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 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 I/O controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1513F-1 PN

- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- 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:

SIMATIC Memory Card required for operation of the CPU

Overview CPU 1515F-2 PN

- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed 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

Overview CPU 1516F-3 PN/DP

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

Note:

SIMATIC Memory Card required for operation of the CPU

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

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518F-4 PN/DP MFP

- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding standard and fail-safe applications with demanding requirements regarding program scope, performance and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device 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 multi-functional 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 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note

SIMATIC Memory Card required for operation of the CPU.

Fail-safe CPUs

Ordering data	Article No.
CPU 1511F-1 PN Fail-safe CPU, 230 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7511-1FK02-0AB0**
CPU 1513F-1 PN Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	**6ES7513-1FL02-0AB0**
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**
CPU 1516F-3 PN/DP Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7516-3FN02-0AB0**
CPU 1517F-3 PN/DP Fail-safe CPU, 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7517-3FP00-0AB0**
CPU 1518F-4 PN/DP Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6ES7518-4FP00-0AB0**
CPU 1518F-4 PN/DP MFP CPU 1518F-4 PN/DP MFP, including C/C++ Runtime and OPC UA Runtime license	**6ES7518-4FX00-1AC0**

Accessories	Article No.
SIMATIC Memory Card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB, also for CPU 1518F-4 PN/DP MFP	**6ES7954-8LP03-0AA0**
32 GB, also for CPU 1518F-4 PN/DP MFP	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for 2 000 mm DIN rail 20 units	**6ES7590-5AA00-0AA0**
System power supply	
For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power plug With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load current supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**

Ordering data	Article No.
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
With insulation displacement terminals, max. transfer rate 12 Mbps	
Without programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With programming device interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP	**6XV1830-0EH10**
Standard type with special design for quick mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC robust cable	**6XV1830-0JH10**
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC flexible cable	**6XV1831-2K**
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC trailing cable	
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC food cable	**6XV1830-0GH10**
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC ground cable	**6XV1830-3FH10**
2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FC FRNC cable GP	**6XV1830-0LH10**
2-wire, shielded, flame-retardant, with copolymer protective jacket FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
PROFIBUS FastConnect stripping tool	**6GK1905-6AA00**
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**

	Article No.
IE FC TP standard cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP trailing cable 2 x 2 (type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 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	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Display module 35 mm	**6ES7591-1AB00-0AA0**
For 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	
Display module 70 mm	**6ES7591-1BB00-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
Display	**6ES7591-1BA02-0AA0**
For CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP MFP and CPU 1518F-4 PN/DP MFP; spare part	
Cover 35 mm	**6ES7591-4AB00-0AA0**
For CPU 1511-1 PN, CPU 1513-1 PN, CPU 1511F-1 PN, CPU 1513F-1 PN, CPU 1511C-1 PN and CPU 1512C-1 PN; spare part	
Cover 70 mm	**6ES7591-4BB00-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1515F-2 PN and CPU 1516F-3 PN/DP; spare part	
Front cover for PROFIBUS DP interface	**6ES7591-8AA00-0AA0**
For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	

Fail-safe CPUs

Ordering data	Article No.
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	**6ES7511-1CK03-4YB5**
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 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, es, it, ru, jp, kr as download	
STEP 7 Professional V17, floating license	**6ES7822-1AA07-0YA5**
STEP 7 Professional V17, floating license, software download including license key [1]	**6ES7822-1AE07-0YA5**
Email address required for delivery	
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 I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco 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 on USB flash drive	**6ES7833-1FA17-0YA5**
Floating license for 1 user, license key for download[2]; email address required for delivery	**6ES7833-1FA17-0YH5**

Ordering data	Article No.
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
SIMATIC Target for Simulink V5.0	
Download incl. license key [1]	**6ES7823-1BE04-0YA5**
Email address required for delivery	
Upgrade of SIMATIC Target 1500S for Simulink V2.0...V4.0 to V5.0, download incl. license key [1]	**6ES7823-1BE04-0YE5**
Email address required for delivery	
SIMATIC Target + ODK 1500S bundle Download incl. license key [1]	**6ES7823-1BE14-0YA0**
Email address required for delivery	
SIMATIC Manual Collection 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	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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

Technical specifications

Article number	**6ES7511-1FK02-0AB0**	**6ES7513-1FL02-0AB0**	**6ES7515-2FM02-0AB0**	**6ES7516-3FN02-0AB0**
	CPU 1511F-1 PN, 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				
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 6ES7511-1FK01-0AB0	V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2FM01-0AB0	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0
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)	225 kbyte	450 kbyte	750 kbyte	1.5 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
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; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Technical specifications

Article number	**6ES7511-1FK02-0AB0**	**6ES7513-1FL02-0AB0**	**6ES7515-2FM02-0AB0**	**6ES7516-3FN02-0AB0**
	CPU 1511F-1 PN, 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
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 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
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program	Yes; per user program
2. Interface				
Interface types				
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
• Number of ports			1	1
• integrated switch			No	No
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server			Yes	Yes
• Media redundancy			No	No

Technical specifications

Article number	**6ES7511-1FK02-0AB0**	**6ES7513-1FL02-0AB0**	**6ES7515-2FM02-0AB0**	**6ES7516-3FN02-0AB0**
	CPU 1511F-1 PN, 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
- Isochronous mode			No	No
- Direct data exchange			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/ deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device				
Services				
- PG/OP communication			Yes	Yes
- Isochronous mode			No	No
- IRT			No	No
- PROFIenergy			Yes; per user program	Yes; per user program
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- activation/deactivation of I-devices			Yes; per user program	Yes; per user program
- Asset management record			Yes; per user program	Yes; per user program
3. Interface				
Interface types				
• RS 485				Yes; X3
• Number of ports				1
Protocols				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes

Technical specifications

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1 PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB Prog., 1,5MB data	**6ES7515-2FM02-0AB0** CPU 1515F-2 PN, 750KB Prog., 3MB Data	**6ES7516-3FN02-0AB0** 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	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

Technical specifications

Article number	**6ES7511-1FK02-0AB0**	**6ES7513-1FL02-0AB0**	**6ES7515-2FM02-0AB0**	**6ES7516-3FN02-0AB0**
	CPU 1511F-1 PN, 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	-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; 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

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Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
General information			
Product type designation	CPU 1517F-3PN/DP	CPU 1518F-4PN/DP	CPU 1518F-4 PN/DP MFP
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V13 Update 3 (FW V1.6) or higher	V17 (FW V2.9) / V13 (FW V1.5) or higher	V17 (FW V2.9) / V15 (FW V2.5) or higher
Display			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Memory			
Work memory			
• integrated (for program)	3 Mbyte	9 Mbyte	9 Mbyte
• integrated (for data)	8 Mbyte	60 Mbyte	60 Mbyte
• integrated (for CPU function library of CPU Runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions			
• Integrated (for C/C++ Runtime application)			512 Mbyte
• available (for Linux runtime application)			1 Gbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock

Technical specifications

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

Technical specifications

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

Technical specifications

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

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Technical specifications

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Supported technology objects			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240	15 360	15 360
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
Standards, approvals, certificates			
Highest safety class achievable in safety mode			
Probability of failure (for service life of 20 years and repair time of 100 hours)			
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Technical specifications

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