

Distributed Controllers



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7/66	<u>SIPLUS ET 200SP Open Controllers</u>
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Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
PG/OP communication, PROFINET IO,
open IE communication (TCP, ISO-on-TCP and UDP),
web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for
easy connection of the SIMATIC ET 200SP to third-party
devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves
(with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module
6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling
speed-controlled, positioning and synchronized
axes (gearing), support for external encoders,
output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU.
The BusAdapter is not included in scope of supply and is to be
ordered separately.

Ordering data

Article No.

CPU 1510SP-1 PN

200 KB work memory for program,
1 MB for data,
PROFINET IO IRT interface;
SIMATIC Memory Card required

6ES7510-1DK03-0AB0

Accessories

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with
electrical interface for connecting
the ET 200SP CPUs to PROFIBUS
at up to 12 Mbps

6ES7545-5DA00-0AB0

SIMATIC Memory Card

4 MB
12 MB
24 MB
256 MB
2 GB
32 GB

6ES7954-8LC03-0AA0
6ES7954-8LE03-0AA0
6ES7954-8LF03-0AA0
6ES7954-8LL03-0AA0
6ES7954-8LP03-0AA0
6ES7954-8LT03-0AA0

DIN rail, 35 mm

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm
cabinets
- Length: 830 mm for 900 mm
cabinets
- Length 2 m

6ES710-8MA11
6ES710-8MA21
6ES710-8MA31
6ES710-8MA41

PE connection element for 2000 mm DIN rail

6ES7590-5AA00-0AA0

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC for increased oscillation and EMC loads

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4,
light gray, card, for inscription with
laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4,
yellow, card, for inscription with
laser printer

6ES7193-6LA10-0AG0

Ordering data	Article No.		Article No.
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		SIMATIC Manual Collection Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	6ES7998-8XC01-8YE0
IE FC RJ45 plug 90 90° cable outlet 1 unit 10 units 50 units	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0 6GK1901-1BB20-2AE0	SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery	6ES7822-1AA08-0YA5 6ES7822-1AE08-0YA5
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	Spare parts	
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	6ES7193-4JB00-0AA0
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	Cover for BusAdapter interface 5 units	6ES7591-3AA00-0AA0
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Server module	6ES7193-6PA00-0AA0
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under http://www.siemens.com/simatic-docu			

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

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Technical specifications

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7510-1DJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Technical specifications

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• 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
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU.
BusAdapter is not included in scope of delivery and is to be ordered separately.

Ordering data

Article No.

CPU 1512SP-1 PN

400 KB work memory for program,
2 MB for data,
PROFINET IO IRT interface;
SIMATIC Memory Card required

6ES7512-1DM03-0AB0

Accessories

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with
electrical interface for connecting
the ET 200SP CPUs to PROFIBUS
at up to 12 Mbps

6ES7545-5DA00-0AB0

SIMATIC Memory Card

4 MB
12 MB
24 MB
256 MB
2 GB
32 GB

6ES7954-8LC03-0AA0
6ES7954-8LE03-0AA0
6ES7954-8LF03-0AA0
6ES7954-8LL03-0AA0
6ES7954-8LP03-0AA0
6ES7954-8LT03-0AA0

DIN rail, 35 mm

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm cabinets
- Length: 830 mm for 900 mm cabinets
- Length 2 m

6ES710-8MA11
6ES710-8MA21
6ES710-8MA31
6ES710-8MA41

PE connection element for 2000 mm DIN rail

6ES7590-5AA00-0AA0

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC for increased oscillation and EMC loads

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

BusAdapter BA 2xLC

6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45

6ES7193-6AG20-0AA0

BusAdapter BA LC/FC

6ES7193-6AG40-0AA0

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

500 labeling strips on roll, light gray,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4,
light gray, card, for inscription with
laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4,
yellow, card, for inscription with
laser printer

6ES7193-6LA10-0AG0

Ordering data	Article No.	Article No.
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		SIMATIC Manual Collection Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT
IE FC RJ45 plug 90 90° cable outlet 1 unit 10 units 50 units	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0 6GK1901-1BB20-2AE0	6ES7998-8XC01-8YE0
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	6ES7998-8XC01-8YE2
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	6ES7822-1AA08-0YA5
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	6ES7822-1AE08-0YA5
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Spare parts
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files under http://www.siemens.com/simatic-docu .		Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units
		Cover for BusAdapter interface 5 units
		Server module
		6ES7193-6PA00-0AA0

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

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Technical specifications

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
General information	
Product type designation	CPU 1512SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7512-1DK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	400 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Technical specifications

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• 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
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Overview



- CPU 1514SP-2 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device, for example.
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of delivery and is to be ordered separately.

Ordering data

Article No.

CPU 1514SP-2 PN

600 KB work memory for program, 3.5 MB for data, PROFINET IO IRT interface, PROFINET RT interface, SIMATIC Memory Card required

6ES7514-2DN03-0AB0

Accessories

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

SIMATIC Memory Card

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0

DIN rail, 35 mm

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm cabinets
- Length: 830 mm for 900 mm cabinets
- Length 2 m

6ES5710-8MA11

6ES5710-8MA21

6ES5710-8MA31

6ES5710-8MA41

PE connection element for 2000 mm DIN rail

6ES7590-5AA00-0AA0

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC for increased oscillation and EMC loads

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

BusAdapter BA 2xLC

6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45

6ES7193-6AG20-0AA0

BusAdapter BA LC/FC

6ES7193-6AG40-0AA0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

Ordering data	Article No.		Article No.
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		SIMATIC Manual Collection Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	6ES7998-8XC01-8YE0
IE FC RJ45 plug 90 90° cable outlet 1 unit 10 units 50 units	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0 6GK1901-1BB20-2AE0	SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates	6ES7998-8XC01-8YE2
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery	6ES7822-1AA08-0YA5 6ES7822-1AE08-0YA5
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	Spare parts	
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	6ES7193-4JB00-0AA0
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	Cover for BusAdapter interface 5 units	6ES7591-3AA00-0AA0
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Server module	6ES7193-6PA00-0AA0
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files under http://www.siemens.com/simatic-docu .			

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

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
General information	
Product type designation	CPU 1514SP-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0)
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Overview



- SIPLUS CPU 1510SP-1 PN for SIPLUS ET 200SP based on SIPLUS-S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
PG/OP communication, PROFINET IO,
open IE communication (TCP, ISO-on-TCP and UDP),
web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves
(with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave
(with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling
speed-controlled and positioning axes, support for
external encoders

Note:

SIMATIC Memory Card required for operation of the CPU.
The BusAdapter is not included in the scope of supply and is to
be ordered separately.
No BusAdapter can be inserted with the variant for the
temperature range -40...+70 °C.

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

Ordering data

Article No.

SIPLUS CPU 1510SP-1 PN

(Extended temperature range and
exposure to environmental
substances)

Work memory 100 KB for program,
750 KB for data,
PROFINET IO IRT interface;
SIMATIC Memory Card required

Temperature range -40 ... +60 °C

6AG1510-1DJ01-2AB0

Temperature range -40 ... +70 °C;
No BusAdapter can be inserted

6AG1510-1DJ01-7AB0**Accessories****BusAdapter BA 2xRJ45****6AG1193-6AR00-7AA0**

(Extended temperature range and
exposure to environmental
substances)

**BusAdapter BA 2xFC for
increased vibration and
EMC loads****6AG1193-6AF00-7AA0**

(Extended temperature range and
exposure to environmental
substances)

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

(Extended temperature range and
exposure to environmental
substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0**SIPLUS Mounting Kit ET 200SP****6AG1193-6AA00-0AA0**

Mounting accessories for use with
increased mechanical vibration and
shock loads.

Not approved for SIPLUS CPU
6AG1510-1DJ01-7AB0 and
BusAdapter BA 2xRJ45

Other accessories

See SIMATIC ET 200SP
CPU 1510SP-1 PN, page 7/2

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1510SP-1 PN

Technical specifications

Article number	6AG1510-1DJ01-2AB0	6AG1510-1DJ01-7AB0
Based on	6ES7510-1DJ01-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6ES7510-1DJ01-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
Ambient conditions		
Ambient temperature during operation		
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -25 °C; = Tmin 50 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax
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
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	No
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles		
- Against mechanical environmental conditions acc. to EN 60721-3-5 - against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
- Coatings for printed circuit board assemblies acc. to EN 61086 - Protection against fouling acc. to EN 60664-3 - Military testing according to MIL-I-46058C, Amendment 7 - Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Overview



- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with medium requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately. No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

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

Ordering data

Article No.

SIPLUS CPU 1512SP-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 200 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

6AG1512-1DK01-2AB0

Temperature range -40 ... +70 °C; No BusAdapter can be inserted

6AG1512-1DK01-7AB0**Accessories****BusAdapter BA 2xRJ45**

(Extended temperature range and exposure to environmental substances)

6AG1193-6AR00-7AA0**BusAdapter BA 2xFC for increased vibration and EMC loads**

(Extended temperature range and exposure to environmental substances)

6AG1193-6AF00-7AA0**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

6AG1901-1BB10-7AA0**SIPLUS Mounting Kit ET 200SP**

Mounting accessories for use with increased mechanical vibration and shock loads.

Not approved for SIPLUS CPU 6AG1512-1DK01-7AB0 and BusAdapter BA 2xRJ45

6AG1193-6AA00-0AA0**Other accessories**

See SIMATIC ET 200SP, CPU 1512SP-1 PN, page 7/6

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1512SP-1 PN

Technical specifications

Article number	6AG1512-1DK01-2AB0	6AG1512-1DK01-7AB0
Based on	6ES7512-1DK01-0AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6ES7512-1DK01-0AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
Ambient conditions		
Ambient temperature during operation		
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax
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
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	No
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles		
- Against mechanical environmental conditions acc. to EN 60721-3-5 - against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
- Coatings for printed circuit board assemblies acc. to EN 61086 - Protection against fouling acc. to EN 60664-3 - Military testing according to MIL-I-46058C, Amendment 7 - Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Overview



- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFINET in centralized and distributed configuration
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1510SP F-1 PN

300 KB work memory for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

6ES7510-1SK03-0AB0**Accessories****CM DP for ET 200SP CPU**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0**SIMATIC Memory Card**

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0**DIN rail, 35 mm**

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm cabinets
- Length: 830 mm for 900 mm cabinets
- Length 2 m

6ES710-8MA11**6ES710-8MA21****6ES710-8MA31****6ES710-8MA41****PE connection element for 2000 mm DIN rail****6ES7590-5AA00-0AA0****BusAdapter BA 2xRJ45****6ES7193-6AR00-0AA0****BusAdapter BA 2xFC for increased oscillation and EMC loads****6ES7193-6AF00-0AA0****BusAdapter BA 2xSCRJ****6ES7193-6AP00-0AA0****BusAdapter BA SCRJ/RJ45****6ES7193-6AP20-0AA0****BusAdapter BA SCRJ/FC****6ES7193-6AP40-0AA0****Equipment labeling plate****6ES7193-6LF30-0AW0**

10 sheets of 16 labels

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0**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 90

90° cable outlet

1 unit

6GK1901-1BB20-2AA0

10 units

6GK1901-1BB20-2AB0

50 units

6GK1901-1BB20-2AE0

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1510SP F-1 PN

Ordering data

Article No.

IE FC RJ45 plug 180

180° cable outlet

1 unit

10 units

50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC TP standard cable GP 2x2

6XV1840-2AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP trailing cable 2 x 2 (type C)

6XV1840-3AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP marine cable 2 x 2 (type B)

6XV1840-4AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC stripping tool

6GK1901-1GA00

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

Manuals for ET 200SP distributed I/O system

ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals

Manuals are available as PDF files on the Internet under <http://www.siemens.com/simatic-docu>.

SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT

SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and the three subsequent updates

Article No.

STEP 7 Professional V18

Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

Windows 10 (64-bit)

- Windows 10 Professional Version 21H1, 21H2
- Windows 10 Enterprise Version 21H1, 21H2
- Windows 10 Enterprise LTSB 2016
- Windows 10 Enterprise LTSB 2019
- Windows 10 Enterprise LTSB 2021

Windows 11 (64-bit)

- Windows 11 Professional 21H2
- Windows 11 Enterprise 21H2

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)
- Windows Server 2022 Standard (full installation)

Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18, floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18, floating license, software download including license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

STEP 7 Safety Advanced V18

Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

Requirement:

STEP 7 Professional V18

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA18-0YA5

Floating license for 1 user; license key for download¹⁾; Email address required for delivery

6ES7833-1FA18-0YH5

Spare parts

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals; 10 units

Cover for BusAdapter interface

6ES7591-3AA00-0AA0

5 units

Server module

6ES7193-6PA00-0AA0

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

Technical specifications

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7510-1SJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1510SP F-1 PN

Technical specifications

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• 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
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB 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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Overview



- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFINET in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1512SP F-1 PN

600 KB work memory for program,
2 MB for data,
PROFINET IO IRT interface,
SIMATIC Memory Card required

6ES7512-1SM03-0AB0**Accessories****CM DP for ET 200SP CPU**

PROFIBUS DP master/slave with
electrical interface for connecting
the ET 200SP CPUs to PROFIBUS
at up to 12 Mbps

6ES7545-5DA00-0AB0**SIMATIC Memory Card**

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0**DIN rail, 35 mm**

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm cabinets
- Length: 830 mm for 900 mm cabinets
- Length 2 m

6ES710-8MA11**6ES710-8MA21****6ES710-8MA31****6ES710-8MA41****PE connection element for 2000 mm DIN rail****6ES7590-5AA00-0AA0****BusAdapter BA 2xRJ45****6ES7193-6AR00-0AA0****BusAdapter BA 2xFC for increased oscillation and EMC loads****6ES7193-6AF00-0AA0****BusAdapter BA 2xSCRJ****6ES7193-6AP00-0AA0****BusAdapter BA SCRJ/RJ45****6ES7193-6AP20-0AA0****BusAdapter BA SCRJ/FC****6ES7193-6AP40-0AA0****Equipment labeling plate****6ES7193-6LF30-0AW0**

10 sheets of 16 labels

Labeling strips

500 labeling strips on roll, light gray,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4,
light gray, card, for inscription with
laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4,
yellow, card, for inscription with
laser printer

6ES7193-6LA10-0AG0**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 90

90° cable outlet

1 unit

6GK1901-1BB20-2AA0

10 units

6GK1901-1BB20-2AB0

50 units

6GK1901-1BB20-2AE0

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Ordering data

Article No.

IE FC RJ45 plug 180

180° cable outlet

1 unit

10 units

50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC TP standard cable GP 2x2

6XV1840-2AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP trailing cable 2 x 2 (type C)

6XV1840-3AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP marine cable 2 x 2 (type B)

6XV1840-4AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC stripping tool

6GK1901-1GA00

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

Manuals for ET 200SP distributed I/O system

ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals

Manuals are available as PDF files on the Internet under <http://www.siemens.com/simatic-docu>.

SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT

SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and the three subsequent updates

Article No.

STEP 7 Professional V18

Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

Windows 10 (64-bit)

- Windows 10 Professional Version 21H1, 21H2
- Windows 10 Enterprise Version 21H1, 21H2
- Windows 10 Enterprise LTSB 2016
- Windows 10 Enterprise LTSB 2019
- Windows 10 Enterprise LTSB 2021

Windows 11 (64-bit)

- Windows 11 Professional 21H2
- Windows 11 Enterprise 21H2

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)
- Windows Server 2022 Standard (full installation)

Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18, floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18, floating license, software download including license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

STEP 7 Safety Advanced V18

Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

Requirement:

STEP 7 Professional V18

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA18-0YA5

Floating license for 1 user; license key for download¹⁾; Email address required for delivery

6ES7833-1FA18-0YH5

Spare parts

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals; 10 units

Cover for BusAdapter interface

6ES7591-3AA00-0AA0

5 units

Server module

6ES7193-6PA00-0AA0

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

Technical specifications

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog./2MB Data
General information	
Product type designation	CPU 1512SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7 512-1SK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog./2MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Technical specifications

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog./2MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• 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
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog./2MB 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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Overview

- CPU 1514SP F21 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515F-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device, for example.
- Supports PROFI-safe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1514SP F-2 PN

900 KB work memory for program,
3.5 MB for data,
PROFINET IO IRT interface,
PROFINET RT interface,
SIMATIC Memory Card required

6ES7514-2SN03-0AB0

Accessories

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with
electrical interface for connecting
the ET 200SP CPUs to PROFIBUS
at up to 12 Mbps

6ES7545-5DA00-0AB0

SIMATIC Memory Card

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0

DIN rail, 35 mm

- Length: 483 mm for 19" cabinets
- Length: 530 mm for 600 mm cabinets
- Length: 830 mm for 900 mm cabinets
- Length 2 m

6ES5710-8MA11

6ES5710-8MA21

6ES5710-8MA31

6ES5710-8MA41

PE connection element for
2000 mm DIN rail

6ES7590-5AA00-0AA0

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC for
increased oscillation and
EMC loads

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow,
for inscription with thermal transfer
roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4,
light gray, card, for inscription with
laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4,
yellow, card, for inscription with
laser printer

6ES7193-6LA10-0AG0

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 90

90° cable outlet

1 unit

6GK1901-1BB20-2AA0

10 units

6GK1901-1BB20-2AB0

50 units

6GK1901-1BB20-2AE0

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Ordering data

Article No.

IE FC RJ45 plug 180

180° cable outlet

1 unit

10 units

50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC TP standard cable GP 2x2

6XV1840-2AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP trailing cable 2 x 2 (type C)

6XV1840-3AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP marine cable 2 x 2 (type B)

6XV1840-4AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC stripping tool

6GK1901-1GA00

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

Manuals for ET 200SP distributed I/O system

ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals

Manuals are available as PDF files on the Internet under <http://www.siemens.com/simatic-docu>.

SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT

SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and the three subsequent updates

Article No.

STEP 7 Professional V18

Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

Windows 10 (64-bit)

- Windows 10 Professional Version 21H1, 21H2
- Windows 10 Enterprise Version 21H1, 21H2
- Windows 10 Enterprise LTSB 2016
- Windows 10 Enterprise LTSB 2019
- Windows 10 Enterprise LTSB 2021

Windows 11 (64-bit)

- Windows 11 Professional 21H2
- Windows 11 Enterprise 21H2

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)
- Windows Server 2022 Standard (full installation)

Type of delivery:

9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18, floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18, floating license, software download including license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

STEP 7 Safety Advanced V18

Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

Requirement:

STEP 7 Professional V18

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA18-0YA5

Floating license for 1 user; license key for download¹⁾; Email address required for delivery

6ES7833-1FA18-0YH5

Spare parts

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals; 10 units

Cover for BusAdapter interface

6ES7591-3AA00-0AA0

5 units

Server module

6ES7193-6PA00-0AA0

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

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
General information	
Product type designation	CPU 1514SP F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0)
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
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
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KbProg.3,5MbData
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1510SP F-1 PN

Overview



- SIPLUS CPU 1510SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

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

Ordering data

Article No.

SIPLUS CPU 1510SP F-1 PN

6AG1510-1SJ01-2AB0

(Extended temperature range and exposure to environmental substances)

Work memory 150 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Accessories

SIPLUS BusAdapter BA 2xRJ45

6AG1193-6AR00-7AA0

SIPLUS BusAdapter BA 2xFC

6AG1193-6AF00-7AA0

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

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

SIPLUS Mounting Kit ET 200SP

6AG1193-6AA00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

Other accessories

See SIMATIC ET 200SP, CPU 1510 F-1 PN, page 7/19

Technical specifications

Article number	6AG1510-1SJ01-2AB0
Based on	6ES7510-1SJ01-0AB0 SIPLUS ET 200SP CPU 1510SP F-1PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
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
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1510-1SJ01-2AB0
Based on	6ES7510-1SJ01-0AB0 SIPLUS ET 200SP CPU 1510SP F-1PN
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1512SP F-1 PN

Overview



- SIPLUS CPU 1512SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFI-safe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

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

Ordering data

Article No.

SIPLUS CPU 1512SP F-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

Temperature range -25...+60 °C

Temperature range -40...+70 °C; No BusAdapter can be inserted

6AG1512-1SK01-2AB0

6AG1512-1SK01-7AB0

Accessories

SIPLUS BusAdapter BA 2xRJ45

6AG1193-6AR00-7AA0

SIPLUS BusAdapter BA 2xFC

6AG1193-6AF00-7AA0

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

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

SIPLUS Mounting Kit ET 200SP

6AG1193-6AA00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter 2xBA RJ45

Other accessories

See SIMATIC ET 200SP, CPU 1512 F-1 PN, page 7/23

Technical specifications

Article number	6AG1512-1SK01-2AB0	6AG1512-1SK01-7AB0
Based on	6ES7512-1SK01-0AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN	6ES7512-1SK01-0AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN
Ambient conditions		
Ambient temperature during operation		
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-25 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -25 °C; = Tmin 50 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax
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
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	No
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles		
- Against mechanical environmental conditions acc. to EN 60721-3-5 - against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
- Coatings for printed circuit board assemblies acc. to EN 61086 - Protection against fouling acc. to EN 60664-3 - Military testing according to MIL-I-46058C, Amendment 7 - Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Overview



- The CPU for applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
 - OPC UA Data Access
 - OPC UA Security
 - OPC UA Methods Call
 - Support of OPC UA Companion specifications
 - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1514SP T-2 PN

900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required

6ES7514-2VN03-0AB0

Accessories

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

SIMATIC Memory Card

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0

DIN rail, 35 mm

• Length: 483 mm for 19" cabinets

6ES5710-8MA11

• Length: 483 mm for 600 mm cabinets

6ES5710-8MA21

• Length: 830 mm for 900 mm cabinets

6ES5710-8MA31

• Length 2 m

6ES5710-8MA41

PE connection element for 2000 mm DIN rail

6ES7590-5AA00-0AA0

20 units

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC for increased oscillation and EMC loads

6ES7193-6AF00-0AA0

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer

6ES7193-6LA10-0AG0

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 90

90° cable outlet

6GK1901-1BB20-2AA0

1 unit

6GK1901-1BB20-2AB0

10 units

6GK1901-1BB20-2AB0

50 units

6GK1901-1BB20-2AE0

Ordering data	Article No.	Article No.
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	
		STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) - Windows 10 Professional Version 21H1, 21H2 - Windows 10 Enterprise Version 21H1, 21H2 - Windows 10 Enterprise LTSB 2016 - Windows 10 Enterprise LTSB 2019 - Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) - Windows 11 Professional 21H2 - Windows 11 Enterprise 21H2 Windows Server (64-bit) - Windows Server 2016 Standard (full installation) - Windows Server 2019 Standard (full installation) - Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery
		6ES7822-1AA08-0YA5 6ES7822-1AE08-0YA5
		SIMATIC Manual Collection Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT
		6ES7998-8XC01-8YE0
		SIMATIC Manual Collection update service for 1 year Current Manual Collection DVD and the three subsequent updates
		6ES7998-8XC01-8YE2
		Spare parts
		Power supply connector Spare part; for connecting the 24 V DC supply voltage With push-in terminals; 10 units
		6ES7193-4JB00-0AA0
		Cover for BusAdapter interface 5 units
		6ES7591-3AA00-0AA0
		Server module
		6ES7193-6PA00-0AA0

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

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
General information	
Product type designation	CPU 1514SP T-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0)
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
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
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Overview



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
 - OPC UA Data Access
 - OPC UA Security
 - OPC UA Methods Call
 - Support of OPC UA Companion specifications
 - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1514SP TF-2 PN**6ES7514-2WN03-0AB0**

900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required

Accessories**CM DP for ET 200SP CPU****6ES7545-5DA00-0AB0**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

SIMATIC Memory Card

4 MB

6ES7954-8LC03-0AA0

12 MB

6ES7954-8LE03-0AA0

24 MB

6ES7954-8LF03-0AA0

256 MB

6ES7954-8LL03-0AA0

2 GB

6ES7954-8LP03-0AA0

32 GB

6ES7954-8LT03-0AA0**DIN rail, 35 mm**

- Length: 483 mm for 19" cabinets

6ES5710-8MA11

- Length: 483 mm for 600 mm cabinets

6ES5710-8MA21

- Length: 830 mm for 900 mm cabinets

6ES5710-8MA31

- Length 2 m

6ES5710-8MA41**PE connection element for 2000 mm DIN rail****6ES7590-5AA00-0AA0**

20 units

BusAdapter BA 2xRJ45**6ES7193-6AR00-0AA0****BusAdapter BA 2xFC for increased oscillation and EMC loads****6ES7193-6AF00-0AA0****Equipment labeling plate****6ES7193-6LF30-0AW0**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer

6ES7193-6LA10-0AG0**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 90

90° cable outlet

1 unit

6GK1901-1BB20-2AA0

10 units

6GK1901-1BB20-2AB0

50 units

6GK1901-1BB20-2AE0

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Ordering data

Article No.

Article No.

IE FC RJ45 plug 180

180° cable outlet

1 unit

10 units

50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC TP standard cable GP 2x2

6XV1840-2AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP trailing cable 2 x 2 (type C)

6XV1840-3AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC TP marine cable 2 x 2 (type B)

6XV1840-4AH10

4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

IE FC stripping tool

6GK1901-1GA00

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

STEP 7 Professional V18

Target system:
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
 - Windows 10 Professional Version 21H1, 21H2
 - Windows 10 Enterprise Version 21H1, 21H2
 - Windows 10 Enterprise LTSB 2016
 - Windows 10 Enterprise LTSB 2019
 - Windows 10 Enterprise LTSB 2021

Windows 11 (64-bit)

- Windows 11 Professional 21H2
- Windows 11 Enterprise 21H2

Windows Server (64-bit)

- Windows Server 2016 Standard (full installation)
- Windows Server 2019 Standard (full installation)
- Windows Server 2022 Standard (full installation)

Type of delivery:
9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18, floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18, floating license, software download including license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

STEP 7 Safety Advanced V18

Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

Requirement

STEP 7 Professional V18

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user; license key on USB flash drive

6ES7833-1FA18-0YA5

Floating license for 1 user, license key for download¹⁾; Email address required for delivery

6ES7833-1FA18-0YH5

SIMATIC Manual Collection

6ES7998-8XC01-8YE0

Electronic manuals on DVD, multilingual: all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering software, runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT

SIMATIC Manual Collection update service for 1 year

6ES7998-8XC01-8YE2

Current Manual Collection DVD and the three subsequent updates

Spare parts

Power supply connector

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals; 10 units

6ES7193-4JB00-0AA0

Cover for BusAdapter interface

6ES7591-3AA00-0AA0

5 units

Server module

6ES7193-6PA00-0AA0

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

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
General information	
Product type designation	CPU 1514SP TF-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V18 (FW V3.0)
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
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
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Overview



- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller Standard and optional preinstalled WinCC Runtime Advanced
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2 x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2

Type of delivery:

German, English, Chinese, Italian, French, Spanish

Industrial OS and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 (8 GB RAM)

6ES7677-2DB43-0GB0

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 (48 GB RAM)

6ES7677-2DB42-0GB0

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 + HMI 128PT
- CPU 1515SP PC2 + HMI 512PT
- CPU 1515SP PC2 + HMI 2048PT

6ES7677-2DB42-0GK0

6ES7677-2DB42-0GL0

6ES7677-2DB42-0GM0

Accessories

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BusAdapter BA 2XLC

6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45

6ES7193-6AG20-0AA0

BusAdapter BA LC/FC

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

Distributed Controllers

based on ET 200SP
ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Ordering data	Article No.	Article No.
STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery	6ES7822-1AA08-0YA5 6ES7822-1AE08-0YA5	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 WinCC Advanced V18 Engineering software in the TIA Portal; in 6 languages: de, en, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime • Floating license; software and documentation on DVD; license key on USB flash drive • Floating license; software, documentation and license key for download ¹⁾ ; Email address required for delivery
		6ES7806-2CD03-0YA0 6ES7806-2CD03-0YG0 6AV2102-0AA08-0AA5 6AV2102-0AA08-0AH5

¹⁾ Up-to-date information and download availability can be found under
<https://www.siemens.com/tia-online-software-delivery>.

Technical specifications

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2	6ES7677-2DB43-0GB0 CPU1515SP PC2
General information		
Product type designation	CPU 1515SP PC2	CPU 1515SP PC2
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V17
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP	S7-1500 Software Controller CPU 1505SP
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Memory		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	1 Mbyte	1 Mbyte
• integrated (for data)	5 Mbyte	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
CPU processing times		
for bit operations, typ.	10 ns	10 ns
for word operations, typ.	12 ns	12 ns
for fixed point arithmetic, typ.	16 ns	16 ns
for floating point arithmetic, typ.	64 ns	64 ns

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2	6ES7677-2DB43-0GB0 CPU1515SP PC2
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DisplayPort	1x DisplayPort
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Number of connections	88	88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
PROFINET IO Controller		
Services		
- Isochronous mode	Yes	Yes
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFIenergy	Yes	Yes

Technical specifications

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2	6ES7677-2DB43-0GB0 CPU1515SP PC2
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE)	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE)
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- 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
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device Services		
- Isochronous mode	No	No
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• Number of DP slaves, max.	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2	6ES7677-2DB43-0GB0 CPU1515SP PC2
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
Media redundancy		
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Switchover time on line break, typ.	200 ms	200 ms
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; From SW CPU 1505SP V2.6	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects		
Motion Control	Yes	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	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40; per axis	40; per axis
- per positioning axis	80; per axis	80; per axis
- per synchronous axis	160; per axis	160; per axis
- per external encoder	80; per external encoder	80; per external encoder
- per output cam	20; per cam	20; per cam
- per cam track	160; per cam track	160; per cam track
- per probe	40; per probe	40; per probe
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules	
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI	SIMATIC Industrial OS
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes

Technical specifications

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2	6ES7677-2DB43-0GB0 CPU1515SP PC2
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Open Development interfaces		
• Size of ODK SO file, max.	5.8 Mbyte	5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

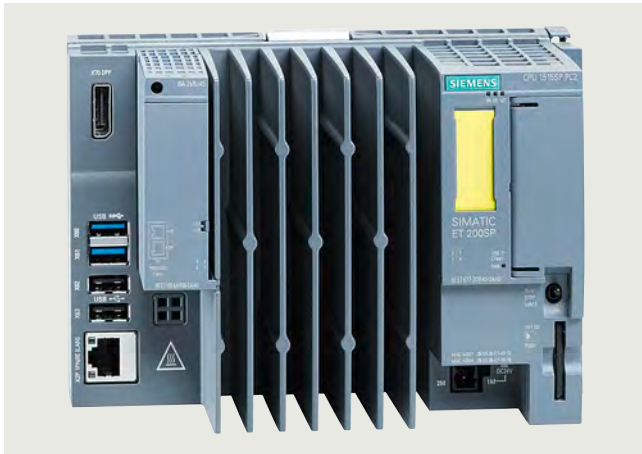
Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Overview



- Turnkey all-in-one solution with preinstalled fail-safe SIMATIC S7-1500 Software Controller and optional preinstalled WinCC Runtime Advanced
- Fail-safe versions make it possible to control machines or plants in a fail-safe environment. This makes it possible to address applications which require an SIL3 (Safety Integrity Level) safety class according to IEC 61508 2nd Edition or a PL e (Performance Level) according to ISO 13849.
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 F (+ HMI)

Type of delivery:

German, English, Chinese, Italian, French, Spanish

Industrial OS and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card

- CPU 1515SP PC2 F (8 GB RAM)

6ES7677-2SB43-0GB0

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card

- CPU 1515SP PC2 F (8 GB RAM)

6ES7677-2SB42-0GB0

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card

- CPU 1515SP PC2 F + HMI 128PT (8 GB RAM)

6ES7677-2SB42-0GK0

- CPU 1515SP PC2 F + HMI 512PT (8 GB RAM)

6ES7677-2SB42-0GL0

- CPU 1515SP PC2 F + HMI 2048PT (8 GB RAM)

6ES7677-2SB42-0GM0

Accessories

BusAdapter BA 2xRJ45

6ES7193-6AR00-0AA0

BusAdapter BA 2xFC

6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ

6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45

6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BusAdapter BA 2XLC

6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45

6ES7193-6AG20-0AA0

BusAdapter BA LC/FC

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

Ordering data	Article No.	Article No.
STEP 7 Professional V18 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) • Windows 10 Professional Version 21H1, 21H2 • Windows 10 Enterprise Version 21H1, 21H2 • Windows 10 Enterprise LTSB 2016 • Windows 10 Enterprise LTSB 2019 • Windows 10 Enterprise LTSB 2021 Windows 11 (64-bit) • Windows 11 Professional 21H2 • Windows 11 Enterprise 21H2 Windows Server (64-bit) • Windows Server 2016 Standard (full installation) • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: de, en, zh included, fr, sp, it, ru, jp, kr as download STEP 7 Professional V18, floating license STEP 7 Professional V18, floating license, software download including license key ¹⁾ Email address required for delivery	6ES7822-1AA08-0YA5 6ES7822-1AE08-0YA5	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 WinCC Advanced V18 Engineering software in the TIA Portal; in 6 languages: de, en, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime • Floating license; software and documentation on DVD; license key on USB flash drive • Floating license; software, documentation and license key for download ¹⁾ ; Email address required for delivery
		6ES7806-2CD03-0YA0 6ES7806-2CD03-0YG0 6AV2102-0AA08-0AA5 6AV2102-0AA08-0AH5

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

Technical specifications

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F	6ES7677-2SB43-0GB0 CPU1515SP PC2 F
General information		
Product type designation	CPU 1515SP PC2 F	CPU 1515SP PC2
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V17
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP F	S7-1500 Software Controller CPU 1505SP
Supply voltage		
Rated value (DC)		24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Memory		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFlash memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	1.5 Mbyte	1 Mbyte
• integrated (for data)	5 Mbyte	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
CPU processing times		
for bit operations, typ.	10 ns	10 ns
for word operations, typ.	12 ns	12 ns
for fixed point arithmetic, typ.	16 ns	16 ns
for floating point arithmetic, typ.	64 ns	64 ns

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F	6ES7677-2SB43-0GB0 CPU1515SP PC2 F
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DisplayPort	1x DisplayPort
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Number of connections	88	88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
PROFINET IO Controller		
Services		
- Isochronous mode	Yes	Yes
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFIenergy		Yes

Technical specifications

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F	6ES7677-2SB43-0GB0 CPU1515SP PC2 F
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE)
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- 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
Address area		
- Inputs, max.		8 kbyte
- Outputs, max.		8 kbyte
PROFINET IO Device Services		
- Isochronous mode	No	No
- shortest clock pulse		500 µs
- IRT	Yes	Yes
- PROFIenergy		Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record		Yes
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• Number of DP slaves, max.	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Address area		
- Inputs, max.		8 kbyte
- Outputs, max.		8 kbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F	6ES7677-2SB43-0GB0 CPU1515SP PC2 F
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
Media redundancy		
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Switchover time on line break, typ.	200 ms	200 ms
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects		
Motion Control	Yes	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	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40; per axis	40; per axis
- per positioning axis	80; per axis	80; per axis
- per synchronous axis	160; per axis	160; per axis
- per external encoder	80; per external encoder	80; per external encoder
- per output cam	20; per cam	20; per cam
- per cam track	160; per cam track	160; per cam track
- per probe	40; per probe	40; per probe
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h	< 1.00E-09
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load	
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x100 mA USB load	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load

Technical specifications

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F	6ES7677-2SB43-0GB0 CPU1515SP PC2 F
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI	SIMATIC Industrial OS
Configuration		
Programming		
Programming language		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Open Development interfaces		
• Size of ODK SO file, max.	3.8 Mbyte	5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Overview



ET 200SP Open Controller CPU 1515SP PC2 T combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller T and optional preinstalled WinCC Runtime Advanced
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 T

ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

Type of delivery:
German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2 T

With pre-installed WinCC RT Advanced

- CPU 1515SP PC2 T + HMI 128PT
- CPU 1515SP PC2 T + HMI 512PT
- CPU 1515SP PC2 T + HMI 2048PT

Accessories

BusAdapter BA 2xRJ45 6ES7193-6AR00-0AA0

BusAdapter BA 2xFC 6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ 6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45 6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BusAdapter BA 2XLC 6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45 6ES7193-6AG20-0AA0

BusAdapter BA LC/FC 6ES7193-6AG40-0AA0

6ES7677-2VB42-0GB0

6ES7677-2VB42-0GK0

6ES7677-2VB42-0GL0

6ES7677-2VB42-0GM0

Article No.

CM DP for ET 200SP CPU

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

Server module

Spare part

6ES7193-6PA00-0AA0

Power supply connector

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

6ES7193-4JB00-0AA0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

Ordering data

Article No.

STEP 7 Professional V18

Target system:
SIMATIC S7-1200, S7-1500,
S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional Version 21H1, 21H2
 - Windows 10 Enterprise Version 21H1, 21H2
 - Windows 10 Enterprise LTSB 2016
 - Windows 10 Enterprise LTSB 2019
 - Windows 10 Enterprise LTSB 2021

- Windows 11 (64-bit)
- Windows 11 Professional 21H2
 - Windows 11 Enterprise 21H2

- Windows Server (64-bit)
- Windows Server 2016 Standard (full installation)
 - Windows Server 2019 Standard (full installation)
 - Windows Server 2022 Standard (full installation)

Type of delivery:
9 languages: de, en, zh included,
fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18,
floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18,
floating license,
software download including
license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

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

WinCC Advanced V18

Engineering software in the
TIA Portal; in 6 languages:
de, en, fr, es, it, zh;
for configuring SIMATIC Panels,
WinCC Runtime Advanced,
WinCC Unified PC Runtime

- Floating license; software and
documentation on DVD;
license key on USB flash drive

6AV2102-0AA08-0AA5

- Floating license; software,
documentation and license key
for download ¹⁾;
Email address required for
delivery

6AV2102-0AA08-0AH5

Technical specifications

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
General information	
Product type designation	CPU 1515SP PC2 T
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP T
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFlash memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1

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

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Technical specifications

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
Video interfaces	
• Graphics interface	1x DisplayPort
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	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
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
Media redundancy	
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required

Technical specifications

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2019 LTSC, 64 bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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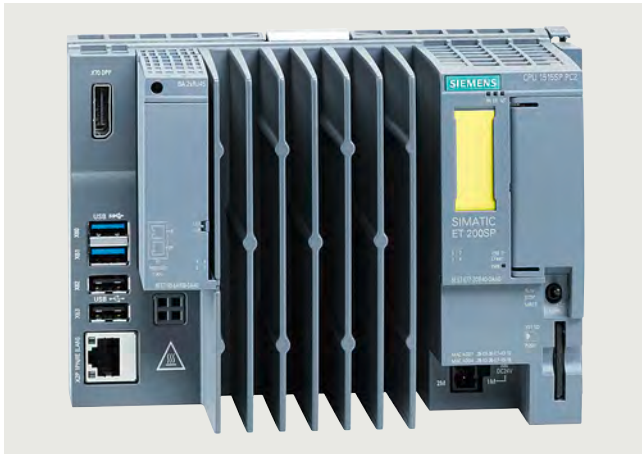
Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Overview



ET 200SP Open Controller, CPU 1515SP PC2 TF, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 Controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller TF and optional preinstalled WinCC Runtime Advanced
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 TF

Fail-safe ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed fail-safe SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

Type of delivery:

German, English, Chinese, Italian, French, Spanish

- CPU 1515SP PC2 TF

With pre-installed WinCC RT Advanced

- CPU 1515SP PC2 TF + HMI 128PT
- CPU 1515SP PC2 TF + HMI 512PT
- CPU 1515SP PC2 TF + HMI 2048PT

Accessories

BusAdapter BA 2xRJ45 6ES7193-6AR00-0AA0

BusAdapter BA 2xFC 6ES7193-6AF00-0AA0

BusAdapter BA 2xSCRJ 6ES7193-6AP00-0AA0

BusAdapter BA SCRJ/RJ45 6ES7193-6AP20-0AA0

BusAdapter BA SCRJ/FC 6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BusAdapter BA 2XLC 6ES7193-6AG00-0AA0

BusAdapter BA LC/RJ45 6ES7193-6AG20-0AA0

BusAdapter BA LC/FC 6ES7193-6AG40-0AA0

6ES7677-2WB42-0GB0

6ES7677-2WB42-0GK0

6ES7677-2WB42-0GL0

6ES7677-2WB42-0GM0

Article No.

CM DP for ET 200SP CPU

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

Server module

Spare part

6ES7193-6PA00-0AA0

Power supply connector

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

6ES7193-4JB00-0AA0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

Ordering data

Article No.

STEP 7 Professional V18

Target system:
SIMATIC S7-1200, S7-1500,
S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
- Windows 10 Professional Version 21H1, 21H2
 - Windows 10 Enterprise Version 21H1, 21H2
 - Windows 10 Enterprise LTSB 2016
 - Windows 10 Enterprise LTSB 2019
 - Windows 10 Enterprise LTSB 2021

- Windows 11 (64-bit)
- Windows 11 Professional 21H2
 - Windows 11 Enterprise 21H2

- Windows Server (64-bit)
- Windows Server 2016 Standard (full installation)
 - Windows Server 2019 Standard (full installation)
 - Windows Server 2022 Standard (full installation)

Type of delivery:
9 languages: de, en, zh included,
fr, sp, it, ru, jp, kr as download

STEP 7 Professional V18,
floating license

6ES7822-1AA08-0YA5

STEP 7 Professional V18,
floating license,
software download including
license key ¹⁾

6ES7822-1AE08-0YA5

Email address required for delivery

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

WinCC Advanced V18

Engineering software in the
TIA Portal; in 6 languages:
de, en, fr, es, it, zh;
for configuring SIMATIC Panels,
WinCC Runtime Advanced,
WinCC Unified PC Runtime

- Floating license; software
and documentation on DVD;
license key on USB flash drive

6AV2102-0AA08-0AA5

- Floating license; software,
documentation and license key
for download ¹⁾;
Email address required for
delivery

6AV2102-0AA08-0AH5

Technical specifications

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
General information	
Product type designation	CPU 1515SP PC2 TF
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP TF
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1

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

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Technical specifications

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
Video interfaces	
• Graphics interface	1x DisplayPort
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	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
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- PROFINergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
Media redundancy	
- Switchover time on line break, typ.	200 ms
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; From SW CPU 1505SP V2.6
• OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis

Technical specifications

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2019 LTSC, 64 bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Note:

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

Ordering data

Article No.

SIPLUS ET 200SP Open Controller CPU 1515SP PC2

SIPLUS ET 200SP CPU with
Windows 10 IoT Enterprise 64-bit
and pre-installed
SIMATIC S7-1500 Software Controller;
8 GB RAM, 30 GB CFast card

Type of delivery:

English, German, Chinese, Italian,
French, Spanish

- SIPLUS ET 200SP
CPU 1515SP PC2

6AG1677-2DB42-2GB0

For areas with exceptional
exposure to environmental
substances (conformal coating);
ambient temperature -40 ... +60 °C

- SIPLUS ET 200SP
CPU 1515SP PC2 Spare

6AG1677-2DB40-2AA0

Spare part, without CFast card

- SIPLUS ET 200SP
CPU 1515SP PC2 L

6AG1677-2DB40-2GB0

8 GB RAM,
128 GB CFast card,
Ready4Linux,

For areas with exceptional
exposure to environmental
substances (conformal coating);
ambient temperature -40 ... +60 °C

Accessories

BusAdapter BA 2xRJ45

(Extended temperature range and
exposure to environmental
substances)

6AG1193-6AR00-7AA0

SIPLUS BA 2xFC BusAdapter

(Extended temperature range and
exposure to environmental
substances)

6AG1193-6AF00-7AA0

BusAdapter BA 2xSCRJ

(Extended temperature range and
exposure to environmental
substances)

6AG1193-6AP00-2AA0

BusAdapter BA 2xLC

(Extended temperature range and
exposure to environmental
substances)

6AG1193-6AG00-2AA0

SIPLUS Mounting Kit ET 200SP

Mounting accessories for use with
increased mechanical vibration and
shock loads. Not approved for
SIPLUS BusAdapter BA 2xRJ45

6AG1193-6AA00-0AA0

Other accessories

See SIMATIC CPU 1515SP PC2,
page 7/46

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Technical specifications

Article number	6AG1677-2DB42-2GB0	6AG1677-2DB40-2AA0	6AG1677-2DB40-2GB0
Based on	6ES7677-2DB42-0GB0	6ES7677-2DB40-0AA0	6ES7677-2DB40-0GB0
	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU 1515SP PC2 L
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	up to 55 °C with max. 64 ET 200SP modules, max. 2x 900 mA USB load and max. 2x 500 mA USB load; up to 60 °C with max. 32 ET 200SP modules and 4x 500 mA USB load; FS06 or higher: up to 70 °C with max. 16 ET 200SP modules, 4x 100 mA USB load and no visualization	up to 55 °C with max. 64 ET 200SP modules, max. 2x 900 mA USB load and max. 2x 500 mA USB load; up to 60 °C with max. 32 ET 200SP modules and 4x 500 mA USB load; FS06 or higher: up to 70 °C with max. 16 ET 200SP modules, 4x 100 mA USB load and no visualization	up to 55 °C with max. 64 ET 200SP modules, max. 2x 900 mA USB load and max. 2x 500 mA USB load; up to 60 °C with max. 32 ET 200SP modules and 4x 500 mA USB load; FS06 or higher: up to 70 °C with max. 16 ET 200SP modules, 4x 100 mA USB load and no visualization
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Technical specifications

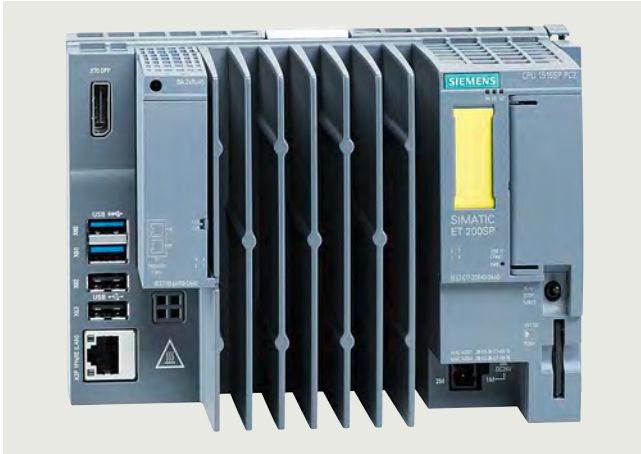
Article number	6AG1677-2DB42-2GB0	6AG1677-2DB40-2AA0	6AG1677-2DB40-2GB0
Based on	6ES7677-2DB42-0GB0	6ES7677-2DB40-0AA0	6ES7677-2DB40-0GB0
	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU 1515SP PC2 L
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Distributed Controllers

based on ET 200SP
SIPLUS ET 200SP Open Controllers

SIPLUS fail-safe CPUs > SIPLUS CPU 1515SP PC2 F

Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Note

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

Ordering data

Article No.

SIPLUS ET 200SP Open Controller CPU 1515SP PC2 F

(Extended temperature range and exposure to environmental substances)

Fail-safe ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Failsafe Software Controller (with WinCC RT Advanced option); 8 GB RAM, 30 GB CFast card;

Type of delivery:
English, German, Chinese, Italian, French, Spanish

- SIPLUS CPU 1515SP PC2 F

6AG1677-2SB42-2GB0

Accessories

BusAdapter BA 2xRJ45

(Extended temperature range and exposure to environmental substances)

6AG1193-6AR00-7AA0

SIPLUS BusAdapter BA 2xFC

(Extended temperature range and exposure to environmental substances)

6AG1193-6AF00-7AA0

BusAdapter BA 2xSCRJ

(Extended temperature range and exposure to environmental substances)

6AG1193-6AP00-2AA0

BusAdapter BA 2xLC

(Extended temperature range and exposure to environmental substances)

6AG1193-6AG00-2AA0

SIPLUS Mounting Kit ET 200SP

Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS BusAdapter BA 2xRJ45

6AG1193-6AA00-0AA0

Other accessories

See SIMATIC CPU 1515SP PC2 F, page 7/52

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS fail-safe CPUs > SIPLUS CPU 1515SP PC2 F

Technical specifications

Article number	6AG1677-2SB42-2GB0
Based on	6ES7677-2SB42-0GB0 SIPLUS ET 200SP CPU1515SP PC2 F
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1677-2SB42-2GB0
Based on	6ES7677-2SB42-0GB0 SIPLUS ET 200SP CPU1515SP PC2 F
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Overview

- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- Component-based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROIsafe available

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Ordering data	Article No.		Article No.
IM 154-8 PN/DP CPU interface module, V3.2 PROFINET IO controller for operating distributed I/Os on PROFINET, with integrated PLC functionality.	6ES7154-8AB01-0AB0	Industrial Ethernet FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
Accessories		• 1 unit • 10 units • 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
MMC 64 KB ¹⁾ For program backup.	6ES7953-8LF31-0AA0	Industrial Ethernet FastConnect installation cables • FastConnect standard cable • FastConnect trailing cable • FastConnect marine cable	6XV1840-2AH10 6XV1840-3AH10 6XV1840-4AH10
MMC 128 KB ¹⁾ For program backup.	6ES7953-8LG31-0AA0	Industrial Ethernet FastConnect installation cables • IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	6XV1870-2D 6XV1870-2F
MMC 512 KB ¹⁾ For program backup.	6ES7953-8LJ31-0AA0	Industrial Ethernet FastConnect Stripping tool	6GK1901-1GA00
MMC 2 MB ¹⁾ For program backup and/or firmware updates.	6ES7953-8LL31-0AA0		
MMC 4 MB ¹⁾ For program backup.	6ES7953-8LM32-0AA0		
MMC 8 MB ¹⁾ For program backup.	6ES7953-8LP31-0AA0		
Connection module For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.	6ES7194-4AN00-0AA0		

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Ordering data

Article No.

Article No.

IE connecting cable M12-180/M12-180

- Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:
 - 0.3 m
 - 0.5 m
 - 1.0 m
 - 1.5 m
 - 2.0 m
 - 3.0 m
 - 5.0 m
 - 10 m
 - 15 m
 - 20 m
 - 30 m
 - 40 m
 - 50 m
- PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m
- PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

6XV1870-8AE30
6XV1870-8AE50
6XV1870-8AH10
6XV1870-8AH15
6XV1870-8AH20
6XV1870-8AH30
6XV1870-8AH50
6XV1870-8AN10
6XV1870-8AN15
6XV1870-8AN20
6XV1870-8AN30
6XV1870-8AN40
6XV1870-8AN50

3RK1902-2NB30
3RK1902-2NB50
3RK1902-2NC10

3RK1902-2HB30
3RK1902-2HB50
3RK1902-2HC10

IE FC M12 plug PRO

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

6GK1901-0DB20-6AA0
6GK1901-0DB20-6AA8
3RK1902-2DA00

IE panel feedthrough

Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

6GK1901-0DM20-2AA5

7/8" connecting cable to power supply

- 5-wire, 5 x 1.5 mm², trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:
 - 1.5 m
 - 2.0 m
 - 3.0 m
 - 5.0 m
 - 10 m
 - 15 m
 - Other special lengths with 90° or 180° cable outlet.
- Trailing power cable, 5 x 1.5 mm², pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m
- Trailing power cable, 5 x 1.5 mm², pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

6XV1822-5BH15
6XV1822-5BH20
6XV1822-5BH30
6XV1822-5BH50
6XV1822-5BN10
6XV1822-5BN15

See under
<http://support.automation.siemens.com/WW/view/en/26999294>.

3RK1902-3NB30
3RK1902-3NB50
3RK1902-3NC10

3RK1902-3GB30
3RK1902-3GB50
3RK1902-3GC10

Power line

5-wire, 5 x 1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.

6XV1830-8AH10

7/8" connection plug

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

6GK1905-0FA00
6GK1905-0FB00
3RK1902-3DA00
3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

Twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3QE50
6XV1870-3QH10
6XV1870-3QH20
6XV1870-3QH60
6XV1870-3QN10

Crossed twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3RE50
6XV1870-3RH10
6XV1870-3RH20
6XV1870-3RH60
6XV1870-3RN10

Ordering data	Article No.	Article No.
M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00	PROFIBUS FC standard cable GP Standard type with special design for quick mounting, 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.
M12 sealing caps with female thread 5 units	6ES7194-4JD60-0AA0	6XV1830-0EH10
PROFIBUS M12 connecting cable Pre-assembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m Other special lengths with 90° or 180° cable outlet	6XV1830-3DH15 6XV1830-3DH20 6XV1830-3DH30 6XV1830-3DH50 6XV1830-3DN10 6XV1830-3DN15 See under http://support.automation.siemens.com/WW/view/en/26999294 .	PROFIBUS FC trailing cable 2-wire, shielded. PROFIBUS FC food cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.
M12 bus termination connector for PROFIBUS, female contact insert	6GK1905-0ED00	6XV1830-3EH10 6XV1830-0GH10 6XV1830-0JH10 2-wire, shielded Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.
M12 bus termination connector for PROFIBUS, male contact insert	6GK1905-0EC00	PROFIBUS M12 connection plug 5-pin, B-coded, metal housing, 1 pack = 5 units. • Female contact insert
M12 plug connector, axial outlet, with male contact insert	6GK1905-0EA00	6GK1905-0EB00

Technical specifications

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384KB	Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384KB
General information		Data areas and their retentivity	
Product function • Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface	Flag • Size, max.	2 048 byte
Supply voltage Rated value (DC)	24 V	Address area I/O address area • Inputs • Outputs	2 048 byte 2 048 byte
Memory		Process image • Inputs, adjustable • Outputs, adjustable	2 048 byte 2 048 byte
Work memory • integrated • expandable	384 kbyte No	Time of day Clock • Hardware clock (real-time)	Yes
Load memory • Plug-in (MMC), max.	8 Mbyte	Operating hours counter • Number	1
CPU processing times for bit operations, typ. for word operations, typ. for fixed point arithmetic, typ. for floating point arithmetic, typ.	0.05 µs 0.09 µs 0.12 µs 0.45 µs	Interfaces Interfaces/bus type	1x MPI/PROFIBUS DP, 1x PROFINET (3 ports)
Counters, timers and their retentivity		1. Interface Interface type	Integrated RS 485 interface
S7 counter • Number	256	Interface types • RS 485	Yes
IEC counter • present	Yes	Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave • Point-to-point connection	Yes Yes Yes No
S7 times • Number	256	PROFIBUS DP master • Number of DP slaves, max.	124
IEC timer • present	Yes		

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Technical specifications

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384KB
2. Interface	
Interface type	PROFINET
Interface types	
• Number of ports	3
Protocols	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
PROFINET IO Controller	
Services	
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of IO Devices with IRT and the option "high flexibility"	128
- Number of connectable IO Devices for RT, max.	128
Protocols	
SIMATIC communication	
• S7 routing	Yes
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
Web server	
• supported	Yes

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384KB
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
Number of connections	
• overall	16
Degree and class of protection	
IP degree of protection	IP65/67
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights	
Weight, approx.	720 g

Overview



- CPU 1513pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1513pro-2 PN**6ES7513-2PL00-0AB0**

300 KB work memory for program, 1.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

Accessories**SIMATIC Memory Card**4 MB¹⁾**6ES7954-8LC03-0AA0**12 MB¹⁾**6ES7954-8LE03-0AA0**24 MB¹⁾**6ES7954-8LF03-0AA0**256 MB¹⁾**6ES7954-8LL03-0AA0**2 GB¹⁾**6ES7954-8LP03-0AA0**32 GB¹⁾**6ES7954-8LT03-0AA0****Connection module****6ES7194-4AP00-0AA0**

CM CPU 2PN M12 / 7/8";

With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D**6XV1870-2F****Industrial Ethernet FastConnect**

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Ordering data

Article No.

Article No.

IE connecting cable M12-180/M12-180

- Pre-assembled
IE FC TP trailing cable GP 2 x 2
(PROFINET type C)
with two 4-pin M12 plugs
(D-coded),
degree of protection IP65/IP67,
in various lengths:
 - 0.3 m
 - 0.5 m
 - 1.0 m
 - 1.5 m
 - 2.0 m
 - 3.0 m
 - 5.0 m
 - 10 m
 - 15 m
 - 20 m
 - 30 m
 - 40 m
 - 50 m
- PROFINET M12 trailing
connecting cable, pre-assembled
at both ends with angled
M12 plugs (male contact insert),
in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m
- PROFINET M12 trailing
connecting cable, pre-assembled
at one end with angled
M12 plug (male contact insert at
one end, other end open),
in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

6XV1870-8AE30
6XV1870-8AE50
6XV1870-8AH10
6XV1870-8AH15
6XV1870-8AH20
6XV1870-8AH30
6XV1870-8AH50
6XV1870-8AN10
6XV1870-8AN15
6XV1870-8AN20
6XV1870-8AN30
6XV1870-8AN40
6XV1870-8AN50

3RK1902-2NB30
3RK1902-2NB50
3RK1902-2NC10

3RK1902-2HB30
3RK1902-2HB50
3RK1902-2HC10

IE FC M12 plug PRO

- PROFINET M12 plug connector,
D-coded with fast connection
system, axial cable outlet.
- 1 unit
 - 8 units
 - PROFINET M12 plug connector,
D-coded, angled.

6GK1901-0DB20-6AA0
6GK1901-0DB20-6AA8
3RK1902-2DA00

IE panel feedthrough

Cabinet bushing for converting
from the M12 connection system
(D-coded, IP65/IP67) to the RJ45
connection system (IP20),
1 pack = 5 units.

6GK1901-0DM20-2AA5

7/8" connecting cable to power supply

- 5-wire, 5 x 1.5 mm², trailable,
pre-assembled with
two 7/8" connectors
(axial cable outlet), 5-pin,
up to 50 m, in various lengths:
 - 1.5 m
 - 2.0 m
 - 3.0 m
 - 5.0 m
 - 10 m
 - 15 m
- Other special lengths with
90° or 180° cable outlet.

6XV1822-5BH15
6XV1822-5BH20
6XV1822-5BH30
6XV1822-5BH50
6XV1822-5BN10
6XV1822-5BN15
See under
<http://support.automation.siemens.com/WW/view/en/26999294>.

- Trailing power cable,
5 x 1.5 mm², pre-assembled at
both ends with 7/8" angled plugs
(female contact insert at one end,
male contact insert at the other
end),
in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

3RK1902-3NB30
3RK1902-3NB50
3RK1902-3NC10

- Trailing power cable,
5 x 1.5 mm², pre-assembled at
one end with 7/8" angled plug with
female contact insert (socket
at one end, other end open),
in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

3RK1902-3GB30
3RK1902-3GB50
3RK1902-3GC10

Power line

5-wire, 5 x 1.5 mm², trailing type,
sold by the meter, minimum order
quantity 20 m, maximum order
quantity 1000 m.

6XV1830-8AH10

7/8" connection plug

For ET 200eco, with axial cable
outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert,
1 unit
- Angled, with male contact insert,
1 unit

6GK1905-0FA00
6GK1905-0FB00
3RK1902-3DA00

3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

Twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3QE50
6XV1870-3QH10
6XV1870-3QH20
6XV1870-3QH60
6XV1870-3QN10

Crossed twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3RE50
6XV1870-3RH10
6XV1870-3RH20
6XV1870-3RH60
6XV1870-3RN10

M12 sealing cap

For protection of unused M12
connections with ET 200pro

3RX9802-0AA00

M12 sealing caps with female thread

5 units

6ES7194-4JD60-0AA0

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN
General information	
Product type designation	CPU 1513pro-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V16 (FW V2.8) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN
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
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

Overview

- CPU 1516pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

Ordering data**Article No.****CPU 1516pro-2 PN**

1 MB work memory for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2PN00-0AB0**Accessories****SIMATIC Memory Card**4 MB¹⁾**6ES7954-8LC03-0AA0**12 MB¹⁾**6ES7954-8LE03-0AA0**24 MB¹⁾**6ES7954-8LF03-0AA0**256 MB¹⁾**6ES7954-8LL03-0AA0**2 GB¹⁾**6ES7954-8LP03-0AA0**32 GB¹⁾**6ES7954-8LT03-0AA0****Connection module****6ES7194-4AP00-0AA0**

CM CPU 2PN M12 / 7/8";

With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET

**Industrial Ethernet
FC RJ45 plug 180**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

**Industrial Ethernet FastConnect
installation cables**

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

**Industrial Ethernet
FastConnect installation cables**

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D**6XV1870-2F****Industrial Ethernet FastConnect**

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Ordering data

Article No.

Article No.

IE connecting cable M12-180/M12-180

- Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- 20 m
- 30 m
- 40 m
- 50 m

- PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

- PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

IE FC M12 plug PRO

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

IE panel feedthrough

Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

7/8" connecting cable to power supply

5-wire, 5 x 1.5 mm², trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- Other special lengths with 90° or 180° cable outlet.

6XV1870-8AE30
6XV1870-8AE50
6XV1870-8AH10
6XV1870-8AH15
6XV1870-8AH20
6XV1870-8AH30
6XV1870-8AH50
6XV1870-8AN10
6XV1870-8AN15
6XV1870-8AN20
6XV1870-8AN30
6XV1870-8AN40
6XV1870-8AN50

3RK1902-2NB30
3RK1902-2NB50
3RK1902-2NC10

3RK1902-2HB30
3RK1902-2HB50
3RK1902-2HC10

6GK1901-0DB20-6AA0
6GK1901-0DB20-6AA8
3RK1902-2DA00

6GK1901-0DM20-2AA5

6XV1822-5BH15
6XV1822-5BH20
6XV1822-5BH30
6XV1822-5BH50
6XV1822-5BN10
6XV1822-5BN15
See under
<http://support.automation.siemens.com/WW/view/en/26999294>.

- Trailing power cable, 5 x 1.5 mm², pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

- Trailing power cable, 5 x 1.5 mm², pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

Power line

5-wire, 5 x 1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.

7/8" connection plug

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

7/8" cover cap, 10 per pack

Twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

Crossed twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

M12 sealing cap

For protection of unused M12 connections with ET 200pro

M12 sealing caps with female thread

5 units

3RK1902-3NB30
3RK1902-3NB50
3RK1902-3NC10

3RK1902-3GB30
3RK1902-3GB50
3RK1902-3GC10

6XV1830-8AH10

6GK1905-0FA00
6GK1905-0FB00
3RK1902-3DA00

3RK1902-3BA00

6ES7194-3JA00-0AA0

6XV1870-3QE50
6XV1870-3QH10
6XV1870-3QH20
6XV1870-3QH60
6XV1870-3QN10

6XV1870-3RE50
6XV1870-3RH10
6XV1870-3RH20
6XV1870-3RH60
6XV1870-3RN10

3RX9802-0AA00

6ES7194-4JD60-0AA0

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN
General information	
Product type designation	CPU 1516pro-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN
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
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

Overview

- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to ISO 13849-1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral web server with the option of creating user-defined web pages
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Ordering data**Article No.****IM 154-8 F PN/DP CPU
interface module, V3.2**

Fail-safe PROFINET IO controller for operating distributed I/O on PROFINET, with integrated PLC functionality.

- 512 KB work memory
- 1.5 MB work memory

6ES7154-8FB01-0AB0
6ES7154-8FX00-0AB0

**S7 Distributed Safety V5.4 SP5
Update 2 programming tool**Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP

Requirement:

Windows 7 SP1 (64-bit),
Windows 10 Professional/Enterprise (64-bit),
Windows Server 2008 R2 SP1 (64-bit),
Windows Server 2012 R2 (64-bit),
Windows Server 2016 (64-bit);
STEP 7 from V5.5 SP1;
Please also note the operating systems that have been released for the STEP 7 version used

Floating license for 1 user,
software and documentation on DVD;
license key on USB flash drive

6ES7833-1FC02-0YA5

Floating license for 1 user,
software, documentation and
license key for download¹⁾;
Email address required for delivery

6ES7833-1FC02-0YH5

S7 Distributed Safety upgrade

From V5.x to V5.4;
floating license for 1 user,
software and documentation on DVD;
license key on USB flash drive

6ES7833-1FC02-0YE5

STEP 7 Safety Advanced V18Task:

Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O

Requirement:

STEP 7 Professional V18

Note:

As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.

Floating license for 1 user;
license key on USB flash drive

6ES7833-1FA18-0YA5

Floating license for 1 user,
license key for download¹⁾;
Email address required for delivery

6ES7833-1FA18-0YH5

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

based on ET 200pro
Fail-safe CPUs

Ordering data	Article No.		Article No.
Accessories		Industrial Ethernet FastConnect installation cables	
SIMATIC Micro Memory Cards		- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. - IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	6XV1870-2D
MMC 64 KB ²⁾	6ES7953-8LF31-0AA0		6XV1870-2F
For program backup.			
MMC 128 KB ²⁾	6ES7953-8LG31-0AA0		
For program backup.			
MMC 512 KB ²⁾	6ES7953-8LJ31-0AA0		
For program backup.			
MMC 2 MB ²⁾	6ES7953-8LL31-0AA0		
For program backup and/or firmware updates.			
MMC 4 MB ²⁾	6ES7953-8LM32-0AA0		
For program backup.			
MMC 8 MB ²⁾	6ES7953-8LP31-0AA0		
For program backup.			
Connection module	6ES7194-4AN00-0AA0		
For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.			
Industrial Ethernet FC RJ45 plug 90			
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet.			
1 unit 10 units	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0	- Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP65/IP67, in various lengths: 0.3 m 0.5 m 1.0 m 15 m 2.0 m 3.0 m 5.0 m 10 m 15 m 20 m 30 m 40 m 50 m - PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths: 3.0 m 5.0 m 10 m - PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths: 3.0 m 5.0 m 10 m	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50
Industrial Ethernet FC RJ45 plug 180			
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet			
1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0		3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10
Industrial Ethernet FastConnect installation cables			
- FastConnect standard cable - FastConnect trailing cable - FastConnect marine cable	6XV1840-2AH10 6XV1840-3AH10 6XV1840-4AH10	IE FC M12 plug PRO	
		PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.	
		1 unit 8 units - PROFINET M12 plug connector, D-coded, angled	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00
		IE panel feedthrough	
		Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units	6GK1901-0DM20-2AA5

2) An MMC is essential for operating the CPU

Ordering data

Article No.

Article No.

7/8" connecting cable to power supply

- 5-wire, 5 x 1.5 mm², trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:
 - 1.5 m
 - 2.0 m
 - 3.0 m
 - 5.0 m
 - 10 m
 - 15 m
 - Other special lengths with 90° or 180° cable outlet
- Trailing power cable, 5 x 1.5 mm², pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m
- Trailing power cable, 5 x 1.5 mm², pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths:
 - 3.0 m
 - 5.0 m
 - 10 m

6XV1822-5BH15
6XV1822-5BH20
6XV1822-5BH30
6XV1822-5BH50
6XV1822-5BN10
6XV1822-5BN15
See under
<http://support.automation.siemens.com/WW/view/en/26999294>.

3RK1902-3NB30
3RK1902-3NB50
3RK1902-3NC10

3RK1902-3GB30
3RK1902-3GB50
3RK1902-3GC10

Power line

5-wire, 5 x 1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.

6XV1830-8AH10

7/8" connection plug

- For ET 200eco, with axial cable outlet
- With male contact insert, 5-pack
 - With female contact insert, 5-pack
 - Angled, with female contact insert, 1 unit
 - Angled, with male contact insert, 1 unit

6GK1905-0FA00
6GK1905-0FB00
3RK1902-3DA00

3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

Twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3QE50
6XV1870-3QH10
6XV1870-3QH20
6XV1870-3QH60
6XV1870-3QN10

Crossed twisted pair cables 4x2 with RJ45 plugs

0.5 m
1 m
2 m
6 m
10 m

6XV1870-3RE50
6XV1870-3RH10
6XV1870-3RH20
6XV1870-3RH60
6XV1870-3RN10

M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

M12 sealing caps with female thread

5 units

6ES7194-4JD60-0AA0

PROFIBUS M12 connecting cable

Pre-assembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths:

1.5 m
2.0 m
3.0 m
5.0 m
10 m
15 m

6XV1830-3DH15
6XV1830-3DH20
6XV1830-3DH30
6XV1830-3DH50
6XV1830-3DN10
6XV1830-3DN15

Other special lengths with 90° or 180° cable outlet

See under
<http://support.automation.siemens.com/WW/view/en/26999294>.

M12 bus termination connector for PROFIBUS, female contact insert

6GK1905-0ED00

M12 bus termination connector for PROFIBUS, male contact insert

6GK1905-0EC00

M12 plug connector, axial outlet, with male contact insert

6GK1905-0EA00

PROFIBUS FC standard cable GP

6XV1830-0EH10

Standard type with special design for quick mounting, 2-wire, shielded.

Sold by the meter;
max. delivery unit 1000 m,
minimum order quantity 20 m.

PROFIBUS FC trailing cable

6XV1830-3EH10

2-wire, shielded.

PROFIBUS FC food cable

6XV1830-0GH10

2-wire, shielded.

Sold by the meter;
max. delivery unit 1000 m,
minimum order quantity 20 m.

PROFIBUS FC robust cable

6XV1830-0JH10

2-wire, shielded.

Sold by the meter;
max. delivery unit 1000 m,
minimum order quantity 20 m.

PROFIBUS M12 connection plug

5-pin, B-coded, metal housing, 1 pack = 5 units.

- Female contact insert

6GK1905-0EB00

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

IM 154-8 F PN/DP CPU

Technical specifications

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB	6ES7154-8FX00-0AB0 ET 200pro: IM 154-8FX PN/DP CPU, 1,5MB
General information		
Product function		
• Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
Supply voltage		
Rated value (DC)	24 V	24 V
Memory		
Work memory		
• integrated	512 kbyte	1 536 kbyte
• expandable	No	No
Load memory		
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte
CPU processing times		
for bit operations, typ.	0.05 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs
Counters, timers and their retentivity		
S7 counter		
• Number	256	256
IEC counter		
• present	Yes	Yes
S7 times		
• Number	256	256
IEC timer		
• present	Yes	Yes
Data areas and their retentivity		
Flag		
• Size, max.	2 048 byte	2 048 byte
Address area		
I/O address area		
• Inputs	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte
Process image		
• Inputs, adjustable	2 048 byte	2 048 byte
• Outputs, adjustable	2 048 byte	2 048 byte
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Operating hours counter		
• Number	1	1
1. Interface		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
Interface types		
• RS 485	Yes	Yes
Protocols		
• MPI	Yes	Yes
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• Point-to-point connection	No	No
PROFIBUS DP master		
• Number of DP slaves, max.	124	124
2. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• Number of ports	3	3

Technical specifications

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB	6ES7154-8FX00-0AB0 ET 200pro: IM 154-8FX PN/DP CPU, 1,5MB
Protocols		
• MPI	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes	Yes
• PROFIBUS DP master	No	No
• PROFIBUS DP slave	No	No
PROFINET IO Controller		
Services		
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- Number of IO Devices with IRT and the option "high flexibility"	128	128
- Number of connectable IO Devices for RT, max.	128	128
Protocols		
SIMATIC communication		
• S7 routing	Yes	Yes
Open IE communication		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	8
• ISO-on-TCP (RFC1006)	Yes	Yes
- Number of connections, max.	8	8
• UDP	Yes	Yes
- Number of connections, max.	8	8
Web server		
• supported	Yes	Yes
Communication functions		
PG/OP communication	Yes	Yes
Global data communication		
• supported	Yes	Yes
S7 basic communication		
• supported	Yes	Yes
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	16	16
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights		
Weight, approx.	720 g	720 g

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Overview



- Fail-safe CPU 1513pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1513pro F-2 PN

450 KB work memory for program, 1.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

6ES7513-2GL00-0AB0

Accessories

SIMATIC Memory Card

4 MB¹⁾

6ES7954-8LC03-0AA0

12 MB¹⁾

6ES7954-8LE03-0AA0

24 MB¹⁾

6ES7954-8LF03-0AA0

256 MB¹⁾

6ES7954-8LL03-0AA0

2 GB¹⁾

6ES7954-8LP03-0AA0

32 GB¹⁾

6ES7954-8LT03-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";
With 3 x M12 and 2 x 7/8",
for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables;
with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Ordering data	Article No.	Article No.
IE connecting cable M12-180/M12-180 Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m • 20 m • 30 m • 40 m • 50 m PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plugs (male contact insert), in various lengths: • 3.0 m • 5.0 m • 10 m PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths: • 3.0 m • 5.0 m • 10 m	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50 3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10 3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10	Trailing power cable, 5 x 1.5 mm ² , pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths: • 3.0 m • 5.0 m • 10 m Trailing power cable, 5 x 1.5 mm ² , pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths: • 3.0 m • 5.0 m • 10 m Power line 5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m. 7/8" connection plug For ET 200eco, with axial cable outlet • With male contact insert, 5-pack • With female contact insert, 5-pack • Angled, with female contact insert, 1 unit • Angled, with male contact insert, 1 unit 7/8" cover cap, 10 per pack Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m M12 sealing cap For protection of unused M12 connections with ET 200pro M12 sealing caps with female thread 5 units
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled.	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10 3RK1902-3GB30 3RK1902-3GB50 3RK1902-3GC10 6XV1830-8AH10
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m • Other special lengths with 90° or 180° cable outlet.	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See under http://support.automation.siemens.com/WW/view/en/26999294 .	6GK1905-0FA00 6GK1905-0FB00 3RK1902-3DA00 3RK1902-3BA00 6ES7194-3JA00-0AA0 6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10 6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10 3RX9802-0AA00 6ES7194-4JD60-0AA0

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN
General information	
Product type designation	CPU 1513pro F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V16 (FW V2.8) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFinergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFinergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
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

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	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
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

CPU 1516pro F-2 PN

Overview



- Fail-safe CPU 1516pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516F-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849

- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1516pro F-2 PN

1.5 MB work memory for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2GN00-0AB0

Accessories

SIMATIC Memory Card

4 MB¹⁾

6ES7954-8LC03-0AA0

12 MB¹⁾

6ES7954-8LE03-0AA0

24 MB¹⁾

6ES7954-8LF03-0AA0

256 MB¹⁾

6ES7954-8LL03-0AA0

2 GB¹⁾

6ES7954-8LP03-0AA0

32 GB¹⁾

6ES7954-8LT03-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";

With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

Article No.

Industrial Ethernet FastConnect installation cables

- **IE FC TP trailing cable GP 2 x 2;** sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- **IE TP torsion cable GP 2 x 2;** sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

IE connecting cable M12-180/M12-180

Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- 20 m
- 30 m
- 40 m
- 50 m

6XV1870-8AE30
6XV1870-8AE50
6XV1870-8AH10
6XV1870-8AH15
6XV1870-8AH20
6XV1870-8AH30
6XV1870-8AH50
6XV1870-8AN10
6XV1870-8AN15
6XV1870-8AN20
6XV1870-8AN30
6XV1870-8AN40
6XV1870-8AN50

PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-2NB30
3RK1902-2NB50
3RK1902-2NC10

¹⁾ An MMC is essential for operating the CPU

Ordering data	Article No.		Article No.
PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths: 3.0 m 5.0 m 10 m	3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10	Trailing power cable, 5 x 1.5 mm ² , pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths: 3.0 m 5.0 m 10 m	3RK1902-3GB30 3RK1902-3GB50 3RK1902-3GC10
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. 1 unit 8 units - PROFINET M12 plug connector, D-coded, angled.	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	Power line 5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	6XV1830-8AH10
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	7/8" connection plug For ET 200eco, with axial cable outlet - With male contact insert, 5-pack - With female contact insert, 5-pack - Angled, with female contact insert, 1 unit - Angled, with male contact insert, 1 unit	6GK1905-0FA00 6GK1905-0FB00 3RK1902-3DA00 3RK1902-3BA00
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m - Other special lengths with 90° or 180° cable outlet.	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See under http://support.automation.siemens.com/WW/view/en/26999294 .	7/8" cover cap, 10 per pack	6ES7194-3JA00-0AA0
Trailing power cable, 5 x 1.5 mm ² , pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths: 3.0 m 5.0 m 10 m	3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10	Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10
		Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10
		M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00
		M12 sealing caps with female thread 5 units	6ES7194-4JD60-0AA0

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
General information	
Product type designation	CPU 1516pro F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and Isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	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
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	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
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	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

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFINET energy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	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
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes
• OPC UA Server	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
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

Distributed Controllers

Notes