SIEMENS

Data sheet 6ES7410-5HM08-0AB0

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

General information	
Product type designation	CPU 410E
HW functional status	1
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	500; max., dependent on the System Expansion Card used
Work memory	
● integrated	4.2 Mbyte
● integrated (for program)	use of max. 4.2 MB work memory
● integrated (for data)	use of max. 4.2 MB work memory
● expandable	No
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	
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; the total size of all data blocks generated with the SFC 22 (CREATE_DB) is limited to 256 KB
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	
● adjustable, max.	64 kbyte
Address area	
I/O address area	
● Inputs	2 048 byte; max. 1 536 bytes for inputs or outputs per interface
● Outputs	2 048 byte; max. 1 536 bytes for inputs or outputs per interface
Process image	
● Inputs, default	2 048 byte; not changeable
● Outputs, default	2 048 byte; 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	
connectable OPs	119
Multicomputing	No
Number of DP masters	
● integrated	1
● via CP	4; CP 443-5 Extended
Number of IO Controllers	
● integrated	2
● via CP	0
Number of operable FMs and CPs (recommended)	
● CP, LAN	4
● PROFIBUS and Ethernet CPs	4
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
● on DP, device	Yes
● in AS, master	Yes
● in AS, device	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 connections	16
Interface types	
● Output current of the interface, max.	150 mA
Protocols	
● PROFIBUS DP master	Yes
● PROFIBUS DP device	No
PROFIBUS DP master	
● Number of connections, max.	16
● Transmission rate, max.	12 Mbit/s
● max. number of DP devices	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 devices	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.	1 536 byte
— Outputs, max.	1 536 byte
User data per DP device	
— user data per DP device, 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 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.	1 536 byte
— Outputs, max.	1 536 byte
— 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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Address area	
— Inputs, max.	1 536 byte
— Outputs, max.	1 536 byte
— 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 with message processing	119; When using Alarm_S/SQ and Alarm_D/DQ
● Number of connectable OPs without message processing	119
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	
● 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
Ambient temperature during storage/transportation	
● min.	-25 °C
● max.	70 °C
Altitude during operation relating to sea level	
● Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see section "Climatic and mechanical environmental conditions"
Resistance	
Usage in industrial process technology	
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes
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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