## **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	
<ul> <li>Programming package</li> </ul>	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
<ul><li>integrated (for program)</li></ul>	Dependent on the System Expansion Card used
<ul><li>integrated (for data)</li></ul>	Dependent on the System Expansion Card used
• expandable	Dependent on the System Expansion Card used
Load memory	
<ul><li>integrated RAM, max.</li></ul>	48 Mbyte
expandable RAM	No
Backup	
<ul><li>with battery</li></ul>	Yes; all data
<ul><li>without battery</li></ul>	Yes; Program and data of the load memory

attery	
Backup battery	
<ul> <li>Backup current, typ.</li> </ul>	370 μA; Valid up to 40°C
<ul> <li>Backup current, max.</li> </ul>	2.1 mA
Backup time, max.	Dealt with in the module data manual with the secondary conditions and the factors of influence
<ul> <li>Feeding of external backup voltage to CPU</li> </ul>	No
PU 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
PU-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	2
Number, max.	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	o i nayto
Number, max.	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	OF HOYES
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 time diam OBs     Number of delay alarm OBs	4; OB 20-23
Number of delay alarm obs     Number of cyclic interrupt OBs	9; OB 30-38 (= Process Tasks)
Number of cyclic interrupt OBs     Number of process alarm OBs	8; OB 40-47
Number of process alarm OBs     Number of DPV1 alarm OBs	3; OB 55-57
Number of startup OBs     Number of savgebraneus error OBs	2; OB 100, 102 9; OB 80-88
Number of asynchronous error OBs	
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	24
per priority class     additional within an array OB	24
additional within an error OB	2
ounters, timers and their retentivity	
IEC counter	V
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
IEC timer	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
ata 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	
	0.411. (
adjustable, max.	64 kbyte

• Inputs	16 kbyte; max., dependent on the System Expansion Card used
Outputs	16 kbyte; max., dependent on the System Expansion Card used
Process image	To kbyte, max., dependent on the System Expansion Card used
• Inputs, default	16 kbyte; not changeable
Outputs, default	16 kbyte; not changeable
consistent data, max.	244 byte
	Yes
Access to consistent data in process image  Subpresses images	tes
Subprocess images	15
Number of subprocess images, max.	15
Hardware configuration	24.22.42
Number of expansion units, max.	21; S7-400 expansion devices
connectable OPs	119
Multicomputing	No
Interface modules	
<ul> <li>Number of connectable IMs (total), max.</li> </ul>	6
<ul> <li>Number of connectable IM 460s, max.</li> </ul>	6
Number of connectable IM 463s, max.	4; Single mode only
Number of DP masters	
<ul><li>integrated</li></ul>	1
• via CP	10; CP 443-5 Extended
Number of IO Controllers	
<ul><li>integrated</li></ul>	2
• via CP	0
Number of operable FMs and CPs (recommended)	
<ul> <li>PROFIBUS and Ethernet CPs</li> </ul>	11; Of which max. 10 CP as DP master
Slots	
• required slots	2
Time of day	
Clock	
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
<ul> <li>retentive and synchronizable</li> </ul>	Yes
<ul> <li>Resolution</li> </ul>	1 ms
<ul> <li>Deviation per day (buffered), max.</li> </ul>	1.7 s; Power off
<ul> <li>Deviation per day (unbuffered), max.</li> </ul>	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	Possible as client and master/slave via SIMATIC process
	1 000 INIC 40 CHERT AND MASICIFOLAVE VIA OHVIATIO PROCESS
Interfaces	2
Number of PROFINET interfaces	2 4. DDOCIDUS DD
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
<ul> <li>Number of slots per interface, max.</li> </ul>	1 632
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	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
, touvalion addolivation of Br slaves	CiR (Configuration in Run)
<ul> <li>Direct data exchange (slave-to-slave</li> </ul>	No
communication)	
— DPV1	Yes
Address area	
— Inputs, max.	6 kbyte
— Outputs, max.	6 kbyte
User data per DP slave	
<ul> <li>User data per DP slave, max.</li> </ul>	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	
<ul><li>Number of ports</li></ul>	2
integrated switch	Yes
Protocols	
<ul> <li>PROFINET IO Controller</li> </ul>	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
<ul> <li>Prioritized startup</li> </ul>	No

CiR (Configur  — IO Devices changing during operation (partner ports), supported  — Device replacement without swap medium  — Send cycles  — Updating time  250 µs, 500 µ  250 µs to 512 user data and d	for stand-alone operation only, not in conjunction with ion in Run)  1 ms, 2 ms, 4 ms ns, minimum value depends on the number of configured ne configured single or redundant mode  102, 135, 161, 34962, 34963, 34964, 65532, 65533,
max. — of which in line, max. — 250 — Activation/deactivation of IO Devices Yes; Approve CIR (Configur Ports), supported — Device replacement without swap medium Yes — Send cycles — Updating time 250 µs to 512 user data and Address area — Inputs, max. — 8 kbyte — User data consistency, max. — 1024 byte Open IE communication • Number of connections, max. — 118 • Local port numbers used at the system end 0, 20, 21, 25, 65534, 65535 • Keep-alive function, supported Yes   3. Interface Upe PROFINET Solated Autonegotiation Yes System redundancy Yes System redundancy Yes Number of connection resources 120 Interface type • Number of ports • integrated switch Yes • Number of ports • integrated switch Yes • Number of ports • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • Open IE communication Yes • Media redundancy Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes Sortem Prosonum Cation Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes Sortem Prosonum Cation Yes Sortem Prosonum Cation Yes Sortem Prosonum Cation Yes Sortem Prosonum Cation Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s	1 ms, 2 ms, 4 ms ns, minimum value depends on the number of configured the configured single or redundant mode
- of which in line, max Activation/deactivation of IO Devices - Activation/deactivation of IO Devices - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium - Send cycles - Updating time - Send cycles -	1 ms, 2 ms, 4 ms ns, minimum value depends on the number of configured the configured single or redundant mode
— Activation/deactivation of IO Devices CIR (Configur Dots), supported Device replacement without swap medium Send cycles Updating time Send cycles Updating time  Address area Inputs, max. User data consistency, max. User data consistency, max.  Local port numbers used at the system end Send etection of transmission rate Autonegotiation Autocrossing System redundancy Redundant subnetworks Number of connection resources Interface types Number of contection resources Interface types Number of contection resources PROFINET IO Controller PROFINET IO Controller PROFINET IO Device PROFINET IO Controller PROFINET IO Con	1 ms, 2 ms, 4 ms ns, minimum value depends on the number of configured the configured single or redundant mode
— IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max. — Outputs, max. — User data consistency, max.  1 024 byte  Open IE communication  Number of connections, max. Local port numbers used at the system end  Attoresc type Interface type Interface type Interface type System redundancy Redundant subnetworks Number of connection resources Interface types  Number of connection of transmission rate  Autocrossing System redundancy Redundant subnetworks Number of connection resources Interface types  Number of connection resources  PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET Obevice PROFINET Obevice PROFINET IO Controller PROFINET IO Controlle	1 ms, 2 ms, 4 ms ns, minimum value depends on the number of configured the configured single or redundant mode
ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max. — Outputs, max. — User data consistency, max.  Open IE communication  Number of connections, max.  Local port numbers used at the system end  Autocrossing System redundancy Redundant subnetworks Number of connection resources  Interface type  Number of connection of transmission rate  Autonegotiation  Autocrossing Yes System redundancy Redundant subnetworks Number of ports — integrated switch Protocols  PROFINET IO Controller PROFINET IO Device — PROFINET IO Device — PROFINET IO Controller — Transmission rate, max.  100 Mbit/s Services — PG/OP communication — Yes — S7 communication — Yes — S7 communication — S6 communication — S7 communication — S6 communication — S7 communication — S6 communication — S8 communication — S9 communication —	ns, minimum value depends on the number of configured ne configured single or redundant mode
— Device replacement without swap medium — Send cycles — Updating time  250 μs to 512 user data and Address area — Inputs, max. — Outputs, max. — Outputs, max. — User data consistency, max.  1 1024 byte  Open IE communication  Number of connections, max. Local port numbers used at the system end Keep-alive function, supported  Interface type Isolated Autonegotiation  Autocrossing System redundancy Redundant subnetworks Number of connection resources Interface types Number of connection resources  PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET CBA Open IE communication  PROFINET IO Controller Tyes PROFINET IO Controller PROFINET IO Controller Tyes PROFINET CBA Tyes PROFINET IO Controller Tyes Transmission rate, max. Too Mabit/s Services  — PG/OP communication Tyes Profiner Io Controller Tyes PROFINET IO Controller Transmission rate, max. Too Mabit/s Services  — PG/OP communication Tyes PS communication Tyes Prosident Address area Too Hada redundancy Tyes Profiner IO Controller Transmission rate, max. Too Mabit/s Services  — PG/OP communication Tyes No; however,	ns, minimum value depends on the number of configured ne configured single or redundant mode
— Send cycles — Updating time  250 µs to 512 µser data and Address area  — Inputs, max. — Outputs, max. — User data consistency, max.  1 024 byte  Open IE communication  • Number of connections, max. • Local port numbers used at the system end  • Keep-alive function, supported  Interface  Interface type  Interface type  Interface type  Interface type  Autocrossing  System redundancy  Redundant subnetworks  Number of connection resources  • Number of ports • Number of ports • Number of ports • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET IO Device • PROFINET IO Device • PROFINET IO Controller • Web server • Media redundancy • Wes  PROFINET IO Controller • Transmission rate, max.  Services  — PG/OP communication — Yes - Shared device  No; however,  No; however,  No; however,  Shared device  No; however,	ns, minimum value depends on the number of configured ne configured single or redundant mode
— Updating time  Address area — Inputs, max. — Outputs, max. — User data consistency, max.  1 024 byte  Open IE communication  Number of connections, max.  Ital  Local port numbers used at the system end  Cepture isolated  Interface  Interface type Isolated  Autocrossing System redundancy Redundant subnetworks Number of connection resources  Interface types  Number of connection resources  Interface type  PROFINET  Isolated  Autocrossing  Yes  System redundancy  Redundant subnetworks Number of connection resources  Interface types  Number of connection resources  PROFINET IO Controller  PROFINET IO Device  PROFINET IO Device  PROFINET CBA  Open IE communication  Web server  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication  Yes  No; however,  No; however,  Shared device  No; however,  No; however,	ns, minimum value depends on the number of configured ne configured single or redundant mode
Address area  — Inputs, max. — Outputs, max. — User data consistency, max.  1 024 byte  Open IE communication  • Number of connections, max. • Local port numbers used at the system end • Keep-alive function, supported  Interface  Interface  Interface type Isolated automatic detection of transmission rate Autonegotiation Autorossing System redundancy Redundant subnetworks Number of connection resources  Interface types  • Number of connection resources  Interface type Isolated automatic detection of transmission rate Autonegotiation Autoreosing Yes System redundancy Yes Redundant subnetworks Number of connection resources  Interface types • Number of connection resources  I 20 Interface types • Number of ports • integrated switch  Protocols • PROFINET IO Controller • PROFINET IO Device • PROFINET Opevice • PROFINET CBA • Open IE communication • Web server • Media redundancy Pres  PROFINET IO Controller • Transmission rate, max.  Services  — PG/OP communication — S7 communication — S7 communication — S7 communication — S8 conduction — S7 communication — Shared device  No; however,	ne configured single or redundant mode
— Inputs, max. — Outputs, max. — User data consistency, max. 1 024 byte  Open IE communication  • Number of connections, max. • Local port numbers used at the system end • Keep-alive function, supported  7 yes  Interface  Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing System redundancy Redundant subnetworks Number of connection resources  • Number of ports • integrated switch  PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • Open IE communication • Web server • Media redundancy Pres PROFINET IO Controller • Transmission rate, max.  Services  — PG/OP communication — S7 communication — Shared device  No; however,  No; however,  Prose  1 024 byte 1 18 kbyte 1 1024 byte 1 108 kbyte 1 1	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Outputs, max User data consistency, max.  User data consistency, max.  User data consistency, max.  Number of connections, max.  Local port numbers used at the system end  Number of connection, supported  Keep-alive function, supported  Keep-alive function, supported  Started Startes  User data consistency, max.  118  0, 20, 21, 25, 65534, 65535  Ves  Startes Starte	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
— User data consistency, max.  Open IE communication  Number of connections, max.  Local port numbers used at the system end  Keep-alive function, supported  Neep-alive function, supported  Interface  Interface type  Isolated  automatic detection of transmission rate  Autonegotiation  Autocrossing  System redundancy  Redundant subnetworks  Number of connection resources  Interface types  Number of connection resources  Protocols  PROFINET  2  integrated switch  Protocols  PROFINET IO Controller  PROFINET IO Device  PROFINET IO Device  PROFINET CBA  Open IE communication  Web server  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication  Yes  No; however,  No; however,  No; however,	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Open IE communication  Number of connections, max. Local port numbers used at the system end Keep-alive function, supported  Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing System redundancy Redundant subnetworks Number of connection resources Interface types Number of ports integrated switch PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET CBA Open IE communication Wes PROFINET IO Controller Transmission rate, max. Services  — PG/OP communication — S7 communication — S1 acommunication — S1 acommunication — S1 acommunication — S2 — No; however, No; however, No; however,	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Number of connections, max.  Local port numbers used at the system end  Cocal port number of ports  Local port numbers used at the system end  Cocal port numbers used numbers used numbers numbers numbers numbers numbers numbers numbers num	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Local port numbers used at the system end     (20, 21, 25, 65534, 65535)     Keep-alive function, supported     Yes    Interface   PROFINET	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Local port numbers used at the system end     (20, 21, 25, 65534, 65535)     Keep-alive function, supported     Yes    Interface   PROFINET	02, 135, 161, 34962, 34963, 34964, 65532, 65533,
Neep-alive function, supported   Yes	
Interface losted yes automatic detection of transmission rate yes; Autosens Autonegotiation yes System redundancy yes Redundant subnetworks yes Number of connection resources 120 linterface types  Number of ports 2  Integrated switch yes PROFINET IO Controller yes PROFINET IO Device No PROFINET CBA No Open IE communication yes Web server Media redundancy yes PROFINET IO Controller  Media redundancy yes PROFINET IO Controller yes No	
Interface type Isolated  automatic detection of transmission rate  Autonegotiation  Autocrossing  System redundancy  Redundant subnetworks  Number of connection resources  • Number of ports  • integrated switch  Protocols  • PROFINET IO Controller  • PROFINET CBA  • Open IE communication  • Web server  • Media redundancy  PROFINET IO Controller  • Transmission rate, max.  Services  - PG/OP communication  - S7 communication  - Shared device  Press  Yes  Yes  Prostinet  Yes  No; however,	
Isolated  automatic detection of transmission rate  Autonegotiation  Autocrossing  System redundancy  Redundant subnetworks  Number of connection resources  Interface types  Number of ports  integrated switch  Protocols  PROFINET IO Controller  PROFINET IO Device  PROFINET CBA  Open IE communication  Web server  Mo  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  PG/OP communication  Yes  Po; Autosens  Yes  2  Yes  No  Yes  No  No  Pes  No  No  No  No  No  No  No  No  No  N	
automatic detection of transmission rate  Autonegotiation  Autocrossing  System redundancy  Redundant subnetworks  Number of connection resources  Number of ports  integrated switch  PROFINET IO Controller  PROFINET CBA  Open IE communication  Web server  Mo  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication  — S7 communication  — S7 communication  Yes  Yes  Yes  Yes  Yes  No; however,	
Autocrossing Autocrossing Yes System redundancy Redundant subnetworks Number of connection resources Interface types  Number of ports Integrated switch Protocols PROFINET IO Controller PROFINET IO Device PROFINET CBA Open IE communication Web server Mo Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — S7 communication — S7 communication — Shared device  Yes  Yes  Yes  Yes  Yes  100 Mbit/s	
Autocrossing System redundancy Redundant subnetworks Number of connection resources Interface types Number of ports Integrated switch Protocols PROFINET IO Controller PROFINET CBA Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — S7 communication — Shared device  Yes  Yes  Yes  No  Yes  100 Mbit/s	ng
System redundancy Redundant subnetworks Yes Number of connection resources Interface types  Number of ports Integrated switch Protocols PROFINET IO Controller PROFINET IO Device PROFINET CBA Open IE communication Web server Mo Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — S7 communication — Shared device  Yes  120  120  120  120  120  120  120  12	
Redundant subnetworks Number of connection resources  Interface types  Number of ports  integrated switch  Protocols  PROFINET IO Controller  PROFINET IO Device  PROFINET CBA  Open IE communication  Web server  Mo  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication  — S7 communication  Yes  No; however,	
Number of connection resources  Interface types  Number of ports  integrated switch  Protocols  PROFINET IO Controller  PROFINET IO Device  PROFINET CBA  Open IE communication  Web server  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication  — S7 communication  Stress  120  120  120  120  120  120  120  1	
Interface types  Number of ports Integrated switch Protocols  PROFINET IO Controller PROFINET IO Device PROFINET CBA Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services  — PG/OP communication — S7 communication — Shared device  1 2 2 4 2 4 3 4 5 2 5 2 5 3 5 4 5 5 5 5 5 5 6 5 7 6 5 5 5 7 6 5 6 5 7 6 7 7 7 7	
<ul> <li>Number of ports</li> <li>integrated switch</li> <li>Protocols</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Yes</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Starting Types</li> <li>Yes</li> <li>No; however,</li> </ul>	
<ul> <li>Number of ports</li> <li>integrated switch</li> <li>Protocols</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Yes</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Starting Types</li> <li>Yes</li> <li>No; however,</li> </ul>	
<ul> <li>integrated switch</li> <li>Protocols</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Yes</li> <li>PG/OP communication</li> <li>Yes</li> <li>Starting of the server</li> <li>No; however,</li> </ul>	
Protocols  PROFINET IO Controller PROFINET IO Device PROFINET CBA Open IE communication Web server Mo Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — S7 communication — Shared device  Yes  Yes  Yes  100 Mbit/s  Yes  Yes  No; however,	
<ul> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 communication</li> <li>— S7 communication</li> <li>— Shared device</li> <li>No</li> <li>No</li> <li>No; however,</li> </ul>	
<ul> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 communication</li> <li>— Shared device</li> <li>No</li> <li>No</li> <li>Yes</li> <li>Yes</li> <li>No; however,</li> </ul>	
<ul> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 communication</li> <li>— S7 communication</li> <li>— Shared device</li> <li>No; however,</li> </ul>	
<ul> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 communication</li> <li>— S7 communication</li> <li>— Shared device</li> <li>Yes</li> <li>No; however,</li> </ul>	
Web server  Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  — PG/OP communication — S7 communication — Shared device  No; however,	
Media redundancy     PROFINET IO Controller     Transmission rate, max.     Services     — PG/OP communication     — S7 communication     — Shared device     Yes     No; however,	
PROFINET IO Controller  ● Transmission rate, max. 100 Mbit/s  Services	
<ul> <li>◆ Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 communication</li> <li>— Shared device</li> <li>100 Mbit/s</li> <li>Yes</li> <li>Yes</li> <li>No; however,</li> </ul>	
Services	
Services  — PG/OP communication Yes — S7 communication Yes — Shared device No; however,	
<ul><li>— S7 communication</li><li>— Shared device</li><li>Yes</li><li>No; however,</li></ul>	
<ul><li>— S7 communication</li><li>— Shared device</li><li>Yes</li><li>No; however,</li></ul>	
— Shared device No; however,	
	sable as part of S7
— Prioritized startup	acure da UGII UL AZ
Niverband frame (111 10 D. )	sadio as part of or
— Number of connectable IO Devices, max. 250	saulo do part or or
<ul><li>— Number of connectable IO Devices for RT, max.</li></ul>	saulo do part or or
— of which in line, max. 250	saulo do part or or
<ul> <li>Activation/deactivation of IO Devices</li> <li>Yes; Approve</li> <li>CiR (Configure</li> </ul>	saulo do part or or
— IO Devices changing during operation (partner ports), supported	for stand-alone operation only, not in conjunction with
	for stand-alone operation only, not in conjunction with
Device replacement without swap medium Yes	for stand-alone operation only, not in conjunction with
	for stand-alone operation only, not in conjunction with ion in Run)
	for stand-alone operation only, not in conjunction with ion in Run)  1 ms, 2 ms, 4 ms
Address area	for stand-alone operation only, not in conjunction with ion in Run)

landa man	O Libration
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
— User data consistency, max.	1 024 byte
Open IE communication	440
Number of connections, max.	118
<ul> <li>Local port numbers used at the system end</li> </ul>	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
PROFISATE PROFISATE	Yes
PROFIBUS PROFIBUS	Yes
AS-Interface	Yes; Via add-on
Redundancy mode	
Media redundancy	
<ul> <li>Switchover time on line break, typ.</li> </ul>	< 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
<ul> <li>Number of connections, max.</li> </ul>	118
— Data length, max.	32 kbyte
<ul> <li>— several passive connections per port, supported</li> </ul>	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
	1 472 byte
Further protocols  • Foundation Fieldbus	Yes; via DP/FF Link
	•
MODBUS  Communication functions	Yes; Via add-on
Communication functions	Vec
PG/OP communication	Yes
<ul> <li>Number of connectable OPs without message processing</li> </ul>	119
Number of connectable OPs with message	119; When using Alarm_S/SQ and Alarm_D/DQ
processing  Data record routing	Yes
Data record routing S7 communication	163
	Von
• supported	Yes
as server	Yes
as client	Yes
<ul> <li>User data per job, max.</li> </ul>	64 kbyte
User data per job (of which consistent), max.	462 byte; 1 variable
S5 compatible communication	
<ul><li>supported</li></ul>	Yes; via CP and FC AG_SEND and FC AG_RECV
<ul> <li>User data per job, max.</li> </ul>	8 kbyte

a Llear data per job (of which consistent), may	240 hyto
User data per job (of which consistent), max.      Number of simultaneous AC SENDAC DECV	240 byte
<ul> <li>Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.</li> </ul>	64/64
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	100, Via di ana loadablo i B
• overall	120
usable for PG communication	,
reserved for PG communication	1
usable for OP communication	'
reserved for OP communication	1
S7 message functions	
	119; max. 119 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with
Number of login stations for message functions, max.	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
<ul> <li>Number of instances for alarm 8 and S7 communication blocks, max.</li> </ul>	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	100
ATEX	ATEX II 3G Ex ec IIC T4 Gc
Ambient conditions	
Ambient temperature during operation	0 °C
• min.	
• max.	70 °C
Configuration	
Programming	
<ul> <li>Command set</li> </ul>	see instruction list
<ul> <li>Nesting levels</li> </ul>	7
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
<ul> <li>System functions (SFC)</li> </ul>	see instruction list

<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
Programming language	
— SCL	Yes
— CFC	Yes
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	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	1.1 kg