## **Data sheet**

## 6ES7412-2EK06-0AB0



\*\*\*\*\*\*\*\*\*\*\*\* Replacement part \*\*\*\*\*\*\*\*\* SIMATIC S7-400, CPU 412-2 PN Central processing unit with: work memory 1 MB, (0.5 MB code, 0.5 MB data), interfaces 1st interface MPI/DP 12 Mbit/s, (X1), 2nd interface Ethernet/PROFINET (X5)

General information	
Product type designation	CPU 412-2 PN
HW functional status	01
Firmware version	V6.0
Product function	
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
Programming package	STEP 7 V5.5 or higher/iMap V3.0 + iMap STEP 7 Add-on V3.0 SP5 or higher
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	30 μs; Time per I/O byte
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.1 A
from backplane bus 5 V DC, max.	1.3 A
from backplane bus 24 V DC, max.	150 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At the DP interface
Power loss	
Power loss, typ.	5.5 W
Memory	
Type of memory	RAM
Work memory	
• integrated	1 Mbyte
• integrated (for program)	0.5 Mbyte
• integrated (for data)	0.5 Mbyte
• expandable	No
Load memory	
expandable FEPROM	Yes; with Memory Card (FLASH)
<ul><li>expandable FEPROM, max.</li></ul>	64 Mbyte
• integrated RAM, max.	512 kbyte
expandable RAM	Yes; with Memory Card (RAM)
• expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
<ul><li>with battery</li></ul>	Yes; all data
<ul><li>without battery</li></ul>	No
Battery	
Backup battery	
<ul> <li>Backup current, typ.</li> </ul>	125 μA; up to 40 °C

<ul> <li>Backup current, max.</li> </ul>	450 μA
<ul> <li>Backup time, max.</li> </ul>	Dealt with in the module data manual with the secondary conditions and the
F	factors of influence
Feeding of external backup voltage to CPU  CPU	5 V DC to 15 V DC
CPU processing times	75
for bit operations, typ.	75 ns
for word operations, typ.	75 ns
for fixed point arithmetic, typ.	75 ns
for floating point arithmetic, typ. CPU-blocks	225 ns
DB	
Number, max.	3 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	o- ruye
Number, max.	1 500; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
Number, max.	1 500; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
Number, max.	see instruction list
• Size, max.	64 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul> <li>Number of time alarm OBs</li> </ul>	2; OB 10, 11
<ul> <li>Number of delay alarm OBs</li> </ul>	2; OB 20, 21
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	2; OB 32, 35 (shortest cycle that can be set = 500 μs)
<ul> <li>Number of process alarm OBs</li> </ul>	2; OB 40, 41
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55-57
<ul> <li>Number of isochronous mode OBs</li> </ul>	2; OB 61-62
<ul> <li>Number of multicomputing OBs</li> </ul>	1; OB 60
<ul> <li>Number of background OBs</li> </ul>	1; OB 90
<ul> <li>Number of startup OBs</li> </ul>	3; OB 100-102
<ul> <li>Number of asynchronous error OBs</li> </ul>	9; OB 80-88
<ul> <li>Number of synchronous error OBs</li> </ul>	2; OB 121, 122
Nesting depth	
<ul> <li>per priority class</li> </ul>	24
additional within an error OB	1
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	Voc
• present	Yes
• Type	SFB Linlimited (limited only by PAM capacity)
Number  S7 times	Unlimited (limited only by RAM capacity)
S7 times  • Number	2 048
Retentivity	∠ V40
— adjustable	Yes
•	No times retentive
— preset  Time range	140 times retentive
— lower limit	10 ms
— upper limit — upper limit	9 990 s
— upper limit	0.000 0
• 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.	4 kbyte; Size of bit memory address area
Retentivity available	Yes
<ul> <li>Retentivity preset</li> </ul>	MB 0 to MB 15
Number of clock memories	8; in 1 memory byte
Local data	
adjustable, max.	8 kbyte
• preset	4 kbyte
Address area	
I/O address area	
<ul><li>Inputs</li></ul>	4 kbyte
Outputs	4 kbyte
Process image	
<ul> <li>Inputs, adjustable</li> </ul>	4 kbyte
Outputs, adjustable	4 kbyte
<ul> <li>Inputs, default</li> </ul>	128 kbyte
<ul> <li>Outputs, default</li> </ul>	128 kbyte
<ul> <li>consistent data, max.</li> </ul>	244 byte
Access to consistent data in process image	Yes
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	15
Digital channels	
<ul><li>Inputs</li></ul>	32 768
— of which central	32 768
<ul> <li>Outputs</li> </ul>	32 768
— of which central	32 768
Analog channels	
<ul><li>Inputs</li></ul>	2 048
— of which central	2 048
<ul><li>Outputs</li></ul>	2 048
— of which central	2 048
Hardware configuration	
Integrated power supply	No
Number of expansion units, max.	21
connectable OPs	47
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
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; IM 463-2
Number of DP masters	
• integrated	1
• via CP	10; CP 443-5 Extended
● via IM 467	4
Mixed mode IM + CP permitted	No; IM 467 not suitable for use with CP 443-5 Ext. and CP 443-1 EX4x, EX20, GX20 (in PROFINET IO mode)
via interface module	0
Number of pluggable S5 modules (via adapter capsule in	6
central device), max.	
Number of IO Controllers	
• integrated	1
• via CP	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20,
Number of operable FMs and CPs (recommended)	max. 4 in central controller
FM  • FM	Limited by number of slots and number of connections
• CP, PtP	CP 440: Limited by number of slots; CP 441: Limited by number of slots and
PROFIBUS and Ethernet CPs	number of connections  14; In total max. 10 CPs as DP master and PROFINET controller, of which up
	to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller

Slots	
• required slots	1
Time of day	
Clock	
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Resolution	1 ms
<ul> <li>Deviation per day (buffered), max.</li> </ul>	1.7 s; Power off
Deviation per day (unbuffered), max.	8.6 s; For power On
Operating hours counter	
• Number	16
<ul> <li>Number/Number range</li> </ul>	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 MPI, master	Yes
• on MPI, device	Yes
• to DP, master	Yes
• on DP, device	Yes
• in AS, master	Yes
• in AS, device	Yes
on Ethernet via NTP  The additional and the state of	Yes; As client
Time difference in system when synchronizing via	10 ms
<ul><li>Ethernet, max.</li><li>MPI, max.</li></ul>	200 ms
Interfaces	200 IIIS
	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports)
Interfaces/bus type  Number of RS 485 interfaces	1
Number of other interfaces	0
Optical interface	No
1. Interface	
Interface type	MPI/PROFIBUS DP
Isolated	Yes
Interface types	
• RS 485	Yes
Output current of the interface, max.	150 mA
Protocols	
• MPI	Yes
<ul> <li>PROFIBUS DP master</li> </ul>	Yes
PROFIBUS DP device	Yes
MPI	
<ul> <li>Number of connections</li> </ul>	32; If a diagnostics repeater is used on the line, the number of connection
Tenenciales with the second	resources on the line is reduced by 1
Transmission rate, max.  Son lices	12 Mbit/s
Services	Von
— PG/OP communication	Yes Yes
Routing     Global data communication	Yes
Global data communication      S7 basic communication	Yes
— S7 basic communication  — S7 communication	Yes
S7 communication  S7 communication, as client	Yes
— S7 communication, as server	Yes
PROFIBUS DP master	
Number of connections, max.	16; If a diagnostics repeater is used on the line, the number of connection
- Hamber of confidencing max.	resources on the line is reduced by 1
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
• max. number of DP devices	32
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
	Yes

— Routing	Yes
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	Yes
— S7 communication	Yes
<ul> <li>— S7 communication, as client</li> </ul>	Yes
<ul> <li>— S7 communication, as server</li> </ul>	Yes
— Equidistance	Yes
<ul> <li>Isochronous mode</li> </ul>	Yes
— SYNC/FREEZE	Yes
<ul> <li>activation/deactivation of DP devices</li> </ul>	Yes
<ul> <li>Direct data exchange (slave-to-slave</li> </ul>	Yes
communication)	
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
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
1st interface / PROFIBUS DP device / header	
Number of connections	16
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
Transmission rate, max.	12 Mbit/s
automatic baud rate search	No
<ul> <li>Address area, max.</li> </ul>	32; Virtual slots
User data per address area, max.	32 byte
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes; with interface active
— Routing	Yes; with interface active
Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	No
— DPV1	No
Transfer memory	INO
·	244 byta
— Inputs — Outputs	244 byte 244 byte
<u> </u>	277 Dylic
2. Interface	DDOCINET
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonogotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF"
Interface types	
<ul><li>RJ 45 (Ethernet)</li></ul>	Yes
<ul> <li>Number of ports</li> </ul>	2
integrated switch	Yes
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
PROFINET CBA	Yes
<ul> <li>PROFIBUS DP master</li> </ul>	N
T I I I I I I I I I I I I I I I I I I I	No

Web server     Penin-to-point connection     No     Media redundancy     Penin-to-point connection     No     Media redundancy     Penin-to-point connection     Transmission rate, max.     PROPINET IO Controller     Transmission rate, max.     Penint of the penin		
Pont-to-point connection   No   Mobile	Open IE communication	Yes
Marcial redundancy	Web server	Yes
PROFINE   Controller	<ul> <li>Point-to-point connection</li> </ul>	No
Framewission rate, max.   100 Mbt/s	Media redundancy	Yes
PGIOP communication	PROFINET IO Controller	
- PG/OP communication - S7 communication - Isochronous mode - Shared device - Provinced startup - Number of IO devices with prioritized startup, max Of which in line, max Of which in line, max Of which in line, max Whither of Connectable IO Devices, max Of which in line, max Whither of IO devices with IRT and the option "high featibility" - Of which in line, max Whither of IO devices with IRT and the option "high featibility" - Of which in line, max Whither of Connectable IO Devices for RT, max Of which in line, max Or which in line, m	Transmission rate, max.	100 Mbit/s
- S7 communication	Services	
- Isochronous mode	<ul> <li>PG/OP communication</li> </ul>	Yes
- Shared device - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Of which IO devices with IRT, max of which In idea, max Number of Devices with IRT and the option "high esballity" - of which in line, max Number of Connectable IO Devices for RT, max Of which in line, max Activation/deactivation of IO Devices - Number of 10 Devices that can be simultaneously activated/deactivation of IO Devices - Number of IO Devices be simultaneously activated/deactivation, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Overlose replacement without swap medium - Send cycles - Updating time	— S7 communication	Yes
- Prioritized startup - Number of IO Devices with prioritized startup, max Number of connectable IO Devices, max Of which I nile., max Of which in line., max Number of IO Devices with IRT and the option "high flexibility" - of which in line., max Number of IO Devices with IRT and the option "high flexibility" - of which in line., max Number of Connectable IO Devices for RT, max Of which in line., max Overees changing during operation (partier ports), supported - Number of IO Devices per tool., max Overees phacement without swap medium - Send cycles - Outputs, max Updating time - Outputs, max Updating time - Outputs, max Updating time - Inputs, max Updating time - Inputs, max Updating time - PROFINET IO Devices and on the amount of configured user data, see PROFINET system description - Inputs, max Updating time - Profice of startup - Inputs, max Updating time - Profice of startup - Inputs, max Updating time - Profice of startup - Inputs, max Outputs, max Output	<ul> <li>Isochronous mode</li> </ul>	Yes; Only with IRT and the High Performance option
- Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Of which Io devices with IRT, max Of which Io fine, max Number of IO Devices with IRT and the option "high flexibility" - of which In line, max Number of Connectable IO Devices for RT, max Of which In line, max In Devices that can be simultaneously advantage of the Connectable IO Devices and the Simultaneously advantage of the Connectable IO Devices and the Simultaneously advantage of the Connectable IO Devices and the Simultaneously advantage of the Connectable IO Devices of the Simultaneously advantage of the Simultaneously and the Simultaneously advantage of the Simultaneously and the Simultaneously an	— Shared device	Yes
- Number of connectable IO Devices, max Of which in line, max Number of IO Devices with IRT, max Standard of the Connectable IO Devices of RT, max Number of IO Devices with IRT and the option "high fierbility" of which in line, max Number of Connectable IO Devices for RT, max Standard of Connectable IO Devices for RT, max Activation deactivation of IO Devices - Number of IO Devices that can be simultaneously activated deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Device per placement without swap medium - Send cycles - Updating time - Device replacement without swap medium - Send cycles - Updating time - Device replacement without swap medium - Send cycles - Updating time - Profiler IO, on the number of IO Devices and number of IO Dev	<ul> <li>Prioritized startup</li> </ul>	Yes
- Of which IO devices with IRT, max of which in line, max Number of IO Devices with IRT and the option "high floxibility" - of which in line, max Number of Connectable IO Devices for RT, max Of which in line, max Of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Send cycles - Updating time - Send cycles - Updating time - Send cycles - Updating time - Z50 us to 12 ms, riminium value depends on preset communication share for PRCFINET IO, on the number of IO Devices and on the amount of configured user data, see PROFINET Bystem description  Address area - Inputs, max Updating time - Ves - Services - PG/OP communication - S7 communication -	<ul> <li>Number of IO devices with prioritized startup, max.</li> </ul>	32
- of which in line, max.	<ul> <li>Number of connectable IO Devices, max.</li> </ul>	256
- Number of IO Devices with IRT and the option "high flexibility" - of which in line, max.	<ul> <li>Of which IO devices with IRT, max.</li> </ul>	64
flexibility*  - of which in line, max.  - Number of connectable IO Devices for RT, max.  - of which in line, max.  - Activation/deactivation of IO Devices  - Number of IO Devices that can be simultaneously activated/deactivated, max.  - IO Devices changing during operation (partner ports), supported  - Number of IO Devices that can be simultaneously activated/deactivated, max.  - IO Devices changing during operation (partner ports), supported  - Number of IO Devices per tool, max.  - Device replacement without swap medium  - Send cycles  - Device replacement without swap medium  - Send cycles  - Updating time  - Updating time  - Updating time  - Updating time  - 250 us to 512 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 us to 512 ms, in minimum value depends on preset communication share for user data, see PROFINET system description  - Address area  - Inputs, max.  - User data consistency, max.  - PGIOP communication  - S7 communication  - S7 communication  - S8 Services  - PGIOP communication  - S8 Services  - PGIOP communication  - S8 Services  - PGIOP communication  - Yes  - Shared device  - Number of IO Controllers with shared device, max.  - User data per submodule, max.  - Use	— of which in line, max.	64
- Number of connectable IO Devices for RT, max of which in line, max Achivation/deactivation of IO Devices - Number of IO Devices that can be simultaneously achivated/deactivated/ max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Device replacement without swap medium - Send cycles - Device replacement without swap medium - Send cycles - Updating time - Send cycles - Send cycl	1 0	256
- of which in line, max.	— of which in line, max.	61
- Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated/max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Device replacement without swap medium - Send cycles - Device replacement without swap medium - Send cycles - Updating time - U	<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	256
- Number of IO Devices that can be simultaneously activated disactivated, max.  - IO Devices changing during operation (partner ports), supported  - Number of IO Devices per tool, max.  - Device replacement without swap medium - Send cycles - Send cycles - Send cycles - Updating time - Updating time - Updating time - Updating time - Inputs, max Updating time - Inputs, max Updating time - Services - PG/OP communication - Sorvices - PG/OP communication - Sorvices - PG/OP communication - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  - Updating time - Sorvices - PG/OP communication - Number of IO Controllers with shared device, max 2  Transfer memory - Inputs, max 1 440 byte; Per IO Controller with shared device - South of the SFC 12 "D, ACT_DP" possible per line. Max. 29  Total sorvices changing during operation (parties of the SFC 12 "D, ACT_DP" possible per line. Max. 32 IO - Sorvices changing during operation (parties of the SFC 12 "D, ACT_DP" possible per line. Max. 32 IO - Sopries of the SFC 12 "D, ACT_DP" possible per line. Max. 32 IO - Sopries of the SFC 12 "D, ACT_DP" possible per line. Max. 32 IO - Sopries of the SFC 12 "D, ACT_DP" poss	— of which in line, max.	256
activated/deactivated, max.  — Io Devices changing during operation (partner ports), supported  — Number of Io Devices per tool, max.  — Device replacement without swap medium — Send cycles — Updating time — Send cycles — Updating time — Updating updat	<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes
ports), supported		8
Devices changing during operation (partner ports) are supported Yes Send cycles - Send cycles - Updating time - Send cycles - Send cycles - Send cycles - Updating time - Send cycles - Inputs, max Updating time - Send cycles - Send cycles - Send cycles - PROFINET IO, on the number of IO Devices and on the amount of configured user data, see PROFINET system description - Send data consistency, max User data consistency, max User data consistency, max User data consistency, max Senvices - PG/OP communication - Senvices - PG/OP communication - Senvices - PG/OP communication - Yes - Isochronous mode - No - IRT - Prioritized startup - Yes - Shared device - Number of IO Controllers with shared device, max Send device - Number of IO Controllers with shared device, max User data per submodule, max 1440 byte; Per IO Controller with shared device - Number, max User data per submodule, max User data per submodule, max User data per submodule, max Send cyclic transmission - Yes - acyclic transmission - Yes - cyclic transmission - Number of connections, max User data per submodule, max Send cyclic transmission - Number of connections, max User data per submodule, max Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers used at the system end - Send port numbers		Yes
Send cycles Send cycles Updating time Updating time Updating time Updating time Send cycles Inputs, max Updating time Inputs, max Updating time Inputs, max Updating time Inputs, max Updating time Send cycles area Inputs, max Updating time Send cycles PG/OP communication Send cycles PG/OP communication Send cycles Send device Send device Number of IO Controllers with shared device, max Updating time Inputs, max Updating time Send cycles Number, max Updating time Send cycles Submodules Number, max Updating time Send cycles Submodule, max Updating time Send cycles Se	<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO Devices changing during operation (partner ports) are supported
250 µs to 4 ms in 125 µs frame 250 µs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO Devices and on the amount of configured user data, see PROFINET system description  Address area  - Inputs, max.	<ul> <li>Device replacement without swap medium</li> </ul>	Yes
PROFINET IO, on the number of IO Devices and on the amount of configured user data, see PROFINET system description  Address area	— Send cycles	
- Inputs, max Outputs, max User data consistency, max.  PROFINET IO Device  Services  - PG/OP communication - S7 communication - Isochronous mode - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Outputs, max Outputs, max User data per submodule, max User data per submodule, max Quick transmission - cyclic transmission - cyclic transmission - Number of connections, max Local port numbers used at the system end - Keep-alive function, supported  Protocols	— Updating time	PROFINET IO, on the number of IO Devices and on the amount of configured
- Outputs, max User data consistency, max.  - User data consistency, max.  PROFINET IO Device  Services  - PG/OP communication - S7 communication - S7 communication - IRT - Prioritized startup - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Outputs, max Outputs, max User data per submodule, max.  PROFINET CBA - a cyclic transmission - Cyclic transmission - Number of connections, max Ves - Open IE communication - Number of connections, max Local port numbers used at the system end - Keep-alive function, supported - Ves - Protocols	Address area	
- User data consistency, max. 1 024 byte  PROFINET IO Device  Services  - PG/OP communication Yes - S7 communication Yes - Isochronous mode No - IRT Yes - Prioritized startup Yes - Shared device Yes - Number of IO Controllers with shared device, max. 2  Transfer memory - Inputs, max. 1 440 byte; Per IO Controller with shared device - Outputs, max. 1 440 byte; Per IO Controller with shared device  Submodules - Number, max. 64 - User data per submodule, max. 1 024 byte  PROFINET CBA - acyclic transmission Yes - cyclic transmission Yes - Cyclic transmission Yes - Open IE communication - Number of connections, max. 46 - Local port numbers used at the system end - 65535 - Keep-alive function, supported  Protocols	— Inputs, max.	4 kbyte
PROFINET IO Device           Services         — PG/OP communication         Yes           — S7 communication         Yes           — Isochronous mode         No           — IRT         Yes           — Prioritized startup         Yes           — Shared device         Yes           — Number of IO Controllers with shared device, max.         2           Transfer memory         Inputs, max.           — Outputs, max.         1 440 byte; Per IO Controller with shared device           Submodules         Inputs, max.           — Number, max.         64           — User data per submodule, max.         1 024 byte           PROFINET CBA         a cyclic transmission           • cyclic transmission         Yes           • cyclic transmission         Yes           • Cyclic transmission         Yes           • Cyclic transmission         Yes           Open IE communication         Yes           • Keep-alive function, supported         Yes           Protocols         Yes	<ul><li>Outputs, max.</li></ul>	4 kbyte
Services  - PG/OP communication Yes - S7 communication Yes - Isochronous mode No - IRT Yes - Prioritized startup Yes - Shared device Yes - Number of IO Controllers with shared device, max. 2  Transfer memory - Inputs, max. 1 440 byte; Per IO Controller with shared device - Outputs, max. 1 440 byte; Per IO Controller with shared device Submodules - Number, max. 64 - User data per submodule, max. 1 024 byte  PROFINET CBA  • acyclic transmission Yes - cyclic transmission Yes  Open IE communication  • Number of connections, max. 46 - Local port numbers used at the system end 65535 • Keep-alive function, supported Yes	<ul> <li>User data consistency, max.</li> </ul>	1 024 byte
- PG/OP communication - S7 communication - S7 communication - Isochronous mode - IRT - Prioritized startup - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Inputs, max Outputs, max Outputs, max User data per submodule, max.  PROFINET CBA	PROFINET IO Device	
- S7 communication Yes  - Isochronous mode No  - IRT Yes  - Prioritized startup Yes  - Shared device Yes  - Number of IO Controllers with shared device, max. 2  Transfer memory  - Inputs, max. 1 440 byte; Per IO Controller with shared device  - Outputs, max. 1 440 byte; Per IO Controller with shared device  Submodules  - Number, max. 64  - User data per submodule, max. 1 024 byte   PROFINET CBA  • acyclic transmission Yes  - cyclic transmission Yes  Open IE communication  • Number of connections, max. 46  - Local port numbers used at the system end 0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535  • Keep-alive function, supported Yes	Services	
- Isochronous mode - IRT - Yes - Prioritized startup - Shared device - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Outputs, max Outputs, max Outputs, max Number, max Number, max User data per submodule, max User data per submodule, max Oyelic transmission - Cyclic transmission - Cyclic transmission - Oyen IE communication - Number of connections, max Number of connections,	<ul><li>— PG/OP communication</li></ul>	Yes
- IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Outputs, max Outputs, max Outputs, max Number, max User data per submodule, max User data per submodule, max Cyclic transmission - cyclic transmission - cyclic transmission - Number of connections, max Number of connections, max Local port numbers used at the system end - Keep-alive function, supported - Yes - Protocools - Ves - Protocools - Ves - Protocools - Ves -	— S7 communication	Yes
- Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  Transfer memory - Inputs, max Outputs, max Outputs, max User data per submodule, max User data per submodule, max Oyclic transmission - oyclic transmission - oyclic transmission - oyclic transmission - Number of connections, max User data the system end - oyclic transmission - oyclic tr	— Isochronous mode	No
- Shared device Yes - Number of IO Controllers with shared device, max. 2  Transfer memory - Inputs, max. 1 440 byte; Per IO Controller with shared device - Outputs, max. 1 440 byte; Per IO Controller with shared device Submodules - Number, max. 64 - User data per submodule, max. 1 024 byte  PROFINET CBA  • acyclic transmission Yes • cyclic transmission Yes Open IE communication • Number of connections, max. 46 • Local port numbers used at the system end 65535 • Keep-alive function, supported  Protocols	— IRT	Yes
Number of IO Controllers with shared device, max.  Transfer memory Inputs, max Outputs, max Outputs, max Outputs, max Outputs, max Number, max Number, max User data per submodule, max User data per submodule, max.  PROFINET CBA acyclic transmission cyclic transmission ves outputs, max User data per submodule, max User data per submodule	— Prioritized startup	Yes
Transfer memory  - Inputs, max Outputs, max Outputs, max. 1 440 byte; Per IO Controller with shared device 1 440 byte; Per IO Controller with shared device  Submodules - Number, max User data per submodule, max. 1 024 byte  PROFINET CBA  • acyclic transmission • cyclic transmission • cyclic transmission • Number of connections, max. • Local port numbers used at the system end • Keep-alive function, supported  Protocols	— Shared device	Yes
- Inputs, max Outputs, max Number, max Number, max User data per submodule, max User data per submodule, max.  PROFINET CBA  • acyclic transmission • cyclic transmission • cyclic transmission • Number of connections, max Local port numbers used at the system end • Keep-alive function, supported  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device  1 440 byte; Per IO Controller with shared device	<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	2
- Outputs, max.  Submodules - Number, max User data per submodule, max.  PROFINET CBA  • acyclic transmission • cyclic transmission  • Number of connections, max.  • Local port numbers used at the system end • Keep-alive function, supported  Protocols	Transfer memory	
Submodules  - Number, max.  - User data per submodule, max.  PROFINET CBA  • acyclic transmission  • cyclic transmission  • Number of connections, max.  • Local port numbers used at the system end  • Keep-alive function, supported  Protocols  64   - 1 024 byte  Yes  Yes  46  - 0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535	— Inputs, max.	1 440 byte; Per IO Controller with shared device
- Number, max.  - User data per submodule, max.  PROFINET CBA  • acyclic transmission • cyclic transmission • Cyclic transmission • Number of connections, max. • Local port numbers used at the system end • Keep-alive function, supported  Protocols  64  1 024 byte  Yes  46  0 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535  Yes	— Outputs, max.	1 440 byte; Per IO Controller with shared device
— User data per submodule, max.  PROFINET CBA   • acyclic transmission  • cyclic transmission  • Number of connections, max.  • Local port numbers used at the system end  • Keep-alive function, supported  Protocols  1 024 byte  Yes  46  0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535  Yes  Protocols	Submodules	
PROFINET CBA  • acyclic transmission • cyclic transmission  Open IE communication  • Number of connections, max. • Local port numbers used at the system end • Keep-alive function, supported  Protocols  Yes  46  0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535  Yes  Yes  Yes  Yes  Yes  47  Yes  Protocols	— Number, max.	64
<ul> <li>acyclic transmission</li> <li>cyclic transmission</li> <li>Yes</li> </ul> Open IE communication <ul> <li>Number of connections, max.</li> <li>Local port numbers used at the system end</li> <li>Keep-alive function, supported</li> </ul> Yes <ul> <li>46</li> <li>0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535</li> <li>Keep-alive function, supported</li> </ul> Yes Protocools	<ul> <li>User data per submodule, max.</li> </ul>	1 024 byte
<ul> <li>cyclic transmission</li> <li>Open IE communication</li> <li>Number of connections, max.</li> <li>Local port numbers used at the system end</li> <li>Keep-alive function, supported</li> <li>Yes</li> <li>Yes</li> </ul>	PROFINET CBA	
Open IE communication       46         ◆ Number of connections, max.       46         ◆ Local port numbers used at the system end       0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535         ◆ Keep-alive function, supported       Yes    Protocols	acyclic transmission	Yes
<ul> <li>Number of connections, max.</li> <li>Local port numbers used at the system end</li> <li>Keep-alive function, supported</li> <li>Yes</li> </ul>	cyclic transmission	Yes
<ul> <li>Local port numbers used at the system end</li> <li>0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535</li> <li>Keep-alive function, supported</li> <li>Yes</li> </ul>	Open IE communication	
	Number of connections, max.	46
Protocols	• Local port numbers used at the system end	
		Yes

Media redundancy	
Media redundancy  — Switchover time on line break, typ.	200 ms
Switchover time on line break, typ.      Number of stations in the ring, max.	200 ms 50
SIMATIC communication	30
• S7 routing	Yes
Open IE communication	165
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.	46
— 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 Adv. and loadable FBs
— Number of connections, max.	46
— Data length, max.	32 kbyte; 1 452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	46
— Data length, max.	1 472 byte
Web server	
• supported	Yes
<ul> <li>User-defined websites</li> </ul>	Yes
Number of HTTP clients	5
Isochronous mode	
Equidistance	Yes
Number of DP masters with isochronous mode	1
User data per isochronous slave, max.	244 byte
shortest clock pulse	1.5 ms; 0.5 ms without use of SFC 126, 127
max. cycle	32 ms
communication functions / header	
PG/OP communication	Yes
<ul> <li>Number of connectable OPs with message processing</li> </ul>	47; When using Alarm_S/SQ and Alarm_D/DQ
Number of connectable OPs without message processing	47
Data record routing	Yes
Global data communication	v
• supported	Yes
Number of GD loops, max.	8
Number of GD packets, transmitter, max.	8
Number of GD packets, receiver, max.	16
Size of GD packets, max.  Size of GD packets (studied agreeint at ) are selected.	54 byte
Size of GD packet (of which consistent), max.  S7 basic communication	1 variable
supported	Yes
<ul><li>User data per job, max.</li></ul>	76 byte
User data per job (of which consistent), max.  User data per job (of which consistent), max.	1 variable
S7 communication	TAINAIL
• 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 FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
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	24/24
CPU, max.	
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
communication functions / PROFINET CBA (with set target commu	·
Setpoint for the CPU communication load	20 %
Number of remote interconnection partners	32
number of master/device functions	150
<ul> <li>total of all master/device connections</li> </ul>	4 500

<ul> <li>data length of all incoming master/device connections, max.</li> </ul>	45 000 byte
<ul> <li>data length of all outgoing master/device connections, max.</li> </ul>	45 000 byte
<ul> <li>Number of device-internal and PROFIBUS interconnections</li> </ul>	1 000
<ul> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> </ul>	16 000 byte
Data length per connection, max.	2 000 byte
performance data / PROFINET CBA / remote interconnection	/ with acyclic transfer / header
— Sampling interval, min.	200 ms; Depending on preset communication load, number of interconnections
	and data length used
<ul> <li>Number of incoming interconnections</li> </ul>	250
<ul> <li>Number of outgoing interconnections</li> </ul>	250
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	8 000 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	8 000 byte
<ul> <li>Data length per connection, max.</li> </ul>	2 000 byte
performance data / PROFINET CBA / remote interconnection	/ with cyclic transfer / header
— Transmission frequency: Transmission interval, min.	1 ms; Depending on preset communication load, number of interconnections and data length used
<ul> <li>Number of incoming interconnections</li> </ul>	300
<ul> <li>Number of outgoing interconnections</li> </ul>	300
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	4 800 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	4 800 byte
Data length per connection, max.	450 byte
performance data / PROFINET CBA / HMI variables via PROF	FINET / acyclic / header
Number of stations that can log on for HMI variables (PN OPC/iMap)	2x PN OPC/1x iMap
<ul> <li>HMI variable updating</li> </ul>	500 ms
— Number of HMI variables	1 000
<ul> <li>Data length of all HMI variables, max.</li> </ul>	32 000 byte
performance data / PROFINET CBA / PROFIBUS proxy functi	onality / header
— supported	Yes; 32 PROFIBUS slaves max. connectable
<ul> <li>Data length per connection, max.</li> </ul>	240 byte; Slave-dependent
Number of connections	
overall	48
<ul> <li>usable for PG communication</li> </ul>	
<ul> <li>reserved for PG communication</li> </ul>	1
<ul> <li>adjustable for PG communication, max.</li> </ul>	0
usable for OP communication	
<ul> <li>reserved for OP communication</li> </ul>	1
<ul> <li>adjustable for OP communication, max.</li> </ul>	0
<ul> <li>usable for S7 basic communication</li> </ul>	
<ul> <li>reserved for S7 basic communication</li> </ul>	0
<ul> <li>adjustable for S7 basic communication, max.</li> </ul>	0
usable for S7 communication	
— reserved for S7 communication	0
<ul> <li>adjustable for S7 communication, max.</li> </ul>	0
usable for routing	
reserved for routing	0
adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	47; Max. 47 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes
SCAN procedure	Yes
Program alarms	Yes
Process diagnostic messages	Yes
simultaneously active Alarm_S blocks, max.	250; 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.	300
• preset, max.	150

Process control messages	Voc
Process control messages  Number of archives that can log on simultaneously (SFB 37	Yes 4
AR_SEND)	7
Number of messages	
overall, max.	256
• in 100 ms grid, max.	0
• in 500 ms grid, max.	256
• in 1000 ms grid, max.	256
Number of additional values	
• with 100 ms grid, max.	0
<ul> <li>with 500, 1000 ms grid, max.</li> </ul>	1
Test commissioning functions	
Status block	Yes; Up to 16 simultaneously
Single step	Yes
Number of breakpoints	16
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes; Up to 16 variable tables
<ul> <li>Variables</li> </ul>	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	70; Status/control
Forcing	
• Forcing	Yes
<ul> <li>Forcing, variables</li> </ul>	Inputs/outputs, bit memories, distributed I/Os
Number of variables, max.	64
Diagnostic buffer	
• present	Yes
Number of entries, max.	400
— adjustable	Yes
— preset	120
Service data	
• can be read out	Yes
EMC	
Emission of radio interference acc. to EN 55 011	Ves
Limit class A, for use in industrial areas     Limit class B, for use in residential areas	Yes
Limit class B, for use in residential areas	No
configuration / header	
Configuration software	Ves
STEP 7  configuration / programming / header	Yes
Command set	see instruction list
	7
<ul><li>Nesting levels</li><li>Access to consistent data in process image</li></ul>	Yes
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
configuration / programming / number of simultaneously acti	
— DPSYC_FR	2
— D_ACT_DP	8
— RD_REC	8
— WR_REC	8
— WR_PARM	8
— PARM_MOD	1
— WR DPARM	2
— WR_DPARM — DPNRM_DG	2 8
— WR_DPARM — DPNRM_DG — RDSYSST	

— DP_TOPOL	1	
configuration / programming / number of simultaneously active SFB / header		
— RDREC	8	
— WRREC	8	
Know-how protection		
<ul> <li>User program protection/password protection</li> </ul>	Yes	
<ul> <li>Block encryption</li> </ul>	Yes; With S7 block Privacy	
Dimensions		
Width	25 mm	
Height	290 mm	
Depth	219 mm	
Weights		
Weight, approx.	750 g	

last modified:

12/8/2024