

SIPLUS S7-1500 CPU 1518-4 PN/DP with conformal coating based on 6ES7518-4AP00-0AB0 . Central processing unit with Work memory 3 MB for Program and 10 MB for data, 1st interface, PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, Ethernet, 4th interface, PROFIBUS, 1 ns bit-performance, SIMATIC Memory Card required



Figure similar

General information	
Product type designation	CPU 1518-4 PN/DP
HW functional status	FS01
Firmware version	V1.5
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version 	V13
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Type of supply voltage	24 V DC
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V

Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	1.55 A
Inrush current, max.	2.4 A; Rated value
I^2t	0.45 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	30 W
Power loss	
Power loss, typ.	24 W
Memory	
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	10 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
• maintenance-free	Yes
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
CPU-blocks	
Number of blocks (total)	10 000
DB	
• Number, max.	10 000; Number range: 1 to 65535
• Size, max.	10 Mbyte
FB	
• Number, max.	9 998; Number range: 1 to 65535
• Size, max.	512 kbyte
FC	
• Number, max.	9 999; Number range: 1 to 65535
• Size, max.	512 kbyte
OB	
• Size, max.	512 kbyte
• Number of free cycle OBs	100
• Number of time alarm OBs	20

• Number of delay alarm OBs	20
• Number of cyclic interrupt OBs	20
• Number of process alarm OBs	50
• Number of DPV1 alarm OBs	3
• Number of isochronous mode OBs	2
• Number of technology synchronous alarm OBs	2
• Number of startup OBs	100
• Number of asynchronous error OBs	4
• Number of synchronous error OBs	2
• Number of diagnostic alarm OBs	1

Nesting depth	
• per priority class	24

Counters, timers and their retentivity

S7 counter	
• Number	2 048

Retentivity	
— adjustable	Yes

IEC counter	
• Number	Any (only limited by the main memory)

Retentivity	
— adjustable	Yes

S7 times	
• Number	2 048

Retentivity	
— adjustable	Yes

IEC timer	
• Number	Any (only limited by the main memory)

Retentivity	
— adjustable	Yes

Data areas and their retentivity

Retentive data area (incl. timers, counters, flags), max.	768 kbyte; Available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 700 KB
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Flag	
• Number, max.	16 kbyte
• Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte

Data blocks	
• Retentivity adjustable	Yes
• Retentivity preset	No

Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block

Address area

Number of IO modules	8 192
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	16 kbyte; 16 KB via the integrated PROFINET IO interface, 8 KB via the integrated DP interface
— Outputs (volume)	16 kbyte; 16 KB via the integrated PROFINET IO interface, 8 KB via the integrated DP interface
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
• Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	10
Number of DP masters	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
• Modules per rack, max.	32; CPU + 31 modules
• Number of lines, max.	1
PtP CM	
• Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
• Backup time	6 wk; At 40 °C ambient temperature, typically
• Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	
• Number	8
Clock synchronization	
• supported	Yes
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes

- on Ethernet via NTP

Yes

Interfaces

Number of PROFINET interfaces

3

Number of PROFIBUS interfaces

1

1. Interface

Interface types

- Number of ports 2
- integrated switch Yes
- RJ 45 (Ethernet) Yes

Protocols

- PROFINET IO Controller Yes
- PROFINET IO Device Yes
- SIMATIC communication Yes
- Open IE communication Yes
- Web server Yes
- Media redundancy Yes

2. 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

3. 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

4. Interface

Interface types

• Number of ports	1
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes
• Industrial Ethernet status LED	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
• Number of connections reserved for ES/HMI/web	10
• Number of connections via integrated interfaces	192
• Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	Yes
— Open IE communication	Yes
— IRT	Yes
— PROFINergy	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
— Number of connectable IO Devices for RT, max.	512
— of which in line, max.	512
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8
— 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

Update time for IRT

— for send cycle of 250 μ s	250 μ s to 4 ms
— for send cycle of 500 μ s	500 μ s to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
— With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s ... 3 875 μ s)

Update time for RT

— for send cycle of 250 μ s	250 μ s to 128 ms
— for send cycle of 500 μ s	500 μ s to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms

PROFINET IO Device

Services

— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	Yes
— PROFINergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4

Redundancy mode

• MRP	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
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SIMATIC communication

• S7 communication, as server	Yes
• S7 communication, as client	Yes
• User data per job, max.	See online help (S7 communication, user data size)

Open IE communication

• TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte

<ul style="list-style-type: none"> • UDP <ul style="list-style-type: none"> — Data length, max. • DHCP • SNMP • DCP • LLDP 	<p>Yes</p> <p>1 472 byte</p> <p>No</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Web server	
<ul style="list-style-type: none"> • HTTP • HTTPS 	<p>Yes; Standard and user-defined pages</p> <p>Yes; Standard and user-defined pages</p>
PROFIBUS DP master	
<ul style="list-style-type: none"> • Number of connections, max. 	48; for the integrated PROFIBUS DP interface
Services	
<ul style="list-style-type: none"> — PG/OP communication — S7 routing — Isochronous mode — Equidistance — Number of DP slaves — Activation/deactivation of DP slaves 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>125; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET</p> <p>Yes</p>
Further protocols	
<ul style="list-style-type: none"> • MODBUS 	Yes; MODBUS TCP
Media redundancy	
<ul style="list-style-type: none"> • Switchover time on line break, typ. • Number of stations in the ring, max. 	<p>200 ms</p> <p>50</p>
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	10 000
Number of simultaneously active program alarms	1 000
Test commissioning functions	
Status block	Yes; Up to 16 simultaneously
Single step	No
Status/control	
<ul style="list-style-type: none"> • Status/control variable • Variables • Number of variables, max. <ul style="list-style-type: none"> — of which status variables, max. 	<p>Yes</p> <p>Inputs, outputs, memory bits, DB, times, counters</p> <p>200; per job</p>

— of which control variables, max.	200; per job
Forcing	
• Forcing, variables	Inputs, outputs
• Number of variables, max.	200
Diagnostic buffer	
• present	Yes
• Number of entries, max.	3 200
— of which powerfail-proof	1 000
Traces	
• Number of configurable Traces	8
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	
• Speed-controlled axis	Yes
— Number of speed-controlled axes, max.	128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported
• Positioning axis	
— Number of positioning axes, max.	128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported
• External encoders	
— Number of external encoders, max.	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
• PID_3Step	Yes; PID controller with integrated optimization for valves
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C

• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— 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; *
Usage in industrial process technology	
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• 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

Configuration

Programming

Programming language

— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes

Know-how protection

• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes

Access protection

• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes

Cycle time monitoring

• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time

Dimensions

Width	175 mm
Height	147 mm
Depth	129 mm

Weights

Weight, approx.	1 988 g
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last modified: 08/30/2019