## Data sheet

SIMATIC PCS 7, CPU 410E PROCESS AUTOMATION, CENTRAL UNIT FOR S7-400 AND S7-400H/F/FH, 5 INTERFACES: 2X PN, 1X DP, 2X FOR SYNC-MODULE FOR SPARE PART USAGE, WITHOUT SYSTEM EXPANSION CARD



General information	
Product type designation	CPU 410E
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
<ul> <li>Field interface security</li> </ul>	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
nomintenace 3 v DC, max.	30 IIIA, At the Di linteriace
Power loss	
Power loss, typ.	10 W
Processor	
CPU speed	450 MHz; Multi-processor system
Memory	
PCS 7 process objects	200; Max.; with PO200M System Expansion Card
Work memory	
• integrated	4 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	
• present	Yes
<ul><li>with battery</li></ul>	Yes; all data
without battery	Yes; Program and data of the load memory
·	
Battery	
Backup battery	270 uA. Valid up to 40°C
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
<ul> <li>Feeding of external backup voltage to CPU</li> </ul>	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 may	16 000: Number range: 1 to 16 000 (= Instances)
• Number, max.	16 000; Number range: 1 to 16 000 (= Instances)
	Dependent on the System Cynansian Card ward
• Size, max.	Dependent on the System Expansion Card used
FB	
	Dependent on the System Expansion Card used  8 000; Number range: 0 to 7999  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
ounters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
Number	Unlimited (limited only by RAM capacity)

Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— adjustable	Yes
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• Number	Unlimited (limited only by RAM capacity)
S7 times	
<ul><li>Number</li></ul>	2 048
Retentivity	
— adjustable	Yes
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
● Type	SFB
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

16 000; Number range: 1 to 16000
Dependent on the System Expansion Card used
64 kbyte
64 kbyte
2 048 byte; max., dependent on the System Expansion Card use
2 048 byte; max., dependent on the System Expansion Card use
1 536 byte; max., dependent on the System Expansion Card use
1 536 byte; max., dependent on the System Expansion Card use
1 536 byte; max., dependent on the System Expansion Card use
1 536 byte; max., dependent on the System Expansion Card use
16 kbyte
16 kbyte
16 kbyte; Total peripheral address range, cannot be changed
16 kbyte; Total peripheral address range, cannot be changed
244 byte
Yes
15
16 384; max., dependent on the System Expansion Card used
16 384; max., dependent on the System Expansion Card used
16 384; max., dependent on the System Expansion Card used
16 384; max., dependent on the System Expansion Card used
1 024; max., dependent on the System Expansion Card used
1 024; max., dependent on the System Expansion Card used
1 024; max., dependent on the System Expansion Card used
1 024; max., dependent on the System Expansion Card used
119
No
No
No 1

<ul> <li>integrated</li> <li>via CP</li> <li>Number of operable FMs and CPs (recommended)</li> </ul>	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
Granularity	1 hour
• 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	Integrated
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA
Number of connection resources	16
Functionality	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
DP master	
<ul><li>Number of connections, max.</li></ul>	16

<ul><li>Transmission rate, max.</li></ul>	12 Mbit/s
<ul><li>Number of DP slaves, max.</li></ul>	96
<ul> <li>Number of slots per interface, max.</li> </ul>	1 632
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	No
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>S7 communication, as server</li> </ul>	Yes
— Equidistance	No
— Isochronous mode	No
— SYNC/FREEZE	No
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes; Single mode only
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	No
— DPV1	Yes
Address area	
— Inputs, max.	1 536 byte; Up to 1 500 IOs (channels)
— Outputs, max.	1 536 byte; Up to 1 500 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	

2. 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
Change of IP address at runtime, supported	No
Number of connection resources	120
Interface types	
Number of ports	2
• integrated switch	Yes
Media redundancy	

• ourseasted	Yes
• supported	
Switchover time on line break, typ.	< 200 ms
Number of stations in the ring, max.	50
Functionality	
PROFINET IO Controller	Yes
PROFINET IO Device	No
PROFINET CBA	No
Open IE communication	Yes
Web server	No
PROFINET IO Controller	
<ul><li>Transmission rate, max.</li></ul>	100 Mbit/s
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— S7 routing	Yes
— S7 communication	Yes
<ul> <li>Open IE communication</li> </ul>	Yes
— Shared device	No; however, usable as part of S7
<ul> <li>Prioritized startup</li> </ul>	No
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	250
<ul> <li>Number of connectable IO Devices for RT,</li> </ul>	250
max.	
— of which in line, max.	250
<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes; Single mode only
<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	No
<ul> <li>Device replacement without swap medium</li> </ul>	Yes
— Send cycles	250 μs, 500 μs, 1 ms, 2 ms, 4 ms
<ul><li>Updating time</li></ul>	$250~\mu s$ to $512~ms,$ minimum value depends on the number of
	configured user data and the configured single or redundant mode
Address area	
— Inputs, max.	1 536 kbyte; Up to 1 500 IOs (channels)
— Outputs, max.	1 536 kbyte; Up to 1 500 IOs (channels)
— User data consistency, max.	1 024 byte
Open IE communication	
<ul><li>Number of connections, max.</li></ul>	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
<ul> <li>Keep-alive function, supported</li> </ul>	Yes
3. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes

Address area  — Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)	automatic detection of transmission rate	Yes; Autosensing
System redundancy Yes Redundant subnetworks Number of connection resources Interface types  • Number of ports • integrated switch Media redundancy  • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  • Number of stations in the ring, max.  • PROFINET IO Controller • PROFINET GBA • Open IE communication • Ves  • Transmission rate, max.  • PROPO communication • Sr routing • Sr communication • Shared device • No; however, usable as part of S7 • Number of connectable IO Devices for RT, max.  — of which in line, max. — of which in line, max. — Activation/deactivation of IO Devices • Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  1536 byte; Up to 1 500 IOS (channels)	Autonegotiation	Yes
Redundant subnetworks Number of connection resources Interface types  Number of ports Interface types  Number of ports Interface types  Number of ports Interface types  Sevictover time on line break, typ. Number of stations in the ring, max.  PROFINET IO Controller Proritized startup Proritized startup Proritized startup Number of connectable IO Devices, max. Prioritized startup Number of connectable IO Devices for RT, max. Activation/deactivation of IO Devices Prositized startup Propriority Supported Device replacement without swap medium Pes Send cycles Updating time  Address area Inputs, max.  1536 byte: Up to 1 500 IOs (channels)	Autocrossing	Yes
Interface types  • Number of ports • integrated switch  Media redundancy  • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  • PROFINET IO Controller • PROFINET ODevice • PROFINET ODevice • No • Yes • Transmission rate, max.  PROFINET IO Controller • Transmission rate, max.  PROFINET IO Communication • Web server  • Transmission rate, max.  POGIOP communication • Yes • PGOP communication • Yes • PS 7 communication • Yes • PS 7 communication • Yes • Shared device • Prioritized startup • Number of connectable IO Devices, max. • Of which in line, max. • Send cycles • Device replacement without swap medium • Send cycles • Updating time  Address area • Inputs, max.  Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)	System redundancy	Yes
Interface types  • Number of ports • Integrated switch  * supported • Switchover time on line break, typ. • Number of stations in the ring, max.  • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • No • PROFINET IO Controller • PROFINET IO Controller • PROFINET IO Device • No • PROFINET IO Controller • Transmission rate, max.  PROFINET IO Controller • Transmission rate, max.  100 Mbit/s  Services  - PG/OP communication - S7 routing - S7 communication - S7 routing - S7 communication - Shared device - Prioritized startup - Number of connectable IO Devices, max Of which in line, max of which in line, max Activation/deactivation of IO Devices - Device replacement without swap medium - Send cycles - Updating time  Address area - Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)	Redundant subnetworks	Yes
<ul> <li>Number of ports</li> <li>integrated switch</li> <li>Yes</li> <li>Media redundancy</li> <li>supported</li> <li>Switchover time on line break, typ.</li> <li>Number of stations in the ring, max.</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>No</li> <li>PROFINET IO Device</li> <li>No</li> <li>PROFINET IO Device</li> <li>No</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>100 Mbit/s</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>So you is a part of S7</li> <li>Porting</li> <li>So yes</li> <li>PG/OP communication</li> <li>Yes</li> <li>So you is a part of S7</li> <li>Porting</li> <li>PS routing</li> <li>Yes</li> <li>Shared device</li> <li>No; however, usable as part of S7</li> <li>Number of connectable IO Devices, max.</li> <li>No humber of connectable IO Devices for RT, max.</li> <li>Of which in line, max.</li> <li>Activation/deactivation of IO Devices</li> <li>IO Devices changing during operation (partner ports), supported</li> <li>Device replacement without swap medium</li> <li>Send cycles</li> <li>Updating time</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	Number of connection resources	120
integrated switch  Media redundancy  supported Switchover time on line break, typ. Number of stations in the ring, max.  PROFINET IO Controller PROFINET IO Device PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller PROFINET CBA Open IE communication Web server No  PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Controller  Transmission rate, max.  Services  Profices  Profices  Profices  Profices  Profices  Profices  Profices  Profices  Stared device Prioritized startup No No; however, usable as part of S7 No No; however, usable as part of S7 No No; however, usable as part of S7  Profices Prioritized startup No No; however, usable as part of S7 No No; however, usable as part of S7 No No; however, usable as part of S7 No Prioritized startup No No; however, usable as part of S7 No No No; however, usable as part of S7 No	Interface types	
Media redundancy  • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • No • PROFINET IO Controller • PROFINET IO Controller • PROFINET IO Controller • PROFINET IO Controller • Ves • PROFINET IO Controller • Transmission rate, max.  Services  - PG/OP communication - S7 routing - S7 routing - S7 communication - S7 routing - S7 communication - S7 routing - S7 communication - Shared device - Prioritized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max Activation/deactivation of IO Devices - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium - Send cycles - Updating time  Address area - Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)	Number of ports	2
supported     Switchover time on line break, typ.     Number of stations in the ring, max.  Functionality  PROFINET IO Controller PROFINET IO Device PROFINET GBA Open IE communication Web server No  PROFINET IO Controller Transmission rate, max.  Services  PG/OP communication Yes S7 routing S7 routing S7 communication Yes Prioritized startup No No; however, usable as part of S7 No No however, usable as part of S7 No No however, usable as part of S7 No No homever of connectable IO Devices, max. No Number of connectable IO Devices for RT, max. Of which in line, max. Activation/deactivation of IO Devices Pole of Which in line, max. Activation/deactivation of IO Devices Pole of Which in line, max. Activation/deactivation of IO Devices Pole of S7 No Services  S8 Services  S9	• integrated switch	Yes
Switchover time on line break, typ. Number of stations in the ring, max.  FUNCTIONALITY  PROFINET IO Controller PROFINET CBA No Open IE communication Web server No  PROFINET IO Controller  Transmission rate, max.  Services  PG/OP communication Yes S7 routing S7 routing S7 routing S7 routing S7 routing S8 round S9 ro	Media redundancy	
Number of stations in the ring, max.  PROFINET IO Controller PROFINET IO Device PROFINET CBA Open IE communication Web server No  PROFINET IO Controller Transmission rate, max.  Services  PRO/P communication Yes Pro/Proritized startup No No, however, usable as part of S7 No Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. Of which in line, max. Service Provitized startup No No Number of connectable IO Devices for RT, max. Service Provitized startup No Number of connectable IO Devices for RT, max. Service Provitized startup No Number of connectable IO Devices for RT, max. Service Provitized startup No	• supported	Yes
Functionality  PROFINET IO Controller PROFINET IO Device PROFINET CBA PROFINET CBA Proper IE communication PROFINET IO Controller  Transmission rate, max.  Services  PG/OP communication Pes Ser routing Ser routing Ser routing Services  PG/OP communication Pes Services  PS (No, however, usable as part of S7 No No Number of connectable IO Devices, max. Poly the device Prioritized startup No Number of connectable IO Devices for RT, max. Pof which in line, max. Services  PS (So) Services  PS (So) Services Services  PS (So) Services	<ul> <li>Switchover time on line break, typ.</li> </ul>	< 200 ms
<ul> <li>PROFINET IO Controller</li> <li>PROFINET CBA</li> <li>No</li> <li>Open IE communication</li> <li>Web server</li> <li>No</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— S7 routing</li> <li>— S7 roumunication</li> <li>— S9 routing</li> <li>— S7 communication</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Activation/deactivation of IO Devices</li> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	<ul> <li>Number of stations in the ring, max.</li> </ul>	50
<ul> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Yes</li> <li>Open IE communication</li> <li>Web server</li> <li>No</li> </ul> PROFINET IO Controller <ul> <li>Transmission rate, max.</li> <li>Touting</li> <li>Yes</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>S7 routing</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>Prioritized startup</li> <li>No</li> <li>No however, usable as part of S7</li> <li>Prioritized startup</li> <li>No</li> <li>Number of connectable IO Devices, max.</li> <li>250</li> <li>Number of connectable IO Devices for RT, max.</li> <li>of which in line, max.</li> <li>Activation/deactivation of IO Devices</li> <li>Yes; Single mode only</li> <li>No</li> <li>Poevice replacement without swap medium</li> <li>Yes</li> <li>Send cycles</li> <li>Updating time</li> <li>So μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> </ul> Address area <ul> <li>Inputs, max.</li> <li>1536 byte; Up to 1500 IOs (channels)</li> </ul>	Functionality	
PROFINET CBA Open IE communication Web server No  PROFINET IO Controller  Transmission rate, max. 100 Mbit/s  Services  PG/OP communication Yes Services Services  PG/OP communication Yes Services Services  PG/OP communication Yes Services Services Services  PG/OP communication Yes Services	PROFINET IO Controller	Yes
<ul> <li>Open IE communication</li> <li>Web server</li> <li>No</li> </ul> PROFINET IO Controller <ul> <li>Transmission rate, max.</li> <li>PG/OP communication</li> <li>Yes</li> <li>S7 routing</li> <li>Yes</li> <li>S7 communication</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>No; however, usable as part of S7</li> <li>Prioritized startup</li> <li>No</li> <li>Number of connectable IO Devices, max.</li> <li>Activation of connectable IO Devices for RT, max.</li> <li>of which in line, max.</li> <li>Activation/deactivation of IO Devices</li> <li>Yes; Single mode only</li> <li>No</li> <li>(partner ports), supported</li> <li>Device replacement without swap medium</li> <li>Send cycles</li> <li>Updating time</li> <li>250 µs, 500 µs, 1 ms, 2 ms, 4 ms</li> <li>Updating time</li> <li>250 µs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> </ul> Address area <ul> <li>Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	PROFINET IO Device	No
No  PROFINET IO Controller      Transmission rate, max.  Services      — PG/OP communication     — S7 routing     — S7 communication     — Open IE communication     — Shared device     — Prioritized startup     — Number of connectable IO Devices for RT, max.      — of which in line, max.     — Activation/deactivation of IO Devices     — IO Devices changing during operation (partner ports), supported     — Device replacement without swap medium     — Send cycles     — Updating time  Address area     — Inputs, max.  100 Mbit/s  100 Mbit	PROFINET CBA	No
No  PROFINET IO Controller      Transmission rate, max.  Services      — PG/OP communication     — S7 routing     — S7 communication     — S9 routing     — No, however, usable as part of S7     — Prioritized startup     — No     — Number of connectable IO Devices, max.     — S90     — Number of connectable IO Devices for R7, max.     — of which in line, max.     — of which in line, max.     — Activation/deactivation of IO Devices     — IO Devices changing during operation (partner ports), supported     — Device replacement without swap medium     — Send cycles     — Updating time     — S90 μs, 500 μs, 1 ms, 2 ms, 4 ms     — Updating time     — Updating time     — S90 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; Up to 1 500 IOs (channels)	Open IE communication	Yes
• Transmission rate, max.  Services  — PG/OP communication — S7 routing — S7 communication — Yes — Open IE communication — Shared device — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)	Web server	No
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 Number of connectable IO Devices for RT, max of which in line, max. 250 - Activation/deactivation of IO Devices Yes; Single mode only - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium Yes - Updating time 250 µs, 500 µs, 1 ms, 2 ms, 4 ms - 250 µs, 500 µs, 1 ms, 2 ms, 4 ms - 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. 1536 byte; Up to 1 500 IOs (channels)	PROFINET IO Controller	
— PG/OP communication — S7 routing — S7 communication — Open IE communication — Shared device — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  Yes  Yes  Yes  Yes  Yes  Single mode only  No  Yes  250  yes, 500 μs, 1 ms, 2 ms, 4 ms  250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode	Transmission rate, max.	100 Mbit/s
— S7 routing — S7 communication — S7 communication — Spared device — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  Yes  No; however, usable as part of S7  No  250  250  250  250  Yes; Single mode only  No  Yes  250  Yes; Single mode only  Yes  250 μs, 500 μs, 1 ms, 2 ms, 4 ms  250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode	Services	
— S7 communication — Open IE communication — Shared device — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  Yes  No No No No Yes Single mode only No Yes  250 μs, 500 μs, 1 ms, 2 ms, 4 ms  250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode	— PG/OP communication	Yes
<ul> <li>— Open IE communication</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Activation/deactivation of IO Devices</li> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>250</li> <li>Yes; Single mode only</li> <li>No</li> <li>Yes</li> <li>— Send cycles</li> <li>— Updating time</li> <li>Yes</li> <li>— Updating time</li> <li>250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>— 150 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	— S7 routing	Yes
— Shared device — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time  Address area — Inputs, max.  No No, however, usable as part of S7  No No 250  Ves, Single mode only No	— S7 communication	Yes
<ul> <li>— Shared device</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Activation/deactivation of IO Devices</li> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>Z50 ys to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>I 536 byte; Up to 1 500 IOs (channels)</li> </ul>	— Open IE communication	Yes
<ul> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Activation/deactivation of IO Devices</li> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>Z50 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>— Updating time</li> <li>Z50 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	•	No; however, usable as part of S7
<ul> <li>Number of connectable IO Devices, max.</li> <li>Number of connectable IO Devices for RT, max.</li> <li>of which in line, max.</li> <li>Activation/deactivation of IO Devices</li> <li>IO Devices changing during operation (partner ports), supported</li> <li>Device replacement without swap medium</li> <li>Send cycles</li> <li>Updating time</li> <li>Address area</li> <li>Inputs, max.</li> <li>250</li> <li>Yes; Single mode only</li> <li>No</li> <li>Yes</li> <li>250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	— Prioritized startup	
<ul> <li>Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Activation/deactivation of IO Devices</li> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>Address area</li> <li>— Inputs, max.</li> <li>250</li> <li>Yes; Single mode only</li> <li>No</li> <li>Yes</li> <li>250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> </ul>	•	250
max.  — of which in line, max.  — Activation/deactivation of IO Devices  — IO Devices changing during operation (partner ports), supported  — Device replacement without swap medium  — Send cycles  — Updating time  250 μs, 500 μs, 1 ms, 2 ms, 4 ms  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; Up to 1 500 IOs (channels)		
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<ul> <li>— IO Devices changing during operation (partner ports), supported</li> <li>— Device replacement without swap medium</li> <li>— Send cycles</li> <li>— Updating time</li> <li>— 250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>— 250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>		Yes; Single mode only
<ul> <li>Device replacement without swap medium</li> <li>Send cycles</li> <li>Updating time</li> <li>250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>	— IO Devices changing during operation	No
<ul> <li>— Send cycles</li> <li>— Updating time</li> <li>— 250 μs, 500 μs, 1 ms, 2 ms, 4 ms</li> <li>— 250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>— Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>		Yes
<ul> <li>Updating time</li> <li>250 μs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode</li> <li>Address area</li> <li>Inputs, max.</li> <li>1 536 byte; Up to 1 500 IOs (channels)</li> </ul>		250 μs, 500 μs, 1 ms, 2 ms, 4 ms
Address area  — Inputs, max.  1 536 byte; Up to 1 500 IOs (channels)		
	Address area	
	— Inputs, max.	1 536 byte; Up to 1 500 IOs (channels)
	— Outputs, max.	1 536 byte; Up to 1 500 IOs (channels)

<ul><li>User data consistency, max.</li></ul>	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
Protocols (Ethernet)	
• TCP/IP	Yes
Open IE communication	
● TCP/IP	
— Data length, max.	32 kbyte
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
— Data length, max.	32 kbyte; 1452 bytes via CP 443-1 Adv.
• UDP	
— 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	119
processing	
<ul> <li>Number of connectable OPs with message</li> </ul>	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	Tor byte, I validate
• supported	Yes; via CP and FC AG_SEND and FC AG_RECV
	8 kbyte
User data per job, max.      User data per job (of which consistent) may	
User data per job (of which consistent), max.      OF NEW ACCENTAGE RESOLUTION	240 byte 64/64
<ul> <li>Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.</li> </ul>	04/04
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	
• overall	120
<ul> <li>usable for PG communication</li> </ul>	
<ul> <li>reserved for PG communication</li> </ul>	1
<ul> <li>usable for OP communication</li> </ul>	
— reserved for OP communication	1
S7 message functions	
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
• 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
<ul><li>Number of variables, max.</li></ul>	70
Diagnostic buffer	
• present	Yes
<ul> <li>Number of entries, max.</li> </ul>	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	
• min.	0 °C
• max.	70 °C
Configuration	
Configuration software	
• STEP 7	Yes; Dependent on the System Expansion Card used
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	
— LAD	Dependent on the System Expansion Card used
— FBD	Dependent on the System Expansion Card used
— STL	Dependent on the System Expansion Card used
— SCL	Yes
— CFC	Yes
— GRAPH	Dependent on the System Expansion Card used
— HiGraph®	Dependent on the System Expansion Card used
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
— MY_DI AKWI — DPNRM_DG	8; SFC 13; per interface
— RDSYSST	8; SFC 51
— DP_TOPOL	1; SFC 103; per interface
— DI _101'0L	1, 51 5 100, por interiace

Number of circultons and a confine CEDs	
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

10/13/2017

last modified: