

Siemens 6ES7414-4HM14-0AB0 Manual

Brand	Siemens
Product Series	Siemens
Product Type	SIMATIC S7-400H CPU 414H

Description

6ES7414-4HM14-0AB0 | Siemens | SIMATIC S7-400H CPU 414H

Manufacturer : Siemens

Product Number: 6ES7414-4HM14-0AB0

Product Type : SIMATIC S7-400H CPU 414H

For S7-400H and S7-400F/FH

4 interfaces: 1 MPI/DP, 1 DP and 2 for sync modules

2.8 MB memory (1.4 MB data, 1.4 MB program)

Power loss, typ. : 6 W

Number of expansion units, max. : 21

Product Dimensions (HxWxD) : 29cm x 5cm x 21.9cm

Weight (kg) : 0.995 Kg

General information

Product type designation CPU 414-4H

Engineering with

- Programming package STEP 7 V5.3 SP2 or higher with HW update

CiR - Configuration in RUN

CiR synchronization time, basic load 100 ms

CiR synchronization time, time per I/O byte 25 µs

Supply voltage

Rated value (DC) Power supply via system power supply

Input current

from backplane bus 5 V DC, typ. 1.4 A

from backplane bus 5 V DC, max. 1.7 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 W

Memory

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Type of memory RAM

Work memory

- integrated 2.8 Mbyte
- integrated (for program) 1.4 Mbyte
- integrated (for data) 1.4 Mbyte
- expandable No

Load memory

- expandable FEPRM Yes
- expandable FEPRM, max. 64 Mbyte
- integrated RAM, max. 256 kbyte
- expandable RAM Yes
- expandable RAM, max. 64 Mbyte

Backup

- present Yes
- with battery Yes; all data
- without battery No

Battery

Backup battery

- Backup current, typ. 190 μ A; Valid up to 40°C
- Backup current, max. 660 μ A
- 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. 0.045 μ s

for word operations, typ. 0.045 μ s

for fixed point arithmetic, typ. 0.045 μ s

for floating point arithmetic, typ. 0.135 μ s

CPU-blocks

DB

- Number, max. 4 095; Number range: 1 to 4095
- Size, max. 64 kbyte

FB

- Number, max. 2 048; Number range: 0 to 2047
- Size, max. 64 kbyte

FC

- Number, max. 2 048; Number range: 0 to 2047
- Size, max. 64 kbyte

OB

- Size, max. 64 kbyte
- Number of time alarm OBs 4
- Number of delay alarm OBs 4
- Number of cyclic interrupt OBs 4
- Number of process alarm OBs 4

Nesting depth

- per priority class 24
- additional within an error OB 1

Counters, timers and their retentivity

S7 counter

- Number 2 048

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Retentivity

- adjustable Yes
- lower limit 0
- upper limit 2 047
- preset Z 0 to Z 7

Counting range

- lower limit 0
- upper limit 999

IEC counter

- present Yes
- Type SFB

S7 times

- Number 2 048

Retentivity

- adjustable Yes
- lower limit 0
- upper limit 2 047
- preset No times retentive

Time range

- lower limit 10 ms
- upper limit 9 990 s

IEC timer

- 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)

Flag

Size, max. 8 kbyte

- Retentivity available Yes
- Retentivity preset MB 0 to MB 15
- Number of clock memories 8; in 1 memory byte

Local data

- adjustable, max. 16 kbyte
- preset 8 kbyte

Address area

I/O address area

- Inputs 8 kbyte
- Outputs 8 kbyte

Process image

- Inputs, adjustable 8 kbyte
- Outputs, adjustable 8 kbyte
- Inputs, default 256 byte
- Outputs, default 256 byte
- consistent data, max. 244 byte
- Access to consistent data in process image Yes

Subprocess images

- Number of subprocess images, max. 15

Digital channels

- Inputs 65 536
- of which central 65 536

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- Outputs 65 536
 - of which central 65 536
- Analog channels
 - Inputs 4 096
 - of which central 4 096
 - Outputs 4 096
 - of which central 4 096
- Hardware configuration
 - Number of expansion units, max. 21
 - connectable OPs 31 without message processing, 8 with message processing
- Multicomputing No
- Interface modules
 - Number of connectable IMs (total), max. 6
 - Number of connectable IM 460s, max. 6
 - Number of connectable IM 463s, max. 4; Single mode only
- Number of DP masters
 - integrated 2
 - via CP 10
 - Mixed mode IM + CP permitted No
- Number of operable FM and CPs (recommended)
 - 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
- Slots
 - required slots 2
- Time of day
- Clock
 - 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
- Operating hours counter
 - Number 8
 - Number/Number range 0 to 7
 - Range of values 0 to 32767 hours
 - Granularity 1 h
 - retentive Yes
 - Clock synchronization
 - 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

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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 32
- Transmission rate, max. 12 Mbit/s

Services

- PG/OP communication Yes
- Routing Yes
- Global data communication No
- S7 basic communication No
- S7 communication 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
- 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

Interface types

- RS 485 Yes
- Output current of the interface, max. 150 mA

Protocols

- PROFIBUS DP master Yes
- PROFIBUS DP slave No

PROFIBUS DP master

- Number of connections, max. 16
- Transmission rate, max. 12 Mbit/s
- Number of DP slaves, max. 96

Services

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

No

Address area

- Inputs, max. 6 kbyte
- Outputs, max. 6 kbyte

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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

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

Protocols

SIMATIC communication

- S7 routing Yes

Communication functions

PG/OP communication Yes

- Number of connectable OPs without message processing

31

- Number of connectable OPs with message processing

8

Global data communication

- supported No

S7 basic communication

- supported No

S7 communication

- 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
- S5 compatible communication
- 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

Standard communication (FMS)

- supported Yes; Via CP and loadable FB

Number of connections

- overall 32
- usable for PG communication
 - reserved for PG communication 1
 - adjustable for PG communication, max. 0
- usable for OP communication
 - reserved for OP communication 0
 - 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
 - reserved for routing 0
 - adjustable for routing, max. 0

S7 message functions

Number of login stations for message functions, max. 8

Symbol-related messages No

Program alarms Yes

simultaneously active Alarm-S blocks, max. 100

Alarm 8-blocks Yes

- Number of instances for alarm 8 and S7 communication blocks, max.

1 200

- preset, max. 900

Process control messages Yes

Number of archives that can log on simultaneously (SFB 37 AR_SEND)

16

Test commissioning functions

Status block Yes

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Single step Yes

Number of breakpoints 4

Status/control

- Status/control variable Yes
- Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
- Number of variables, max. 70

Forcing

- Forcing Yes
- Forcing, variables Inputs/outputs, bit memories, distributed I/Os
- Number of variables, max. 256

Diagnostic buffer

- present Yes
 - Number of entries, max. 3 200
- adjustable Yes
- preset 120

Configuration

Configuration software

- STEP 7 Yes

Programming

- 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

Programming language

- LAD Yes
- FBD Yes
- STL Yes
- SCL Yes
- CFC Yes
- GRAPH Yes
- HiGraph® Yes

Number of simultaneously active SFCs

- RD_REC 8
- WR_REC 8
- WR_PARM 8
- PARM_MOD 1
- WR_DPARM 2
- DPNRM_DG 8
- RDSYSST 8
- DP_TOPOL 1

Number of simultaneously active SFBs

- RDREC 8
- WRREC 8

Know-how protection

- User program protection/password protection Yes

Dimensions

Width 50 mm

Height 290 mm

Depth 219 mm

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Weights

Weight, approx. 995 g

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