

SIMATIC S7-1500H, CPU 1518HF-4 PN, central processing unit with 9 MB work memory for program and 60 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required



General information	
Product type designation	CPU 1518HF-4PN
HW functional status	FS01
Firmware version	V2.9
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	No
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V17
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode selector switch	1
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"> Mains/voltage failure stored energy time 	5 ms
Input current	
Current consumption (rated value)	1.55 A
Current consumption, max.	1.95 A
Inrush current, max.	2.4 A; Rated value
I^2t	0.02 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	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
<ul style="list-style-type: none"> integrated (for program) 	9 Mbyte
<ul style="list-style-type: none"> integrated (for data) 	60 Mbyte
Load memory	

• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
• maintenance-free	Yes
CPU processing times	
for bit operations, typ.	4 ns
for word operations, typ.	6 ns
for fixed point arithmetic, typ.	6 ns
for floating point arithmetic, typ.	24 ns
CPU-blocks	
Number of elements (total)	20 000; 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 100 µs
• Number of process alarm OBs	50
• 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.	768 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 700 KB
Flag	
• Size, 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; max. number of modules / submodules
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
— Outputs (volume)	16 kbyte
Subprocess images	
• Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	1
Number of IO Controllers	
• integrated	1
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	16
Clock synchronization	
• supported	Yes
• on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	3
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes
• Web server	No
• Media redundancy	Yes
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes; per user program
— Number of connectable IO Devices, max.	256
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO Device	No

<ul style="list-style-type: none"> • SIMATIC communication • Open IE communication • Web server • Media redundancy 	<p>Yes; Only Server</p> <p>Yes</p> <p>No</p> <p>No</p>
3. Interface	
Interface types	
<ul style="list-style-type: none"> • RJ 45 (Ethernet) • Number of ports • integrated switch 	<p>Yes; X3</p> <p>1</p> <p>No</p>
Protocols	
<ul style="list-style-type: none"> • IP protocol • SIMATIC communication • Open IE communication 	<p>Yes; IPv4</p> <p>Yes; Only Server</p> <p>Yes</p>
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5
Interface types	
RJ 45 (Ethernet)	
<ul style="list-style-type: none"> • 100 Mbps • 1000 Mbps • Autonegotiation • Autocrossing • Industrial Ethernet status LED 	<p>Yes</p> <p>Yes; Only possible at the X3 interface of the CPU 1518</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	
<ul style="list-style-type: none"> • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths 	<p>320</p> <p>10</p> <p>320</p> <p>64</p>
Redundancy mode	
Media redundancy	
<ul style="list-style-type: none"> — Media redundancy — MRP — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — Number of stations in the ring, max. 	<p>only via 1st interface (X1)</p> <p>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</p> <p>Yes; as MRP ring node according to IEC 62439-2 Edition 3.0</p> <p>No</p> <p>200 ms; PROFINET MRP</p> <p>50</p>
SIMATIC communication	
<ul style="list-style-type: none"> • PG/OP communication • S7 routing • S7 communication, as server • S7 communication, as client 	<p>Yes; encryption with TLS V1.3 pre-selected</p> <p>Yes</p> <p>Yes</p> <p>No</p>
Open IE communication	
<ul style="list-style-type: none"> • TCP/IP <ul style="list-style-type: none"> — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> — Data length, max. • UDP <ul style="list-style-type: none"> — Data length, max. — UDP multicast • DHCP • DNS • SNMP • DCP • LLDP 	<p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>2 kbyte; 1 472 bytes for UDP broadcast</p> <p>Yes; 128 multicast circuits (of which max. 5 via X1)</p> <p>No</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Web server	

• HTTP	No
• HTTPS	No
OPC UA	
• OPC UA Client	No
• OPC UA Server	No
Further protocols	
• MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	No
S7 message functions	
Number of login stations for message functions, max.	64
Program alarms	Yes
Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	5 000
Number of simultaneously active program alarms	
• Number of program alarms	4 000
• Number of alarms for system diagnostics	1 000
Test commissioning functions	
Joint commission (Team Engineering)	No
Status block	Yes; Up to 16 simultaneously
Single step	No
Number of breakpoints	20; Breakpoints are only supported in RUN-Solo status
Status/control	
• Status/control variable	Yes
• 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
Forcing	
• Forcing	Yes
• Forcing, variables	peripheral inputs/outputs (without fail-safe)
• 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
• Memory size per trace, max.	512 kbyte
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	No
Controller	
• 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	
• High-speed counter	No
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
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

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 / header

configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— 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
programming / cycle time monitoring / header	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time

Dimensions

Width	210 mm
Height	147 mm
Depth	129 mm

last modified: 11/3/2021 