

SIPLUS S7-1500 CPU 1518F-4 PN/DP with conformal coating based on 6ES7518-4FP00-0AB0. Central processing unit with Work memory 4.5 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



General information	
Product type designation	CPU 1518F-4PN/DP
Product function	
• Isochronous mode	Yes
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
Mains buffering	
• Mains/voltage failure stored energy time	5 ms
Input current	

Current consumption (rated value)	1.55 A
Inrush current, max.	2.4 A; Rated value
I <sup>2</sup> t	0.02 A <sup>2</sup> ·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
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### Memory

SIMATIC memory card required	Yes
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#### Work memory

<ul style="list-style-type: none"> <li>integrated (for program)</li> </ul>	6 Mbyte
<ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>	20 Mbyte

#### Load memory

<ul style="list-style-type: none"> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte
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#### Backup

<ul style="list-style-type: none"> <li>maintenance-free</li> </ul>	Yes
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### 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
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#### DB

<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	10 000; Number range: 1 to 65535
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	10 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB

#### FB

<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	9 998; Number range: 1 to 65535
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	512 kbyte

#### FC

<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	9 999; Number range: 1 to 65535
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	512 kbyte

#### OB

<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	512 kbyte
<ul style="list-style-type: none"> <li>Number of free cycle OBs</li> </ul>	100
<ul style="list-style-type: none"> <li>Number of time alarm OBs</li> </ul>	20
<ul style="list-style-type: none"> <li>Number of delay alarm OBs</li> </ul>	20
<ul style="list-style-type: none"> <li>Number of cyclic interrupt OBs</li> </ul>	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
<b>Nesting depth</b>	
• per priority class	24; Up to 8 possible for F-blocks

### Counters, timers and their retentivity

<b>S7 counter</b>	
• Number	2 048
<b>Retentivity</b>	
— adjustable	Yes
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>Retentivity</b>	
— adjustable	Yes
<b>S7 times</b>	
• Number	2 048
<b>Retentivity</b>	
— adjustable	Yes
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Retentivity</b>	
— adjustable	Yes

### Data areas and their retentivity

Retentive data area (incl. timers, counters, flags), max.	768 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 700 KB
<b>Flag</b>	
• Number, max.	16 kbyte
• Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
<b>Data blocks</b>	
• Retentivity adjustable	Yes
• Retentivity preset	No
<b>Local data</b>	
• per priority class, max.	64 kbyte; max. 16 KB per block
<b>Address area</b>	
Number of IO modules	16 384; max. number of modules / submodules
<b>I/O address area</b>	

• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>per integrated IO subsystem</b>	
— 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
<b>per CM/CP</b>	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
<b>Subprocess images</b>	
• Number of subprocess images, max.	32

<b>Hardware configuration</b>	
Number of distributed IO systems	20
<b>Number of DP masters</b>	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
<b>Number of IO Controllers</b>	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
<b>Rack</b>	
• Modules per rack, max.	32; CPU + 31 modules
• Number of lines, max.	1
<b>PtP CM</b>	
• Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots

<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
• Backup time	6 wk; At 40 °C ambient temperature, typically
• Deviation per day, max.	10 s; Typ.: 2 s
<b>Operating hours counter</b>	
• Number	16
<b>Clock synchronization</b>	
• 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
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	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.	256
— of which in line, max.	256
— 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
<b>Update time for IRT</b>	
— for send cycle of 250 µs	250 µs to 4 ms
— for send cycle of 500 µs	500 µs 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 µs: 375 µs, 625 µs ... 3 875 µs)

Update time for RT	
— for send cycle of 250 µs	250 µs to 128 ms
— for send cycle of 500 µs	500 µs 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
— IRT	Yes
— PROFinergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4

## 2. Interface

Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

## 3. Interface

Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

## 4. Interface

Interface types	
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• RS 485	Yes
• Number of ports	1
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes
<b>Interface types</b>	
<b>RJ 45 (Ethernet)</b>	
• 100 Mbps	Yes
• 1000 Mbps	Yes; Only possible at the 3rd PROFINET interface of the CPU 1518
• Autonegotiation	Yes
• Autocrossing	Yes
• Industrial Ethernet status LED	Yes
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
<b>Protocols</b>	
<b>Number of connections</b>	
• 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
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
— MRP	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— Switchover time on line break, typ.	200 ms
— Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• S7 communication, as server	Yes
• S7 communication, as client	Yes
• User data per job, max.	See online help (S7 communication, user data size)
<b>Open IE communication</b>	
• 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
• UDP	Yes
— Data length, max.	1 472 byte
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
<b>Web server</b>	
• HTTP	Yes; Standard and user-defined pages
• HTTPS	Yes; Standard and user-defined pages
<b>PROFIBUS DP master</b>	
• Number of connections, max.	48; for the integrated PROFIBUS DP interface
<b>Services</b>	
— PG/OP communication	Yes
— S7 routing	Yes
— Data record routing	Yes
— Isochronous mode	Yes
— Equidistance	Yes
— Number of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Activation/deactivation of DP slaves	Yes
<b>Further protocols</b>	
• MODBUS	Yes; MODBUS TCP
<b>Isochronous mode</b>	
Equidistance	Yes
<b>S7 message functions</b>	
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	
• Number of program alarms	1 000
• Number of alarms for system diagnostics	200
• Number of alarms for motion technology objects	160
<b>Test commissioning functions</b>	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 10 engineering systems
Status block	Yes; Up to 16 simultaneously (in total across all ES clients)
Single step	No
<b>Status/control</b>	
• Status/control variable	Yes



<ul style="list-style-type: none"> <li>• Variables</li> <li>• Number of variables, max. <ul style="list-style-type: none"> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul> </li> </ul>	Inputs, outputs, memory bits, DB, times, counters  200; per job 200; per job
<b>Forcing</b>	
<ul style="list-style-type: none"> <li>• Forcing, variables</li> <li>• Number of variables, max.</li> </ul>	Inputs, outputs 200
<b>Diagnostic buffer</b>	
<ul style="list-style-type: none"> <li>• present</li> <li>• Number of entries, max. <ul style="list-style-type: none"> <li>— of which powerfail-proof</li> </ul> </li> </ul>	Yes 3 200 1 000
<b>Traces</b>	
<ul style="list-style-type: none"> <li>• Number of configurable Traces</li> </ul>	8; Up to 512 KB of data per trace are possible
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>• RUN/STOP LED</li> <li>• ERROR LED</li> <li>• MAINT LED</li> <li>• Connection display LINK TX/RX</li> </ul>	Yes Yes Yes Yes
<b>Supported technology objects</b>	
<b>Motion Control</b> <ul style="list-style-type: none"> <li>• Speed-controlled axis <ul style="list-style-type: none"> <li>— Number of speed-controlled axes, max.</li> </ul> </li> <li>• Positioning axis <ul style="list-style-type: none"> <li>— Number of positioning axes, max.</li> </ul> </li> <li>• Synchronized axes (relative gear synchronization) <ul style="list-style-type: none"> <li>— Number of axes, max.</li> </ul> </li> <li>• External encoders <ul style="list-style-type: none"> <li>— Number of external encoders, max.</li> </ul> </li> </ul>	Yes  128; Requirement: There must be no other motion technology objects created  128; Requirement: There must be no other motion technology objects created  64; Requirement: There must be no other motion technology objects created  128; Requirement: There must be no other motion technology objects created
<b>Controller</b> <ul style="list-style-type: none"> <li>• PID_Compact</li> <li>• PID_3Step</li> <li>• PID-Temp</li> </ul>	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b> <ul style="list-style-type: none"> <li>• High-speed counter</li> </ul>	Yes
<b>Standards, approvals, certificates</b>	
Highest safety class achievable in safety mode	

<ul style="list-style-type: none"> <li>• Performance level according to ISO 13849-1</li> <li>• SIL acc. to IEC 61508</li> </ul>	<p>PLe</p> <p>SIL 3</p>
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
<b>Ambient conditions</b>	
Ambient temperature during operation	
<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>	<p>0 °C</p> <p>60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off</p> <p>0 °C</p> <p>40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off</p>
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> <li>• Ambient air temperature-barometric pressure-altitude</li> </ul>	<p>3 000 m</p> <p>Restrictions for installation altitudes &gt; 2 000 m, see entry ID: 109763260</p>
Relative humidity	
<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 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)
<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>	
<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>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Cycle time monitoring</b>	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
<b>Dimensions</b>	
Width	175 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	1 988 g

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