

SIMATIC S7-1500

Central processing units

Standard CPUs

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) • integrated (for data)	500 kbyte 3 Mbyte	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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Central processing units

Standard CPUs

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

Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

	6ES7521-1BH00-0AB0 DI 16x24 V DC HF	6ES7521-1BL00-0AB0 DI 32x24 V DC HF	6ES7521-1BH50-0AA0 DI 16x24 V DC SRC BA	6ES7521-1FH00-0AA0 DI 16x230 V AC BA
General information				
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with				
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• MSI	Yes	Yes	Yes	Yes
Supply voltage				
Type of supply voltage	DC	DC		
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		
Digital inputs				
Number of digital inputs	16	32	16	16
m/p-reading	p-reading	p-reading	m-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 1				Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	
Input voltage				
• Type of input voltage	DC	DC	DC	AC
• Rated value, AC				230 V; 120/230 V AC; 60/50 Hz
• Rated value, DC	24 V	24 V	24 V	
• for signal "0"	-30 to +5 V	-30 to +5 V	30 to -5 V	0 to 40 V AC
• for signal "1"	11 to 30 V	11 to 30 V	-11 to -30 V	79 to 264 V AC
Input current				
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC
Input delay (for rated value of input voltage)				
• for standard inputs				
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No
• for interrupt inputs				
- Parameterizable	Yes	Yes	No	No

SIMATIC S7-1500

Digital modules

SM 521 digital input modules

Technical specifications (continued)

	6ES7521-1BH10-0AA0 DI 16 x 24 V DC BA	6ES7521-1BL10-0AA0 DI 32 x 24 V DC BA
Galvanic isolation		
Electrical isolation channels		
• between the channels and the backplane bus	Yes	Yes
Isolation		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
Decentralized operation		
Prioritized startup	Yes	Yes
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	260 g

Ordering data

SM 521 digital input modules

Module width 35 mm;
with parameters and diagnostic
functions

16 inputs, 24 V DC, isolated,
parameterizable diagnostics and
hardware interrupts

32 inputs, 24 V DC, isolated,
parameterizable diagnostics and
hardware interrupts

16 inputs, 24 V DC, isolated,
input delay 3.2 ms

16 inputs, 230 V AC, isolated,
input delay 20 ms

Module width 25 mm; without
parameters or diagnostic functions;
front connector (push-in) included
in scope of delivery

16 inputs, 24 V DC, isolated

32 inputs, 24 V DC, isolated

Article No.

6ES7521-1BH00-0AB0

6ES7521-1BL00-0AB0

6ES7521-1BH50-0AA0

6ES7521-1FH00-0AA0

6ES7521-1BH10-0AA0

6ES7521-1BL10-0AA0

Article No.

Accessories

Front connectors

For 35 mm modules;
including four potential bridges,
cable ties and individual labeling
strips, 40-pin

- Screw terminals
- Push-in

For 25 mm modules;
including cable ties and individual
labeling strips; push-in terminal
40-pin; spare part

Potential bridges for front connectors

20 units; spare part

DIN A4 labeling sheets

For 35 mm modules;
10 sheets with 10 labeling strips
each for I/O modules; perforated,
Al gray

For 25 mm modules;
10 sheets with 10 labeling strips
each for I/O modules; perforated,
Al gray

U connector

5 units; spare part

Universal front door for I/O modules

For 35 mm modules;
5 front doors; with 5 labeling strips
(front) and 5 cabling diagrams per
front door; spare part

For 25 mm modules;
5 front doors; with 5 labeling strips
(front) and 5 cabling diagrams per
front door; spare part

6ES7592-1AM00-0XB0

6ES7592-1BM00-0XB0

6ES7592-1BM00-0XA0

6ES7592-3AA00-0AA0

6ES7592-2AX00-0AA0

6ES7592-1AX00-0AA0

6ES7590-0AA00-0AA0

6ES7528-0AA00-7AA0

6ES7528-0AA00-0AA0