SIEMENS

Data sheet 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	
● 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 µA; 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 µs; 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: 0 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
● 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	
● data volume / as local data / adjustable / maximum	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
● Range of values	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 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	NTP as client and as server/client via SIMATIC procedure
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 connections	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	
— 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
product function / at the 2nd interface / change of the IP address at runtime	No
Number of connections	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 µs, 500 µs, 1 ms, 2 ms, 4 ms
— Updating time	250 µs 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
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 connections	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
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— Send cycles	250 µs, 500 µs, 1 ms, 2 ms, 4 ms
— Updating time	250 µs 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
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
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)

Plug-in interface modules	Synchronization module 6ES7960-1AA06-0XA0, 6ES7960-1AB06-0XA0 or 6ES7960-1AA08-0XA0
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 / header	
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	
● 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	
● test-/initiation function / service data readable	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 / header	
configuration / programming / header	
● 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
configuration / programming / number of simultaneously active SFC / header	
— 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
configuration / programming / number of simultaneously active SFB / header	
— 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

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