

## 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.

##### **SIMATIC DP, CPU 1510SP-1 PN for ET 200SP**

Central processing unit with 200 KB  
work memory for program and  
1 MB for data, 1st interface:  
PROFINET IRT with 3-port switch,  
25 ns bit performance,  
SIMATIC Memory Card required,  
BusAdapter required  
for ports 1 and 2  
Observe the approvals  
and certificates according to  
entry 109817615 at  
[support.industry.siemens.com!](http://support.industry.siemens.com!)

**6ES7510-1DK03-0AB0**

#### Accessories

##### **SIMATIC DP, CM PROFIBUS DP**

For ET 200SP CPU module w.  
PROFIBUS DP interface  
(9-pin D-sub socket) DP master  
for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

#### SIMATIC Memory Card

##### **SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**

3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU**

3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

#### DIN rail 35 mm

##### **SIMATIC, DIN rail 35 mm**

Length: 483 mm for 19" cabinets

**6ES7510-8MA11**

##### **SIMATIC, DIN rail 35 mm**

Length: 530 mm for 600 mm  
cabinets

**6ES7510-8MA21**

##### **SIMATIC, DIN rail 35 mm**

Length: 830 mm for 900 mm  
cabinets

**6ES7510-8MA31**

##### **SIMATIC, DIN rail 35 mm**

Length 2 m

**6ES7510-8MA41**

##### **SIMATIC S7-1500, grounding screw**

For connecting PE to the  
S7-1500 mounting rail;  
essential for 2000 mm mounting rail,  
20 units per packing unit

**6ES7590-5AA00-0AA0**

##### **SIMATIC ET 200SP, BA 2xRJ45 BusAdapter**

2 RJ45 sockets

**6ES7193-6AR00-0AA0**

##### **SIMATIC ET 200SP, BA 2xFC BusAdapter**

2x FastConnect connection

**6ES7193-6AF00-0AA0**

##### **SIMATIC ET 200SP, BA 2xSCRJ BusAdapter**

2 SCRJ FO connections

**6ES7193-6AP00-0AA0**

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| Ordering data                                                                                                                                                                                                                             | Article No.        |                                                                                                                                                                                                                                                                                                                                                    | Article No.        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP,<br/>BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x RJ45 connection                                                                                                         | 6ES7193-6AP20-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 10 units.                                                                                                        | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC ET 200SP,<br/>BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x FastConnect (FC) connection                                                                                              | 6ES7193-6AP40-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 50 units.                                                                                                        | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP,<br/>160 reference designation labels</b><br>10 sheets (160 labels), for BA,<br>BU, IM and I/O modules                                                                                                                | 6ES7193-6LF30-0AW0 | <b>Industrial Ethernet FC TP<br/>standard cable, GP 2x2<br/>(PROFINET type A)</b><br>TP installation cable for connection<br>to IE FC RJ45 2x2, for universal use,<br>4-wire, shielded Cat5e,<br>sold by the meter, delivery unit<br>maximum length of 4000 m,<br>minimum order quantity 20 m.                                                     | 6XV1840-2AH10      |
| <b>Labeling strips</b>                                                                                                                                                                                                                    |                    | <b>Industrial Ethernet FC TP trailing<br/>cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection<br>to FC outlet RJ 45, for use in cable<br>carriers, 4-wire, shielded, Cat5e,<br>sold by the meter<br>(4 million bending cycles),<br>delivery unit max. 2000 m,<br>minimum order quantity 20 m.                                 | 6XV1840-3AH10      |
| <b>SIMATIC ET 200SP,<br/>500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                                        | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FC TP marine<br/>cable</b><br>TP installation cable for connection<br>to FC outlet RJ45, marine certified,<br>4-wire, shielded, Cat5e,<br>sold by the meter, delivery unit<br>maximum length of 1000 m,<br>minimum order quantity 20 m.                                                                                     | 6XV1840-4AH10      |
| <b>SIMATIC ET 200SP,<br/>500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                                            | 6ES7193-6LR10-0AG0 | <b>Industrial Ethernet FastConnect<br/>stripping tool</b><br>Stripping tool for fast stripping of<br>insulation from the IE FastConnect<br>cables.                                                                                                                                                                                                 | 6GK1901-1GA00      |
| <b>SIMATIC ET 200SP,<br/>1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated,<br>paper, 180 g/sqm                                                                                                                        | 6ES7193-6LA10-0AA0 | <b>Manuals for ET 200SP<br/>distributed I/O system</b><br>ET 200SP library:<br>ET 200SP Manual Collection,<br>comprising system manual, product<br>information, and device manuals<br><br>Manuals are available as PDF files<br>on the Internet under<br><a href="https://www.siemens.com/simatic-docu">https://www.siemens.com/simatic-docu</a> . |                    |
| <b>SIMATIC ET 200SP,<br/>1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated,<br>paper, 180 g/sqm                                                                                                                            | 6ES7193-6LA10-0AG0 | <b>SIMATIC Manual Collection DL<br/>in 5 languages<sup>1)</sup></b><br>All manuals for<br>S7-1200/1500/200/300/400,<br>LOGO!, SIMATIC DP, PC, PG,<br>STEP 7, Engineering SW,<br>Runtime SW, SIMATIC HMI,<br>SIMATIC NET, SIMATIC IDENT<br><br>Consignee email address required<br>for delivery.                                                    | 6ES7998-8XE01-8YE0 |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                                   |                    |                                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 50 units. | 6GK1901-1BB20-2AE0 |                                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                                                |                    |                                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 1 unit. | 6GK1901-1BB10-2AA0 |                                                                                                                                                                                                                                                                                                                                                    |                    |

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| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Article No.        |                                                                                                                                                                                                                                                                                                                                    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| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br><br>Consignee email address required for delivery.<br><br>Current Manual Collection DVD and the three subsequent updates                                                                                                                                                           | 6ES7998-8XE01-8YE2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| <b>STEP 7 Professional V20</b><br><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br><br>Requirement:<br><br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br><br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br><br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br><br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                    | <b>SIMATIC STEP 7 Professional V20; floating license</b><br><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br><b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br>Consignee email address required for delivery<br><br><b>Spare parts</b><br><br><b>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</b><br><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit<br><br><b>SIMATIC ET 200SP, spare part 5 covers</b><br><br>For BusAdapter interface of the ET 200SP CPU<br><br><b>SIMATIC ET 200SP, spare part server module</b><br><br>For ET 200SP | 6ES7822-1AA24-0YA5<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><b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<sup>1)</sup> Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

# Distributed Controllers

based on ET 200SP  
Standard CPUs

## CPU 1510SP-1 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7510-1DK03-0AB0</b><br>CPU 1510SP-1 PN,<br>200KB Prog., 1MB Data                                                                             |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1510SP-1 PN                                                                                                                                    |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher; configurable with older<br>TIA Portal versions as<br>6ES7510-1DJ01-0AB0                                |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 200 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 1 Mbyte                                                                                                                                            |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                              |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7510-1DK03-0AB0</b><br>CPU 1510SP-1 PN,<br>200KB Prog., 1MB Data                                                                                                                |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P3; opt. X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                         |
| • Number of ports                                                                   | 3; 1. integr. + 2. via BusAdapter                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128; In total, up to 512 distributed<br>I/O devices can be connected<br>via AS-i, PROFIBUS or PROFINET                                                                                |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1510SP-1 PN

#### Technical specifications

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7510-1DK03-0AB0</b><br>CPU 1510SP-1 PN,<br>200KB Prog., 1MB Data                                                            |
| <b>2. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                  |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                                               | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                         | <b>6ES7510-1DK03-0AB0</b><br>CPU 1510SP-1 PN,<br>200KB Prog., 1MB Data |
| <b>Product functions/security</b>                      |                                                                        |
| PROFINET Security Class                                | 1                                                                      |
| signed firmware update                                 | Yes                                                                    |
| Secure Boot                                            | Yes                                                                    |
| safely removing data                                   | Yes                                                                    |
| <b>Ambient conditions</b>                              |                                                                        |
| <b>Ambient temperature during operation</b>            |                                                                        |
| • horizontal installation, min.                        | -30 °C; No condensation                                                |
| • horizontal installation, max.                        | 60 °C                                                                  |
| • vertical installation, min.                          | -30 °C; No condensation                                                |
| • vertical installation, max.                          | 50 °C                                                                  |
| <b>Altitude during operation relating to sea level</b> |                                                                        |
| • Installation altitude above sea level, max.          | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual |
| <b>Configuration</b>                                   |                                                                        |
| <b>Configuration/programming</b>                       |                                                                        |
| <b>Programming language</b>                            |                                                                        |
| - LAD                                                  | Yes                                                                    |
| - FBD                                                  | Yes                                                                    |
| - STL                                                  | Yes                                                                    |
| - SCL                                                  | Yes                                                                    |
| - CFC                                                  | Yes                                                                    |
| - GRAPH                                                | Yes                                                                    |
| <b>Know-how protection</b>                             |                                                                        |
| • User program protection/ password protection         | Yes                                                                    |
| • Copy protection                                      | Yes                                                                    |
| • Block protection                                     | Yes                                                                    |
| <b>Access protection</b>                               |                                                                        |
| • protection of confidential configuration data        | Yes                                                                    |
| • Protection level: Write protection                   | Yes                                                                    |
| • Protection level: Read/write protection              | Yes                                                                    |
| • Protection level: Write protection for Failsafe      | No                                                                     |
| • Protection level: Complete protection                | Yes                                                                    |
| • User administration                                  | Yes; device-wide and centralized                                       |
| • Number of users                                      | 100                                                                    |
| <b>Dimensions</b>                                      |                                                                        |
| Width                                                  | 100 mm                                                                 |
| Height                                                 | 117 mm                                                                 |
| Depth                                                  | 75 mm                                                                  |
| <b>Weights</b>                                         |                                                                        |
| 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.

##### **SIMATIC DP, CPU 1512SP-1 PN for ET 200SP**

Central processing unit with 400 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2  
Observe the approvals and certificates according to entry 109817615 at [support.industry.siemens.com!](http://support.industry.siemens.com!)

**6ES7512-1DM03-0AB0**

#### Accessories

##### **SIMATIC DP, CM PROFIBUS DP for ET 200SP**

CPU module with PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

#### SIMATIC Memory Card

##### **SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**

3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU**

3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

#### DIN rail 35 mm

##### **SIMATIC, DIN rail 35 mm,**

Length: 483 mm for 19" cabinets

**6ES710-8MA11**

##### **SIMATIC, DIN rail 35 mm**

Length: 530 mm for 600 mm cabinets

**6ES710-8MA21**

##### **SIMATIC, DIN rail 35 mm**

Length: 830 mm for 900 mm cabinets

**6ES710-8MA31**

##### **SIMATIC, DIN rail 35 mm**

Length 2 m

**6ES710-8MA41**

##### **SIMATIC S7-1500, grounding screw**

For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit

**6ES7590-5AA00-0AA0**

##### **SIMATIC ET 200SP, BA 2xRJ45 BusAdapter**

2 RJ45 sockets

**6ES7193-6AR00-0AA0**

##### **SIMATIC ET 200SP, BA 2xFC BusAdapter**

2x FastConnect connection

**6ES7193-6AF00-0AA0**

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1512SP-1 PN

| Ordering data                                                                                                                                                                                                            | Article No.        |                                                                                                                                                                                                                                                                                              | Article No.        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP, BA 2xSCRJ BusAdapter</b><br>2 SCRJ FO connections                                                                                                                                                   | 6ES7193-6AP00-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 90 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet<br>1 pack = 50 units.                                                                     | 6GK1901-1BB20-2AE0 |
| <b>SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x RJ45 connection                                                                                            | 6ES7193-6AP20-0AA0 |                                                                                                                                                                                                                                                                                              |                    |
| <b>SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x FastConnect (FC) connection                                                                                 | 6ES7193-6AP40-0AA0 | <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                                                                                                   |                    |
| <b>SIMATIC BA 2xLC BusAdapter</b><br>2x LC glass fiber-optic cable connections                                                                                                                                           | 6ES7193-6AG00-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet<br>1 pack = 1 unit.                                                                     | 6GK1901-1BB10-2AA0 |
| <b>SIMATIC BusAdapter: BA LC/RJ45</b><br>Media converter glass FOC/CU<br>1x LC FO connection and<br>1x RJ45 connection                                                                                                   | 6ES7193-6AG20-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet<br>1 pack = 10 units.                                                                   | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC BusAdapter: BA LC/FC</b><br>Media converter glass FOC/CU<br>1x LC FO connection and<br>1x FastConnect (FC) connection                                                                                         | 6ES7193-6AG40-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet<br>1 pack = 50 units.                                                                   | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP, 160 reference designation labels</b><br>10 sheets (160 labels), for BA, BU, IM and I/O modules                                                                                                      | 6ES7193-6LF30-0AW0 |                                                                                                                                                                                                                                                                                              |                    |
| <b>Labeling strips</b>                                                                                                                                                                                                   |                    |                                                                                                                                                                                                                                                                                              |                    |
| <b>SIMATIC ET 200SP, 500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                           | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A)</b><br>TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.                      | 6XV1840-2AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                               | 6ES7193-6LR10-0AG0 |                                                                                                                                                                                                                                                                                              |                    |
| <b>SIMATIC ET 200SP, 1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                              | 6ES7193-6LA10-0AA0 | <b>Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m. | 6XV1840-3AH10      |
| <b>SIMATIC ET 200SP, 1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                                  | 6ES7193-6LA10-0AG0 | <b>Industrial Ethernet FC TP marine cable</b><br>TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.                                                  | 6XV1840-4AH10      |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                  |                    | <b>Industrial Ethernet FastConnect stripping tool</b><br>Stripping tool for fast stripping of insulation from the IE FastConnect cables.                                                                                                                                                     | 6GK1901-1GA00      |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x 2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                              |                    |

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1512SP-1 PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Article No.               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Article No.               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Manuals for ET 200SP distributed I/O system</b><br><br>ET 200SP library:<br>ET 200SP Manual Collection, comprising system manual, product information, and device manuals<br><br>Manuals can be downloaded from the Internet as PDF files under <a href="https://www.siemens.com/simatic-docu">https://www.siemens.com/simatic-docu</a> .                                                                                                                                                                                                                                                                                                                                 |                           | <b>SIMATIC STEP 7 Professional V20; floating license</b><br><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                            | <b>6ES7822-1AA24-0YA5</b> |
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br><br>Consignee email address required for delivery.                                                                                                                                                                                                                                                                                                                                                                                                | <b>6ES7998-8XE01-8YE0</b> | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br>Consignee email address required for delivery | <b>6ES7822-1AE24-0YA5</b> |
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br><br>Consignee email address required for delivery.                                                                                                                                                                                                                                 | <b>6ES7998-8XE01-8YE2</b> | <b>Spare parts</b><br><br><b>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</b><br><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit                                                                                                                                                                                                                                                                                                     | <b>6ES7193-4JB00-0AA0</b> |
| <b>STEP 7 Professional V20</b><br><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br><br>Requirement:<br><br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br><br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br><br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br><br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC ET 200SP, spare part 5 covers</b><br><br>For BusAdapter interface of the ET 200SP CPU                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>6ES7591-3AA00-0AA0</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           | <b>SIMATIC ET 200SP, spare part server module</b><br><br>For ET 200SP                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>6ES7193-6PA00-0AA0</b> |

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

# Distributed Controllers

based on ET 200SP  
Standard CPUs

## CPU 1512SP-1 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7512-1DM03-0AB0</b><br>CPU 1512SP-1 PN,<br>400 KB Prog., 2 MB Data                                                                           |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1512SP-1 PN                                                                                                                                    |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19 (FW V3.1) / V18 (FW V3.0)<br>or higher; with older TIA Portal<br>versions configurable as<br>6ES7 512-1DK01-0AB0                               |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 400 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 2 Mbyte                                                                                                                                            |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                             |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7512-1DM03-0AB0</b><br>CPU 1512SP-1 PN,<br>400 KB Prog., 2 MB Data                                                                                                              |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P3; opt. X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                         |
| • Number of ports                                                                   | 3; 1. integr. + 2. via BusAdapter                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128; In total, up to 512 distributed<br>I/O devices can be connected<br>via AS-i, PROFIBUS or PROFINET                                                                                |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1512SP-1 PN

#### Technical specifications

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7512-1DM03-0AB0</b><br>CPU 1512SP-1 PN,<br>400 KB Prog., 2 MB Data                                                          |
| <b>2. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                  |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                         | <b>6ES7512-1DM03-0AB0</b><br>CPU 1512SP-1 PN,<br>400 KB Prog., 2 MB Data |
| <b>Ambient conditions</b>                              |                                                                          |
| <b>Ambient temperature during operation</b>            |                                                                          |
| • horizontal installation, min.                        | -30 °C; No condensation                                                  |
| • horizontal installation, max.                        | 60 °C                                                                    |
| • vertical installation, min.                          | -30 °C; No condensation                                                  |
| • vertical installation, max.                          | 50 °C                                                                    |
| <b>Altitude during operation relating to sea level</b> |                                                                          |
| • Installation altitude above sea level, max.          | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual   |
| <b>Configuration</b>                                   |                                                                          |
| <b>Configuration/programming</b>                       |                                                                          |
| <b>Programming language</b>                            |                                                                          |
| - LAD                                                  | Yes                                                                      |
| - FBD                                                  | Yes                                                                      |
| - STL                                                  | Yes                                                                      |
| - SCL                                                  | Yes                                                                      |
| - CFC                                                  | Yes                                                                      |
| - GRAPH                                                | Yes                                                                      |
| <b>Know-how protection</b>                             |                                                                          |
| • User program protection/ password protection         | Yes                                                                      |
| • Copy protection                                      | Yes                                                                      |
| • Block protection                                     | Yes                                                                      |
| <b>Access protection</b>                               |                                                                          |
| • protection of confidential configuration data        | Yes                                                                      |
| • Protection level: Write protection                   | Yes                                                                      |
| • Protection level: Read/write protection              | Yes                                                                      |
| • Protection level: Write protection for Failsafe      | No                                                                       |
| • Protection level: Complete protection                | Yes                                                                      |
| • User administration                                  | Yes; device-wide                                                         |
| <b>Dimensions</b>                                      |                                                                          |
| Width                                                  | 100 mm                                                                   |
| Height                                                 | 117 mm                                                                   |
| Depth                                                  | 75 mm                                                                    |
| <b>Weights</b>                                         |                                                                          |
| 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.

##### **SIMATIC DP, CPU 1514SP-2 PN for ET 200SP**

Central processing unit with 600 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface. Observe the approvals and certificates according to entry 109818872 at [support.industry.siemens.com](http://support.industry.siemens.com)!

**6ES7514-2DN03-0AB0**

##### **Accessories**

**SIMATIC DP, CM PROFIBUS DP**  
For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

##### **SIMATIC Memory Card**

**SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**  
3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

**SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**  
3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

**SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**  
3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

**SIMATIC S7, memory card for S7-1x00 CPU**  
3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

**SIMATIC S7, memory card for S7-1x 00 CPU**  
3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

**SIMATIC S7, memory card for S7-1x 00 CPU**  
3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

##### **DIN rail 35 mm**

**SIMATIC, DIN rail 35 mm**  
Length: 483 mm for 19" cabinets

**6ES710-8MA11**

**SIMATIC, DIN rail 35 mm**  
Length: 530 mm for 600 mm cabinets

**6ES710-8MA21**

**SIMATIC, DIN rail 35 mm**  
Length: 830 mm for 900 mm cabinets

**6ES710-8MA31**

**SIMATIC, DIN rail 35 mm**  
Length 2 m

**6ES710-8MA41**

**SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail**

Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit

**6ES7590-5AA00-0AA0**

**SIMATIC ET 200SP, BA 2xRJ45 BusAdapter**

2 RJ45 sockets

**6ES7193-6AR00-0AA0**

**SIMATIC ET 200SP, BA 2xFC BusAdapter**

2x FastConnect connection

**6ES7193-6AF00-0AA0**

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1514SP-2 PN

| Ordering data                                                                                                                                                                                                                             | Article No.        |                                                                                                                                                                                                                                                                                                                   | Article No.        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP,<br/>BA 2xSCRJ BusAdapter</b><br>2 SCRJ FO connections                                                                                                                                                                | 6ES7193-6AP00-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 50 units.                                                                         | 6GK1901-1BB20-2AE0 |
| <b>SIMATIC ET 200SP,<br/>BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x RJ45 connection                                                                                                         | 6ES7193-6AP20-0AA0 |                                                                                                                                                                                                                                                                                                                   |                    |
| <b>SIMATIC ET 200SP,<br/>BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x FastConnect (FC) connection                                                                                              | 6ES7193-6AP40-0AA0 | <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                                                                                                                        |                    |
| <b>SIMATIC BA 2xLC BusAdapter</b><br>2x LC glass fiber-optic cable<br>connections                                                                                                                                                         | 6ES7193-6AG00-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 1 unit.                                                                         | 6GK1901-1BB10-2AA0 |
| <b>SIMATIC BusAdapter:<br/>BA LC/RJ45</b><br>Media converter glass FOC/CU<br>1x LC FO connection and<br>1x RJ45 connection                                                                                                                | 6ES7193-6AG20-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 10 units.                                                                       | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC BusAdapter: BA LC/FC</b><br>Media converter glass FOC/CU<br>1x LC FO connection and<br>1x FastConnect (FC) connection                                                                                                          | 6ES7193-6AG40-0AA0 | <b>Industrial Ethernet FastConnect<br/>RJ45 plug 180 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>180° cable outlet<br>1 pack = 50 units.                                                                       | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP,<br/>160 reference designation labels</b><br>10 sheets (160 labels), for BA,<br>BU, IM and I/O modules                                                                                                                | 6ES7193-6LF30-0AW0 |                                                                                                                                                                                                                                                                                                                   |                    |
| <b>Labeling strips</b>                                                                                                                                                                                                                    |                    |                                                                                                                                                                                                                                                                                                                   |                    |
| <b>SIMATIC ET 200SP,<br/>500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                                        | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FC TP<br/>standard cable, GP 2x2<br/>(PROFINET type A)</b><br>TP installation cable for connection<br>to IE FC RJ45 2x2, for universal use,<br>4-wire, shielded Cat5e,<br>sold by the meter, delivery unit<br>maximum length of 4000 m,<br>minimum order quantity 20 m.                    | 6XV1840-2AH10      |
| <b>SIMATIC ET 200SP,<br/>500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                                            | 6ES7193-6LR10-0AG0 |                                                                                                                                                                                                                                                                                                                   |                    |
| <b>SIMATIC ET 200SP,<br/>1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated,<br>paper, 180 g/sqm                                                                                                                        | 6ES7193-6LA10-0AA0 | <b>Industrial Ethernet FC TP trailing<br/>cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection<br>to FC outlet RJ 45, for use in cable<br>carriers, 4-wire, shielded, Cat5e,<br>sold by the meter<br>(4 million bending cycles)<br>Delivery unit max. 2000 m,<br>minimum order quantity 20 m. | 6XV1840-3AH10      |
| <b>SIMATIC ET 200SP,<br/>1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated,<br>paper, 180 g/sqm                                                                                                                            | 6ES7193-6LA10-0AG0 | <b>Industrial Ethernet FC TP marine<br/>cable</b><br>TP installation cable for connection<br>to FC outlet RJ45, marine certified,<br>4-wire, shielded, Cat5e,<br>sold by the meter, delivery unit<br>maximum length of 1000 m,<br>minimum order quantity 20 m.                                                    | 6XV1840-4AH10      |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                                   |                    | <b>Industrial Ethernet FastConnect<br/>stripping tool</b><br>Stripping tool for fast stripping of<br>insulation from the IE FastConnect<br>cables.                                                                                                                                                                | 6GK1901-1GA00      |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                                                   |                    |
| <b>Industrial Ethernet FastConnect<br/>RJ45 plug 90 2x2</b><br>RJ45 plug-in connector<br>(10/100 Mbps), with rugged<br>metal enclosure and<br>FC connection technology,<br>for IE FC cable 2x2;<br>90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                                                   |                    |

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1514SP-2 PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Article No.               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Article No.                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>Manuals for ET 200SP distributed I/O system</b><br><br>ET 200SP library:<br>ET 200SP Manual Collection, comprising system manual, product information, and device manuals<br><br>Manuals can be downloaded from the Internet as PDF files under <a href="https://www.siemens.com/simatic-docu">https://www.siemens.com/simatic-docu</a> .                                                                                                                                                                                                                                                                                                                                     |                           | <b>SIMATIC STEP 7 Professional V20; floating license</b><br><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                            | <b>6ES7822-1AA24-0YA5</b>                                  |
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br><br>Consignee email address required for delivery.                                                                                                                                                                                                                                                                                                                                                                                                    | <b>6ES7998-8XE01-8YE0</b> | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br>Consignee email address required for delivery | <b>6ES7822-1AE24-0YA5</b>                                  |
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br><br>Consignee email address required for delivery.<br><br>Current Manual Collection DVD and the three subsequent updates                                                                                                                                                               | <b>6ES7998-8XE01-8YE2</b> | <b>Spare parts</b><br><br><b>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</b><br><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit                                                                                                                                                                                                                                                                                                     | <b>6ES7193-4JB00-0AA0</b>                                  |
| <b>STEP 7 Professional V20</b><br><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br><br>Requirement:<br><br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br><br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br><br>Windows Server (64-bit)<br><br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br><br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC ET 200SP, spare part 5 covers</b><br><br>For BusAdapter interface of the ET 200SP CPU<br><br><b>SIMATIC ET 200SP, spare part server module</b><br><br>For ET 200SP                                                                                                                                                                                                                                                                                                                                                  | <b>6ES7591-3AA00-0AA0</b><br><br><b>6ES7193-6PA00-0AA0</b> |

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

# Distributed Controllers

based on ET 200SP  
Standard CPUs

## CPU 1514SP-2 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data                                                                         |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1514SP-2 PN                                                                                                                                    |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher                                                                                                         |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 600 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 3.5 Mbyte                                                                                                                                          |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                              |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data                                                                                                            |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                                     |
| • Number of ports                                                                   | 2; via BusAdapter                                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 256; in total, up to 1024 distributed<br>I/O devices can be connected via<br>AS-i, PROFIBUS or PROFINET                                                                               |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 256                                                                                                                                                                                   |
| - of which in line, max.                                                            | 256                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP  
Standard CPUs

### CPU 1514SP-2 PN

#### Technical specifications

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data                                                                                             |
| <b>2. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| • RJ 45 (Ethernet)                                                            | Yes; X2                                                                                                                                                                |
| • Number of ports                                                             | 1                                                                                                                                                                      |
| • integrated switch                                                           | No                                                                                                                                                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| • 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                                                                                                                                                                     |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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 1024 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 Security Class                                                     | 1                                                                                                                                                                      |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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                                                                                                                                                  |
| - PROFINET Security Class                                                     | SNMP Configuration and DCP Read Only                                                                                                                                   |

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data                                                        |
| <b>3. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 192; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                                               | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                                                                                                               |

## Distributed Controllers

based on ET 200SP

Standard CPUs

### CPU 1514SP-2 PN

#### Technical specifications

|                                                        |                                                                            |                                                      |                                                                            |
|--------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|
| Article number                                         | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data | Article number                                       | <b>6ES7514-2DN03-0AB0</b><br>CPU 1514SP-2 PN,<br>600 KB Prog., 3,5 MB Data |
| <b>Product functions/security</b>                      |                                                                            | <b>Know-how protection</b>                           |                                                                            |
| PROFINET Security Class                                | 1                                                                          | • User program protection/<br>password protection    | Yes                                                                        |
| signed firmware update                                 | Yes                                                                        | • Copy protection                                    | Yes                                                                        |
| Secure Boot                                            | Yes                                                                        | • Block protection                                   | Yes                                                                        |
| safely removing data                                   | Yes                                                                        |                                                      |                                                                            |
| <b>Ambient conditions</b>                              |                                                                            | <b>Access protection</b>                             |                                                                            |
| <b>Ambient temperature during operation</b>            |                                                                            | • protection of confidential<br>configuration data   | Yes                                                                        |
| • horizontal installation, min.                        | -30 °C; No condensation                                                    | • Protection level: Write protection                 | Yes                                                                        |
| • horizontal installation, max.                        | 60 °C                                                                      | • Protection level: Read/write<br>protection         | Yes                                                                        |
| • vertical installation, min.                          | -30 °C; No condensation                                                    | • Protection level: Write protection for<br>Failsafe | No                                                                         |
| • vertical installation, max.                          | 50 °C                                                                      | • Protection level: Complete<br>protection           | Yes                                                                        |
| <b>Altitude during operation relating to sea level</b> |                                                                            | • User administration                                | Yes; device-wide and centralized                                           |
| • Installation altitude above sea level,<br>max.       | 5 000 m; Restrictions for installation<br>altitudes > 2 000 m, see manual  | • Number of users                                    | 100                                                                        |
| <b>Configuration</b>                                   |                                                                            | <b>Dimensions</b>                                    |                                                                            |
| <b>Configuration/programming</b>                       |                                                                            | Width                                                | 100 mm                                                                     |
| <b>Programming language</b>                            |                                                                            | Height                                               | 117 mm                                                                     |
| - LAD                                                  | Yes                                                                        | Depth                                                | 75 mm                                                                      |
| - FBD                                                  | Yes                                                                        |                                                      |                                                                            |
| - STL                                                  | Yes                                                                        | <b>Weights</b>                                       |                                                                            |
| - SCL                                                  | Yes                                                                        | Weight, approx.                                      | 265 g                                                                      |
| - CFC                                                  | Yes                                                                        |                                                      |                                                                            |
| - GRAPH                                                | Yes                                                                        |                                                      |                                                                            |

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1510SP-1 PN

#### 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 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)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous 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 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

200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required  
Temperature range -40 ... +60 °C

200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required  
Temperature range -40 ... +70 °C; No BusAdapter can be inserted

##### Accessories

##### BA 2xRJ45 BusAdapter

(Extended temperature range and exposure to environmental substances)

##### BA 2xFC BusAdapter for increased vibration and EMC loads

(Extended temperature range and exposure to environmental substances)

6AG1510-1DK03-2AB0

6AG1510-1DK03-7AB0

6AG1193-6AR00-7AA0

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

##### SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

##### Other accessories

6AG1901-1BB10-7AA0

6AG1193-6AA00-0AA0

6AG1193-6AB00-0AA0

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                                                                 | <b>6AG1510-1DK03-2AB0</b>                                                                            | <b>6AG1510-1DK03-7AB0</b>                                                                            |
| Based on                                                                       | <b>6ES7510-1DK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP-1 PN                                      | <b>6ES7510-1DK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP-1 PN                                      |
| <b>Ambient conditions</b>                                                      |                                                                                                      |                                                                                                      |
| <b>Ambient temperature during operation</b>                                    |                                                                                                      |                                                                                                      |
| • horizontal installation, min.                                                | -40 °C; = Tmin (incl. condensation/frost)                                                            | -40 °C; = Tmin (incl. condensation/frost)                                                            |
| • horizontal installation, max.                                                | 60 °C; = Tmax                                                                                        | 70 °C; = Tmax                                                                                        |
| • vertical installation, min.                                                  | -40 °C; = Tmin                                                                                       | -40 °C; = Tmin                                                                                       |
| • vertical installation, max.                                                  | 50 °C; = Tmax                                                                                        | 50 °C; = Tmax                                                                                        |
| <b>Altitude during operation relating to sea level</b>                         |                                                                                                      |                                                                                                      |
| • Installation altitude above sea level, max.                                  | 5 000 m;<br>Restrictions for installation altitudes > 2 000 m, see manual                            | 5 000 m;<br>Restrictions for installation altitudes > 2 000 m, see manual                            |
| <b>Relative humidity</b>                                                       |                                                                                                      |                                                                                                      |
| • With condensation, tested in accordance with IEC 60068-2-38, max.            | 100 %;<br>RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation | 100 %;<br>RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation |
| <b>Resistance</b>                                                              |                                                                                                      |                                                                                                      |
| <b>Coolants and lubricants</b>                                                 |                                                                                                      |                                                                                                      |
| - 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                                                        |
| <b>Use in stationary industrial systems</b>                                    |                                                                                                      |                                                                                                      |
| - to biologically active substances according to EN 60721-3-3                  | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request   | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request   |
| - to chemically active substances according to EN 60721-3-3                    | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *             | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *             |
| - to mechanically active substances according to EN 60721-3-3                  | Yes; Class 3S4 incl. sand, dust, *                                                                   | Yes; Class 3S4 incl. sand, dust, *                                                                   |
| - Against mechanical environmental conditions acc. to EN 60721-3-3             | Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)      |                                                                                                      |
| <b>Use on land craft, rail vehicles and special-purpose vehicles</b>           |                                                                                                      |                                                                                                      |
| - Against mechanical environmental conditions acc. to EN 60721-3-5             |                                                                                                      |                                                                                                      |
| - against mechanical environmental conditions in agriculture acc. to ISO 15003 |                                                                                                      |                                                                                                      |
| <b>Use on ships/at sea</b>                                                     |                                                                                                      |                                                                                                      |
| - to biologically active substances according to EN 60721-3-6                  | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                     | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                     |
| - to chemically active substances according to EN 60721-3-6                    | 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; *                                                                   |
| - Against mechanical environmental conditions acc. to EN 60721-3-6             | Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)       |                                                                                                      |

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1510SP-1 PN

#### Technical specifications

|                                                                                                                         |                                                                                                                                                                                     |                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                                                          | <b>6AG1510-1DK03-2AB0</b>                                                                                                                                                           | <b>6AG1510-1DK03-7AB0</b>                                                                                                                                                           |
| Based on                                                                                                                | <b>6ES7510-1DK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP-1 PN                                                                                                                     | <b>6ES7510-1DK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP-1 PN                                                                                                                     |
| <b>Usage in industrial process technology</b>                                                                           |                                                                                                                                                                                     |                                                                                                                                                                                     |
| - Against chemically active substances acc. to EN 60654-4                                                               | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           |
| - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                            | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |
| <b>Remark</b>                                                                                                           |                                                                                                                                                                                     |                                                                                                                                                                                     |
| - 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!                                                                                        |
| <b>Conformal coating</b>                                                                                                |                                                                                                                                                                                     |                                                                                                                                                                                     |
| • Coatings for printed circuit board assemblies acc. to EN 61086                                                        | Yes; Class 2 for high reliability                                                                                                                                                   | Yes; Class 2 for high reliability                                                                                                                                                   |
| • Protection against fouling acc. to EN 60664-3                                                                         | Yes; Type 1 protection                                                                                                                                                              | Yes; Type 1 protection                                                                                                                                                              |
| • Military testing according to MIL-I-46058C, Amendment 7                                                               | Yes; Discoloration of coating possible during service life                                                                                                                          | Yes; Discoloration of coating possible during service life                                                                                                                          |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A                                                                                                                                                     | Yes; Conformal coating, Class A                                                                                                                                                     |

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1512SP-1 PN

#### Overview



- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with average 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 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)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous 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 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)

400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required  
Temperature range -40 ... +60 °C;

**6AG1512-1DM03-2AB0**

400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required  
Temperature range -40 ... +70 °C; No BusAdapter can be inserted

**6AG1512-1DM03-7AB0**

##### Accessories

##### BA 2xRJ45 BusAdapter

(Extended temperature range and exposure to environmental substances)

**6AG1193-6AR00-7AA0**

##### BA 2xFC BusAdapter 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 with maximum width of 172 mm

**6AG1193-6AA00-0AA0**

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

**6AG1193-6AB00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

##### Other accessories

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

## Distributed Controllers

based on ET 200SP  
SIPLUS standard CPUs

### SIPLUS CPU 1512SP-1 PN

#### Technical specifications

| Article number                                                                                                                                                                                                                                                                                                                                                          | <b>6AG1512-1DM03-2AB0</b>                                                                                                                                                                                                                                                                                                             | <b>6AG1512-1DM03-7AB0</b>                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Based on                                                                                                                                                                                                                                                                                                                                                                | <b>6ES7512-1DM03-0AB0</b>                                                                                                                                                                                                                                                                                                             | <b>6ES7512-1DM03-0AB0</b>                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                         | SIPLUS ET 200SP CPU 1512SP-1 PN                                                                                                                                                                                                                                                                                                       | SIPLUS ET 200SP CPU 1512SP-1 PN                                                                                                                                                                                                      |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <b>Ambient temperature during operation</b>                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>                                                                                                                                                                        | -40 °C; = Tmin (incl. condensation/frost)<br>60 °C; = Tmax<br>-40 °C; = Tmin<br>50 °C; = Tmax                                                                                                                                                                                                                                         | -40 °C; = Tmin (incl. condensation/frost)<br>70 °C; = Tmax<br>-40 °C; = Tmin<br>50 °C; = Tmax                                                                                                                                        |
| <b>Altitude during operation relating to sea level</b>                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>                                                                                                                                                                                                                                                                           | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                                                                                                                                                                                                                                                                | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                                                                                                                                                               |
| <b>Relative humidity</b>                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>                                                                                                                                                                                                                                                     | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                                                                                                                                                     | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                                                    |
| <b>Resistance</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <b>Coolants and lubricants</b>                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>                                                                                                                                                                                                                                                           | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                                                                                                                                         | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                                        |
| <b>Use in stationary industrial systems</b>                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-3</li> <li>to chemically active substances according to EN 60721-3-3</li> <li>to mechanically active substances according to EN 60721-3-3</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-3</li> </ul>                                         | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request<br>Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *<br>Yes; Class 3S4 incl. sand, dust, *<br>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0) | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request<br>Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *<br>Yes; Class 3S4 incl. sand, dust, * |
| <b>Use on ships/at sea</b>                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>to biologically active substances according to EN 60721-3-6</li> <li>to chemically active substances according to EN 60721-3-6</li> <li>to mechanically active substances according to EN 60721-3-6</li> <li>Against mechanical environmental conditions acc. to EN 60721-3-6</li> </ul>                                         | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)<br>Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *<br>Yes; Class 6S3 incl. sand, dust; *<br>Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)                                   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)<br>Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *<br>Yes; Class 6S3 incl. sand, dust; *                                   |
| <b>Usage in industrial process technology</b>                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Against chemically active substances acc. to EN 60654-4</li> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>                                                                                                                                                           | Yes; Class 3 (excluding trichlorethylene)<br>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)<br>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)     |
| <b>Remark</b>                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>                                                                                                                                                                                                             | * 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!                                                                                                                                         |
| <b>Conformal coating</b>                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Military testing according to MIL-I-46058C, Amendment 7</li> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul> | Yes; Class 2 for high reliability<br>Yes; Type 1 protection<br>Yes; Discoloration of coating possible during service life<br>Yes; Conformal coating, Class A                                                                                                                                                                          | Yes; Class 2 for high reliability<br>Yes; Type 1 protection<br>Yes; Discoloration of coating possible during service life<br>Yes; Conformal coating, Class A                                                                         |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

#### 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 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 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.

##### **SIMATIC DP, CPU 1510SP F-1 PN for ET 200SP**

Central processing unit with 300 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2  
Observe the approvals and certificates according to entry 109817615 at [support.industry.siemens.com!](http://support.industry.siemens.com!)

**6ES7510-1SK03-0AB0**

#### Accessories

##### **SIMATIC DP, CM PROFIBUS DP**

For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

#### SIMATIC Memory Card

##### **SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**

3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU**

3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

#### DIN rail 35 mm

##### **SIMATIC, DIN rail 35 mm**

Length: 483 mm for 19" cabinets

**6ES7510-8MA11**

##### **SIMATIC, DIN rail 35 mm**

Length: 530 mm for 600 mm cabinets

**6ES7510-8MA21**

##### **SIMATIC, DIN rail 35 mm**

Length: 830 mm for 900 mm cabinets

**6ES7510-8MA31**

##### **SIMATIC, DIN rail 35 mm**

Length 2 m

**6ES7510-8MA41**

##### **SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail**

Absolutely necessary for the 2000 mm mounting rail  
20 units per packing unit

**6ES7590-5AA00-0AA0**

##### **SIMATIC ET 200SP, BA 2xRJ45 BusAdapter**

2 RJ45 sockets

**6ES7193-6AR00-0AA0**

##### **SIMATIC ET 200SP, BA 2xFC BusAdapter**

2x FastConnect connection

**6ES7193-6AF00-0AA0**

##### **SIMATIC ET 200SP, BA 2xSCRJ BusAdapter**

2 SCRJ FO connections

**6ES7193-6AP00-0AA0**

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

| Ordering data                                                                                                                                                                                                          | Article No.        |                                                                                                                                                                                                                                                                                                                              | Article No.        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x RJ45 connection                                                                                          | 6ES7193-6AP20-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 10 units.                                                                                                     | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x FastConnect (FC) connection                                                                               | 6ES7193-6AP40-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 50 units.                                                                                                     | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP, 160 reference designation labels</b><br>10 sheets (160 labels), for BA, BU, IM and I/O modules                                                                                                    | 6ES7193-6LF30-0AW0 | <b>Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A)</b><br>TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.                                                      | 6XV1840-2AH10      |
| <b>Labeling strips</b>                                                                                                                                                                                                 |                    | <b>Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.                                 | 6XV1840-3AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                         | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FC TP marine cable</b><br>TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.                                                                                  | 6XV1840-4AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                             | 6ES7193-6LR10-0AG0 | <b>Industrial Ethernet FastConnect stripping tool</b><br>Stripping tool for fast stripping of insulation from the IE FastConnect cables.                                                                                                                                                                                     | 6GK1901-1GA00      |
| <b>SIMATIC ET 200SP, 1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                            | 6ES7193-6LA10-0AA0 | <b>Manuals for ET 200SP distributed I/O system</b><br>ET 200SP library:<br>ET 200SP Manual Collection, comprising system manual, product information, and device manuals<br>Manuals are available as PDF files on the Internet under <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a> . |                    |
| <b>SIMATIC ET 200SP, 1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                                | 6ES7193-6LA10-0AG0 | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br>Consignee email address required for delivery.                                                        | 6ES7998-8XE01-8YE0 |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                |                    |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 50 units. | 6GK1901-1BB20-2AE0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                             |                    |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 1 unit. | 6GK1901-1BB10-2AA0 |                                                                                                                                                                                                                                                                                                                              |                    |

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

# Distributed Controllers

based on ET 200SP

Fail-safe CPUs

## CPU 1510SP F-1 PN

### Ordering data

### Article No.

### Article No.

#### SIMATIC Manual Collection DL in 5 languages<sup>1)</sup>

Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice. Consignee email address required for delivery.

6ES7998-8XE01-8YE2

#### STEP 7 Professional V20

Target system:  
SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC

Requirement:

- Windows 10 (64-bit)
  - Windows 10 Professional Version 22H2
  - Windows 10 Enterprise Version 22H2
  - Windows 10 Enterprise 2019 LTSC & 2021 LTSC

- Windows 11 (64-bit)
  - Windows 11 Professional Version 22H2 & 23H2
  - Windows 11 Enterprise Version 22H2 & 23H2

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

Type of delivery:

9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download

#### SIMATIC STEP 7 Professional V20; floating license

Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.

The system requirements specification can be found at <https://www.siemens.com/compatool>

6ES7822-1AA24-0YA5

#### SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup>

Engineering software in the TIA Portal; software, documentation and license key for downloading<sup>1)</sup>; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.

The system requirements specification can be found at <https://www.siemens.com/compatool>

Consignee email address required for delivery

6ES7822-1AE24-0YA5

#### STEP 7 Safety Advanced V20

Task:

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

Requirement:

STEP 7 Professional V20

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.

#### SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive

Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB

6ES7833-1FA24-0YA5

#### SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download<sup>1)</sup>

Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery

6ES7833-1FA24-0YH5

#### Spare parts

#### Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F

PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit

6ES7193-4JB00-0AA0

#### SIMATIC ET 200SP, spare part 5 covers

For BusAdapter interface of the ET 200SP CPU

6ES7591-3AA00-0AA0

#### SIMATIC ET 200SP, spare part server module

For ET 200SP

6ES7193-6PA00-0AA0

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

# Distributed Controllers

based on ET 200SP

Fail-safe CPUs

## CPU 1510SP F-1 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7510-1SK03-0AB0</b><br>CPU1510SP F-1 PN, 300KB Prog.,<br>1MB Data                                                                            |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1510SP F-1 PN                                                                                                                                  |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher; configurable with older<br>TIA Portal versions as<br>6ES7510-1SJ01-0AB0                                |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 300 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 1 Mbyte                                                                                                                                            |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                              |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7510-1SK03-0AB0</b><br>CPU1510SP F-1 PN, 300KB Prog.,<br>1MB Data                                                                                                               |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P3; opt. X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                         |
| • Number of ports                                                                   | 3; 1. integr. + 2. via BusAdapter                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128; In total, up to 512 distributed<br>I/O devices can be connected<br>via AS-i, PROFIBUS or PROFINET                                                                                |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

#### Technical specifications

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7510-1SK03-0AB0</b><br>CPU1510SP F-1 PN, 300KB Prog.,<br>1MB Data                                                           |
| <b>2. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                  |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                                               | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                                                            | <b>6ES7510-1SK03-0AB0</b><br>CPU1510SP F-1 PN, 300KB Prog.,<br>1MB Data |
| <b>Standards, approvals, certificates</b>                                                 |                                                                         |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                         |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                         |
| - Low demand mode: PFDavg in accordance with SIL3                                         | < 2.00E-05                                                              |
| - High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09                                                              |
| <b>Product functions/security</b>                                                         |                                                                         |
| PROFINET Security Class                                                                   | 1                                                                       |
| signed firmware update                                                                    | Yes                                                                     |
| Secure Boot                                                                               | Yes                                                                     |
| safely removing data                                                                      | Yes                                                                     |
| <b>Ambient conditions</b>                                                                 |                                                                         |
| <b>Ambient temperature during operation</b>                                               |                                                                         |
| • horizontal installation, min.                                                           | -30 °C; No condensation                                                 |
| • horizontal installation, max.                                                           | 60 °C                                                                   |
| • vertical installation, min.                                                             | -30 °C; No condensation                                                 |
| • vertical installation, max.                                                             | 50 °C                                                                   |
| <b>Altitude during operation relating to sea level</b>                                    |                                                                         |
| • Installation altitude above sea level, max.                                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual  |
| <b>Configuration</b>                                                                      |                                                                         |
| <b>Configuration/programming</b>                                                          |                                                                         |
| <b>Programming language</b>                                                               |                                                                         |
| - LAD                                                                                     | Yes; incl. failsafe                                                     |
| - FBD                                                                                     | Yes; incl. failsafe                                                     |
| - STL                                                                                     | Yes                                                                     |
| - SCL                                                                                     | Yes                                                                     |
| - CFC                                                                                     | No                                                                      |
| - GRAPH                                                                                   | Yes                                                                     |
| <b>Know-how protection</b>                                                                |                                                                         |
| • User program protection/ password protection                                            | Yes                                                                     |
| • Copy protection                                                                         | Yes                                                                     |
| • Block protection                                                                        | Yes                                                                     |
| <b>Access protection</b>                                                                  |                                                                         |
| • 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                                                                     |
| • User administration                                                                     | Yes; device-wide and centralized                                        |
| • Number of users                                                                         | 100                                                                     |
| <b>Dimensions</b>                                                                         |                                                                         |
| Width                                                                                     | 100 mm                                                                  |
| Height                                                                                    | 117 mm                                                                  |
| Depth                                                                                     | 75 mm                                                                   |
| <b>Weights</b>                                                                            |                                                                         |
| Weight, approx.                                                                           | 265 g                                                                   |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

#### 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 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
- 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.

##### **SIMATIC DP, CPU 1512SP F-1 PN for ET 200SP**

Central processing unit with 600 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!

**6ES7512-1SM03-0AB0**

#### Accessories

##### **SIMATIC DP, CM PROFIBUS DP for ET 200SP CPU**

Module with PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

#### **SIMATIC Memory Card**

##### **SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**

3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU**

3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

#### **DIN rail 35 mm**

##### **SIMATIC, DIN rail 35 mm**

Length: 483 mm for 19" cabinets

**6ES7510-8MA11**

##### **SIMATIC, DIN rail 35 mm**

Length: 530 mm for 600 mm cabinets

**6ES7510-8MA21**

##### **SIMATIC, DIN rail 35 mm**

Length: 830 mm for 900 mm cabinets

**6ES7510-8MA31**

##### **SIMATIC, DIN rail 35 mm**

Length 2 m

**6ES7510-8MA41**

##### **SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail**

Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit

**6ES7590-5AA00-0AA0**

##### **SIMATIC ET 200SP, BA 2xRJ45 BusAdapter**

2 RJ45 sockets

**6ES7193-6AR00-0AA0**

##### **SIMATIC ET 200SP, BA 2xFC BusAdapter**

2x FastConnect connection

**6ES7193-6AF00-0AA0**

##### **SIMATIC ET 200SP, BA 2xSCRJ BusAdapter**

2 SCRJ FO connections

**6ES7193-6AP00-0AA0**

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

| Ordering data                                                                                                                                                                                                          | Article No.        |                                                                                                                                                                                                                                                                                                                              | Article No.        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x RJ45 connection                                                                                          | 6ES7193-6AP20-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 10 units.                                                                                                     | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and<br>1x FastConnect (FC) connection                                                                               | 6ES7193-6AP40-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 50 units.                                                                                                     | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP, 1600 reference designation labels</b><br>10 sheets (160 labels), for BA, BU, IM and I/O modules                                                                                                   | 6ES7193-6LF30-0AW0 | <b>Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A)</b><br>TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.                                                      | 6XV1840-2AH10      |
| <b>Labeling strips</b>                                                                                                                                                                                                 |                    | <b>Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.                                 | 6XV1840-3AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                         | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FC TP marine cable</b><br>TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.                                                                                  | 6XV1840-4AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                             | 6ES7193-6LR10-0AG0 | <b>Industrial Ethernet FastConnect stripping tool</b><br>Stripping tool for fast stripping of insulation from the IE FastConnect cables.                                                                                                                                                                                     | 6GK1901-1GA00      |
| <b>SIMATIC ET 200SP, 1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                            | 6ES7193-6LA10-0AA0 | <b>Manuals for ET 200SP distributed I/O system</b><br>ET 200SP library:<br>ET 200SP Manual Collection, comprising system manual, product information, and device manuals<br>Manuals are available as PDF files on the Internet under <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a> . |                    |
| <b>SIMATIC ET 200SP, 1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                                | 6ES7193-6LA10-0AG0 | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br>Consignee email address required for delivery.                                                        | 6ES7998-8XE01-8YE0 |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                |                    |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 50 units. | 6GK1901-1BB20-2AE0 |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                             |                    |                                                                                                                                                                                                                                                                                                                              |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 1 unit. | 6GK1901-1BB10-2AA0 |                                                                                                                                                                                                                                                                                                                              |                    |

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

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Article No.        | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br>Consignee email address required for delivery.<br>Current Manual Collection DVD and the three subsequent updates                                                                                                                                               | 6ES7998-8XE01-8YE2 | <b>STEP 7 Safety Advanced V20</b><br>Task:<br>Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco<br>Requirement:<br>STEP 7 Professional V20<br>Note:<br>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. |
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                    | <b>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive</b><br>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F<br>Content: 1x USB                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download<sup>1)</sup></b><br>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery                                                                                                                                                                                                                                 |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                          | 6ES7822-1AA24-0YA5 | <b>Spare parts</b><br><b>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</b><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery                                                                                                                                   | 6ES7822-1AE24-0YA5 | <b>SIMATIC ET 200SP, spare part 5 covers</b><br>For BusAdapter interface of the ET 200SP CPU<br><b>SIMATIC ET 200SP, spare part server module</b><br>For ET 200SP                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>6ES7193-4JB00-0AA0</b><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>6ES7591-3AA00-0AA0</b><br>For BusAdapter interface of the ET 200SP CPU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>6ES7193-6PA00-0AA0</b><br>For ET 200SP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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

# Distributed Controllers

based on ET 200SP

Fail-safe CPUs

## CPU 1512SP F-1 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7512-1SM03-0AB0</b><br>CPU 1512SP F-1 PN,<br>600 KB Prog./2 MB Data                                                                          |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1512SP F-1 PN                                                                                                                                  |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19 (FW V3.1) / V18 (FW V3.0)<br>or higher; with older TIA Portal<br>versions configurable as<br>6ES7512-1SK01-0AB0                                |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 600 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 2 Mbyte                                                                                                                                            |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                             |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7512-1SM03-0AB0</b><br>CPU 1512SP F-1 PN,<br>600 KB Prog./2 MB Data                                                                                                             |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P3; opt. X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                         |
| • Number of ports                                                                   | 3; 1. integr. + 2. via BusAdapter                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128; In total, up to 512 distributed<br>I/O devices can be connected<br>via AS-i, PROFIBUS or PROFINET                                                                                |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

#### Technical specifications

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7512-1SM03-0AB0</b><br>CPU 1512SP F-1 PN,<br>600 KB Prog./2 MB Data                                                         |
| <b>2. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                  |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                                                            | <b>6ES7512-1SM03-0AB0</b><br>CPU 1512SP F-1 PN,<br>600 KB Prog./2 MB Data |
| <b>Standards, approvals, certificates</b>                                                 |                                                                           |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                           |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                           |
| - Low demand mode: PFDavg in accordance with SIL3                                         | < 2.00E-05                                                                |
| - High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09                                                                |
| <b>Ambient conditions</b>                                                                 |                                                                           |
| <b>Ambient temperature during operation</b>                                               |                                                                           |
| • horizontal installation, min.                                                           | -30 °C; No condensation                                                   |
| • horizontal installation, max.                                                           | 60 °C                                                                     |
| • vertical installation, min.                                                             | -30 °C; No condensation                                                   |
| • vertical installation, max.                                                             | 50 °C                                                                     |
| <b>Altitude during operation relating to sea level</b>                                    |                                                                           |
| • Installation altitude above sea level, max.                                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual    |
| <b>Configuration</b>                                                                      |                                                                           |
| <b>Configuration/programming</b>                                                          |                                                                           |
| <b>Programming language</b>                                                               |                                                                           |
| - LAD                                                                                     | Yes; incl. failsafe                                                       |
| - FBD                                                                                     | Yes; incl. failsafe                                                       |
| - STL                                                                                     | Yes                                                                       |
| - SCL                                                                                     | Yes                                                                       |
| - CFC                                                                                     | Yes; either CFC or failsafe functionality                                 |
| - GRAPH                                                                                   | Yes                                                                       |
| <b>Know-how protection</b>                                                                |                                                                           |
| • User program protection/ password protection                                            | Yes                                                                       |
| • Copy protection                                                                         | Yes                                                                       |
| • Block protection                                                                        | Yes                                                                       |
| <b>Access protection</b>                                                                  |                                                                           |
| • 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                                                                       |
| • User administration                                                                     | Yes; device-wide                                                          |
| <b>Dimensions</b>                                                                         |                                                                           |
| Width                                                                                     | 100 mm                                                                    |
| Height                                                                                    | 117 mm                                                                    |
| Depth                                                                                     | 75 mm                                                                     |
| <b>Weights</b>                                                                            |                                                                           |
| Weight, approx.                                                                           | 265 g                                                                     |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1514SP F-2 PN

#### 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 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
- 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.

##### **SIMATIC DP, CPU 1514SP F-2 PN for ET 200SP**

Central processing unit with 900 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface Observe the approvals and certificates according to entry 109818872 at [support.industry.siemens.com!](http://support.industry.siemens.com!)

**6ES7514-2SN03-0AB0**

##### **Accessories**

##### **SIMATIC DP, CM PROFIBUS DP**

For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

**6ES7545-5DA00-0AB0**

##### **SIMATIC Memory Card**

##### **SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS**

3.3 V Flash, 4 MB

**6ES7954-8LC04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 12 MB

**6ES7954-8LE04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS**

3.3 V Flash, 24 MB

**6ES7954-8LF04-0AA0**

##### **SIMATIC S7, memory card for S7-1x00 CPU**

3.3 V Flash, 256 MB

**6ES7954-8LL04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 2 GB

**6ES7954-8LP04-0AA0**

##### **SIMATIC S7, memory card for S7-1x 00 CPU**

3.3 V Flash, 32 GB

**6ES7954-8LT04-0AA0**

##### **DIN rail 35 mm**

##### **SIMATIC, DIN rail 35 mm**

Length: 483 mm for 19" cabinets

**6ES7510-8MA11**

##### **SIMATIC, DIN rail 35 mm**

Length: 530 mm for 600 mm cabinets

**6ES7510-8MA21**

##### **SIMATIC, DIN rail 35 mm**

Length: 830 mm for 900 mm cabinets

**6ES7510-8MA31**

##### **SIMATIC, DIN rail 35 mm**

Length 2 m

**6ES7510-8MA41**

##### **SIMATIC S7-1500, grounding screw**

For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit

**6ES7590-5AA00-0AA0**

SIMATIC ET 200SP, BA 2XRJ45 BusAdapter 2x RJ45 sockets

**6ES7193-6AR00-0AA0**

SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connections

**6ES7193-6AF00-0AA0**

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1514SP F-2 PN

| Ordering data                                                                                                                                                                                                          | Article No.        |                                                                                                                                                                                                                                                                                                                                    | Article No.        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SIMATIC ET 200SP, BA 2xSCRJ BusAdapter</b><br>2 SCRJ FO connections                                                                                                                                                 | 6ES7193-6AP00-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 10 units.                                                                                                           | 6GK1901-1BB10-2AB0 |
| <b>SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and 1x RJ45 connection                                                                                             | 6ES7193-6AP20-0AA0 | <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 50 units.                                                                                                           | 6GK1901-1BB10-2AE0 |
| <b>SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC</b><br>Media converter FOC-CU<br>1x SCRJ FO connection and 1x FastConnect (FC) connection                                                                                  | 6ES7193-6AP40-0AA0 | <b>Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A)</b><br>TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.                                                            | 6XV1840-2AH10      |
| <b>SIMATIC ET 200SP, 160 reference designation labels</b><br>10 sheets (160 labels), for BA, BU, IM and I/O modules                                                                                                    | 6ES7193-6LF30-0AW0 | <b>Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C)</b><br>TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.                                       | 6XV1840-3AH10      |
| <b>Labeling strips</b>                                                                                                                                                                                                 |                    | <b>Industrial Ethernet FC TP marine cable</b><br>TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.                                                                                        | 6XV1840-4AH10      |
| <b>SIMATIC ET 200SP, 500 labeling strips, light gray</b><br>Roll of 500 strips                                                                                                                                         | 6ES7193-6LR10-0AA0 | <b>Industrial Ethernet FastConnect stripping tool</b><br>Stripping tool for fast stripping of insulation from the IE FastConnect cables.                                                                                                                                                                                           | 6GK1901-1GA00      |
| <b>SIMATIC ET 200SP, 500 labeling strips, yellow</b><br>Roll of 500 strips                                                                                                                                             | 6ES7193-6LR10-0AG0 | <b>Manuals for ET 200SP distributed I/O system</b><br>ET 200SP library:<br>ET 200SP Manual Collection, comprising system manual, product information, and device manuals<br><br>Manuals are available as PDF files on the Internet under <a href="https://www.siemens.com/simatic-docu">https://www.siemens.com/simatic-docu</a> . |                    |
| <b>SIMATIC ET 200SP, 1000 labeling strips, light gray</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                            | 6ES7193-6LA10-0AA0 | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br>Consignee email address required for delivery.                                                              | 6ES7998-8XE01-8YE0 |
| <b>SIMATIC ET 200SP, 1000 labeling strips, yellow</b><br>10 sheets DIN A4, perforated, paper, 180 g/sqm                                                                                                                | 6ES7193-6LA10-0AG0 |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>IE FC RJ45 plugs</b>                                                                                                                                                                                                |                    |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 1 unit.   | 6GK1901-1BB20-2AA0 |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 10 units. | 6GK1901-1BB20-2AB0 |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 90 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet<br>1 pack = 50 units. | 6GK1901-1BB20-2AE0 |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>IE FC RJ45 plug 180</b>                                                                                                                                                                                             |                    |                                                                                                                                                                                                                                                                                                                                    |                    |
| <b>Industrial Ethernet FastConnect RJ45 plug 180 2x2</b><br>RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet<br>1 pack = 1 unit. | 6GK1901-1BB10-2AA0 |                                                                                                                                                                                                                                                                                                                                    |                    |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1514SP F-2 PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Article No.        | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br>Consignee email address required for delivery.                                                                                                                                                                                                                 | 6ES7998-8XE01-8YE2 | <b>STEP 7 Safety Advanced V20</b><br>Task:<br>Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco<br>Requirement:<br>STEP 7 Professional V20<br>Note:<br>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. |
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                    | <b>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive</b><br>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F<br>Content: 1x USB                                                                                                                                                                                                                                                                    |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                          | 6ES7822-1AA24-0YA5 | <b>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download<sup>1)</sup></b><br>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery                                                                                                                                                                                                                                 |
| <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery                                                                                                                                   | 6ES7822-1AE24-0YA5 | <b>Spare parts</b><br><b>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</b><br>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>SIMATIC ET 200SP, spare part 5 covers</b><br>For BusAdapter interface of the ET 200SP CPU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | <b>SIMATIC ET 200SP, spare part server module</b><br>For ET 200SP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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

# Distributed Controllers

based on ET 200SP

Fail-safe CPUs

## CPU 1514SP F-2 PN

### Technical specifications

|                                                              |                                                                                                                                                    |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                               | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data                                                                        |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1514SP F-2 PN                                                                                                                                  |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher                                                                                                         |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 900 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 3.5 Mbyte                                                                                                                                          |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                              |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data                                                                                                           |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                                     |
| • Number of ports                                                                   | 2; via BusAdapter                                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 256; in total, up to 1024 distributed<br>I/O devices can be connected via<br>AS-i, PROFIBUS or PROFINET                                                                               |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 256                                                                                                                                                                                   |
| - of which in line, max.                                                            | 256                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1514SP F-2 PN

#### Technical specifications

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data                                                                                            |
| <b>2. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| • RJ 45 (Ethernet)                                                            | Yes; X2                                                                                                                                                                |
| • Number of ports                                                             | 1                                                                                                                                                                      |
| • integrated switch                                                           | No                                                                                                                                                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| • 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                                                                                                                                                                     |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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 1024 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 Security Class                                                     | 1                                                                                                                                                                      |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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                                                                                                                                                  |
| - PROFINET Security Class                                                     | SNMP Configuration and DCP Read Only                                                                                                                                   |

|                                                                       |                                                                                                                                   |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                        | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data                                                       |
| <b>3. Interface</b>                                                   |                                                                                                                                   |
| <b>Interface types</b>                                                |                                                                                                                                   |
| • RS 485                                                              | Yes; Via CM DP module                                                                                                             |
| • Number of ports                                                     | 1                                                                                                                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| • PROFIBUS DP master                                                  | Yes                                                                                                                               |
| • PROFIBUS DP device                                                  | Yes                                                                                                                               |
| • SIMATIC communication                                               | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>                                             |                                                                                                                                   |
| • max. number of DP devices                                           | 125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                 |
| <b>Protocols</b>                                                      |                                                                                                                                   |
| <b>Number of connections</b>                                          |                                                                                                                                   |
| • Number of connections, max.                                         | 192; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                                                |                                                                                                                                   |
| <b>Media redundancy</b>                                               |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>                                          |                                                                                                                                   |
| • S7 routing                                                          | Yes                                                                                                                               |
| <b>OPC UA</b>                                                         |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                                               | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                   |                                                                                                                                   |
| 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                                                                                                                               |

## Distributed Controllers

based on ET 200SP

Fail-safe CPUs

### CPU 1514SP F-2 PN

#### Technical specifications

|                                                                                           |                                                                             |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Article number                                                                            | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data |
| <b>Standards, approvals, certificates</b>                                                 |                                                                             |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                             |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                             |
| - Low demand mode: PFDavg in accordance with SIL3                                         | < 2.00E-05                                                                  |
| - High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09                                                                  |
| <b>Product functions/security</b>                                                         |                                                                             |
| PROFINET Security Class                                                                   | 1                                                                           |
| signed firmware update                                                                    | Yes                                                                         |
| Secure Boot                                                                               | Yes                                                                         |
| safely removing data                                                                      | Yes                                                                         |
| <b>Ambient conditions</b>                                                                 |                                                                             |
| <b>Ambient temperature during operation</b>                                               |                                                                             |
| • horizontal installation, min.                                                           | -30 °C; No condensation                                                     |
| • horizontal installation, max.                                                           | 60 °C                                                                       |
| • vertical installation, min.                                                             | -30 °C; No condensation                                                     |
| • vertical installation, max.                                                             | 50 °C                                                                       |
| <b>Altitude during operation relating to sea level</b>                                    |                                                                             |
| • Installation altitude above sea level, max.                                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual      |

|                                                   |                                                                             |
|---------------------------------------------------|-----------------------------------------------------------------------------|
| Article number                                    | <b>6ES7514-2SN03-0AB0</b><br>CPU 1514SP F-2 PN,<br>900 Kb Prog. 3,5 Mb Data |
| <b>Configuration</b>                              |                                                                             |
| <b>Configuration/programming</b>                  |                                                                             |
| <b>Programming language</b>                       |                                                                             |
| - LAD                                             | Yes; incl. failsafe                                                         |
| - FBD                                             | Yes; incl. failsafe                                                         |
| - STL                                             | Yes                                                                         |
| - SCL                                             | Yes                                                                         |
| - CFC                                             | No                                                                          |
| - GRAPH                                           | Yes                                                                         |
| <b>Know-how protection</b>                        |                                                                             |
| • User program protection/ password protection    | Yes                                                                         |
| • Copy protection                                 | Yes                                                                         |
| • Block protection                                | Yes                                                                         |
| <b>Access protection</b>                          |                                                                             |
| • 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                                                                         |
| • User administration                             | Yes; device-wide and centralized                                            |
| • Number of users                                 | 100                                                                         |
| <b>Dimensions</b>                                 |                                                                             |
| Width                                             | 100 mm                                                                      |
| Height                                            | 117 mm                                                                      |
| Depth                                             | 75 mm                                                                       |
| <b>Weights</b>                                    |                                                                             |
| 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 configurations
- 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 device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous 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.

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 F-1 PN

**6AG1510-1SK03-2AB0**

(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 -40 ... +60 °C

##### Accessories

##### SIPLUS BA 2xRJ45 BusAdapter

**6AG1193-6AR00-7AA0**

##### SIPLUS BA 2xFC BusAdapter

**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 with maximum width of 172 mm

**6AG1193-6AA00-0AA0**

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

**6AG1193-6AB00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

##### Other accessories

See SIMATIC ET 200SP, CPU 1510 F-1 PN, page 7/23

## Distributed Controllers

based on ET 200SP  
SIPLUS fail-safe CPUs

### SIPLUS CPU 1510SP F-1 PN

#### Technical specifications

|                                                                     |                                                                                                    |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Article number                                                      | <b>6AG1510-1SK03-2AB0</b>                                                                          |
| Based on                                                            | <b>6ES7510-1SK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP F-1 PN                                  |
| <b>Ambient conditions</b>                                           |                                                                                                    |
| <b>Ambient temperature during operation</b>                         |                                                                                                    |
| • horizontal installation, min.                                     | -40 °C; = Tmin<br>(incl. condensation/frost)                                                       |
| • horizontal installation, max.                                     | 60 °C; = Tmax                                                                                      |
| • vertical installation, min.                                       | -40 °C; = Tmin                                                                                     |
| • vertical installation, max.                                       | 50 °C; = Tmax                                                                                      |
| <b>Altitude during operation relating to sea level</b>              |                                                                                                    |
| • Installation altitude above sea level, max.                       | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             |
| <b>Relative humidity</b>                                            |                                                                                                    |
| • With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation  |
| <b>Resistance</b>                                                   |                                                                                                    |
| <b>Coolants and lubricants</b>                                      |                                                                                                    |
| - Resistant to commercially available coolants and lubricants       | Yes; Incl. diesel and oil droplets in the air                                                      |
| <b>Use in stationary industrial systems</b>                         |                                                                                                    |
| - 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// 6AG1193-6AB00-0AA0)    |

|                                                                                                                         |                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                                                          | <b>6AG1510-1SK03-2AB0</b>                                                                                                                                                           |
| Based on                                                                                                                | <b>6ES7510-1SK03-0AB0</b><br>SIPLUS ET 200SP<br>CPU 1510SP F-1 PN                                                                                                                   |
| <b>Use on ships/at sea</b>                                                                                              |                                                                                                                                                                                     |
| - 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// 6AG1193-6AB00-0AA0)                                                                                     |
| <b>Usage in industrial process technology</b>                                                                           |                                                                                                                                                                                     |
| - 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) |
| <b>Remark</b>                                                                                                           |                                                                                                                                                                                     |
| - 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!                                                                                        |
| <b>Conformal coating</b>                                                                                                |                                                                                                                                                                                     |
| • 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 average requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- Supports PROFI-safe in centralized and distributed configurations
- 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 device for 125 PROFIBUS DP devices (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.

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 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

**6AG1512-1SK01-2AB0**

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

**6AG1512-1SK01-7AB0**

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

**6AG1512-1SM03-2AB0**

Temperature range -40...+0 °C;

**6AG1512-1SM03-7AB0**

600 KB work memory for program, 2 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required  
Temperature range -40...+70 °C; No BusAdapter can be inserted

##### Accessories

##### SIPLUS BA 2xRJ45 BusAdapter

**6AG1193-6AR00-7AA0**

##### SIPLUS BA 2xFC BusAdapter

**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 with maximum width of 172 mm

**6AG1193-6AA00-0AA0**

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

**6AG1193-6AB00-0AA0**

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

##### Other accessories

See SIMATIC ET 200SP, CPU 1512 F-1 PN, page 7/28

## Distributed Controllers

based on ET 200SP  
SIPLUS fail-safe CPUs

### SIPLUS CPU 1512SP F-1 PN

#### Technical specifications

| Article number                                                                 | 6AG1512-1SK01-2AB0                                                                                 | 6AG1512-1SK01-7AB0                                                                                 | 6AG1512-1SM03-2AB0                                                                                 | 6AG1512-1SM03-7AB0                                                                                 |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Based on                                                                       | 6ES7512-1SK01-0AB0                                                                                 | 6ES7512-1SK01-0AB0                                                                                 | 6ES7512-1SM03-0AB0                                                                                 | 6ES7512-1SM03-0AB0                                                                                 |
|                                                                                | SIPLUS ET 200SP<br>CPU 1512SP F-1PN                                                                | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                               | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                               | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                               |
| <b>Ambient conditions</b>                                                      |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| <b>Ambient temperature during operation</b>                                    |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| • horizontal installation, min.                                                | -25 °C; = Tmin<br>(incl. condensation/frost)                                                       | -40 °C; = Tmin<br>(incl. condensation/frost)                                                       | -40 °C; = Tmin<br>(incl. condensation/frost)                                                       | -40 °C; = Tmin<br>(incl. condensation/frost)                                                       |
| • horizontal installation, max.                                                | 60 °C; = Tmax                                                                                      | 70 °C; = Tmax                                                                                      | 60 °C; = Tmax                                                                                      | 70 °C; = Tmax                                                                                      |
| • vertical installation, min.                                                  | -25 °C; = Tmin                                                                                     | -40 °C; = Tmin                                                                                     | -40 °C; = Tmin                                                                                     | -40 °C; = Tmin                                                                                     |
| • vertical installation, max.                                                  | 50 °C; = Tmax                                                                                      | 50 °C; = Tmax                                                                                      | 50 °C; = Tmax                                                                                      | 50 °C; = Tmax                                                                                      |
| <b>Altitude during operation relating to sea level</b>                         |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| • Installation altitude above sea level, max.                                  | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             |
| <b>Relative humidity</b>                                                       |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| • With condensation, tested in accordance with IEC 60068-2-38, max.            | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation  | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation  | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation  | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation  |
| <b>Resistance</b>                                                              |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| <b>Coolants and lubricants</b>                                                 |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| - Resistant to commercially available coolants and lubricants                  | Yes; Incl. diesel and oil droplets in the air                                                      | No                                                                                                 | Yes; Incl. diesel and oil droplets in the air                                                      | Yes; Incl. diesel and oil droplets in the air                                                      |
| <b>Use in stationary industrial systems</b>                                    |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| - to biologically active substances according to EN 60721-3-3                  | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request |
| - to chemically active substances according to EN 60721-3-3                    | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           |
| - to mechanically active substances according to EN 60721-3-3                  | Yes; Class 3S4 incl. sand, dust, *                                                                 | Yes; Class 3S4 incl. sand, dust, *                                                                 | Yes; Class 3S4 incl. sand, dust, *                                                                 | Yes; Class 3S4 incl. sand, dust, *                                                                 |
| - 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// 6AG1193-6AB00-0AA0)    |                                                                                                    |
| <b>Use on land craft, rail vehicles and special-purpose vehicles</b>           |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| - Against mechanical environmental conditions acc. to EN 60721-3-5             | Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)                         |                                                                                                    |                                                                                                    |                                                                                                    |
| - against mechanical environmental conditions in agriculture acc. to ISO 15003 | Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)             |                                                                                                    |                                                                                                    |                                                                                                    |
| <b>Use on ships/at sea</b>                                                     |                                                                                                    |                                                                                                    |                                                                                                    |                                                                                                    |
| - to biologically active substances according to EN 60721-3-6                  | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                   |
| - to chemically active substances according to EN 60721-3-6                    | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *           |
| - to mechanically active substances according to EN 60721-3-6                  | Yes; Class 6S3 incl. sand, dust; *                                                                 | Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *                 | 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// 6AG1193-6AB00-0AA0)    |                                                                                                    |

## Distributed Controllers

based on ET 200SP  
SIPLUS fail-safe CPUs

### SIPLUS CPU 1512SP F-1 PN

#### Technical specifications

| Article number                                                                                                          | 6AG1512-1SK01-2AB0                                                                                                                                                                  | 6AG1512-1SK01-7AB0                                                                                                                                                                  | 6AG1512-1SM03-2AB0                                                                                                                                                                  | 6AG1512-1SM03-7AB0                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Based on                                                                                                                | 6ES7512-1SK01-0AB0                                                                                                                                                                  | 6ES7512-1SK01-0AB0                                                                                                                                                                  | 6ES7512-1SM03-0AB0                                                                                                                                                                  | 6ES7512-1SM03-0AB0                                                                                                                                                                  |
|                                                                                                                         | SIPLUS ET 200SP<br>CPU 1512SP F-1PN                                                                                                                                                 | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                                                                                                                | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                                                                                                                | SIPLUS ET 200SP<br>CPU 1512SP F-1 PN                                                                                                                                                |
| <b>Usage in industrial process technology</b>                                                                           |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |
| - Against chemically active substances acc. to EN 60654-4                                                               | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           |
| - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                            | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |
| <b>Remark</b>                                                                                                           |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |
| - Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04             | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        |
| <b>Conformal coating</b>                                                                                                |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |                                                                                                                                                                                     |
| • Coatings for printed circuit board assemblies acc. to EN 61086                                                        | Yes; Class 2 for high reliability                                                                                                                                                   | Yes; Class 2 for high reliability                                                                                                                                                   | Yes; Class 2 for high reliability                                                                                                                                                   | Yes; Class 2 for high reliability                                                                                                                                                   |
| • Protection against fouling acc. to EN 60664-3                                                                         | Yes; Type 1 protection                                                                                                                                                              | Yes; Type 1 protection                                                                                                                                                              | Yes; Type 1 protection                                                                                                                                                              | Yes; Type 1 protection                                                                                                                                                              |
| • Military testing according to MIL-I-46058C, Amendment 7                                                               | Yes; Discoloration of coating possible during service life                                                                                                                          | Yes; Discoloration of coating possible during service life                                                                                                                          | Yes; Discoloration of coating possible during service life                                                                                                                          | Yes; Discoloration of coating possible during service life                                                                                                                          |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A                                                                                                                                                     | Yes; Conformal coating, Class A                                                                                                                                                     | Yes; Conformal coating, Class A                                                                                                                                                     | Yes; Conformal coating, Class A                                                                                                                                                     |

## 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 third-party 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.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- 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/device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

##### SIMATIC Memory Card

4 MB

6ES7954-8LC04-0AA0

12 MB

6ES7954-8LE04-0AA0

24 MB

6ES7954-8LF04-0AA0

256 MB

6ES7954-8LL04-0AA0

2 GB

6ES7954-8LP04-0AA0

32 GB

6ES7954-8LT04-0AA0

##### DIN rail 35 mm

- Length: 483 mm for 19" cabinets
- Length: 483 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 mounting rail

20 units

6ES7590-5AA00-0AA0

##### BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

##### BA 2xFC BusAdapter for increased vibration and EMC loads

6ES7193-6AF00-0AA0

##### Equipment labeling plate

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

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, perforated, for inscription with laser printer

6ES7193-6LA10-0AA0

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

6ES7193-6LA10-0AG0

##### IE FC RJ45 plugs

RJ45 plug-in 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 T-2 PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Article No.                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Article No.               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>IE FC RJ45 plug 180</b><br>180° cable outlet<br><br>1 unit<br>10 units<br>50 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>6GK1901-1BB10-2AA0</b><br><b>6GK1901-1BB10-2AB0</b><br><b>6GK1901-1BB10-2AE0</b> | <b>SIMATIC STEP 7 Professional V20; floating license</b><br><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                            | <b>6ES7822-1AA24-0YA5</b> |
| <b>IE FC TP standard cable GP 2x2</b><br><br>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                                                                                                                                                                                                                                                                                                                                                                                                                | <b>6XV1840-2AH10</b>                                                                | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br>Consignee email address required for delivery | <b>6ES7822-1AE24-0YA5</b> |
| <b>IE FC TP trailing cable 2 x 2 (type C)</b><br><br>4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m                                                                                                                                                                                                                                                                                                                                                                       | <b>6XV1840-3AH10</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |
| <b>IE FC TP marine cable 2 x 2 (type B)</b><br><br>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                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>6XV1840-4AH10</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |
| <b>IE FC stripping tool</b><br><br>Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>6GK1901-1GA00</b>                                                                | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br><br>Consignee email address required for delivery.                                                                                                                                                                                                                                                  | <b>6ES7998-8XE01-8YE0</b> |
| <b>STEP 7 Professional V20</b><br><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br><br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br><br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br><br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br><br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                                                                                     | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice<br><br>Consignee email address required for delivery.                                                                                   | <b>6ES7998-8XE01-8YE2</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | <b>Spare parts</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | <b>Power supply connector</b><br><br>Spare part; for connecting the 24 V DC supply voltage<br>• With push-in terminals; 10 units                                                                                                                                                                                                                                                                                                                                                                                               | <b>6ES7193-4JB00-0AA0</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | <b>Cover for BusAdapter interface</b><br><br>5 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>6ES7591-3AA00-0AA0</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | <b>Server module</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>6ES7193-6PA00-0AA0</b> |

<sup>1)</sup> Up-to-date information and download availability can be found at <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                                               | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat                                                                           |
| <b>General information</b>                                   |                                                                                                                                                    |
| Product type designation                                     | CPU 1514SP T-2 PN                                                                                                                                  |
| <b>Engineering with</b>                                      |                                                                                                                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher                                                                                                         |
| <b>Supply voltage</b>                                        |                                                                                                                                                    |
| Rated value (DC)                                             | 24 V                                                                                                                                               |
| <b>Memory</b>                                                |                                                                                                                                                    |
| <b>Work memory</b>                                           |                                                                                                                                                    |
| • integrated (for program)                                   | 900 kbyte                                                                                                                                          |
| • integrated (for data)                                      | 3.5 Mbyte                                                                                                                                          |
| <b>Load memory</b>                                           |                                                                                                                                                    |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                                                                                           |
| <b>CPU processing times</b>                                  |                                                                                                                                                    |
| 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                                                                                                                                              |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                                                                                                    |
| <b>S7 counter</b>                                            |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC counter</b>                                           |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>S7 times</b>                                              |                                                                                                                                                    |
| • Number                                                     | 2 048                                                                                                                                              |
| <b>IEC timer</b>                                             |                                                                                                                                                    |
| • Number                                                     | Any (only limited by the main<br>memory)                                                                                                           |
| <b>Data areas and their retentivity</b>                      |                                                                                                                                                    |
| <b>Flag</b>                                                  |                                                                                                                                                    |
| • Size, max.                                                 | 16 kbyte                                                                                                                                           |
| <b>Address area</b>                                          |                                                                                                                                                    |
| <b>I/O address area</b>                                      |                                                                                                                                                    |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>                              |                                                                                                                                                    |
| • Address space per module, max.                             | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>                             |                                                                                                                                                    |
| • Address space per station, max.                            | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                                           |                                                                                                                                                    |
| <b>Clock</b>                                                 |                                                                                                                                                    |
| • Type                                                       | Hardware clock                                                                                                                                     |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat                                                                                                              |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • RJ 45 (Ethernet)                                                                  | Yes; X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                                                     |
| • Number of ports                                                                   | 2; via BusAdapter                                                                                                                                                                     |
| • integrated switch                                                                 | Yes                                                                                                                                                                                   |
| • BusAdapter (PROFINET)                                                             | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller</b>                                                       |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 256; in total, up to 1024 distributed<br>I/O devices can be connected via<br>AS-i, PROFIBUS or PROFINET                                                                               |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 256                                                                                                                                                                                   |
| - of which in line, max.                                                            | 256                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                                     |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>PROFINET IO Device</b>                                                           |                                                                                                                                                                                       |
| <b>Services</b>                                                                     |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | No                                                                                                                                                                                    |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFINergy                                                                        | Yes; per user program                                                                                                                                                                 |
| - Shared device                                                                     | Yes                                                                                                                                                                                   |
| - Number of IO Controllers with<br>shared device, max.                              | 4                                                                                                                                                                                     |
| - activation/deactivation of I-devices                                              | Yes; per user program                                                                                                                                                                 |
| - Asset management record                                                           | Yes; per user program                                                                                                                                                                 |
| - PROFINET Security Class                                                           | SNMP Configuration and<br>DCP Read Only                                                                                                                                               |

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP T-2 PN

#### Technical specifications

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat                                                                                               |
| <b>2. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| • RJ 45 (Ethernet)                                                            | Yes; X2                                                                                                                                                                |
| • Number of ports                                                             | 1                                                                                                                                                                      |
| • integrated switch                                                           | No                                                                                                                                                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| • 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                                                                                                                                                                     |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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 1024 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 Security Class                                                     | 1                                                                                                                                                                      |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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                                                                                                                                                  |
| - PROFINET Security Class                                                     | SNMP Configuration and DCP Read Only                                                                                                                                   |

|                                        |                                                                                                                                   |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                         | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat                                                          |
| <b>3. Interface</b>                    |                                                                                                                                   |
| <b>Interface types</b>                 |                                                                                                                                   |
| • RS 485                               | Yes; Via CM DP module                                                                                                             |
| • Number of ports                      | 1                                                                                                                                 |
| <b>Protocols</b>                       |                                                                                                                                   |
| • PROFIBUS DP master                   | Yes                                                                                                                               |
| • PROFIBUS DP device                   | Yes                                                                                                                               |
| • SIMATIC communication                | Yes                                                                                                                               |
| <b>PROFIBUS DP master</b>              |                                                                                                                                   |
| • max. number of DP devices            | 125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                 |
| <b>Protocols</b>                       |                                                                                                                                   |
| <b>Number of connections</b>           |                                                                                                                                   |
| • Number of connections, max.          | 192; via integrated interfaces of the CPU and connected CPs / CMs                                                                 |
| <b>Redundancy mode</b>                 |                                                                                                                                   |
| <b>Media redundancy</b>                |                                                                                                                                   |
| - 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                                                                                                                                |
| <b>SIMATIC communication</b>           |                                                                                                                                   |
| • S7 routing                           | Yes                                                                                                                               |
| <b>OPC UA</b>                          |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                | Yes                                                                                                                               |

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP T-2 PN

#### Technical specifications

|                                                                                |                                                                                                                                   |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                 | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat                                                          |
| <b>Supported technology objects</b>                                            |                                                                                                                                   |
| 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                                                                                                                                |
| - per cam (50 points and 600 segments)                                         | 2                                                                                                                                 |
| - per cam (50 points and 6 000 segments)                                       | 20                                                                                                                                |
| - for each set of kinematics                                                   | 30                                                                                                                                |
| - per Interpreter                                                              | 60                                                                                                                                |
| - 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                                                                                                                               |

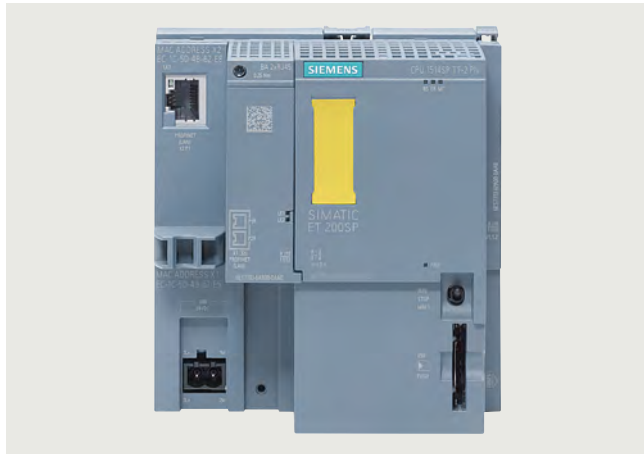
|                                                        |                                                                          |
|--------------------------------------------------------|--------------------------------------------------------------------------|
| Article number                                         | <b>6ES7514-2VN03-0AB0</b><br>CPU 1514SP T-2 PN,<br>900KB Prg., 3,5MB Dat |
| <b>Product functions/security</b>                      |                                                                          |
| PROFINET Security Class                                | 1                                                                        |
| signed firmware update                                 | Yes                                                                      |
| Secure Boot                                            | Yes                                                                      |
| safely removing data                                   | Yes                                                                      |
| <b>Ambient conditions</b>                              |                                                                          |
| <b>Ambient temperature during operation</b>            |                                                                          |
| • horizontal installation, min.                        | -30 °C; No condensation                                                  |
| • horizontal installation, max.                        | 60 °C                                                                    |
| • vertical installation, min.                          | -30 °C; No condensation                                                  |
| • vertical installation, max.                          | 50 °C                                                                    |
| <b>Altitude during operation relating to sea level</b> |                                                                          |
| • Installation altitude above sea level, max.          | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual   |
| <b>Configuration</b>                                   |                                                                          |
| <b>Configuration/programming</b>                       |                                                                          |
| <b>Programming language</b>                            |                                                                          |
| - LAD                                                  | Yes                                                                      |
| - FBD                                                  | Yes                                                                      |
| - STL                                                  | Yes                                                                      |
| - SCL                                                  | Yes                                                                      |
| - CFC                                                  | Yes                                                                      |
| - GRAPH                                                | Yes                                                                      |
| <b>Know-how protection</b>                             |                                                                          |
| • User program protection/ password protection         | Yes                                                                      |
| • Copy protection                                      | Yes                                                                      |
| • Block protection                                     | Yes                                                                      |
| <b>Access protection</b>                               |                                                                          |
| • protection of confidential configuration data        | Yes                                                                      |
| • Protection level: Write protection                   | Yes                                                                      |
| • Protection level: Read/write protection              | Yes                                                                      |
| • Protection level: Write protection for Failsafe      | No                                                                       |
| • Protection level: Complete protection                | Yes                                                                      |
| • User administration                                  | Yes; device-wide and centralized                                         |
| • Number of users                                      | 100                                                                      |
| <b>Dimensions</b>                                      |                                                                          |
| Width                                                  | 100 mm                                                                   |
| Height                                                 | 117 mm                                                                   |
| Depth                                                  | 75 mm                                                                    |
| <b>Weights</b>                                         |                                                                          |
| Weight, approx.                                        | 265 g                                                                    |

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP TF-2 PN

#### 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 third-party 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.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- 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

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

6ES7514-2WN03-0AB0

##### Accessories

##### CM DP for ET 200SP CPU

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

6ES7545-5DA00-0AB0

##### SIMATIC Memory Card

4 MB

6ES7954-8LC04-0AA0

12 MB

6ES7954-8LE04-0AA0

24 MB

6ES7954-8LF04-0AA0

256 MB

6ES7954-8LL04-0AA0

2 GB

6ES7954-8LP04-0AA0

32 GB

6ES7954-8LT04-0AA0

##### DIN rail 35 mm

- Length: 483 mm for 19" cabinets
- Length: 483 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 mounting rail

20 units

6ES7590-5AA00-0AA0

##### BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

##### BA 2xFC BusAdapter for increased vibration and EMC loads

6ES7193-6AF00-0AA0

##### Equipment labeling plate

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

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, perforated, for inscription with laser printer

6ES7193-6LA10-0AA0

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

6ES7193-6LA10-0AG0

##### IE FC RJ45 plugs

RJ45 plug-in 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.                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>IE FC RJ45 plug 180</b><br>180° cable outlet<br>1 unit<br>10 units<br>50 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>6GK1901-1BB10-2AA0</b><br><b>6GK1901-1BB10-2AB0</b><br><b>6GK1901-1BB10-2AE0</b> | <b>SIMATIC STEP 7 Professional V20; floating license</b><br><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                                                                                                                                                                                                   | <b>6ES7822-1AA24-0YA5</b>                                  |
| <b>IE FC TP standard cable GP 2x2</b><br>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                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>6XV1840-2AH10</b>                                                                | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br><br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br><br>Consignee email address required for delivery                                                                                                                                                                                                                                                                                                        | <b>6ES7822-1AE24-0YA5</b>                                  |
| <b>IE FC TP trailing cable 2 x 2 (type C)</b><br>4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m                                                                                                                                                                                                                                                                                                                                                                           | <b>6XV1840-3AH10</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |
| <b>IE FC TP marine cable 2 x 2 (type B)</b><br>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                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>6XV1840-4AH10</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |
| <b>IE FC stripping tool</b><br><br>Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>6GK1901-1GA00</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |
| <b>STEP 7 Professional V20</b><br><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC<br><br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional Version 22H2<br>• Windows 10 Enterprise Version 22H2<br>• Windows 10 Enterprise 2019 LTSC & 2021 LTSC<br><br>Windows 11 (64-bit)<br>• Windows 11 Professional Version 22H2 & 23H2<br>• Windows 11 Enterprise Version 22H2 & 23H2<br><br>Windows Server (64-bit)<br>• Windows Server 2019 Standard (full installation)<br>• Windows Server 2022 Standard (full installation)<br><br>Type of delivery:<br>9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download |                                                                                     | <b>STEP 7 Safety Advanced V20</b><br><br>Task:<br>Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco<br>Requirement<br>STEP 7 Professional V20<br><br><u>Note:</u><br>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.<br><br>Floating license for 1 user; license key on USB flash drive<br><br>Floating license for 1 user, license key for download <sup>1)</sup> ; Email address required for delivery | <b>6ES7833-1FA24-0YA5</b><br><br><b>6ES7833-1FA24-0YH5</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | <b>SIMATIC Manual Collection DL in 5 languages<sup>1)</sup></b><br><br>All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT<br><br>Consignee email address required for delivery.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>6ES7998-8XE01-8YE0</b>                                  |

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

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP TF-2 PN

#### Ordering data

**SIMATIC Manual Collection DL in 5 languages<sup>1)</sup>**  
Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice  
Consignee email address required for delivery.

#### Article No.

**6ES7998-8XE01-8YE2**

#### Article No.

#### 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**

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

#### Technical specifications

|                                                              |                                                                            |
|--------------------------------------------------------------|----------------------------------------------------------------------------|
| Article number                                               | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat |
| <b>General information</b>                                   |                                                                            |
| Product type designation                                     | CPU 1514SP TF-2 PN                                                         |
| <b>Engineering with</b>                                      |                                                                            |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V20 (FW V4.0) / V18 (FW V3.0)<br>or higher                                 |
| <b>Supply voltage</b>                                        |                                                                            |
| Rated value (DC)                                             | 24 V                                                                       |
| <b>Memory</b>                                                |                                                                            |
| <b>Work memory</b>                                           |                                                                            |
| • integrated (for program)                                   | 900 kbyte                                                                  |
| • integrated (for data)                                      | 3.5 Mbyte                                                                  |
| <b>Load memory</b>                                           |                                                                            |
| • Plug-in (SIMATIC Memory Card),<br>max.                     | 32 Gbyte                                                                   |
| <b>CPU processing times</b>                                  |                                                                            |
| 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                                                                      |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                                            |
| <b>S7 counter</b>                                            |                                                                            |
| • Number                                                     | 2 048                                                                      |
| <b>IEC counter</b>                                           |                                                                            |
| • Number                                                     | Any (only limited by the main<br>memory)                                   |
| <b>S7 times</b>                                              |                                                                            |
| • Number                                                     | 2 048                                                                      |
| <b>IEC timer</b>                                             |                                                                            |
| • Number                                                     | Any (only limited by the main<br>memory)                                   |
| <b>Data areas and their retentivity</b>                      |                                                                            |
| <b>Flag</b>                                                  |                                                                            |
| • Size, max.                                                 | 16 kbyte                                                                   |

|                                   |                                                                                                                                                    |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                    | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat                                                                         |
| <b>Address area</b>               |                                                                                                                                                    |
| <b>I/O address area</b>           |                                                                                                                                                    |
| • Inputs                          | 32 kbyte; All inputs are in the<br>process image                                                                                                   |
| • Outputs                         | 32 kbyte; All outputs are in the<br>process image                                                                                                  |
| <b>Address space per module</b>   |                                                                                                                                                    |
| • Address space per module, max.  | 288 byte; For input and output data<br>respectively                                                                                                |
| <b>Address space per station</b>  |                                                                                                                                                    |
| • Address space per station, max. | 2 560 byte; for central inputs and<br>outputs; depending on configuration;<br>2 048 bytes for ET 200SP modules +<br>512 bytes for ET 200AL modules |
| <b>Time of day</b>                |                                                                                                                                                    |
| <b>Clock</b>                      |                                                                                                                                                    |
| • Type                            | Hardware clock                                                                                                                                     |
| <b>1. Interface</b>               |                                                                                                                                                    |
| <b>Interface types</b>            |                                                                                                                                                    |
| • RJ 45 (Ethernet)                | Yes; X1 P1 and X1 P2 via<br>BusAdapter BA 2x RJ45                                                                                                  |
| • Number of ports                 | 2; via BusAdapter                                                                                                                                  |
| • integrated switch               | Yes                                                                                                                                                |
| • BusAdapter (PROFINET)           | Yes; compatible BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC     |
| <b>Protocols</b>                  |                                                                                                                                                    |
| • 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                                                                                                                                                |

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP TF-2 PN

#### Technical specifications

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat                                                                                             |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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 1024 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 Security Class                                                     | 1                                                                                                                                                                      |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - Isochronous mode                                                            | No                                                                                                                                                                     |
| - IRT                                                                         | Yes                                                                                                                                                                    |
| - PROFIenergy                                                                 | 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                                                                                                                                                  |
| - PROFINET Security Class                                                     | SNMP Configuration and DCP Read Only                                                                                                                                   |
| <b>2. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| • RJ 45 (Ethernet)                                                            | Yes; X2                                                                                                                                                                |
| • Number of ports                                                             | 1                                                                                                                                                                      |
| • integrated switch                                                           | No                                                                                                                                                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| • 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                                                                                                                                                                     |

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat                                                                                             |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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 1024 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 Security Class                                                     | 1                                                                                                                                                                      |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| - 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                                                                                                                                                  |
| - PROFINET Security Class                                                     | SNMP Configuration and DCP Read Only                                                                                                                                   |
| <b>3. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| • RS 485                                                                      | Yes; Via CM DP module                                                                                                                                                  |
| • Number of ports                                                             | 1                                                                                                                                                                      |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| • PROFIBUS DP master                                                          | Yes                                                                                                                                                                    |
| • PROFIBUS DP device                                                          | Yes                                                                                                                                                                    |
| • SIMATIC communication                                                       | Yes                                                                                                                                                                    |
| <b>PROFIBUS DP master</b>                                                     |                                                                                                                                                                        |
| • max. number of DP devices                                                   | 125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                                                      |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| <b>Number of connections</b>                                                  |                                                                                                                                                                        |
| • Number of connections, max.                                                 | 192; via integrated interfaces of the CPU and connected CPs / CMs                                                                                                      |
| <b>Redundancy mode</b>                                                        |                                                                                                                                                                        |
| <b>Media redundancy</b>                                                       |                                                                                                                                                                        |
| - 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                                                                                                                                                                     |

## Distributed Controllers

based on ET 200SP  
Technology CPUs

### CPU 1514SP TF-2 PN

#### Technical specifications

|                                                                                |                                                                                                                                   |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                 | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat                                                        |
| <b>SIMATIC communication</b>                                                   |                                                                                                                                   |
| • S7 routing                                                                   | Yes                                                                                                                               |
| <b>OPC UA</b>                                                                  |                                                                                                                                   |
| • 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, role-based access control |
| • Alarms and Conditions                                                        | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                            |                                                                                                                                   |
| 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                                                                                                                                |
| - per cam (50 points and 600 segments)                                         | 2                                                                                                                                 |
| - per cam (50 points and 6 000 segments)                                       | 20                                                                                                                                |
| - for each set of kinematics                                                   | 30                                                                                                                                |
| - per Interpreter                                                              | 60                                                                                                                                |
| - 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                                                                            | <b>6ES7514-2WN03-0AB0</b><br>CPU 1514SP TF-2 PN,<br>900 KB Prg, 3,5 MB Dat |
| <b>Standards, approvals, certificates</b>                                                 |                                                                            |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                            |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                            |
| - Low demand mode: PFDavg in accordance with SIL3                                         | < 2.00E-05                                                                 |
| - High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09                                                                 |
| <b>Product functions/security</b>                                                         |                                                                            |
| PROFINET Security Class                                                                   | 1                                                                          |
| signed firmware update                                                                    | Yes                                                                        |
| Secure Boot                                                                               | Yes                                                                        |
| safely removing data                                                                      | Yes                                                                        |
| <b>Ambient conditions</b>                                                                 |                                                                            |
| <b>Ambient temperature during operation</b>                                               |                                                                            |
| • horizontal installation, min.                                                           | -30 °C; No condensation                                                    |
| • horizontal installation, max.                                                           | 60 °C                                                                      |
| • vertical installation, min.                                                             | -30 °C; No condensation                                                    |
| • vertical installation, max.                                                             | 50 °C                                                                      |
| <b>Altitude during operation relating to sea level</b>                                    |                                                                            |
| • Installation altitude above sea level, max.                                             | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual     |
| <b>Configuration</b>                                                                      |                                                                            |
| <b>Configuration/programming</b>                                                          |                                                                            |
| <b>Programming language</b>                                                               |                                                                            |
| - LAD                                                                                     | Yes; incl. failsafe                                                        |
| - FBD                                                                                     | Yes; incl. failsafe                                                        |
| - STL                                                                                     | Yes                                                                        |
| - SCL                                                                                     | Yes                                                                        |
| - CFC                                                                                     | Yes; either CFC or failsafe functionality                                  |
| - GRAPH                                                                                   | Yes                                                                        |
| <b>Know-how protection</b>                                                                |                                                                            |
| • User program protection/ password protection                                            | Yes                                                                        |
| • Copy protection                                                                         | Yes                                                                        |
| • Block protection                                                                        | Yes                                                                        |
| <b>Access protection</b>                                                                  |                                                                            |
| • protection of confidential configuration data                                           | Yes                                                                        |
| • Protection level: Write protection                                                      | Yes; Specific write protection both for Standard and for Failsafe          |
| • Protection level: Read/write protection                                                 | Yes                                                                        |
| • Protection level: Write protection for Failsafe                                         | Yes                                                                        |
| • Protection level: Complete protection                                                   | Yes                                                                        |
| • User administration                                                                     | Yes; device-wide and centralized                                           |
| • Number of users                                                                         | 100                                                                        |
| <b>Dimensions</b>                                                                         |                                                                            |
| Width                                                                                     | 100 mm                                                                     |
| Height                                                                                    | 117 mm                                                                     |
| Depth                                                                                     | 75 mm                                                                      |
| <b>Weights</b>                                                                            |                                                                            |
| 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:  
en, de, fr, es, it, zh

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

- CPU 1515SP PC2 (8 GB RAM)

**6ES7677-2DB43-0GB1**

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

- CPU 1515SP PC2 (48 GB RAM)

**6ES7677-2DB42-0GB1**

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

**BA 2xRJ45 BusAdapter**

**6ES7193-6AR00-0AA0**

**BA 2xFC BusAdapter**

**6ES7193-6AF00-0AA0**

**BA 2xSCRJ BusAdapter**

**6ES7193-6AP00-0AA0**

**BA SCRJ/RJ45 BusAdapter**

**6ES7193-6AP20-0AA0**

**BA SCRJ/FC BusAdapter**

**6ES7193-6AP40-0AA0**

For increased vibration and EMC loads

**BA 2XLC BusAdapter**

**6ES7193-6AG00-0AA0**

**BA LC/RJ45 BusAdapter**

**6ES7193-6AG20-0AA0**

**BA LC/FC BusAdapter**

**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

**6ES7193-6LR10-0AA0**

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

**6ES7193-6LA10-0AA0**

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

**6ES7193-6LA10-0AA0**

##### SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 operating system upgrade package

**6ES7678-2AD01-0AA0**

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade image

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Standard CPUs > CPU 1515SP PC2

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Article No.               | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2,<br>S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional<br>Version 22H2<br>• Windows 10 Enterprise<br>Version 22H2<br>• Windows 10 Enterprise 2019<br>LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional<br>Version 22H2 & 23H2<br>• Windows 11 Enterprise<br>Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard<br>(full installation)<br>• Windows Server 2022 Standard<br>(full installation)<br>Type of delivery:<br>9 languages: en, de, zh included,<br>fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery<br><b>6ES7822-1AE24-0YA5</b> |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                                                     | <b>6ES7822-1AA24-0YA5</b> | <b>SIMATIC ODK 1500S</b><br>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<br><b>6ES7806-2CD03-0YA0</b><br>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) <sup>1)</sup><br><b>6ES7806-2CD03-0YG0</b>                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           | <b>WinCC Advanced V19</b><br>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime<br>• Floating license; software and documentation on DVD; license key on USB flash drive<br><b>6AV2102-0AA02-3AA5</b><br>• Floating license; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery<br><b>6AV2102-0AA02-3AH5</b>                                                                |

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

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Standard CPUs > CPU 1515SP PC2

#### Technical specifications

|                                                              |                                                |                                                    |
|--------------------------------------------------------------|------------------------------------------------|----------------------------------------------------|
| Article number                                               | <b>6ES7677-2DB42-0GB1</b><br>CPU1515SP PC2     | <b>6ES7677-2DB43-0GB1</b><br>CPU1515SP PC2 - IndOS |
| <b>General information</b>                                   |                                                |                                                    |
| Product type designation                                     | CPU 1515SP PC2                                 | CPU1515SP PC2 - IndOS                              |
| <b>Engineering with</b>                                      |                                                |                                                    |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19                                            | V19                                                |
| <b>Installed software</b>                                    |                                                |                                                    |
| • Visualization                                              | No                                             | No                                                 |
| • Control                                                    | S7-1500 Software Controller CPU 1505SP         | S7-1500 Software Controller CPU 1505SP             |
| <b>Supply voltage</b>                                        |                                                |                                                    |
| Rated value (DC)                                             | 24 V                                           | 24 V                                               |
| <b>Processor</b>                                             |                                                |                                                    |
| Processor type                                               | Intel Atom E3940, 1.6 GHz, 4 cores             | Intel Atom E3940, 1.6 GHz, 4 cores                 |
| <b>Memory</b>                                                |                                                |                                                    |
| 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                           |
| <b>Work memory</b>                                           |                                                |                                                    |
| • integrated (for program)                                   | 2 Mbyte                                        | 2 Mbyte                                            |
| • integrated (for data)                                      | 7.5 Mbyte                                      | 7.5 Mbyte                                          |
| • integrated (for CPU function library<br>of CPU Runtime)    | 20 Mbyte                                       | 20 Mbyte                                           |
| <b>Load memory</b>                                           |                                                |                                                    |
| • integrated (on PC mass storage)                            | 320 Mbyte                                      | 320 Mbyte                                          |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                |                                                    |
| <b>S7 counter</b>                                            |                                                |                                                    |
| • Number                                                     | 2 048                                          | 2 048                                              |
| <b>IEC counter</b>                                           |                                                |                                                    |
| • Number                                                     | Any (only limited by the main memory)          | Any (only limited by the main memory)              |
| <b>S7 times</b>                                              |                                                |                                                    |
| • Number                                                     | 2 048                                          | 2 048                                              |
| <b>IEC timer</b>                                             |                                                |                                                    |
| • Number                                                     | Any (only limited by the main memory)          | Any (only limited by the main memory)              |
| <b>Data areas and their retentivity</b>                      |                                                |                                                    |
| <b>Flag</b>                                                  |                                                |                                                    |
| • Size, max.                                                 | 16 kbyte                                       | 16 kbyte                                           |
| <b>Address area</b>                                          |                                                |                                                    |
| <b>I/O address area</b>                                      |                                                |                                                    |
| • 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     |
| <b>Hardware configuration</b>                                |                                                |                                                    |
| Integrated power supply                                      | Yes                                            | Yes                                                |
| <b>Time of day</b>                                           |                                                |                                                    |
| <b>Clock</b>                                                 |                                                |                                                    |
| • Type                                                       | Hardware clock                                 | Hardware clock                                     |
| • Hardware clock (real-time)                                 | Yes; Resolution: 1 s                           | Yes; Resolution: 1 s                               |
| <b>Interfaces</b>                                            |                                                |                                                    |
| Number of industrial Ethernet<br>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                                                  |
| <b>Video interfaces</b>                                      |                                                |                                                    |
| • Graphics interface                                         | 1x DisplayPort                                 | 1x DisplayPort                                     |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Standard CPUs > CPU 1515SP PC2

#### Technical specifications

| Article number                                                                | <b>6ES7677-2DB42-0GB1</b><br>CPU1515SP PC2                                                                                                                             | <b>6ES7677-2DB43-0GB1</b><br>CPU1515SP PC2 - IndOS                                                                                                                     |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Interface</b>                                                           |                                                                                                                                                                        |                                                                                                                                                                        |
| Interface type                                                                | PROFINET                                                                                                                                                               | PROFINET                                                                                                                                                               |
| automatic detection of transmission rate                                      | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| Autonegotiation                                                               | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| Autocrossing                                                                  | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| Number of connections                                                         | 88                                                                                                                                                                     | 88                                                                                                                                                                     |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |                                                                                                                                                                        |
| • 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 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                                     | 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                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |                                                                                                                                                                        |
| • IP protocol                                                                 | Yes; IPv4                                                                                                                                                              | Yes; IPv4                                                                                                                                                              |
| • PROFINET IO Controller                                                      | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| • PROFINET IO Device                                                          | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| • SIMATIC communication                                                       | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| • Open IE communication                                                       | Yes; Optionally also encrypted                                                                                                                                         | Yes; Optionally also encrypted                                                                                                                                         |
| • Web server                                                                  | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| • Media redundancy                                                            | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |                                                                                                                                                                        |
| - Isochronous mode                                                            | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| - Direct data exchange                                                        | Yes; Requirement: IRT and isochronous mode (MRPD optional)                                                                                                             | Yes; Requirement: IRT and isochronous mode (MRPD optional)                                                                                                             |
| - shortest clock pulse                                                        | 500 µs                                                                                                                                                                 | 500 µs                                                                                                                                                                 |
| - IRT                                                                         | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| - PROFIenergy                                                                 | Yes                                                                                                                                                                    | Yes                                                                                                                                                                    |
| - Prioritized startup                                                         | Yes; Max. 32 PROFINET devices                                                                                                                                          | Yes; Max. 32 PROFINET devices                                                                                                                                          |
| - 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 |
| - PROFINET Security Class                                                     | 1                                                                                                                                                                      | 1                                                                                                                                                                      |
| <b>Address area</b>                                                           |                                                                                                                                                                        |                                                                                                                                                                        |
| - Inputs, max.                                                                | 8 kbyte                                                                                                                                                                | 8 kbyte                                                                                                                                                                |
| - Outputs, max.                                                               | 8 kbyte                                                                                                                                                                | 8 kbyte                                                                                                                                                                |

## Distributed Controllers

based on ET 200SP

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### Standard CPUs > CPU 1515SP PC2

#### Technical specifications

| Article number                                      | <b>6ES7677-2DB42-0GB1</b><br>CPU1515SP PC2                                         | <b>6ES7677-2DB43-0GB1</b><br>CPU1515SP PC2 - IndOS                                 |
|-----------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>PROFINET IO Device</b>                           |                                                                                    |                                                                                    |
| <b>Services</b>                                     |                                                                                    |                                                                                    |
| - Isochronous mode                                  | No                                                                                 | No                                                                                 |
| - IRT                                               | Yes                                                                                | Yes                                                                                |
| - PROFINergy                                        | Yes; per user program                                                              | Yes; per user program                                                              |
| - Prioritized startup                               | Yes                                                                                | Yes                                                                                |
| - Shared device                                     | Yes                                                                                | Yes                                                                                |
| - Number of IO Controllers with shared device, max. | 4                                                                                  | 4                                                                                  |
| - activation/deactivation of I-devices              | Yes; per user program                                                              | Yes; per user program                                                              |
| - Asset management record                           | Yes; per user program                                                              | Yes; per user program                                                              |
| - PROFINET Security Class                           | SNMP Configuration and DCP Read Only                                               | SNMP Configuration and DCP Read Only                                               |
| <b>2. Interface</b>                                 |                                                                                    |                                                                                    |
| Interface type                                      | Integrated Ethernet interface                                                      | Integrated Ethernet interface                                                      |
| automatic detection of transmission rate            | Yes                                                                                | Yes                                                                                |
| Autonegotiation                                     | Yes                                                                                | Yes                                                                                |
| Autocrossing                                        | Yes                                                                                | Yes                                                                                |
| <b>Interface types</b>                              |                                                                                    |                                                                                    |
| • 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                                                                                  |
| <b>3. Interface</b>                                 |                                                                                    |                                                                                    |
| Interface type                                      | PROFIBUS with CM DP                                                                | PROFIBUS with CM DP                                                                |
| Number of connections                               | 44                                                                                 | 44                                                                                 |
| <b>Interface types</b>                              |                                                                                    |                                                                                    |
| • RS 485                                            | Yes                                                                                | Yes                                                                                |
| <b>Protocols</b>                                    |                                                                                    |                                                                                    |
| • PROFIBUS DP master                                | Yes                                                                                | Yes                                                                                |
| • PROFIBUS DP device                                | Yes                                                                                | Yes                                                                                |
| • SIMATIC communication                             | Yes                                                                                | Yes                                                                                |
| <b>PROFIBUS DP master</b>                           |                                                                                    |                                                                                    |
| • max. number of DP devices                         | 125                                                                                | 125                                                                                |
| <b>Services</b>                                     |                                                                                    |                                                                                    |
| - Equidistance                                      | No                                                                                 | No                                                                                 |
| - Isochronous mode                                  | No                                                                                 | No                                                                                 |
| <b>Address area</b>                                 |                                                                                    |                                                                                    |
| - Inputs, max.                                      | 8 kbyte                                                                            | 8 kbyte                                                                            |
| - Outputs, max.                                     | 8 kbyte                                                                            | 8 kbyte                                                                            |
| <b>Protocols</b>                                    |                                                                                    |                                                                                    |
| <b>Number of connections</b>                        |                                                                                    |                                                                                    |
| • Number of connections, max.                       | 88                                                                                 | 88                                                                                 |
| <b>Redundancy mode</b>                              |                                                                                    |                                                                                    |
| <b>Media redundancy</b>                             |                                                                                    |                                                                                    |
| - Media redundancy                                  | Yes; only via BusAdapter                                                           | Yes; only via BusAdapter                                                           |
| - MRP                                               | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client |
| - MRP interconnection, supported                    | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                         | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                         |
| - MRPD                                              | Yes; Requirement: IRT                                                              | Yes; Requirement: IRT                                                              |
| - Switchover time on line break, typ.               | 200 ms; For MRP, bumpless for MRPD                                                 | 200 ms; For MRP, bumpless for MRPD                                                 |
| - Number of stations in the ring, max.              | 50                                                                                 | 50                                                                                 |
| <b>SIMATIC communication</b>                        |                                                                                    |                                                                                    |
| • S7 routing                                        | Yes                                                                                | Yes                                                                                |
| <b>OPC UA</b>                                       |                                                                                    |                                                                                    |
| • OPC UA Client                                     | Yes; Data access (read, write), method call                                        | Yes; Data access (read, write), method call                                        |
| • OPC UA Server                                     | Yes; Data access (read, write, subscribe), method call, custom address space       | Yes; Data access (read, write, subscribe), method call, custom address space       |
| • Alarms and Conditions                             | Yes                                                                                | Yes                                                                                |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Standard CPUs > CPU 1515SP PC2

#### Technical specifications

| Article number                                                        | <b>6ES7677-2DB42-0GB1</b><br>CPU1515SP PC2                                                                                                 | <b>6ES7677-2DB43-0GB1</b><br>CPU1515SP PC2 - IndOS                                                                                         |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported technology objects</b>                                   |                                                                                                                                            |                                                                                                                                            |
| Motion Control                                                        | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects | 2 400                                                                                                                                      | 2 400                                                                                                                                      |
| • Required Motion Control resources                                   |                                                                                                                                            |                                                                                                                                            |
| - per speed-controlled axis                                           | 40                                                                                                                                         | 40                                                                                                                                         |
| - per positioning axis                                                | 80                                                                                                                                         | 80                                                                                                                                         |
| - per synchronous axis                                                | 160                                                                                                                                        | 160                                                                                                                                        |
| - per external encoder                                                | 80                                                                                                                                         | 80                                                                                                                                         |
| - per output cam                                                      | 20                                                                                                                                         | 20                                                                                                                                         |
| - per cam track                                                       | 160                                                                                                                                        | 160                                                                                                                                        |
| - per probe                                                           | 40                                                                                                                                         | 40                                                                                                                                         |
| Controller                                                            |                                                                                                                                            |                                                                                                                                            |
| • PID_Compact                                                         | Yes; Universal PID controller with integrated optimization                                                                                 | Yes; Universal PID controller with integrated optimization                                                                                 |
| • PID_3Step                                                           | Yes; PID controller with integrated optimization for valves                                                                                | Yes; PID controller with integrated optimization for valves                                                                                |
| • PID-Temp                                                            | Yes; PID controller with integrated optimization for temperature                                                                           | Yes; PID controller with integrated optimization for temperature                                                                           |
| Counting and measuring                                                |                                                                                                                                            |                                                                                                                                            |
| • High-speed counter                                                  | Yes                                                                                                                                        | Yes                                                                                                                                        |
| <b>Ambient conditions</b>                                             |                                                                                                                                            |                                                                                                                                            |
| <b>Ambient temperature during operation</b>                           |                                                                                                                                            |                                                                                                                                            |
| • min.                                                                | -20 °C                                                                                                                                     | -20 °C                                                                                                                                     |
| • horizontal installation, min.                                       | -20 °C                                                                                                                                     | -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                      | 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; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% 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                           |
| <b>Operating systems</b>                                              |                                                                                                                                            |                                                                                                                                            |
| pre-installed operating system                                        | Windows 10 IoT Enterprise 2021 LTSC                                                                                                        | SIMATIC Industrial OS                                                                                                                      |
| <b>Configuration</b>                                                  |                                                                                                                                            |                                                                                                                                            |
| <b>Configuration/programming</b>                                      |                                                                                                                                            |                                                                                                                                            |
| <b>Programming language</b>                                           |                                                                                                                                            |                                                                                                                                            |
| - LAD                                                                 | Yes                                                                                                                                        | Yes                                                                                                                                        |
| - FBD                                                                 | Yes                                                                                                                                        | Yes                                                                                                                                        |
| - STL                                                                 | Yes                                                                                                                                        | Yes                                                                                                                                        |
| - SCL                                                                 | Yes                                                                                                                                        | Yes                                                                                                                                        |
| - CFC                                                                 | No                                                                                                                                         | No                                                                                                                                         |
| - GRAPH                                                               | Yes                                                                                                                                        | Yes                                                                                                                                        |
| <b>Know-how protection</b>                                            |                                                                                                                                            |                                                                                                                                            |
| • User program protection/ password protection                        | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • Copy protection                                                     | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • Block protection                                                    | Yes                                                                                                                                        | Yes                                                                                                                                        |
| <b>Access protection</b>                                              |                                                                                                                                            |                                                                                                                                            |
| • protection of confidential configuration data                       | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • Protection level: Write protection                                  | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • Protection level: Read/write protection                             | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • Protection level: Complete protection                               | Yes                                                                                                                                        | Yes                                                                                                                                        |
| • User administration                                                 | Yes; device-wide                                                                                                                           | Yes; device-wide                                                                                                                           |
| • Number of users                                                     | 100                                                                                                                                        | 100                                                                                                                                        |
| <b>Open Development interfaces</b>                                    |                                                                                                                                            |                                                                                                                                            |
| • Size of ODK SO file, max.                                           | 5.8 Mbyte                                                                                                                                  | 5.8 Mbyte                                                                                                                                  |

Distributed Controllers  
based on ET 200SP  
ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

|                            |                                            |                                                    |
|----------------------------|--------------------------------------------|----------------------------------------------------|
| Article number             | <b>6ES7677-2DB42-0GB1</b><br>CPU1515SP PC2 | <b>6ES7677-2DB43-0GB1</b><br>CPU1515SP PC2 - IndOS |
| <b>Peripherals/Options</b> |                                            |                                                    |
| SD card                    | Optionally for additional mass storage     | Optionally for additional mass storage             |
| <b>Dimensions</b>          |                                            |                                                    |
| Width                      | 160 mm                                     | 160 mm                                             |
| Height                     | 117 mm                                     | 117 mm                                             |
| Depth                      | 75 mm                                      | 75 mm                                              |
| <b>Weights</b>             |                                            |                                                    |
| Weight, approx.            | 0.83 kg                                    | 0.83 kg                                            |

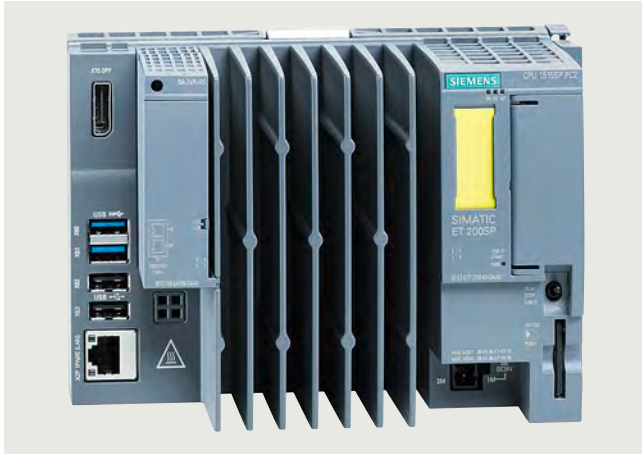
## Distributed Controllers

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:  
en, de, fr, es, it, zh

Industrial OS and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card  
• CPU 1515SP PC2 F (8 GB RAM)

**6ES7677-2SB43-0GB1**

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)

**6ES7677-2SB42-0GB1**

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

**BA 2xRJ45 BusAdapter**

**6ES7193-6AR00-0AA0**

**BA 2xFC BusAdapter**

**6ES7193-6AF00-0AA0**

**BA 2xSCRJ BusAdapter**

**6ES7193-6AP00-0AA0**

**BA SCRJ/RJ45 BusAdapter**

**6ES7193-6AP20-0AA0**

**BA SCRJ/FC BusAdapter**

**6ES7193-6AP40-0AA0**

For increased vibration and EMC loads

**BA 2XLC BusAdapter**

**6ES7193-6AG00-0AA0**

**BA LC/RJ45 BusAdapter**

**6ES7193-6AG20-0AA0**

**BA LC/FC BusAdapter**

**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**

##### SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F Operating system upgrade package

**6ES7678-2AS01-0AA0**

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and SB flash drive with upgrade image

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Article No.               | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2,<br>S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional<br>Version 22H2<br>• Windows 10 Enterprise<br>Version 22H2<br>• Windows 10 Enterprise 2019<br>LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional<br>Version 22H2 & 23H2<br>• Windows 11 Enterprise<br>Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard<br>(full installation)<br>• Windows Server 2022 Standard<br>(full installation)<br>Type of delivery:<br>9 languages: en, de, zh included,<br>fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery<br><b>6ES7822-1AE24-0YA5</b> |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                                                     | <b>6ES7822-1AA24-0YA5</b> | <b>SIMATIC ODK 1500S</b><br>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<br><b>6ES7806-2CD03-0YA0</b><br>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) <sup>1)</sup><br><b>6ES7806-2CD03-0YG0</b>                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           | <b>WinCC Advanced V19</b><br>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime<br>• Floating license; software and documentation on DVD; license key on USB flash drive<br><b>6AV2102-0AA02-3AA5</b><br>• Floating license; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery<br><b>6AV2102-0AA02-3AH5</b>                                                                |

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

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

#### Technical specifications

|                                                              |                                                |                                                      |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------|
| Article number                                               | <b>6ES7677-2SB42-0GB1</b><br>CPU1515SP PC2 F   | <b>6ES7677-2SB43-0GB1</b><br>CPU1515SP PC2 F - IndOS |
| <b>General information</b>                                   |                                                |                                                      |
| Product type designation                                     | CPU 1515SP PC2 F                               | CPU1515SP PC2 F - IndOS                              |
| <b>Engineering with</b>                                      |                                                |                                                      |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19                                            | V19                                                  |
| <b>Installed software</b>                                    |                                                |                                                      |
| • Visualization                                              | No                                             | No                                                   |
| • Control                                                    | S7-1500 Software Controller CPU 1505SP F       | S7-1500 Software Controller CPU 1505SP F             |
| <b>Supply voltage</b>                                        |                                                |                                                      |
| Rated value (DC)                                             | 24 V                                           | 24 V                                                 |
| <b>Processor</b>                                             |                                                |                                                      |
| Processor type                                               | Intel Atom E3940, 1.6 GHz, 4 cores             | Intel Atom E3940, 1.6 GHz, 4 cores                   |
| <b>Memory</b>                                                |                                                |                                                      |
| 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                             |
| <b>Work memory</b>                                           |                                                |                                                      |
| • integrated (for program)                                   | 3 Mbyte                                        | 3 Mbyte                                              |
| • integrated (for data)                                      | 7.5 Mbyte                                      | 7.5 Mbyte                                            |
| • integrated (for CPU function library<br>of CPU Runtime)    | 20 Mbyte                                       | 20 Mbyte                                             |
| <b>Load memory</b>                                           |                                                |                                                      |
| • integrated (on PC mass storage)                            | 320 Mbyte                                      | 320 Mbyte                                            |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                |                                                      |
| <b>S7 counter</b>                                            |                                                |                                                      |
| • Number                                                     | 2 048                                          | 2 048                                                |
| <b>IEC counter</b>                                           |                                                |                                                      |
| • Number                                                     | Any (only limited by the main memory)          | Any (only limited by the main memory)                |
| <b>S7 times</b>                                              |                                                |                                                      |
| • Number                                                     | 2 048                                          | 2 048                                                |
| <b>IEC timer</b>                                             |                                                |                                                      |
| • Number                                                     | Any (only limited by the main memory)          | Any (only limited by the main memory)                |
| <b>Data areas and their retentivity</b>                      |                                                |                                                      |
| <b>Flag</b>                                                  |                                                |                                                      |
| • Size, max.                                                 | 16 kbyte                                       | 16 kbyte                                             |
| <b>Address area</b>                                          |                                                |                                                      |
| <b>I/O address area</b>                                      |                                                |                                                      |
| • 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       |
| <b>Hardware configuration</b>                                |                                                |                                                      |
| Integrated power supply                                      | Yes                                            | Yes                                                  |
| <b>Time of day</b>                                           |                                                |                                                      |
| <b>Clock</b>                                                 |                                                |                                                      |
| • Type                                                       | Hardware clock                                 | Hardware clock                                       |
| • Hardware clock (real-time)                                 | Yes; Resolution: 1 s                           | Yes; Resolution: 1 s                                 |
| <b>Interfaces</b>                                            |                                                |                                                      |
| Number of industrial Ethernet<br>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                                                    |
| <b>Video interfaces</b>                                      |                                                |                                                      |
| • Graphics interface                                         | 1x DisplayPort                                 | 1x DisplayPort                                       |
| <b>1. Interface</b>                                          |                                                |                                                      |
| Interface type                                               | PROFINET                                       | PROFINET                                             |
| automatic detection of transmission<br>rate                  | Yes                                            | Yes                                                  |
| Autonegotiation                                              | Yes                                            | Yes                                                  |
| Autocrossing                                                 | Yes                                            | Yes                                                  |
| Number of connections                                        | 88                                             | 88                                                   |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

#### Technical specifications

| Article number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>6ES7677-2SB42-0GB1</b><br>CPU1515SP PC2 F                                                                                                                                                                                                                                                                                                                | <b>6ES7677-2SB43-0GB1</b><br>CPU1515SP PC2 F - IndOS                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Interface types</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• RJ 45 (Ethernet) <ul style="list-style-type: none"> <li>- Transmission rate, max.</li> <li>- Industrial Ethernet status LED</li> </ul> </li> <li>• Number of ports</li> <li>• integrated switch</li> <li>• BusAdapter (PROFINET)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes; Via BusAdapter BA 2x RJ45<br>100 Mbit/s<br>Yes<br>2<br>Yes<br>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                                                                                                                                                       | Yes; Via BusAdapter BA 2x RJ45<br>100 Mbit/s<br>Yes<br>2<br>Yes<br>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                                                                                                                                                       |
| <b>Protocols</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• IP protocol</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• SIMATIC communication</li> <li>• Open IE communication</li> <li>• Web server</li> <li>• Media redundancy</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes; IPv4<br>Yes<br>Yes<br>Yes<br>Yes; Optionally also encrypted<br>Yes<br>Yes                                                                                                                                                                                                                                                                              | Yes; IPv4<br>Yes<br>Yes<br>Yes<br>Yes; Optionally also encrypted<br>Yes<br>Yes                                                                                                                                                                                                                                                                              |
| <b>PROFINET IO Controller</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <b>Services</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>- Isochronous mode</li> <li>- Direct data exchange</li> <li>- shortest clock pulse</li> <li>- IRT</li> <li>- PROFIenergy</li> <li>- Prioritized startup</li> <li>- Number of connectable IO Devices, max.</li> <li>- Of which IO devices with IRT, max.</li> <li>- of which in line, max.</li> <li>- Number of connectable IO Devices for RT, max.</li> <li>- of which in line, max.</li> <li>- Number of IO Devices that can be simultaneously activated/deactivated, max.</li> <li>- IO Devices changing during operation (partner ports), supported</li> <li>- Number of IO Devices per tool, max.</li> <li>- Updating times</li> <li>- PROFINET Security Class</li> </ul> | Yes<br>Yes; Requirement: IRT and isochronous mode (MRPD optional)<br>500 µs<br>Yes<br>Yes<br>Yes; Max. 32 PROFINET devices<br>128<br>64<br>64<br>128<br>128<br>8<br>Yes<br>8<br>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<br>1 | Yes<br>Yes; Requirement: IRT and isochronous mode (MRPD optional)<br>500 µs<br>Yes<br>Yes<br>Yes; Max. 32 PROFINET devices<br>128<br>64<br>64<br>128<br>128<br>8<br>Yes<br>8<br>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<br>1 |
| <b>Address area</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>- Inputs, max.</li> <li>- Outputs, max.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8 kbyte<br>8 kbyte                                                                                                                                                                                                                                                                                                                                          | 8 kbyte<br>8 kbyte                                                                                                                                                                                                                                                                                                                                          |
| <b>PROFINET IO Device</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <b>Services</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>- Isochronous mode</li> <li>- IRT</li> <li>- PROFIenergy</li> <li>- Prioritized startup</li> <li>- Shared device</li> <li>- Number of IO Controllers with shared device, max.</li> <li>- activation/deactivation of I-devices</li> <li>- Asset management record</li> <li>- PROFINET Security Class</li> </ul>                                                                                                                                                                                                                                                                                                                                                                | No<br>Yes<br>Yes; per user program<br>Yes<br>Yes<br>4<br>Yes; per user program<br>Yes; per user program<br>SNMP Configuration and DCP Read Only                                                                                                                                                                                                             | No<br>Yes<br>Yes; per user program<br>Yes<br>Yes<br>4<br>Yes; per user program<br>Yes; per user program<br>SNMP Configuration and DCP Read Only                                                                                                                                                                                                             |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

#### Technical specifications

| Article number                           | <b>6ES7677-2SB42-0GB1</b><br>CPU1515SP PC2 F                                       | <b>6ES7677-2SB43-0GB1</b><br>CPU1515SP PC2 F - IndOS                               |
|------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>2. Interface</b>                      |                                                                                    |                                                                                    |
| Interface type                           | Integrated Ethernet interface                                                      | Integrated Ethernet interface                                                      |
| automatic detection of transmission rate | Yes                                                                                | Yes                                                                                |
| Autonegotiation                          | Yes                                                                                | Yes                                                                                |
| Autocrossing                             | Yes                                                                                | Yes                                                                                |
| <b>Interface types</b>                   |                                                                                    |                                                                                    |
| • 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                                                                                  |
| <b>3. Interface</b>                      |                                                                                    |                                                                                    |
| Interface type                           | PROFIBUS with CM DP                                                                | PROFIBUS with CM DP                                                                |
| Number of connections                    | 44                                                                                 | 44                                                                                 |
| <b>Interface types</b>                   |                                                                                    |                                                                                    |
| • RS 485                                 | Yes                                                                                | Yes                                                                                |
| <b>Protocols</b>                         |                                                                                    |                                                                                    |
| • PROFIBUS DP master                     | Yes                                                                                | Yes                                                                                |
| • PROFIBUS DP device                     | Yes                                                                                | Yes                                                                                |
| • SIMATIC communication                  | Yes                                                                                | Yes                                                                                |
| <b>PROFIBUS DP master</b>                |                                                                                    |                                                                                    |
| • max. number of DP devices              | 125                                                                                | 125                                                                                |
| <b>Services</b>                          |                                                                                    |                                                                                    |
| - Equidistance                           | No                                                                                 | No                                                                                 |
| - Isochronous mode                       | No                                                                                 | No                                                                                 |
| <b>Address area</b>                      |                                                                                    |                                                                                    |
| - Inputs, max.                           | 8 kbyte                                                                            | 8 kbyte                                                                            |
| - Outputs, max.                          | 8 kbyte                                                                            | 8 kbyte                                                                            |
| <b>Protocols</b>                         |                                                                                    |                                                                                    |
| <b>Number of connections</b>             |                                                                                    |                                                                                    |
| • Number of connections, max.            | 88                                                                                 | 88                                                                                 |
| <b>Redundancy mode</b>                   |                                                                                    |                                                                                    |
| <b>Media redundancy</b>                  |                                                                                    |                                                                                    |
| - Media redundancy                       | Yes; only via BusAdapter                                                           | Yes; only via BusAdapter                                                           |
| - MRP                                    | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client |
| - MRP interconnection, supported         | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                         | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                         |
| - MRPD                                   | Yes; Requirement: IRT                                                              | Yes; Requirement: IRT                                                              |
| - Switchover time on line break, typ.    | 200 ms; For MRP, bumpless for MRPD                                                 | 200 ms; For MRP, bumpless for MRPD                                                 |
| - Number of stations in the ring, max.   | 50                                                                                 | 50                                                                                 |
| <b>SIMATIC communication</b>             |                                                                                    |                                                                                    |
| • S7 routing                             | Yes                                                                                | Yes                                                                                |
| <b>OPC UA</b>                            |                                                                                    |                                                                                    |
| • OPC UA Client                          | Yes; Data access (read, write), method call                                        | Yes; Data access (read, write), method call                                        |
| • OPC UA Server                          | Yes; Data access (read, write, subscribe), method call, custom address space       | Yes; Data access (read, write, subscribe), method call, custom address space       |
| • Alarms and Conditions                  | Yes                                                                                | Yes                                                                                |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

#### Technical specifications

| Article number                                                                            | <b>6ES7677-2SB42-0GB1</b><br>CPU1515SP PC2 F                                                                                               | <b>6ES7677-2SB43-0GB1</b><br>CPU1515SP PC2 F - IndOS                                                                                       |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported technology objects</b>                                                       |                                                                                                                                            |                                                                                                                                            |
| Motion Control                                                                            | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects                     | 2 400                                                                                                                                      | 2 400                                                                                                                                      |
| • Required Motion Control resources                                                       |                                                                                                                                            |                                                                                                                                            |
| - per speed-controlled axis                                                               | 40                                                                                                                                         | 40                                                                                                                                         |
| - per positioning axis                                                                    | 80                                                                                                                                         | 80                                                                                                                                         |
| - per synchronous axis                                                                    | 160                                                                                                                                        | 160                                                                                                                                        |
| - per external encoder                                                                    | 80                                                                                                                                         | 80                                                                                                                                         |
| - per output cam                                                                          | 20                                                                                                                                         | 20                                                                                                                                         |
| - per cam track                                                                           | 160                                                                                                                                        | 160                                                                                                                                        |
| - per probe                                                                               | 40                                                                                                                                         | 40                                                                                                                                         |
| Controller                                                                                |                                                                                                                                            |                                                                                                                                            |
| • PID_Compact                                                                             | Yes; Universal PID controller with integrated optimization                                                                                 | Yes; Universal PID controller with integrated optimization                                                                                 |
| • PID_3Step                                                                               | Yes; PID controller with integrated optimization for valves                                                                                | Yes; PID controller with integrated optimization for valves                                                                                |
| • PID-Temp                                                                                | Yes; PID controller with integrated optimization for temperature                                                                           | Yes; PID controller with integrated optimization for temperature                                                                           |
| Counting and measuring                                                                    |                                                                                                                                            |                                                                                                                                            |
| • High-speed counter                                                                      | Yes                                                                                                                                        | Yes                                                                                                                                        |
| <b>Standards, approvals, certificates</b>                                                 |                                                                                                                                            |                                                                                                                                            |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                                                                                            |                                                                                                                                            |
| • Performance level according to ISO 13849-1                                              | PLe                                                                                                                                        | PLe                                                                                                                                        |
| • SIL acc. to IEC 61508                                                                   | SIL 3                                                                                                                                      | Up to SIL 3                                                                                                                                |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                                                                                            |                                                                                                                                            |
| - 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                                                                                                                                 |
| <b>Ambient conditions</b>                                                                 |                                                                                                                                            |                                                                                                                                            |
| <b>Ambient temperature during operation</b>                                               |                                                                                                                                            |                                                                                                                                            |
| • min.                                                                                    | -20 °C                                                                                                                                     | -20 °C                                                                                                                                     |
| • horizontal installation, min.                                                           | -20 °C                                                                                                                                     | -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                      | 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; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% 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                           |
| <b>Operating systems</b>                                                                  |                                                                                                                                            |                                                                                                                                            |
| pre-installed operating system                                                            | Windows 10 IoT Enterprise 2021 LTSC                                                                                                        | SIMATIC Industrial OS                                                                                                                      |
| <b>Configuration</b>                                                                      |                                                                                                                                            |                                                                                                                                            |
| <b>Configuration/programming</b>                                                          |                                                                                                                                            |                                                                                                                                            |
| <b>Programming language</b>                                                               |                                                                                                                                            |                                                                                                                                            |
| - 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                                                                                                                                        |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Fail-safe CPUs > CPU 1515SP PC2 F

#### Technical specifications

| Article number                                       | <b>6ES7677-2SB42-0GB1</b><br>CPU1515SP PC2 F | <b>6ES7677-2SB43-0GB1</b><br>CPU1515SP PC2 F - IndOS |
|------------------------------------------------------|----------------------------------------------|------------------------------------------------------|
| <b>Know-how protection</b>                           |                                              |                                                      |
| • User program protection/<br>password protection    | Yes                                          | Yes                                                  |
| • Copy protection                                    | Yes                                          | Yes                                                  |
| • Block protection                                   | Yes                                          | Yes                                                  |
| <b>Access protection</b>                             |                                              |                                                      |
| • protection of confidential<br>configuration data   | Yes                                          | Yes                                                  |
| • Protection level: Write protection                 | Yes                                          | Yes                                                  |
| • Protection level: Read/write<br>protection         | Yes                                          | Yes                                                  |
| • Protection level: Write protection for<br>Failsafe | Yes                                          | Yes                                                  |
| • Protection level: Complete<br>protection           | Yes                                          | Yes                                                  |
| • User administration                                | Yes; device-wide                             | Yes; device-wide                                     |
| • Number of users                                    | 100                                          | 100                                                  |
| <b>Open Development interfaces</b>                   |                                              |                                                      |
| • Size of ODK SO file, max.                          | 5.8 Mbyte                                    | 5.8 Mbyte                                            |
| <b>Peripherals/Options</b>                           |                                              |                                                      |
| SD card                                              | Optionally for additional mass storage       | Optionally for additional mass storage               |
| <b>Dimensions</b>                                    |                                              |                                                      |
| Width                                                | 160 mm                                       | 160 mm                                               |
| Height                                               | 117 mm                                       | 117 mm                                               |
| Depth                                                | 75 mm                                        | 75 mm                                                |
| <b>Weights</b>                                       |                                              |                                                      |
| 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 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 synchronous 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
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

#### 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 preinstalled 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:

en, de, fr, es, it, zh

- CPU 1515SP PC2 T

6ES7677-2VB42-0GB1

With preinstalled WinCC RT Advanced

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

6ES7677-2VB42-0GK0

6ES7677-2VB42-0GL0

6ES7677-2VB42-0GM0

##### Accessories

**BA 2xRJ45 BusAdapter**

6ES7193-6AR00-0AA0

**BA 2xFC BusAdapter**

6ES7193-6AF00-0AA0

**BA 2xSCRJ BusAdapter**

6ES7193-6AP00-0AA0

**BA SCRJ/RJ45 BusAdapter**

6ES7193-6AP20-0AA0

**BA SCRJ/FC BusAdapter**

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BA 2XLC BusAdapter**

6ES7193-6AG00-0AA0

**BA LC/RJ45 BusAdapter**

6ES7193-6AG20-0AA0

**BA LC/FC BusAdapter**

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

##### SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 T Operating system upgrade package

6ES7678-2AV01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP T V3

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPUes > CPU 1515SP PC2 T

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Article No.               | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2,<br>S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional<br>Version 22H2<br>• Windows 10 Enterprise<br>Version 22H2<br>• Windows 10 Enterprise 2019<br>LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional<br>Version 22H2 & 23H2<br>• Windows 11 Enterprise<br>Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard<br>(full installation)<br>• Windows Server 2022 Standard<br>(full installation)<br>Type of delivery:<br>9 languages: en, de, zh included,<br>fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery<br><b>6ES7822-1AE24-0YA5</b> |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                                                     | <b>6ES7822-1AA24-0YA5</b> | <b>SIMATIC ODK 1500S</b><br>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<br><b>6ES7806-2CD03-0YA0</b><br>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) <sup>1)</sup><br><b>6ES7806-2CD03-0YG0</b>                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           | <b>WinCC Advanced V19</b><br>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime<br>• Floating license; software and documentation on DVD; license key on USB flash drive<br><b>6AV2102-0AA02-3AA5</b><br>• Floating license; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery<br><b>6AV2102-0AA02-3AH5</b>                                                                |

<sup>1)</sup> Up-to-date information and download availability can be found at <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                                               | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T      |
| <b>General information</b>                                   |                                                   |
| Product type designation                                     | CPU 1515SP PC2 T                                  |
| <b>Engineering with</b>                                      |                                                   |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19                                               |
| <b>Installed software</b>                                    |                                                   |
| • Visualization                                              | No                                                |
| • Control                                                    | S7-1500 Software Controller<br>CPU 1505SP T       |
| <b>Supply voltage</b>                                        |                                                   |
| Rated value (DC)                                             | 24 V                                              |
| <b>Processor</b>                                             |                                                   |
| Processor type                                               | Intel Atom E3940, 1.6 GHz, 4 cores                |
| <b>Memory</b>                                                |                                                   |
| Type of memory                                               | DDR3L                                             |
| Main memory                                                  | 8 GB RAM                                          |
| CFast memory card                                            | Yes; 128 GB flash memory                          |
| <b>Work memory</b>                                           |                                                   |
| • integrated (for program)                                   | 3 Mbyte                                           |
| • integrated (for data)                                      | 7.5 Mbyte                                         |
| • integrated (for CPU function library<br>of CPU Runtime)    | 20 Mbyte                                          |
| <b>Load memory</b>                                           |                                                   |
| • integrated (on PC mass storage)                            | 320 Mbyte                                         |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                   |
| <b>S7 counter</b>                                            |                                                   |
| • Number                                                     | 2 048                                             |
| <b>IEC counter</b>                                           |                                                   |
| • Number                                                     | Any (only limited by the main<br>memory)          |
| <b>S7 times</b>                                              |                                                   |
| • Number                                                     | 2 048                                             |
| <b>IEC timer</b>                                             |                                                   |
| • Number                                                     | Any (only limited by the main<br>memory)          |
| <b>Data areas and their retentivity</b>                      |                                                   |
| <b>Flag</b>                                                  |                                                   |
| • Size, max.                                                 | 16 kbyte                                          |
| <b>Address area</b>                                          |                                                   |
| <b>I/O address area</b>                                      |                                                   |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image  |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image |
| <b>Hardware configuration</b>                                |                                                   |
| Integrated power supply                                      | Yes                                               |
| <b>Time of day</b>                                           |                                                   |
| <b>Clock</b>                                                 |                                                   |
| • Type                                                       | Hardware clock                                    |
| • Hardware clock (real-time)                                 | Yes; Resolution: 1 s                              |
| <b>Interfaces</b>                                            |                                                   |
| Number of industrial Ethernet<br>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<br>side        |
| Number of SD card slots                                      | 1                                                 |
| <b>Video interfaces</b>                                      |                                                   |
| • Graphics interface                                         | 1x DisplayPort                                    |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T                                                                                                                                          |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| Interface type                                                                      | PROFINET                                                                                                                                                                              |
| automatic detection of transmission<br>rate                                         | Yes                                                                                                                                                                                   |
| Autonegotiation                                                                     | Yes                                                                                                                                                                                   |
| Autocrossing                                                                        | Yes                                                                                                                                                                                   |
| Number of connections                                                               | 88                                                                                                                                                                                    |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • 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 BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller<br/>Services</b>                                          |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - shortest clock pulse                                                              | 500 µs                                                                                                                                                                                |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFIenergy                                                                       | Yes                                                                                                                                                                                   |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128                                                                                                                                                                                   |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - of which in line, max.                                                            | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that can be<br>simultaneously<br>activated/deactivated, max. | 8                                                                                                                                                                                     |
| - IO Devices changing during<br>operation (partner ports),<br>supported             | Yes                                                                                                                                                                                   |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>Address area</b>                                                                 |                                                                                                                                                                                       |
| - Inputs, max.                                                                      | 8 kbyte                                                                                                                                                                               |
| - Outputs, max.                                                                     | 8 kbyte                                                                                                                                                                               |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPU > CPU 1515SP PC2 T

#### Technical specifications

|                                                     |                                                                                    |
|-----------------------------------------------------|------------------------------------------------------------------------------------|
| Article number                                      | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T                                       |
| <b>PROFINET IO Device</b>                           |                                                                                    |
| <b>Services</b>                                     |                                                                                    |
| - Isochronous mode                                  | No                                                                                 |
| - IRT                                               | Yes                                                                                |
| - PROFINergy                                        | Yes; per user program                                                              |
| - Prioritized startup                               | Yes                                                                                |
| - 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                                                              |
| - PROFINET Security Class                           | SNMP Configuration and DCP Read Only                                               |
| <b>2. Interface</b>                                 |                                                                                    |
| Interface type                                      | Integrated Ethernet interface                                                      |
| automatic detection of transmission rate            | Yes                                                                                |
| Autonegotiation                                     | Yes                                                                                |
| Autocrossing                                        | Yes                                                                                |
| <b>Interface types</b>                              |                                                                                    |
| • RJ 45 (Ethernet)                                  | Yes; Integrated                                                                    |
| - Transmission rate, max.                           | 1 000 Mbit/s                                                                       |
| - Industrial Ethernet status LED                    | No                                                                                 |
| • Number of ports                                   | 1                                                                                  |
| <b>3. Interface</b>                                 |                                                                                    |
| Interface type                                      | PROFIBUS with CM DP                                                                |
| Number of connections                               | 44                                                                                 |
| <b>Interface types</b>                              |                                                                                    |
| • RS 485                                            | Yes                                                                                |
| <b>Protocols</b>                                    |                                                                                    |
| • PROFIBUS DP master                                | Yes                                                                                |
| • PROFIBUS DP device                                | Yes                                                                                |
| • SIMATIC communication                             | Yes                                                                                |
| <b>PROFIBUS DP master</b>                           |                                                                                    |
| • max. number of DP devices                         | 125                                                                                |
| <b>Services</b>                                     |                                                                                    |
| - Equidistance                                      | No                                                                                 |
| - Isochronous mode                                  | No                                                                                 |
| <b>Address area</b>                                 |                                                                                    |
| - Inputs, max.                                      | 8 kbyte                                                                            |
| - Outputs, max.                                     | 8 kbyte                                                                            |
| <b>Protocols</b>                                    |                                                                                    |
| <b>Number of connections</b>                        |                                                                                    |
| • Number of connections, max.                       | 88                                                                                 |
| <b>Redundancy mode</b>                              |                                                                                    |
| <b>Media redundancy</b>                             |                                                                                    |
| - 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                                                                                 |

|                                                                                |                                                                                                                                            |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                 | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T                                                                                               |
| <b>SIMATIC communication</b>                                                   |                                                                                                                                            |
| • S7 routing                                                                   | Yes                                                                                                                                        |
| <b>OPC UA</b>                                                                  |                                                                                                                                            |
| • OPC UA Client                                                                | Yes; Data access (read, write), method call                                                                                                |
| • OPC UA Server                                                                | Yes; Data access (read, write, subscribe), method call, custom address space                                                               |
| • Alarms and Conditions                                                        | Yes                                                                                                                                        |
| <b>Supported technology objects</b>                                            |                                                                                                                                            |
| Motion Control                                                                 | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects          | 5 120                                                                                                                                      |
| • 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                                                                                                                                         |
| • 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                                                                                                                                          |
| <b>Controller</b>                                                              |                                                                                                                                            |
| • 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                                                                           |
| <b>Counting and measuring</b>                                                  |                                                                                                                                            |
| • High-speed counter                                                           | Yes                                                                                                                                        |
| <b>Ambient conditions</b>                                                      |                                                                                                                                            |
| <b>Ambient temperature during operation</b>                                    |                                                                                                                                            |
| • 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                           |
| <b>Operating systems</b>                                                       |                                                                                                                                            |
| pre-installed operating system                                                 | Windows 10 IoT Enterprise 2021 LTSC                                                                                                        |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPU > CPU 1515SP PC2 T

#### Technical specifications

|                                                    |                                              |
|----------------------------------------------------|----------------------------------------------|
| Article number                                     | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T |
| <b>Configuration</b>                               |                                              |
| <b>Configuration/programming</b>                   |                                              |
| <b>Programming language</b>                        |                                              |
| - LAD                                              | Yes                                          |
| - FBD                                              | Yes                                          |
| - STL                                              | Yes                                          |
| - SCL                                              | Yes                                          |
| - CFC                                              | No                                           |
| - GRAPH                                            | Yes                                          |
| <b>Know-how protection</b>                         |                                              |
| • User program protection/<br>password protection  | Yes                                          |
| • Copy protection                                  | Yes                                          |
| • Block protection                                 | Yes                                          |
| <b>Access protection</b>                           |                                              |
| • protection of confidential<br>configuration data | Yes                                          |
| • Protection level: Write protection               | Yes                                          |
| • Protection level: Read/write<br>protection       | Yes                                          |
| • Protection level: Complete<br>protection         | Yes                                          |
| • User administration                              | Yes; device-wide                             |
| • Number of users                                  | 100                                          |
| <b>Open Development interfaces</b>                 |                                              |
| • Size of ODK SO file, max.                        | 5.8 Mbyte                                    |

|                            |                                              |
|----------------------------|----------------------------------------------|
| Article number             | <b>6ES7677-2VB42-0GB1</b><br>CPU1515SP PC2 T |
| <b>Peripherals/Options</b> |                                              |
| SD card                    | Optionally for additional mass<br>storage    |
| <b>Dimensions</b>          |                                              |
| Width                      | 160 mm                                       |
| Height                     | 117 mm                                       |
| Depth                      | 75 mm                                        |
| <b>Weights</b>             |                                              |
| Weight, approx.            | 0.83 kg                                      |

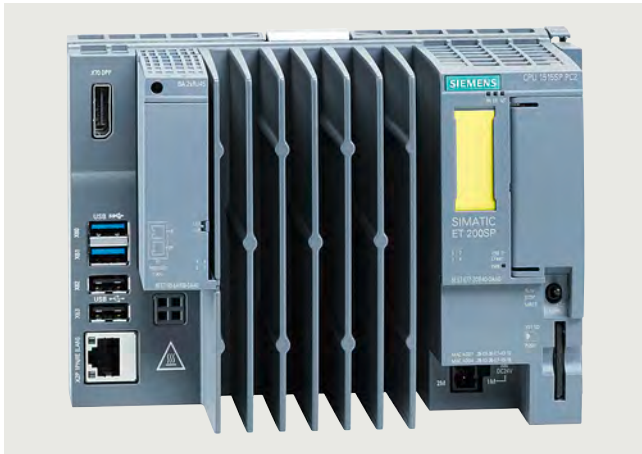
## Distributed Controllers

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 fail-safe 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 synchronous 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
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

#### 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 preinstalled 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:

en, de, fr, es, it, zh

- CPU 1515SP PC2 TF

6ES7677-2WB42-0GB1

With preinstalled WinCC RT Advanced

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

6ES7677-2WB42-0GK0

6ES7677-2WB42-0GL0

6ES7677-2WB42-0GM0

##### Accessories

**BA 2xRJ45 BusAdapter**

6ES7193-6AR00-0AA0

**BA 2xFC BusAdapter**

6ES7193-6AF00-0AA0

**BA 2xSCRJ BusAdapter**

6ES7193-6AP00-0AA0

**BA SCRJ/RJ45 BusAdapter**

6ES7193-6AP20-0AA0

**BA SCRJ/FC BusAdapter**

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

**BA 2XLC BusAdapter**

6ES7193-6AG00-0AA0

**BA LC/RJ45 BusAdapter**

6ES7193-6AG20-0AA0

**BA LC/FC BusAdapter**

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

##### SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 TF Operating system upgrade package,

6ES7678-2AW01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP TF V3

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPUes > CPU 1515SP PC2 TF

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Article No.               | Article No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STEP 7 Professional V20</b><br>Target system:<br>SIMATIC S7-1200, S7-1200 G2,<br>S7-1500, S7-300, S7-400, WinAC<br>Requirement:<br>Windows 10 (64-bit)<br>• Windows 10 Professional<br>Version 22H2<br>• Windows 10 Enterprise<br>Version 22H2<br>• Windows 10 Enterprise 2019<br>LTSC & 2021 LTSC<br>Windows 11 (64-bit)<br>• Windows 11 Professional<br>Version 22H2 & 23H2<br>• Windows 11 Enterprise<br>Version 22H2 & 23H2<br>Windows Server (64-bit)<br>• Windows Server 2019 Standard<br>(full installation)<br>• Windows Server 2022 Standard<br>(full installation)<br>Type of delivery:<br>9 languages: en, de, zh included,<br>fr, sp, it, ru, ja, ko as download |                           | <b>SIMATIC STEP 7 Professional V20, floating license download<sup>1)</sup></b><br>Engineering software in the TIA Portal; software, documentation and license key for downloading <sup>1)</sup> ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a><br>Consignee email address required for delivery<br><b>6ES7822-1AE24-0YA5</b> |
| <b>SIMATIC STEP 7 Professional V20; floating license</b><br>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.<br>The system requirements specification can be found at <a href="https://www.siemens.com/compatool">https://www.siemens.com/compatool</a>                                                                                                                                                                                                                                     | <b>6ES7822-1AA24-0YA5</b> | <b>SIMATIC ODK 1500S</b><br>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<br><b>6ES7806-2CD03-0YA0</b><br>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) <sup>1)</sup><br><b>6ES7806-2CD03-0YG0</b>                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           | <b>WinCC Advanced V19</b><br>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime<br>• Floating license; software and documentation on DVD; license key on USB flash drive<br><b>6AV2102-0AA02-3AA5</b><br>• Floating license; software, documentation and license key for download <sup>1)</sup> ; Email address required for delivery<br><b>6AV2102-0AA02-3AH5</b>                                                                |

<sup>1)</sup> Up-to-date information and download availability can be found at <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                                               | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF     |
| <b>General information</b>                                   |                                                   |
| Product type designation                                     | CPU 1515SP PC2 TF                                 |
| <b>Engineering with</b>                                      |                                                   |
| • STEP 7 TIA Portal configurable/<br>integrated from version | V19                                               |
| <b>Installed software</b>                                    |                                                   |
| • Visualization                                              | No                                                |
| • Control                                                    | S7-1500 Software Controller<br>CPU 1505SP TF      |
| <b>Supply voltage</b>                                        |                                                   |
| Rated value (DC)                                             | 24 V                                              |
| <b>Processor</b>                                             |                                                   |
| Processor type                                               | Intel Atom E3940, 1.6 GHz, 4 cores                |
| <b>Memory</b>                                                |                                                   |
| Type of memory                                               | DDR3L                                             |
| Main memory                                                  | 8 GB RAM                                          |
| CFast memory card                                            | Yes; 128 GB flash memory                          |
| <b>Work memory</b>                                           |                                                   |
| • integrated (for program)                                   | 3 Mbyte                                           |
| • integrated (for data)                                      | 7.5 Mbyte                                         |
| • integrated (for CPU function library<br>of CPU Runtime)    | 20 Mbyte                                          |
| <b>Load memory</b>                                           |                                                   |
| • integrated (on PC mass storage)                            | 320 Mbyte                                         |
| <b>Counters, timers and their<br/>retentivity</b>            |                                                   |
| <b>S7 counter</b>                                            |                                                   |
| • Number                                                     | 2 048                                             |
| <b>IEC counter</b>                                           |                                                   |
| • Number                                                     | Any (only limited by the main<br>memory)          |
| <b>S7 times</b>                                              |                                                   |
| • Number                                                     | 2 048                                             |
| <b>IEC timer</b>                                             |                                                   |
| • Number                                                     | Any (only limited by the main<br>memory)          |
| <b>Data areas and their retentivity</b>                      |                                                   |
| <b>Flag</b>                                                  |                                                   |
| • Size, max.                                                 | 16 kbyte                                          |
| <b>Address area</b>                                          |                                                   |
| <b>I/O address area</b>                                      |                                                   |
| • Inputs                                                     | 32 kbyte; All inputs are in the<br>process image  |
| • Outputs                                                    | 32 kbyte; All outputs are in the<br>process image |
| <b>Hardware configuration</b>                                |                                                   |
| Integrated power supply                                      | Yes                                               |
| <b>Time of day</b>                                           |                                                   |
| <b>Clock</b>                                                 |                                                   |
| • Type                                                       | Hardware clock                                    |
| • Hardware clock (real-time)                                 | Yes; Resolution: 1 s                              |
| <b>Interfaces</b>                                            |                                                   |
| Number of industrial Ethernet<br>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<br>side        |
| Number of SD card slots                                      | 1                                                 |
| <b>Video interfaces</b>                                      |                                                   |
| • Graphics interface                                         | 1x DisplayPort                                    |

|                                                                                     |                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                      | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF                                                                                                                                         |
| <b>1. Interface</b>                                                                 |                                                                                                                                                                                       |
| Interface type                                                                      | PROFINET                                                                                                                                                                              |
| automatic detection of transmission<br>rate                                         | Yes                                                                                                                                                                                   |
| Autonegotiation                                                                     | Yes                                                                                                                                                                                   |
| Autocrossing                                                                        | Yes                                                                                                                                                                                   |
| Number of connections                                                               | 88                                                                                                                                                                                    |
| <b>Interface types</b>                                                              |                                                                                                                                                                                       |
| • 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 BusAdapters:<br>BA 2x RJ45, BA 2x M12, BA 2x FC,<br>BA 2x LC, BA LC/RJ45, BA LC/FC,<br>BA 2x SCRJ, BA SCRJ/RJ45,<br>BA SCRJ/FC                                        |
| <b>Protocols</b>                                                                    |                                                                                                                                                                                       |
| • 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                                                                                                                                                                                   |
| <b>PROFINET IO Controller<br/>Services</b>                                          |                                                                                                                                                                                       |
| - Isochronous mode                                                                  | Yes                                                                                                                                                                                   |
| - Direct data exchange                                                              | Yes; Requirement: IRT and<br>isochronous mode (MRPD optional)                                                                                                                         |
| - shortest clock pulse                                                              | 500 µs                                                                                                                                                                                |
| - IRT                                                                               | Yes                                                                                                                                                                                   |
| - PROFIenergy                                                                       | Yes                                                                                                                                                                                   |
| - Prioritized startup                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                                         |
| - Number of connectable<br>IO Devices, max.                                         | 128                                                                                                                                                                                   |
| - Of which IO devices with IRT, max.                                                | 64                                                                                                                                                                                    |
| - of which in line, max.                                                            | 64                                                                                                                                                                                    |
| - Number of connectable<br>IO Devices for RT, max.                                  | 128                                                                                                                                                                                   |
| - of which in line, max.                                                            | 128                                                                                                                                                                                   |
| - Number of IO Devices that<br>can be simultaneously<br>activated/deactivated, max. | 8                                                                                                                                                                                     |
| - IO Devices changing during<br>operation (partner ports),<br>supported             | Yes                                                                                                                                                                                   |
| - Number of IO Devices per tool,<br>max.                                            | 8                                                                                                                                                                                     |
| - Updating times                                                                    | The minimum value of the update<br>time also depends on<br>communication share set for<br>PROFINET IO, on the number of<br>IO devices, and on the quantity of<br>configured user data |
| - PROFINET Security Class                                                           | 1                                                                                                                                                                                     |
| <b>Address area</b>                                                                 |                                                                                                                                                                                       |
| - Inputs, max.                                                                      | 8 kbyte                                                                                                                                                                               |
| - Outputs, max.                                                                     | 8 kbyte                                                                                                                                                                               |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPU > CPU 1515SP PC2 TF

#### Technical specifications

|                                                     |                                                                                    |
|-----------------------------------------------------|------------------------------------------------------------------------------------|
| Article number                                      | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF                                      |
| <b>PROFINET IO Device</b>                           |                                                                                    |
| <b>Services</b>                                     |                                                                                    |
| - Isochronous mode                                  | No                                                                                 |
| - IRT                                               | Yes                                                                                |
| - PROFINergy                                        | Yes; per user program                                                              |
| - Prioritized startup                               | Yes                                                                                |
| - 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                                                              |
| - PROFINET Security Class                           | SNMP Configuration and DCP Read Only                                               |
| <b>2. Interface</b>                                 |                                                                                    |
| Interface type                                      | Integrated Ethernet interface                                                      |
| automatic detection of transmission rate            | Yes                                                                                |
| Autonegotiation                                     | Yes                                                                                |
| Autocrossing                                        | Yes                                                                                |
| <b>Interface types</b>                              |                                                                                    |
| • RJ 45 (Ethernet)                                  | Yes; Integrated                                                                    |
| - Transmission rate, max.                           | 1 000 Mbit/s                                                                       |
| - Industrial Ethernet status LED                    | No                                                                                 |
| • Number of ports                                   | 1                                                                                  |
| <b>3. Interface</b>                                 |                                                                                    |
| Interface type                                      | PROFIBUS with CM DP                                                                |
| Number of connections                               | 44                                                                                 |
| <b>Interface types</b>                              |                                                                                    |
| • RS 485                                            | Yes                                                                                |
| <b>Protocols</b>                                    |                                                                                    |
| • PROFIBUS DP master                                | Yes                                                                                |
| • PROFIBUS DP device                                | Yes                                                                                |
| • SIMATIC communication                             | Yes                                                                                |
| <b>PROFIBUS DP master</b>                           |                                                                                    |
| • max. number of DP devices                         | 125                                                                                |
| <b>Services</b>                                     |                                                                                    |
| - Equidistance                                      | No                                                                                 |
| - Isochronous mode                                  | No                                                                                 |
| <b>Address area</b>                                 |                                                                                    |
| - Inputs, max.                                      | 8 kbyte                                                                            |
| - Outputs, max.                                     | 8 kbyte                                                                            |
| <b>Protocols</b>                                    |                                                                                    |
| <b>Number of connections</b>                        |                                                                                    |
| • Number of connections, max.                       | 88                                                                                 |
| <b>Redundancy mode</b>                              |                                                                                    |
| <b>Media redundancy</b>                             |                                                                                    |
| - 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                                                                                 |

|                                                                                           |                                                                                                                                            |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                            | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF                                                                                              |
| <b>SIMATIC communication</b>                                                              |                                                                                                                                            |
| • S7 routing                                                                              | Yes                                                                                                                                        |
| <b>OPC UA</b>                                                                             |                                                                                                                                            |
| • OPC UA Client                                                                           | Yes; Data access (read, write), method call                                                                                                |
| • OPC UA Server                                                                           | Yes; Data access (read, write, subscribe), method call, custom address space                                                               |
| • Alarms and Conditions                                                                   | Yes                                                                                                                                        |
| <b>Supported technology objects</b>                                                       |                                                                                                                                            |
| Motion Control                                                                            | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects                     | 5 120                                                                                                                                      |
| • 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                                                                                                                                         |
| • 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                                                                                                                                          |
| <b>Controller</b>                                                                         |                                                                                                                                            |
| • 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                                                                           |
| <b>Counting and measuring</b>                                                             |                                                                                                                                            |
| • High-speed counter                                                                      | Yes                                                                                                                                        |
| <b>Standards, approvals, certificates</b>                                                 |                                                                                                                                            |
| <b>Highest safety class achievable in safety mode</b>                                     |                                                                                                                                            |
| • Performance level according to ISO 13849-1                                              | PLe                                                                                                                                        |
| • SIL acc. to IEC 61508                                                                   | SIL 3                                                                                                                                      |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                                                                                            |
| - 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                                                                                                                             |

## Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

### Technology-CPU > CPU 1515SP PC2 TF

#### Technical specifications

|                                                   |                                                                                                                                   |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Article number                                    | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF                                                                                     |
| <b>Ambient conditions</b>                         |                                                                                                                                   |
| <b>Ambient temperature during operation</b>       |                                                                                                                                   |
| • min.                                            | -20 °C                                                                                                                            |
| • horizontal installation, min.                   | -20 °C                                                                                                                            |
| • horizontal installation, max.                   | 60 °C; from 55°C:<br>with max. 32 ET 200SP modules;<br>4x 0.3 A USB load;<br>CFast memory card max. 10% load;<br>SD card not used |
| • vertical installation, min.                     | -20 °C                                                                                                                            |
| • vertical installation, max.                     | 50 °C; from 45°C:<br>with max. 32 ET 200SP modules;<br>4x 0.3 A USB load;<br>CFast memory card and SD card;<br>max. 10% load      |
| <b>Operating systems</b>                          |                                                                                                                                   |
| pre-installed operating system                    | Windows 10 Enterprise 2021 LTSC                                                                                                   |
| <b>Configuration</b>                              |                                                                                                                                   |
| <b>Configuration/programming</b>                  |                                                                                                                                   |
| <b>Programming language</b>                       |                                                                                                                                   |
| - LAD                                             | Yes; incl. failsafe                                                                                                               |
| - FBD                                             | Yes; incl. failsafe                                                                                                               |
| - STL                                             | Yes                                                                                                                               |
| - SCL                                             | Yes                                                                                                                               |
| - CFC                                             | No                                                                                                                                |
| - GRAPH                                           | Yes                                                                                                                               |
| <b>Know-how protection</b>                        |                                                                                                                                   |
| • User program protection/<br>password protection | Yes                                                                                                                               |
| • Copy protection                                 | Yes                                                                                                                               |
| • Block protection                                | Yes                                                                                                                               |

|                                                      |                                               |
|------------------------------------------------------|-----------------------------------------------|
| Article number                                       | <b>6ES7677-2WB42-0GB1</b><br>CPU1515SP PC2 TF |
| <b>Access protection</b>                             |                                               |
| • protection of confidential<br>configuration data   | Yes                                           |
| • Protection level: Write protection                 | Yes                                           |
| • Protection level: Read/write<br>protection         | Yes                                           |
| • Protection level: Write protection for<br>Failsafe | Yes                                           |
| • Protection level: Complete<br>protection           | Yes                                           |
| • User administration                                | Yes; device-wide                              |
| • Number of users                                    | 100                                           |
| <b>Open Development interfaces</b>                   |                                               |
| • Size of ODK SO file, max.                          | 5.8 Mbyte                                     |
| <b>Peripherals/Options</b>                           |                                               |
| SD card                                              | Optionally for additional mass<br>storage     |
| <b>Dimensions</b>                                    |                                               |
| Width                                                | 160 mm                                        |
| Height                                               | 117 mm                                        |
| Depth                                                | 75 mm                                         |
| <b>Weights</b>                                       |                                               |
| 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 preinstalled SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card

##### Type of delivery:

en, de, fr, es, it, zh

##### • SIPLUS ET 200SP CPU 1515SP PC2

6AG1677-2DB42-2GB1

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

#### Accessories

##### BA 2xRJ45 BusAdapter

6AG1193-6AR00-7AA0

(Extended temperature range and exposure to environmental substances)

##### SIPLUS BA 2xFC BusAdapter

6AG1193-6AF00-7AA0

(Extended temperature range and exposure to environmental substances)

##### BA 2xSCRJ BusAdapter

6AG1193-6AP00-2AA0

(Extended temperature range and exposure to environmental substances)

##### BA 2xLC BusAdapter

6AG1193-6AG00-2AA0

(Extended temperature range and exposure to environmental substances)

##### SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

#### Other accessories

See SIMATIC CPU 1515SP PC2, page 7/54

## Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

### SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

#### Technical specifications

|                                                                     |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                      | <b>6AG1677-2DB42-2GB1</b>                                                                                                                                                                                                                                            | <b>6AG1677-2DB40-2AA0</b>                                                                                                                                                                                                            |
| Based on                                                            | <b>6ES7677-2DB42-0GB1</b><br>SIPLUS ET 200SP CPU1515SP PC2                                                                                                                                                                                                           | <b>6ES7677-2DB40-0AA0</b><br>SIPLUS ET 200SP CPU1515SP PC2                                                                                                                                                                           |
| <b>Ambient conditions</b>                                           |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| <b>Ambient temperature during operation</b>                         |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • min.                                                              | -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 |                                                                                                                                                                                                                                      |
| • horizontal installation, min.                                     | -40 °C; = Tmin (incl. condensation/frost)                                                                                                                                                                                                                            | -40 °C; = Tmin (incl. condensation/frost)                                                                                                                                                                                            |
| • horizontal installation, max.                                     | 70 °C; = Tmax                                                                                                                                                                                                                                                        | 70 °C; = Tmax;<br>from 55 °C: with max. 32 ET 200SP modules and 4x 500 mA USB load;<br>from 60 °C with max. 16 ET 200SP modules, max. 4x 100 mA USB load, no visualization and projected empty space between CPU and ET 200SP module |
| • vertical installation, min.                                       | -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                                                                                                                                                             |
| <b>Ambient temperature during storage/transportation</b>            |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • min.                                                              | -40 °C                                                                                                                                                                                                                                                               | -40 °C                                                                                                                                                                                                                               |
| • max.                                                              | 70 °C                                                                                                                                                                                                                                                                | 70 °C                                                                                                                                                                                                                                |
| <b>Altitude during operation relating to sea level</b>              |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • Installation altitude above sea level, max.                       | 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)                                                                                                                                                                       |
| <b>Relative humidity</b>                                            |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • 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                                                                                                                                    |
| <b>Vibrations</b>                                                   |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • Operation, tested according to IEC 60068-2-6                      | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| • Transport, tested acc. to IEC 60068-2-6                           | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| <b>Shock testing</b>                                                |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| • tested according to IEC 60068-2-6                                 | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| • tested according to IEC 60068-2-27                                | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| • tested according to IEC 60068-2-29                                | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| • Storage/transport, tested acc. to IEC 60068-2-27                  | Yes                                                                                                                                                                                                                                                                  | Yes                                                                                                                                                                                                                                  |
| <b>Resistance</b>                                                   |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| <b>Coolants and lubricants</b>                                      |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| - 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                                                                                                                                                                                        |
| <b>Use in stationary industrial systems</b>                         |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                      |
| - to biologically active substances according to EN 60721-3-3       | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                                                                                                   | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                                                                   |
| - to chemically active substances according to EN 60721-3-3         | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                                                                             | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                                             |
| - to mechanically active substances according to EN 60721-3-3       | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                                                                                                   | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                                                                   |

**Distributed Controllers**  
based on ET 200SP  
SIPLUS ET 200SP Open Controllers

**SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2**

**Technical specifications**

|                                                                                                                                                                         |                                                            |                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| Article number                                                                                                                                                          | <b>6AG1677-2DB42-2GB1</b>                                  | <b>6AG1677-2DB40-2AA0</b>                                  |
| Based on                                                                                                                                                                | <b>6ES7677-2DB42-0GB1</b><br>SIPLUS ET 200SP CPU1515SP PC2 | <b>6ES7677-2DB40-0AA0</b><br>SIPLUS ET 200SP CPU1515SP PC2 |
| <b>Conformal coating</b>                                                                                                                                                |                                                            |                                                            |
| <ul style="list-style-type: none"><li>• Coatings for printed circuit board assemblies acc. to EN 61086</li></ul>                                                        | Yes; Class 2 for high reliability                          | Yes; Class 2 for high reliability                          |
| <ul style="list-style-type: none"><li>• Protection against fouling acc. to EN 60664-3</li></ul>                                                                         | Yes; Type 1 protection                                     | Yes; Type 1 protection                                     |
| <ul style="list-style-type: none"><li>• Military testing according to MIL-I-46058C, Amendment 7</li></ul>                                                               | Yes; Discoloration of coating possible during service life | Yes; Discoloration of coating possible during service life |
| <ul style="list-style-type: none"><li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li></ul> | Yes; Conformal coating, Class A                            | Yes; Conformal coating, Class A                            |

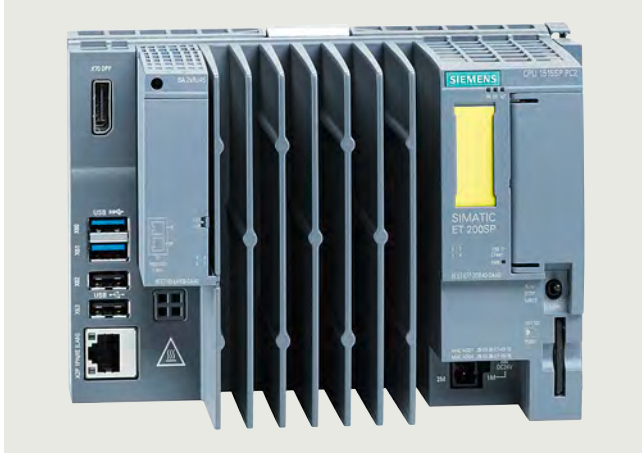
## Distributed Controllers

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)

8 GB RAM, 128 GB CFast with Windows 10 IoT Enterprise 64-bit and S7-1500 Failsafe Software Controller CPU 1505SP F preinstalled, interfaces: 1x slot CFast, 1x slot SD/MMC, 1x connector for ET 200SP BusAdapter PROFINET, 1x 10/100/1000 Mbps Ethernet, 2x USB 3.0; 2x USB 2.0, 1x DisplayPort, documentation on CFast, restore image on CFast

##### • SIPLUS CPU 1515SP PC2 F

6AG1677-2SB42-2GB1

#### Accessories

##### BA 2xRJ45 BusAdapter

(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

##### BA 2xSCRJ BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AP00-2AA0

##### BA 2xLC BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AG00-2AA0

##### SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

##### SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

#### Other accessories

See SIMATIC CPU 1515SP PC2 F, page 7/61

## Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

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

#### Technical specifications

|                                                                     |                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                      | <b>6AG1677-2SB42-2GB1</b>                                                                                                                                                                                                                           |
| Based on                                                            | <b>6ES7677-2SB42-0GB1</b><br>SIPLUS ET 200SP<br>CPU1515SP PC2 F                                                                                                                                                                                     |
| <b>Ambient conditions</b>                                           |                                                                                                                                                                                                                                                     |
| <b>Ambient temperature during operation</b>                         |                                                                                                                                                                                                                                                     |
| • min.                                                              | -40 °C; = Tmin                                                                                                                                                                                                                                      |
| • horizontal installation, min.                                     | -40 °C; = Tmin<br>(incl. condensation/frost)                                                                                                                                                                                                        |
| • horizontal installation, max.                                     | 70 °C; = Tmax; from 55 °C:<br>with max. 32 ET 200SP modules and<br>4x 500 mA USB load;<br>from 60 °C with max. 16 ET 200SP<br>modules, max. 4x 100 mA USB load,<br>no visualization and projected empty<br>space between CPU and ET 200SP<br>module |
| • vertical installation, min.                                       | -40 °C; = Tmin                                                                                                                                                                                                                                      |
| • vertical installation, max.                                       | 50 °C; = Tmax;<br>with max. 32 ET 200SP modules and<br>max. 4x 500 mA USB load                                                                                                                                                                      |
| <b>Ambient temperature during storage/transportation</b>            |                                                                                                                                                                                                                                                     |
| • min.                                                              | -40 °C                                                                                                                                                                                                                                              |
| • max.                                                              | 70 °C                                                                                                                                                                                                                                               |
| <b>Altitude during operation relating to sea level</b>              |                                                                                                                                                                                                                                                     |
| • Installation altitude above sea level, max.                       | 2 000 m                                                                                                                                                                                                                                             |
| • Ambient air temperature-barometric pressure-altitude              | Tmin ... Tmax<br>at 1 140 hPa ... 795 hPa<br>(-1 000 m ... +2 000 m)                                                                                                                                                                                |
| <b>Relative humidity</b>                                            |                                                                                                                                                                                                                                                     |
| • With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost<br>(no commissioning in bedewed<br>state), horizontal installation                                                                                                                                             |
| <b>Vibrations</b>                                                   |                                                                                                                                                                                                                                                     |
| • Operation, tested according to IEC 60068-2-6                      | Yes                                                                                                                                                                                                                                                 |
| • Transport, tested acc. to IEC 60068-2-6                           | Yes                                                                                                                                                                                                                                                 |
| <b>Shock testing</b>                                                |                                                                                                                                                                                                                                                     |
| • tested according to IEC 60068-2-6                                 | Yes                                                                                                                                                                                                                                                 |
| • tested according to IEC 60068-2-27                                | Yes                                                                                                                                                                                                                                                 |

|                                                                                                                         |                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Article number                                                                                                          | <b>6AG1677-2SB42-2GB1</b>                                                                                                                                                           |
| Based on                                                                                                                | <b>6ES7677-2SB42-0GB1</b><br>SIPLUS ET 200SP<br>CPU1515SP PC2 F                                                                                                                     |
| <b>Use on ships/at sea</b>                                                                                              |                                                                                                                                                                                     |
| - 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 (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)                                                                                       |
| <b>Usage in industrial process technology</b>                                                                           |                                                                                                                                                                                     |
| - 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) |
| <b>Remark</b>                                                                                                           |                                                                                                                                                                                     |
| - 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!                                                                                        |
| <b>Conformal coating</b>                                                                                                |                                                                                                                                                                                     |
| • 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                                                                                                                                                     |