

SIMATIC S7-1500H, CPU 1517H-3 PN, central processing unit with 2 MB work memory for program and 8 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd/4th interface: H-SYNC, SIMATIC Memory Card required



General information	
Product type designation	CPU 1517H-3 PN
HW functional status	FS06
Firmware version	V3.0
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
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V18 (FW V3.0) / V15.1 (FW V2.6) or higher
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"> <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)	1.5 A
Current consumption, max.	1.9 A
Inrush current, max.	1.9 A; Rated value
$I^2t$	0.4 A <sup>2</sup> ·s
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"> <li>integrated (for program)</li> </ul>	2 Mbyte
<ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>	8 Mbyte
Load memory	
<ul style="list-style-type: none"> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte
Backup	
<ul style="list-style-type: none"> <li>maintenance-free</li> </ul>	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)	12 000; Blocks (OB, FB, FC, DB) and UDTs
----------------------------	--

### DB

• Number range	Number range: 1 to 59 999
• Size, max.	8 Mbyte; For non-optimized block accesses, the max. size of the DB 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
----------------------	----

## 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
----------	---

<ul style="list-style-type: none"> <li>• Outputs</li> </ul>	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
<ul style="list-style-type: none"> <li>— Inputs (volume)</li> <li>— Outputs (volume)</li> </ul>	16 kbyte 16 kbyte
Subprocess images	
<ul style="list-style-type: none"> <li>• Number of subprocess images, max.</li> </ul>	32
<b>Hardware configuration</b>	
Number of distributed IO systems	1
Number of IO Controllers	
<ul style="list-style-type: none"> <li>• integrated</li> </ul>	1
Rack	
<ul style="list-style-type: none"> <li>• Modules per rack, max.</li> </ul>	1; CPU
<b>Time of day</b>	
Clock	
<ul style="list-style-type: none"> <li>• Type</li> <li>• Backup time</li> <li>• Deviation per day, max.</li> </ul>	Hardware clock 6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s
Operating hours counter	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	16
Clock synchronization	
<ul style="list-style-type: none"> <li>• supported</li> <li>• on Ethernet via NTP</li> </ul>	Yes Yes
<b>Interfaces</b>	
Number of PROFINET interfaces	2
<b>1. Interface</b>	
Interface types	
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> <li>• integrated switch</li> </ul>	Yes; X1 2 Yes
Protocols	
<ul style="list-style-type: none"> <li>• IP protocol</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• SIMATIC communication</li> <li>• Open IE communication</li> <li>• Web server</li> <li>• Media redundancy</li> </ul>	Yes; IPv4 Yes No Yes; Only Server Yes No Yes
PROFINET IO Controller	
Services	
<ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Isochronous mode</li> <li>— IRT</li> <li>— PROFIenergy</li> <li>— Number of connectable IO Devices, max.</li> <li>— Updating times</li> </ul>	Yes No No Yes 256 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	
<ul style="list-style-type: none"> <li>— for send cycle of 1 ms</li> </ul>	1 ms to 512 ms
<b>2. Interface</b>	
Interface types	
<ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> <li>• integrated switch</li> </ul>	Yes; X2 1 No
Protocols	
<ul style="list-style-type: none"> <li>• IP protocol</li> <li>• PROFINET IO Controller</li> <li>• PROFINET IO Device</li> <li>• SIMATIC communication</li> <li>• Open IE communication</li> <li>• Web server</li> <li>• Media redundancy</li> </ul>	Yes; IPv4 No No Yes; Only Server Yes No No
<b>3. Interface</b>	

Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7 960-1FE00-0AA5

#### 4. 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
• Autonegotiation	Yes
• Autocrossing	Yes
• Industrial Ethernet status LED	Yes

#### Protocols

PROFIsafe	No
-----------	----

#### Number of connections

• Number of connections, max.	288
• Number of connections reserved for ES/HMI/web	10
• Number of S7 routing paths	64

#### Redundancy mode

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

#### Media redundancy

— 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; 128 multicast circuits (of which max. 5 via X1)
• DHCP	No
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes

#### Web server

• HTTP	No
• HTTPS	No

#### OPC UA

• OPC UA Client	No
• OPC UA Server	No

#### Further protocols

• MODBUS	Yes; MODBUS TCP
----------	-----------------

#### 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	2 000

• Number of alarms for system diagnostics	1 000
<b>Test commissioning functions</b>	
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
<b>Status/control</b>	
• Status/control variable	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, 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
• Forcing, variables	Peripheral inputs/outputs
• 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
• Connection display LINK TX/RX	Yes
<b>Supported technology objects</b>	
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
• High-speed counter	No
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• 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
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>configuration / header</b>	
<b>configuration / programming / header</b>	
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
<b>Access protection</b>	

• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>programming / cycle time monitoring / header</b>	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
<b>Dimensions</b>	
Width	210 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	2 094 g; Interface modules: 2x 18 g