



Figure similar

\*\*\*\*\* Replacement part \*\*\*\*\* SIMATIC S7-400H, CPU 417H Central processing unit for S7-400H 4 interfaces: 1 MPI/DP, 1 DP and 2 for sync modules 30 MB memory (15 MB data/15 MB program)

General information	
Product type designation	CPU 417H
HW functional status	1
Firmware version	V4.5
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.3 SP2 or higher with HW update
CiR - Configuration in RUN	
CiR synchronization time, basic load	60 ms
CiR synchronization time, time per I/O byte	10 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.5 A
from backplane bus 5 V DC, max.	1.8 A
from backplane bus 24 V DC, max.	150 mA; Per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	6.5 W
Memory	
Type of memory	RAM
Work memory	
<ul style="list-style-type: none"> <li>integrated</li> </ul>	30 Mbyte
<ul style="list-style-type: none"> <li>integrated (for program)</li> </ul>	15 Mbyte
<ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>	15 Mbyte
<ul style="list-style-type: none"> <li>expandable</li> </ul>	No
Load memory	
<ul style="list-style-type: none"> <li>expandable FEPRM</li> </ul>	Yes
<ul style="list-style-type: none"> <li>expandable FEPRM, max.</li> </ul>	64 Mbyte
<ul style="list-style-type: none"> <li>integrated RAM, max.</li> </ul>	256 kbyte
<ul style="list-style-type: none"> <li>expandable RAM</li> </ul>	Yes
<ul style="list-style-type: none"> <li>expandable RAM, max.</li> </ul>	64 Mbyte
Backup	
<ul style="list-style-type: none"> <li>present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>with battery</li> </ul>	Yes; all data
<ul style="list-style-type: none"> <li>without battery</li> </ul>	No
Battery	
Backup battery	
<ul style="list-style-type: none"> <li>Backup current, typ.</li> </ul>	970 µA; Valid up to 40°C
<ul style="list-style-type: none"> <li>Backup current, max.</li> </ul>	1 980 µA

- Backup time, max.

Dealt with in the module data manual with the secondary conditions and the factors of influence

- Feeding of external backup voltage to CPU

5 V DC to 15 V DC

#### CPU processing times

for bit operations, typ.	0.018 µs
for word operations, typ.	0.018 µs
for fixed point arithmetic, typ.	0.018 µs
for floating point arithmetic, typ.	0.054 µs

#### CPU-blocks

<b>DB</b>	
• Number, max.	8 191; Number range: 1 - 8191
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	6 144; Number range: 0 - 6143
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	6 144; Number range: 0 - 6143
• Size, max.	64 kbyte
<b>OB</b>	
• Size, max.	64 kbyte
• Number of time alarm OBs	8
• Number of delay alarm OBs	4
• Number of cyclic interrupt OBs	9
• Number of process alarm OBs	8
<b>Nesting depth</b>	
• per priority class	24
• additional within an error OB	2

#### Counters, timers and their retentivity

<b>S7 counter</b>	
• Number	2 048
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
<b>Counting range</b>	
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
<b>S7 times</b>	
• Number	2 048
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	No times retentive
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB

#### Data areas and their retentivity

Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
<b>Flag</b>	
• Size, max.	16 kbyte
• Retentivity available	Yes
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; in 1 memory byte

<b>Local data</b>	
• adjustable, max.	64 kbyte
• preset	32 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	16 kbyte
• Outputs	16 kbyte
<b>Process image</b>	
• Inputs, adjustable	16 kbyte
• Outputs, adjustable	16 kbyte
• Inputs, default	1 024 byte
• Outputs, default	1 024 byte
• consistent data, max.	244 byte
• Access to consistent data in process image	Yes
<b>Subprocess images</b>	
• Number of subprocess images, max.	15
<b>Digital channels</b>	
• Inputs	131 072
— of which central	131 072
• Outputs	131 072
— of which central	131 072
<b>Analog channels</b>	
• Inputs	8 192
— of which central	8 192
• Outputs	8 192
— of which central	8 192
<b>Hardware configuration</b>	
Number of expansion units, max.	21
connectable OPs	63 without message processing, 16 with message processing
Multicomputing	No
<b>Interface modules</b>	
• Number of connectable IMs (total), max.	6
• Number of connectable IM 460s, max.	6
• Number of connectable IM 463s, max.	4; Single mode only
<b>Number of DP masters</b>	
• integrated	2
• via CP	10
• Mixed mode IM + CP permitted	No
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections
• CP, PtP	See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections
• PROFIBUS and Ethernet CPs	14; Of which max. 10 CP as DP master
<b>Slots</b>	
• required slots	2
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Resolution	1 ms
• Deviation per day (buffered), max.	1.7 s; Power off
• Deviation per day (unbuffered), max.	8.6 s; Power on
<b>Operating hours counter</b>	
• Number	8
• Number/Number range	0 to 7
• Range of values	0 to 32767 hours
• Granularity	1 h
• retentive	Yes
<b>Clock synchronization</b>	
• supported	Yes

• to MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes

Time difference in system when synchronizing via	
• MPI, max.	200 ms

### Interfaces

Number of RS 485 interfaces	2
Number of other interfaces	0
Optical interface	No

### 1. Interface

Interface type	MPI/PROFIBUS DP
Isolated	Yes

Interface types	
• RS 485	Yes
• Output current of the interface, max.	150 mA

Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No

MPI	
• Number of connections	44
• Transmission rate, max.	12 Mbit/s

Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes

PROFIBUS DP master	
• Number of connections, max.	32
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32

Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Equidistance	No
— SYNC/FREEZE	No
— Activation/deactivation of DP slaves	No
— Direct data exchange (slave-to-slave communication)	No

Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte

User data per DP slave	
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte

### 2. Interface

Interface type	PROFIBUS DP
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Isolated	Yes
Number of connection resources	32
<b>Interface types</b>	
• RS 485	Yes
• Output current of the interface, max.	150 mA
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
<b>PROFIBUS DP master</b>	
• Number of connections, max.	32
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	125
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— Equidistance	No
— SYNC/FREEZE	No
— Direct data exchange (slave-to-slave communication)	No
<b>Address area</b>	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
<b>User data per DP slave</b>	
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte

### 3. Interface

Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization submodule IF 960 6ES7960-1AA04-0XA0 or 6ES7960-1AB04-0XA0

### 4. Interface

Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization submodule IF 960 6ES7960-1AA04-0XA0 or 6ES7960-1AB04-0XA0

### communication functions / header

PG/OP communication	Yes
• Number of connectable OPs without message processing	63
• Number of connectable OPs with message processing	16
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• communication function / S7 basic communication	No
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes
• User data per job, max.	64 kbyte
• User data per job (of which consistent), max.	462 byte; 1 variable
<b>S5 compatible communication</b>	
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)
• User data per job, max.	8 kbyte
• User data per job (of which consistent), max.	240 byte
• Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.	64/64
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB
<b>Number of connections</b>	

• overall	64
• usable for PG communication	
— reserved for PG communication	1
— adjustable for PG communication, max.	0
• usable for OP communication	
— reserved for OP communication	1
— adjustable for OP communication, max.	0
• usable for S7 basic communication	
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, max.	0
• usable for S7 communication	
— reserved for S7 communication	0
— adjustable for S7 communication, max.	0
• usable for routing	0
— reserved for routing	0
— adjustable for routing, max.	0
<b>S7 message functions</b>	
Number of login stations for message functions, max.	16
Symbol-related messages	No
Program alarms	Yes
simultaneously active Alarm-S blocks, max.	200
Alarm 8-blocks	Yes
• Number of instances for alarm 8 and S7 communication blocks, max.	10 000
• preset, max.	1 200
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	64
<b>Test commissioning functions</b>	
Status block	Yes
Single step	Yes
Number of breakpoints	4
<b>Status/control</b>	
• Status/control variable	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
• Number of variables, max.	70
<b>Forcing</b>	
• Forcing	Yes
• Forcing, variables	Inputs/outputs, bit memories, distributed I/Os
• Number of variables, max.	512
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	3 200
— adjustable	Yes
— preset	120
<b>configuration / header</b>	
<b>Configuration software</b>	
• STEP 7	Yes
<b>configuration / programming / header</b>	
• Command set	see instruction list
• Nesting levels	8
• Access to consistent data in process image	Yes
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes

— HiGraph®	Yes
configuration / programming / number of simultaneously active SFC / header	
— RD_REC	8
— WR_REC	8
— WR_PARM	8
— PARM_MOD	1
— WR_DPARM	2
— DPNRM_DG	8
— RDSYSST	8
— DP_TOPOLOG	1
configuration / programming / number of simultaneously active SFB / header	
— RDREC	8
— WRREC	8
Know-how protection	
• User program protection/password protection	Yes
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	219 mm
<b>Weights</b>	
Weight, approx.	995 g

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