

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

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Overview CPU 1511-1 PN



- Entry-level CPU in the S7-1500 Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 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 1513-1 PN



- The CPU for applications with medium requirements for program/data storage in the S7-1500 Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET 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 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 1515-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central 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 speed-controlled 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

Overview CPU 1516-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- Used as central 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:

SIMATIC Memory Card required for operation of the CPU

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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:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1518-4 PN/DP MFP



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU Runtime, there is an additional C/C++ runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central 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 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

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Ordering data	Article No.	Ordering data	Article No.
CPU 1511-1 PN 150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7511-1AK02-0AB0	PE connection element for 2 000 mm DIN rail 20 units	6ES7590-5AA00-0AA0
CPU 1513-1 PN 300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	6ES7513-1AL02-0AB0	System power supply For supplying the backplane bus of the S7-1500 Controller	
CPU 1515-2 PN 500 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC Memory Card required	6ES7515-2AM02-0AB0	24 V DC input voltage, power 25 W	6ES7505-0KA00-0AB0
CPU 1516-3 PN/DP 1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3AN02-0AB0	24/48/60 V DC input voltage, power 60 W	6ES7505-0RA00-0AB0
CPU 1517-3 PN/DP 2 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3AP00-0AB0	24/48/60 V DC input voltage, power 60 W, buffering functionality	6ES7505-0RB00-0AB0
CPU 1518-4 PN/DP 4 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4AP00-0AB0	120/230 V AC input voltage, power 60 W	6ES7507-0RA00-0AB0
CPU 1518-4 PN/DP MFP CPU 1518-4 PN/DP MFP, including C/C++ Runtime and OPC UA Runtime license	6ES7518-4AX00-1AC0	Power plug With coding element for power supply module; spare part, 10 units	6ES7590-8AA00-0AA0
Accessories		Load current supply 24 V DC/3 A 24 V DC/8 A	6EP1332-4BA00 6EP1333-4BA00
SIMATIC Memory Card		Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	6ES7193-4JB00-0AA0
4 MB	6ES7954-8LC03-0AA0	PROFIBUS FastConnect RS485 bus connector with 90° cable outlet With insulation displacement, max. transfer rate 12 Mbps	
12 MB	6ES7954-8LE03-0AA0	Without programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BA70-0XA0
24 MB	6ES7954-8LF03-0AA0	With programming device interface, grounding via control cabinet contact surface; 1 unit	6ES7972-0BB70-0XA0
256 MB	6ES7954-8LL03-0AA0	PROFIBUS FC standard cable GP	6XV1830-0EH10
2 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LP03-0AA0	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	
32 GB, also for CPU 1518-4 PN/DP MFP	6ES7954-8LT03-0AA0	PROFIBUS FC robust cable	6XV1830-0JH10
SIMATIC S7-1500 DIN rail		2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
Fixed lengths, with grounding elements		PROFIBUS FC flexible cable	6XV1831-2K
• 160 mm	6ES7590-1AB60-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• 245 mm	6ES7590-1AC40-0AA0	PROFIBUS FC trailing cable	
• 482 mm	6ES7590-1AE80-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• 530 mm	6ES7590-1AF30-0AA0	Sheath color: Petrol	6XV1830-3EH10
• 830 mm	6ES7590-1AJ30-0AA0	Sheath color: Violet	6XV1831-2L
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		PROFIBUS FC food cable	6XV1830-0GH10
• 2 000 mm	6ES7590-1BC00-0AA0	2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	

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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
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	6XV1830-0LH10	Display For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part
PROFIBUS FastConnect stripping tool Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	Cover 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		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
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	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
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	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 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation
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) <ul style="list-style-type: none"> Windows 10 Professional Version 1909, 2004, 20H2 Windows 10 Enterprise Version 1909, 2004, 20H2 Windows 10 IoT Enterprise 2016 LTSC Windows 10 IoT Enterprise 2019 LTSC Windows Server (64-bit) <ul style="list-style-type: none"> Windows Server 2016 Standard (full installation) Windows Server 2019 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, es, it, ru, jp, kr as download
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	STEP 7 Professional V17, floating license 6ES7822-1AA07-0YA5 STEP 7 Professional V17, floating license, software download including license key ¹⁾ 6ES7822-1AE07-0YA5
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Email address required for delivery
Display module 35 mm For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	6ES7591-1AB00-0AA0	

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

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Ordering data

SIMATIC ODK 1500S

Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive

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⁾
Email address required for delivery

Article No.

6ES7806-2CD03-0YA0

6ES7806-2CD03-0YG0

Article No.

SIMATIC Target for Simulink V5.0

Download incl. license key ¹⁾
Email address required for delivery

Upgrade of SIMATIC Target 1500S for Simulink V2.0...V4.0 to V5.0, download incl. license key ¹⁾
Email address required for delivery

SIMATIC Target + ODK 1500S bundle

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

Technical specifications

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1 PN, 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				
Rated value (DC)	24 V	24 V	24 V	24 V
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

Article number	6ES7511-1AK02-0AB0 CPU 1511-1 PN, 150KB Program, 1MB Data	6ES7513-1AL02-0AB0 CPU 1513-1 PN, 300KB Prog., 1,5MB Data	6ES7515-2AM02-0AB0 CPU 1515-2 PN, 500KB Prog., 3MB Data	6ES7516-3AN02-0AB0 CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
Counters, timers and their retentivity				
S7 counter				
• Number	2 048	2 048	2 048	2 048
IEC counter				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity				
Flag				
• Size, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area				
I/O address area				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes	Yes

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Article number	6ES7511-1AK02-0AB0 CPU 1511-1 PN, 150KB Program, 1MB Data	6ES7513-1AL02-0AB0 CPU 1513-1 PN, 300KB Prog., 1,5MB Data	6ES7515-2AM02-0AB0 CPU 1515-2 PN, 500KB Prog., 3MB Data	6ES7516-3AN02-0AB0 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
- PROFINergy	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	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- IRT	Yes	Yes	Yes	Yes
- PROFINergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface				
Interface types				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No

Technical specifications

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1 PN, 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

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

Technical specifications

Article number	6ES7511-1AK02-0AB0	6ES7513-1AL02-0AB0	6ES7515-2AM02-0AB0	6ES7516-3AN02-0AB0
	CPU 1511-1 PN, 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)	only via 1st interface (X1)	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50	50	50
SIMATIC communication				
• S7 routing	Yes	Yes	Yes	Yes
OPC UA				
• OPC UA Client	Yes	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	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

Technical specifications

Article number	6ES7511-1AK02-0AB0 CPU 1511-1 PN, 150KB Program, 1MB Data	6ES7513-1AL02-0AB0 CPU 1513-1 PN, 300KB Prog., 1,5MB Data	6ES7515-2AM02-0AB0 CPU 1515-2 PN, 500KB Prog., 3MB Data	6ES7516-3AN02-0AB0 CPU 1516-3 PN/DP, 1MB Prog., 5MB Data
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-25 °C; No condensation	-25 °C; No condensation	-25 °C; No condensation	-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	-25 °C; No condensation	-25 °C; No condensation	-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	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				
• 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				
Weight, approx.	405 g	405 g	830 g	845 g

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

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

Technical specifications

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Memory			
Work memory			
• integrated (for program)	2 Mbyte	6 Mbyte	6 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions			
• Integrated (for C/C++ Runtime application)			1 024 Mbyte
• available (for Linux runtime application)			1 Gbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock
1. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes

Technical specifications

Article number	6ES7517-3AP00-0AB0	6ES7518-4AP00-0AB0	6ES7518-4AX00-1AC0
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
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	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	Yes	Yes; Minimum send cycle of 250 µs	Yes; Minimum send cycle of 250 µs
- 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
• Media redundancy	No	No	No

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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, 6 MB Prog., 60MB 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	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- Isochronous mode	No	No	No
- IRT	No	No	No
- 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 devices can be connected via AS-i, PROFIBUS or PROFINET		

Technical specifications

Article number	6ES7517-3AP00-0AB0	6ES7518-4AP00-0AB0	6ES7518-4AX00-1AC0
	CPU 1517-3 PN/DP, 2MB Prog./8MB Data	CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
4. Interface			
Interface types			
<ul style="list-style-type: none"> • RS 485 • Number of ports 		Yes; X4 1	Yes; X4 1
Protocols			
<ul style="list-style-type: none"> • PROFIBUS DP master • PROFIBUS DP slave • SIMATIC communication 		Yes No Yes	Yes No Yes
PROFIBUS DP master			
<ul style="list-style-type: none"> • Number of DP slaves, max. 		125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols			
Number of connections			
<ul style="list-style-type: none"> • 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			
<ul style="list-style-type: none"> - Media redundancy - MRP - MRP interconnection, supported - MRPD - Switchover time on line break, typ. - Number of stations in the ring, max. 	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50
SIMATIC communication			
<ul style="list-style-type: none"> • S7 routing 	Yes	Yes	Yes
OPC UA			
<ul style="list-style-type: none"> • OPC UA Client • OPC UA Server • Alarms and Conditions 	Yes Yes; Data access (read, write, subscribe), method call, custom address space Yes	Yes Yes; Data access (read, write, subscribe), method call, custom address space Yes	Yes Yes; Data access (read, write, subscribe), method call, custom address space 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
<ul style="list-style-type: none"> • Number of available Motion Control resources for technology objects • Required Motion Control resources <ul style="list-style-type: none"> - per speed-controlled axis - per positioning axis - per synchronous axis - per external encoder - per output cam - per cam track - per probe 	10 240 40 80 160 80 20 160 40	15 360 40 80 160 80 20 160 40	15 360 40 80 160 80 20 160 40
Controller			
<ul style="list-style-type: none"> • PID_Compact • PID_3Step • PID-Temp 	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Counting and measuring			
<ul style="list-style-type: none"> • High-speed counter 	Yes	Yes	Yes

SIMATIC S7-1500 Advanced Controllers

Central processing units

Standard CPUs

Technical specifications

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Open Development interfaces			
• Size of ODK SO file, max.			9.8 Mbyte
Dimensions			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	1 978 g	1 988 g	2 117 g