES7998-8XC01-8YE2
5 units; spare part		update service for 1 year	
Shielding set I/O		Current "Manual Collection" DVD	
Infeed element, shield clamp, and shield terminal; 5 units, spare part • For 35 mm modules • For 25 mm modules	6ES7590-5CA00-0AA0 6ES7590-5CA10-0XA0	and the three subsequent updates	
Shield terminal element	6ES7590-5BA00-0AA0		
10 units; spare part			