



SIMATIC S7-1500H, CPU 1518HF-4 PN, central processing unit with 18 MB work memory for program and 150 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET with 2-port switch, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required



General information	
Product type designation	CPU 1518HF-4 PN
HW functional status	FS01
Firmware version	V4.0
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	No
<ul style="list-style-type: none"> <li>SysLog</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V20 (FW V4.0)
Redundancy	
<ul style="list-style-type: none"> <li>stand-alone operation</li> </ul>	No
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
<ul style="list-style-type: none"> <li>Repeat rate, min.</li> </ul>	1/s
Input current	
Current consumption (rated value)	1.4 A
Current consumption, max.	1.9 A
Inrush current, max.	1.9 A; Rated value
$I^2t$	0.5 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.	22 W

Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	18 Mbyte
• integrated (for data)	150 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.	8 ns
CPU-blocks	
Number of elements (total)	40 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
• Number range	1 ... 60 999; subdivided into: number range that can be used by the user: 1 ... 59 999, and number range of DBs created via SFC 86: 60 000 ... 60 999
• Size, max.	16 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
• Number range	0 ... 65 535
• Size, max.	1 Mbyte
FC	
• Number range	0 ... 65 535
• Size, max.	1 Mbyte
OB	
• Size, max.	1 Mbyte
• Number of free cycle OBs	100
• Number of time alarm OBs	20
• Number of delay alarm OBs	20
• Number of cyclic interrupt OBs	20; with minimum OB 3x cycle of 1 ms
• Number of process alarm OBs	50
• Number of DPV1 alarm OBs	3
• 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; Up to 8 possible for F-blocks
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.	5 Mbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data: 4.5 MB
Extended retentive data area (incl. timers, counters, flags), max.	100 Mbyte; When using PS 6 0W 24/48/60 V DC HF
<b>Flag</b>	
• Size, 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	8 192; 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
per integrated IO subsystem	
— Inputs (volume)	16 kbyte
— Outputs (volume)	16 kbyte
<b>Subprocess images</b>	
• Number of subprocess images, max.	31
<b>Hardware configuration</b>	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET, but also by the connection of I/O via IE/PB-Links.
<b>Number of IO Controllers</b>	
• integrated	1
<b>Rack</b>	
• Modules per rack, max.	9; CPU + 2 PS + 6 CP
<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
• on Ethernet via NTP	Yes
<b>Interfaces</b>	
Number of PROFINET interfaces	3
<b>1. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
<b>PROFINET IO Controller</b>	
<b>Services</b>	
— Isochronous mode	No
— IRT	No
— PROFINergy	Yes; per user program

— Number of connectable IO Devices, max.	256
— 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>Update time for RT</b>	
— for send cycle of 1 ms	1 ms to 512 ms
<b>2. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
<b>3. Interface</b>	
<b>Interface types</b>	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
<b>Protocols</b>	
• IP protocol	Yes; IPv4
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
<b>4. Interface</b>	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
<b>5. Interface</b>	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
<b>Interface types</b>	
<b>RJ 45 (Ethernet)</b>	
• 100 Mbps	Yes
• 1000 Mbps	Yes; Only possible at the X3 interface of the CPU 1518
• Autonegotiation	Yes
• Autocrossing	Yes
• Industrial Ethernet status LED	Yes
<b>Protocols</b>	
PROFIsafe	Yes; V2.4 / V2.6
<b>Number of connections</b>	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs
• Number of connections reserved for ES/HMI/web	10
• Number of connections via integrated interfaces	320
• Number of S7 routing paths	64
<b>Redundancy mode</b>	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	Yes
<b>Media redundancy</b>	
— Media redundancy	Yes; only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
— MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	No

— Switchover time on line break, typ.	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 routing	Yes
• S7 communication, as server	Yes
• S7 communication, as client	No
<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.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; max. 128 multicast circuits
• DHCP	No
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• Encryption	Yes; Optional
<b>Web server</b>	
• HTTP	No
• HTTPS	Yes; only via Web API
• web API	Yes
— Number of sessions, max.	200
— number of simultaneous HTTP calls, max.	4
— HTTP request body, max.	131 072 byte
<b>OPC UA</b>	
• Runtime license required	Yes; "Large" license required per CPU
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
— Application authentication	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
— User authentication	"anonymous" or by user name & password
— GDS support (certificate management)	No
— Number of sessions, max.	32
— Number of subscriptions per session, max.	25
— Sampling interval, min.	25 ms
— Publishing interval, min.	25 ms
— Number of server methods, max.	100; max. 20 concurrently running jobs each for asynchronous instructions OPC-UA_ServerMethodPre (V1.1) and OPC-UA_ServerMethodPost (V1.1)
— Number of inputs/outputs per server method, max.	20
— Number of monitored items, recommended max.	25 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
— Number of nodes for user-defined server interfaces, max.	50 000
• Alarms and Conditions	No
<b>Further protocols</b>	
• MODBUS	Yes; MODBUS TCP
<b>S7 message functions</b>	
Number of login stations for message functions, max.	64
number of subscriptions, max.	750
number of tags/attributes for subscriptions, max.	120 000
Program alarms	Yes
Number of configurable program messages, max.	20 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH

Number of loadable program messages in RUN, max.	20 000
Number of simultaneously active program alarms	
• Number of program alarms	4 000
• Number of alarms for system diagnostics	1 000
<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
Single step	No
Number of breakpoints	20; Breakpoints are only supported in RUN-Solo status
Profiling	Yes
<b>Status/control</b>	
• Status/control variable	Yes; without fail-safe
• Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
• Number of variables, max.	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
<b>Forcing</b>	
• Forcing	Yes; without fail-safe
• Forcing, variables	peripheral inputs/outputs (without fail-safe)
• Number of variables, max.	200
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	3 200
— of which powerfail-proof	1 000
<b>Traces</b>	
• Number of configurable Traces	8
• Memory size per trace, max.	512 kbyte
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• STOP ACTIVE LED	Yes
• Connection display LINK TX/RX	Yes
<b>Supported technology objects</b>	
Motion Control	No
<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
Counting and measuring	Yes
<b>Standards, approvals, certificates</b>	
Siemens Eco Profile (SEP)	Siemens EcoTech
Recycler Guide available	Yes
<b>Ecological footprint</b>	
• environmental product declaration	Yes
<b>Global warming potential</b>	
— global warming potential, (total) [CO2 eq]	488 kg
— global warming potential, (during production) [CO2 eq]	78.3 kg
— global warming potential, (during operation) [CO2 eq]	417 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-8.12 kg
<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	< 2.00E-05

SIL3	
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

### Security

PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

### Ambient conditions

Ambient temperature during operation	
• horizontal installation, min.	0 °C
• 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
• 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; Restrictions for installation altitudes > 2 000 m, see manual

### Configuration

Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— CFC	Yes; either CFC or failsafe functionality
— GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	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
• Number of groups	100
• Number of roles	50
Cycle time monitoring	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time

### Dimensions

Width	210 mm
Height	147 mm
Depth	129 mm

### Weights

Weight, approx.	1 806 g
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### Classifications

	Version	Classification
eClass	14	27-24-22-07
eClass	12	27-24-22-07
eClass	9.1	27-24-22-07

eClass	9	27-24-22-07
eClass	8	27-24-22-07
eClass	7.1	27-24-22-07
eClass	6	27-24-22-07
ETIM	10	EC000236
ETIM	9	EC000236
ETIM	8	EC000236
ETIM	7	EC000236

Approvals / Certificates

General Product Approval

[KC](#)



[Miscellaneous](#)

[Manufacturer Declaration](#)

[China RoHS](#)

General Product Approval

EMV

For use in hazardous locations



[TUEV](#)

[KC](#)



[CCC-Ex](#)

For use in hazardous locations

Functional Safety

[FM](#)



[Type Examination Certificate](#)



IECEX

[Miscellaneous](#)

[Type Examination Certificate](#)

Functional Safety

Maritime application

other

Environment

[TUEV](#)



[PROFINET](#)



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