SIMATIC S7-1500
Central processing units

Standard CPUs

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■ Overview CPU 1515-2 PN

- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages
- SIMATIC memory card required for operation of the CPU

■ Overview CPU 1518-4 PN/DP

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

■ Technical specifications

	6ES7515-2AM00-0AB0 CPU 1515-2 PN	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP
General information		
Engineering with		
• STEP 7 TIA Portal can be configured/integrated as of version	V13	V13
Display		
Screen diagonal (cm)	6.1 cm	6.1 cm
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Power losses		
Power loss, typ.	6.3 W	24 W
Memory		
Work memory		
• integrated (for program)	500 kbyte	3 Mbyte
• integrated (for data)	3 Mbyte	10 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	30 ns	1 ns
for word operations, typ.	36 ns	2 ns
for fixed point arithmetic, typ.	48 ns	2 ns
for floating point arithmetic, typ.	192 ns	6 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)

■ **Technical specifications** (continued)

	6ES7515-2AM00-0AB0 CPU 1515-2 PN	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP
Data areas and their retentivity		
Flag		
• Number, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
Interfaces		
1st interface		
• Interface types		
- Number of ports	2	2
- Integrated switch	Yes	Yes
- RJ 45 (Ethernet)	Yes	Yes
• Protocols		
- PROFINET IO Controller	Yes	Yes
- PROFINET IO Device	Yes	Yes
- SIMATIC communication	Yes	Yes
- Open IE communication	Yes	Yes
- Web server	Yes	Yes
- Media redundancy	Yes	Yes
2nd interface		
• Interface types		
- Number of ports	1	1
- Integrated switch	No	No
- RJ 45 (Ethernet)	Yes	Yes
• Protocols		
- PROFINET IO Controller	No	No
- PROFINET IO Device	No	No
- SIMATIC communication	Yes	Yes
- Open IE communication	Yes	Yes
- Web server	Yes	Yes
3rd interface		
• Interface types		
- Number of ports		1
- Integrated switch		No
- RJ 45 (Ethernet)		Yes
• Protocols		
- PROFINET IO Controller		No
- PROFINET IO Device		No
- SIMATIC communication		Yes
- Open IE communication		Yes
- Web server		Yes
4th interface		
• Interface types		
- Number of ports		1
- RS 485		Yes
• Protocols		
- SIMATIC communication		Yes
- PROFIBUS DP master		Yes
- PROFIBUS DP slave		No
Protocols		
Number of connections		
• Number of connections, max.	192	384
PROFINET IO Controller		
• Services		
- Max. number of connectable IO devices for RT	256	512
- Number of IO Devices with IRT and the option "high performance", max.	64	64
PROFIBUS		
• Services		
- Number of DP slaves		125

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■ **Technical specifications** (continued)

	6ES7515-2AM00-0AB0 CPU 1515-2 PN	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	Yes	Yes
supported technology objects		
Motion	Yes	Yes
• Speed-controlled axis		
- Number of speed-controlled axes, max.	20; Up to 20 axes in total (speed-controlled, positioning axis, external encoders) are supported	128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported
• Positioning axis		
- Number of positioning axes, max.	20; Up to 20 axes in total (speed-controlled, positioning axis, external encoders) are supported	128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported
• External encoders		
- Number of external encoders, max.	20; Up to 20 axes in total (speed-controlled, positioning axis, external encoders) are supported	128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported
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
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Operating temperature		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration		
programming		
• Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
Know-how protection		
• User program protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Dimensions		
Width	70 mm	175 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	830 g	1 988 g

■ **Ordering data**

	Article No.
CPU 1515-2 PN	**6ES7515-2AM00-0AB0**
Work memory 500 KB for program, 3 MB for data, PROFINET IO IRT interface, PROFINET interface; SIMATIC memory card required	
CPU 1518-4 PN/DP	**6ES7518-4AP00-0AB0**
Work memory 3 MB for program, 10 MB for data, PROFINET IO IRT interface, 2 PROFINET/PROFIBUS interfaces; SIMATIC memory card required	
Accessories	
SIMATIC memory card	
4 MB	**6ES7954-8LC02-0AA0**
12 MB	**6ES7954-8LE02-0AA0**
24 MB	**6ES7954-8LF02-0AA0**
2 GB	**6ES7954-8LP01-0AA0**
SIMATIC S7-1500 mounting rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3A	**6EP1332-4BA00**
24 V DC/8A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• with push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect bus connector RS485 with 90° cable outlet	
with insulation displacement, max. transmission rate 12 Mbit/s	
without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
with PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**

	Article No.
PROFIBUS FC Standard Cable GP	**6XV1830-0EH10**
Standard type with special design for fast mounting, 2-core, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Robust Cable	**6XV1830-0JH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Flexible Cable	**6XV1831-2K**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Trailing Cable	
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC Food Cable	**6XV1830-0GH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC Ground Cable	**6XV1830-3FH10**
2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FC FRNC Cable GP	**6XV1830-0LH10**
2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
PROFIBUS FastConnect Stripping Tool	**6GK1905-6AA00**
Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 Plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	