

Siemens 6ES7410-5HX08-0AB0 Manual

Brand	Siemens
Product Series	Siemens
Product Type	designation CPU 410-5H

Description

6ES7410-5HX08-0AB0

SIMATIC PCS 7, CPU 410-5H Process Automation, central processing unit
for S7-400 and S7-400H/F/FH, 5 interfaces: 2x PN, 1x DP, 2x for sync
modules for using as spare part, without System Expansion Card

General information

Product type designation CPU 410-5H

HW functional status 2

Firmware version V8.2

Design of PLC basic unit With Conformal Coating (ISA-S71.04 severity level G1; G2; G3) and
operating temperature to 70 °C

Product function

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- SysLog Yes; via TCP; up to 4 receivers can be parameterized; buffer capacity
max. 3 200 entries

- Field interface security Yes

Engineering with

- Programming package SIMATIC PCS 7 V9.0 or higher

CiR - Configuration in RUN

CiR synchronization time, basic load 60 ms

CiR synchronization time, time per I/O byte 0 µs

Input current

from backplane bus 5 V DC, typ. 2 A

from backplane bus 5 V DC, max. 2.4 A

from backplane bus 24 V DC, max. 150 mA; DP interface

from interface 5 V DC, max. 90 mA; At the DP interface

Power loss

Power loss, typ. 10 W

Processor

CPU speed 450 MHz; Multi-processor system

Memory

PCS 7 process objects 100 ... approx. 2 600, adjustable with System Expansion Card

Work memory

- integrated 32 Mbyte; max., dependent on the System Expansion Card used
- integrated (for program) Dependent on the System Expansion Card used
- integrated (for data) Dependent on the System Expansion Card used
- expandable Dependent on the System Expansion Card used

Load memory

- integrated RAM, max. 48 Mbyte

- expandable RAM No

Backup

- with battery Yes; all data
- without battery Yes; Program and data of the load memory

Battery

Backup battery

- Backup current, typ. 370 μ A; Valid up to 40°C
- Backup current, max. 2.1 mA
- 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 No

CPU processing times

for bit operations, typ. 7.5 ns

for word operations, typ. 7.5 ns

for fixed point arithmetic, typ. 7.5 ns

for floating point arithmetic, typ. 15 ns

average processing time of PCS 7 typicals 110 μ s; with APL Typicals

Process tasks, max. 9; Individually adjustable from 10 ms to 5 s

CPU-blocks

DB

- Number, max. 16 000; Number range: 1 to 16 000 (= Instances)
- Size, max. 64 kbyte; Dependent on the System Expansion Card used

FB

- Number, max. 8 000; Number range: 1 to 7999
- Size, max. 64 kbyte

FC

- Number, max. 8 000; Number range: 0 to 7999
- Size, max. 64 kbyte

OB

- Number, max. see instruction list
- Size, max. 64 kbyte
- Number of free cycle OBs 1; OB 1
- Number of time alarm OBs 8; OB 10-17
- Number of delay alarm OBs 4; OB 20-23
- Number of cyclic interrupt OBs 9; OB 30-38 (= Process Tasks)
- Number of process alarm OBs 8; OB 40-47
- Number of DPV1 alarm OBs 3; OB 55-57
- Number of startup OBs 2; OB 100, 102
- Number of asynchronous error OBs 9; OB 80-88
- Number of synchronous error OBs 2; OB 121, 122

Nesting depth

- per priority class 24
- additional within an error OB 2

Counters, timers and their retentivity

IEC counter

- present Yes
- Type SFB
- Number Unlimited (limited only by RAM capacity)

IEC timer

- present Yes

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- Type SFB
- Number Unlimited (limited only by RAM capacity)

Data areas and their retentivity

Retentive data area (incl. timers, counters, flags), max. Total working and load memory (with backup battery)

Flag

- Size, max. 16 384 byte
- Retentivity available Yes
- Number of clock memories 8; in 1 memory byte

Local data

- adjustable, max. 64 kbyte

Address area

I/O address area

Inputs 16 kbyte; max., dependent on the System Expansion Card used

- Outputs 16 kbyte; max., dependent on the System Expansion Card used

Process image

- Inputs, default 16 kbyte; not changeable
- Outputs, default 16 kbyte; not changeable
- consistent data, max. 244 byte
- Access to consistent data in process image Yes

Subprocess images

- Number of subprocess images, max. 15

Hardware configuration

Number of expansion units, max. 21; S7-400 expansion devices

connectable OPs 119

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 1
- via CP 10; CP 443-5 Extended

Number of IO Controllers

- integrated 2
- via CP 0

Number of operable FMs and CPs (recommended)

- PROFIBUS and Ethernet CPs 11; 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 16
- Number/Number range 0 to 15

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- Range of values SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2³¹ - 1 hours
- Granularity 1 h
- retentive Yes

Clock synchronization

- supported Yes
- to DP, master Yes
- to DP, slave Yes
- in AS, master Yes
- in AS, slave Yes
- on Ethernet via NTP Possible as client and master/slave via SIMATIC process

Interfaces

Number of PROFINET interfaces 2

Number of RS 485 interfaces 1; PROFIBUS DP

Number of other interfaces 2; 2x synchronization

1. Interface

Interface type RS 485 / PROFIBUS

Isolated Yes

Number of connection resources 16

Interface types

- 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
- Number of slots per interface, max. 1 632

Services

- PG/OP communication Yes
- Routing Yes; S7 routing
- Global data communication No
- S7 basic communication No
- S7 communication Yes
- S7 communication, as client Yes
- S7 communication, as server Yes
- Equidistance No
- Isochronous mode No
- SYNC/FREEZE No
- Activation/deactivation of DP slaves Yes; Approved for stand-alone operation only, not in conjunction with

CiR (Configuration in Run)

- Direct data exchange (slave-to-slave communication)

No

- DPV1 Yes

Address area

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

User data per DP slave

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- 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 PROFINET

Isolated Yes

automatic detection of transmission rate Yes; Autosensing

Autonegotiation Yes

Autocrossing Yes

System redundancy Yes

Redundant subnetworks Yes

Change of IP address at runtime, supported No

Number of connection resources 120

Interface types

- Number of ports 2
- integrated switch Yes

Protocols

- PROFINET IO Controller Yes
- PROFINET IO Device No
- PROFINET CBA No
- Open IE communication Yes
- Web server No
- Media redundancy Yes

PROFINET IO Controller

- Transmission rate, max. 100 Mbit/s

Services

- PG/OP communication Yes
- S7 communication Yes
- Shared device No; however, usable as part of S7
- Prioritized startup No

— Number of connectable IO Devices, max. 250

— Number of connectable IO Devices for RT,
max.

250

— of which in line, max. 250

— Activation/deactivation of IO Devices Yes; Approved for stand-alone operation only, not in conjunction with
CiR (Configuration in Run)

— IO Devices changing during operation (partner
ports), supported

No

— Device replacement without swap medium Yes

— Send cycles 250 μ s, 500 μ s, 1 ms, 2 ms, 4 ms

— Updating time 250 μ s to 512 ms, minimum value depends on the number of configured
user data and the configured single or redundant mode

Address area

— Inputs, max. 8 kbyte

— Outputs, max. 8 kbyte

— User data consistency, max. 1 024 byte

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Open IE communication

- Number of connections, max. 118
- Local port numbers used at the system end 0, 20, 21, 25, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
- Keep-alive function, supported Yes

3. Interface

Interface type PROFINET

Isolated Yes

automatic detection of transmission rate Yes; Autosensing

Autonegotiation Yes

Autocrossing Yes

System redundancy Yes

Redundant subnetworks Yes

Number of connection resources 120

Interface types

- Number of ports 2
- integrated switch Yes

Protocols

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- PROFINET IO Device No
- PROFINET CBA No
- Open IE communication Yes
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- Media redundancy Yes

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4. Interface

Interface type Pluggable synchronization submodule (FO)

Plug-in interface modules Synchronization module 6ES7960-1AA06-0XA0, 6ES7960-1AB06-0XA0 or 6ES7960-1AA08-0XA0

5. Interface

Interface type Pluggable synchronization submodule (FO)

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Protocols

Supports protocol for PROFINET IO Yes

PROFINET CBA No

PROFIsafe Yes

PROFIBUS Yes

AS-Interface Yes; Via add-on

Redundancy mode

Media redundancy

— Switchover time on line break, typ. < 200 ms

— Number of stations in the ring, max. 50

SIMATIC communication

- S7 routing Yes

Open IE communication

- TCP/IP Yes; via integrated PROFINET interface and loadable FBs

— Number of connections, max. 118

— Data length, max. 32 kbyte

— several passive connections per port, supported

Yes

- ISO-on-TCP (RFC1006) Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs

— Number of connections, max. 118

— Data length, max. 32 kbyte; 1 452 bytes via CP 443-1 Adv.

- UDP Yes; via integrated PROFINET interface and loadable FBs

— Number of connections, max. 118

— Data length, max. 1 472 byte

Further protocols

- Foundation Fieldbus Yes; via DP/FF Link

- MODBUS Yes; Via add-on

Communication functions

PG/OP communication Yes

- Number of connectable OPs without message

processing

119

- Number of connectable OPs with message

processing

119; When using Alarm_S/SQ and Alarm_D/DQ

Data record routing Yes

S7 communication

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- 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 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

Standard communication (FMS)

- supported Yes; Via CP and loadable FB

Number of connections

- overall 120
- usable for PG communication
- reserved for PG communication 1
- usable for OP communication
- reserved for OP communication 1

S7 message functions

Number of login stations for message functions, max. 119; max. 119 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)

Program alarms Yes

Process diagnostic messages Yes

simultaneously active Alarm-S blocks, max. 1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks

Alarm 8-blocks Yes

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

10 000

Process control messages Yes

Number of archives that can log on simultaneously (SFB

37 AR_SEND)

64

Test commissioning functions

Status block Yes

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

Diagnostic buffer

- present Yes
- Number of entries, max. 3 200

Service data

- can be read out Yes

Standards, approvals, certificates

CE mark Yes

UKCA mark Yes

CSA approval Yes

UL approval Yes

cULus Yes

FM approval Yes

RCM (formerly C-TICK) Yes

KC approval Yes

EAC (formerly Gost-R) Yes

CCC Yes

Use in hazardous areas

- ATEX ATEX II 3G Ex ec IIC T4 Gc

Ambient conditions

Ambient temperature during operation

- min. 0 °C
- max. 70 °C

Configuration

Programming

- Command set see instruction list
- Nesting levels 7
- Access to consistent data in process image Yes
- System functions (SFC) see instruction list

System function blocks (SFB) see instruction list

Programming language

- SCL Yes
- CFC Yes

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Number of simultaneously active SFCs

- RD_REC 8; SFC 59; per interface
- WR_REC 8; SFC 58; per interface
- WR_PARM 8; SFC 55; per interface
- PARM_MOD 1; SFC 57; per interface
- WR_DPARM 2; SFC 56; per interface
- DPNRM_DG 8; SFC 13; per interface
- RDSYSST 8; SFC 51
- DP_TOPOL 1; SFC 103; per interface

Number of simultaneously active SFBs

- RDREC 8; SFB 52; per interface, but not more than 32 across all external interfaces
- WRREC 8; SFB 53; per interface, but not more than 32 across all external interfaces

Know-how protection

- User program protection/password protection Yes
- Block encryption Yes; With S7 block Privacy

Dimensions

Width 50 mm

Height 290 mm

Depth 219 mm

Weights

Weight, approx. 1.1 kg