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 integrated (for program) 	Dependent on the System Expansion Card used
	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	
• present	Yes
 with battery 	Yes; all data
• without battery	Yes; Program and data of the load memory
Battery	
Backup battery	
	370 μA; Valid up to 40°C
Backup battery	370 μA; Valid up to 40°C 2.1 mA
Backup batteryBackup current, typ.	2.1 mA Dealt with in the module data manual with the secondary
Backup battery Backup current, typ. Backup current, max. Backup time, max.	2.1 mA Dealt with in the module data manual with the secondary conditions and the factors of influence
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Backup battery • Backup current, typ. • Backup current, max. • Backup time, max. • Feeding of external backup voltage to CPU CPU processing times for bit operations, typ. for word operations, typ.	 2.1 mA Dealt with in the module data manual with the secondary conditions and the factors of influence No 7.5 ns 7.5 ns
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Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	Total working and load memory (with backup battery)
Flag	
• Number, max.	16 384 byte
 Retentivity available 	Yes
 Number of clock memories 	8; in 1 memory byte
Local data	
 adjustable, max. 	64 kbyte
• preset	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, adjustable 	16 kbyte
 Outputs, adjustable 	16 kbyte
 Inputs, default 	16 kbyte; Total peripheral address range, cannot be changed
 Outputs, default 	16 kbyte; Total peripheral address range, cannot be changed
 consistent data, max. 	244 byte
 Access to consistent data in process image 	Yes
Subprocess images	
 Number of subprocess images, max. 	15
Digital channels	
Inputs	131 072; max., dependent on the System Expansion Card used
— of which central	131 072; max., dependent on the System Expansion Card used
Outputs	131 072; max., dependent on the System Expansion Card used
— of which central	131 072; max., dependent on the System Expansion Card used
Analog channels	
Inputs	8 192; max., dependent on the System Expansion Card used
— of which central	8 192; max., dependent on the System Expansion Card used
• Outputs	8 192; max., dependent on the System Expansion Card used
— of which central	8 192; max., dependent on the System Expansion Card used
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

• integrated1• via CP10; CP 443-5 ExtendedNumber of IO Controllers2• integrated2• via CP0Number of operable FMs and CPs (recommended)11; Of which max. 10 CP as DP master• PROFIBUS and Ethernet CPs11; Of which max. 10 CP as DP master• required slots2	Number of DP masters	
• via CP10; CP 443-S ExtendedNumeer of IO Controllers2• inlegrated2• via CP0Numeer of operable FMs and CPs (recommended)11; Of which max. 10 CP as DP master• PROFIBUS and Ethemet CPs3Slots-• required slots2• required slots2• Cook-• Hardware clock (real-time)Yes• Resolution1 ms• Deviation per day (buffered), max.1.7 s; Power off• Deviation per day (buffered), max.1.7 s; Power off• Number10• Number/Number range0 to 15• Range of valuesSFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2*31 - 1 hours• Granularity1 h• retentiveYes• SupportedYes• SupportedYes• to DP, slaveYes• number of RSOFINET interfaces2• to DP, slave1, PROFIBUS DP• number of PROFINET interfaces2• number of RS 485 interfaces1, PROFIBUS DP• number of RS 485 interfaces1, PROFIBUS DP• number of other interfacesYes• to State as client and master/slave vis SIMATIC process• to State as client and master/slave vis SIMATIC process• to State as Client and master/slave vis SIMATIC process• to State as Client as Client interfaces2• to State as Client a		1
Number of IO Controllers 2 • integrated 2 • integrated 0 Number of operable FMs and CPs (recommended) • It (of which max. 10 CP as DP master • required slots 2 • required slots 2 • required slots 2 Clock 2 • Hardware clock (real-time) Yes • retentive and synchronizable Yes • Deviation per day (buffered), max. 1 ms • Deviation per day (buffered), max. 8.6 s; Power off • Deviation per day (buffered), max. 8.6 s; Power on Operating hours counter 1 • 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 • etentive Yes • Lop P, slave Yes • Lop P, slave Yes • In AS, slave Yes • In AS, slave Yes • In AS, slave 1; PROFIBUS DP Number of PROFINET interfaces	-	
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Number0Number of operable FMs and CPs (recommended)•ROCFIBUS and Ethernet CPs11; Of which max. 10 CP as DP masterSlots2•required slots2Cince of dyVes• fardware clock (real-time)Yes• tetentive and synchronizableYes• etentive and synchronizableYes• beviation per day (buffered), max.36 s; Power off• Deviation per day (buffered), max.36 s; Power on• Deviation per day (buffered), max.36 s; Power on• Number16• Number10 to 15• Range of valuesSFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours• Granularity1h• retentiveYes• SupportedYes• to DP, masterYes• to DP, slaveYes• on Ethernet via NTPYesNumber of PROFINET interfaces2Number of PROFINET interfaces1Prover supply to interface (15 to 30 VDC), max.160 mANumber of connection resources16		2
Number of operable FMs and CPs (recommended) • PROFIBUS and Ethernet CPs 11; Of which max. 10 CP as DP master Slots 2 • required slots 2 Clock Ves • redentities and synchronizable Yes • retentive and synchronizable Yes • Resolution 1 ms • Deviation per day (buffered), max. 8 6; Power off • Deviation per day (nbuffered), max. 8 6; Power off • Deviation per day (nbuffered), max. 16 • Number 16 • Number of values SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2*31 - 1 hours • Granularity 1 h • retentive Yes • Supported Yes • supported Yes • In AS, master Yes • In AS, master Yes • In SA, master 2 • In AS, master 2 • In Ethernet via NTP Possible as client and master/slave via SIMATIC processe		
• PROFIBUS and Ethernet CPs 11; Of which max. 10 CP as DP master Slots 2 • required slots 2 Cince Ves • Hardware clock (real-time) Yes • Hardware dock (real-time) Yes • Resolution 1 ms • Deviation per day (buffered), max. 8.6 s; Power off • Deviation per day (buffered), max. 8.6 s; Power on Operating hours couter 0 to 15 • Number(Number range 0 to 15 • Range of values SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^431 - 1 hours • Granularity 1 h • ettentive Yes • supported Yes • supported Yes • to DP, slave Yes • to DP, slave Yes • in AS, master Yes • in AS, slave Yes • unber of PROFINET interfaces 2 Number of PROFINET interfaces 2 Number of RS 435 interfaces 1; PROFIBUS DP Number of RS 435 interfaces 1; PROFIBUS DP Number of RS 435 interfaces 1; PROFIBUS DP Number of RS 4		
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• required slots 2 Time of day Clock • Hardware clock (real-time) Yes • retentive and synchronizable Yes • Resolution 1 ms • Deviation per day (buffered), max. 8.6 s; Power off • Deviation per day (unbuffered), max. 6.6 s; Power on Operating hours counter 16 • Number 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 • 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 • retentive Yes • to DP, master Yes • to DP, slave Yes • on Ethernet via NTP Possible as client and master/slave via SIMATIC process Number of PROFINET interfaces 2 Number of PROFINET in		
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• in AS, masterYes• in AS, slaveYes• on Ethernet via NTPPossible as client and master/slave via SIMATIC processInterfaces2Number of PROFINET interfaces2Number of RS 485 interfaces1; PROFIBUS DPNumber of other interfaces2; 2x synchronizationInterface typeIntegratedPhysicsRS 485 / PROFIBUSIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16	• to DP, master	Yes
• in AS, slave • on Ethernet via NTPYes Possible as client and master/slave via SIMATIC processInterfacesNumber of PROFINET interfaces2Number of RS 485 interfaces1; PROFIBUS DPNumber of other interfaces2; 2x synchronizationInterfaceIntegratedPhysicsRS 485 / PROFIBUSIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16	● to DP, slave	Yes
• on Ethernet via NTPPossible as client and master/slave via SIMATIC processInterfaces2Number of PROFINET interfaces2Number of RS 485 interfaces1; PROFIBUS DPNumber of other interfaces2; 2x synchronizationInterfaceInterfaceIntegratedPhysicsRS 485 / PROFIBUSIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16	● in AS, master	Yes
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Number of PROFINET interfaces2Number of RS 485 interfaces1; PROFIBUS DPNumber of other interfaces2; 2x synchronization1. InterfaceIntegratedInterface typeIntegratedPhysicsRS 485 / PROFIBUSIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16	• on Ethernet via NTP	Possible as client and master/slave via SIMATIC process
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Number of other interfaces2; 2x synchronization1. Interface1. IntegratedInterface typeIntegratedPhysicsRS 485 / PROFIBUSIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16		2
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IntegratedIntegratedPhysicsIsolatedPower supply to interface (15 to 30 V DC), max.Number of connection resources16	Number of other interfaces	2; 2x synchronization
IntegratedIntegratedPhysicsIsolatedPower supply to interface (15 to 30 V DC), max.Number of connection resources16	1. Interface	
Isolated Yes Power supply to interface (15 to 30 V DC), max. 150 mA Number of connection resources 16		Integrated
Power supply to interface (15 to 30 V DC), max.150 mANumber of connection resources16	Physics	RS 485 / PROFIBUS
Number of connection resources 16	Isolated	Yes
	Power supply to interface (15 to 30 V DC), max.	150 mA
Protocols	Number of connection resources	16
	Protocols	

PROFIBUS DP master	Yes
	No
PROFIBUS DP slave	INU
PROFIBUS DP master	16
• Number of connections, max.	
• 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; up to 2 800 IOs (channels)
— Outputs, max.	6 kbyte; up to 2 800 IOs (channels)
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
Physics	Ethernet RJ45
Isolated	Yes Vice Autoensing
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes
Autocrossing System redundancy	Yes
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 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
Media redundancy	
 supported 	Yes
 Switchover time on line break, typ. 	< 200 ms
• Number of stations in the ring, max.	50
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	No
• PROFINET CBA	No
 Open IE communication 	Yes
Web server	No
PROFINET IO Controller	
 Transmission rate, max. 	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— S7 communication	Yes
— Open IE 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,	250
max.	
— 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; up to 3 800 IOs (channels)
— Outputs, max.	8 kbyte; up to 3 800 IOs (channels)
— 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 Yes
- Keep-alive function, supported

3. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
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
Media redundancy	
• supported	Yes
 Switchover time on line break, typ. 	< 200 ms
 Number of stations in the ring, max. 	50
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	No
PROFINET CBA	No
Open IE communication	Yes
Web server	No
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— S7 communication	Yes
— Open IE 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,	250
max.	
— 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; up to 3 800 IOs (channels)
— Outputs, max.	8 kbyte; up to 3 800 IOs (channels)
— 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
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; 1452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs

— Number of connections, max.	118
	1 472 byte
— Data length, max. Further protocols	
Foundation Fieldbus	Yes; via DP/FF Link
	Yes; Via add-on
• MODBUS	
Communication functions	
PG/OP communication	Yes
 Number of connectable OPs without message 	119
processing	
 Number of connectable OPs with message 	119; When using Alarm_S/SQ and Alarm_D/DQ
processing	
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 	64/64
orders per CPU, max.	
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 and Alarm_D (OPs); max. 12 with
	Alarm_8 and Alarm_P (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
Alarm 8-blocks	blocks Yes
	Yes 10 000
 Number of instances for alarm 8 and S7 communication blocks, max. 	10 000

• preset, 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
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• ATEX	ATEX II 3G Ex nA IIC T4 Gc
Ambient conditions	
Ambient temperature during operation	A *O
• 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
Number of simultaneously active SFCs	
	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
last modified:	01/31/2019