

Siemens
EcoTech



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	FS02
Firmware version	V4.1
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• SysLog	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Redundancy	
• stand-alone operation	No

CiR - Configuration in RUN

product function / Configuration in Run (CiR) possible	Yes
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Display

Screen diagonal [cm]	6.1 cm
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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

• Mains/voltage failure stored energy time	5 ms
• Repeat rate, min.	1/s

Input current

Current consumption (rated value)	1.3 A
Current consumption, max.	1.9 A
Inrush current, max.	1.9 A; Rated value
I^2t	0.5 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.		19.7 W
Storage		
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 timer		
• Number		2 048
Retentivity		
— adjustable		Yes
IEC timer		
• Number		Any (only limited by the main memory)
Retentivity		

— can be set	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	4.5 Mbyte; in total; for bit memories, timers, counters, DBs, and technology data (axes)
Extended retentive data area (incl. timers, counters, flags), max.	100 Mbyte; When using PS 6 0W 24/48/60 V DC HF
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.	31
Hardware configuration	
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.
Number of IO Controllers	
• Integrated	1
Rack	
• Modules per rack, max.	9; CPU + 2 PS + 6 CP
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	64
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; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
— Isochronous mode	No

- IRT
- Dynamic Frame Packing (DFP)
- PROFINergy
- Prioritized startup
- Number of connectable IO Devices, max.
- Updating times

No

Yes

Yes; per user program

No

512

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 RT

- for send cycle of 1 ms

1 ms to 512 ms

2. Interface

Interface types

- RJ 45 (Ethernet) Yes; X2
- Number of ports 2
- integrated switch Yes

Protocols

- 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

3. Interface

Interface types

- RJ 45 (Ethernet) Yes; X3
- Number of ports 1
- integrated switch No

Protocols

- 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

4. Interface

Interface type Pluggable synchronization submodule (FO)

Plug-in interface modules Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5

5. Interface

Interface type Pluggable synchronization submodule (FO)

Plug-in interface modules Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5

Interface types

RJ 45 (Ethernet)

- 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

Protocols

PROFIsafe Yes; V2.4 / V2.6

Number of connections

- 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

Redundancy mode

- PROFINET system redundancy (S2) Yes
- PROFINET system redundancy (R1) Yes

Media redundancy	
— 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
SIMATIC communication	
• PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 routing	Yes
• S7 communication, as server	Yes
• S7 communication, as client	No
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
• 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
Web server	
• HTTP	No
• HTTPS	Yes; standard pages
• web API	Yes
— Number of sessions, max.	200
— number of simultaneous HTTP calls, max.	4
— HTTP request body, max.	131 072 byte
OPC UA	
• 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)	Yes
— 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.	4 000; max. 100 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.	30 000; 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.	200 000
• Alarms and Conditions	No
Further protocols	
• MODBUS	Yes; MODBUS TCP
S7 message functions	

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
Test commissioning functions	
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
Status/control	
• 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
Forcing	
• Forcing	Yes; without fail-safe
• 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
• STOP ACTIVE 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	Yes
Standards, approvals, certificates	
Ecological footprint	
Global warming potential	
— 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]	-8.21 kg
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		
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; Interface modules: 2x 18 g		
Classifications			
		Version	Classification

eClass	16	27-24-22-07
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



[Miscellaneous](#)

[Manufacturer Declaration](#)



General Product Approval

EMV

For use in hazardous locations



[TUEV](#)

[China RoHS](#)

[Manufacturer Declaration](#)



For use in hazardous locations

[CCC-Ex](#)

[FM](#)



[Type Examination Certificate](#)



[Miscellaneous](#)

For use in hazardous locations

Functional Safety

Test Certificates

[CCC-Ex](#)

[Type Examination Certificate](#)

[TUEV](#)



[Type Examination Certificate](#)

[Type Test Certificates/Test Report](#)

Maritime application

other



[KR \(Korean Register of Shipping\)](#)

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Environment



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