Data sheet

6ES7416-3ES07-0AB0



SIMATIC S7-400, CPU 416-3 PN/DP Central processing unit with: Work memory 16 MB, (8 MB code, 8 MB data), interfaces 1st interface MPI/DP 12 Mbit/s, (X1), 2nd interface Ethernet/PROFINET (X5) 3rd interface IF 964-DP plug-in (IF1)

General information	
Product type designation	CPU 416-3 PN/DP
HW functional status	01
Firmware version	V7.0
Product function	
 Isochronous mode 	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
 Programming package 	STEP 7 V5.5 or higher with HSP 262
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	10 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.3 A
from backplane bus 5 V DC, max.	1.6 A
from backplane bus 24 V DC, max.	300 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	6.5 W
Power loss, max.	8 W
Memory	
Type of memory	RAM
Work memory	
integrated	16 Mbyte
integrated (for program)	8 Mbyte
integrated (for data)	8 Mbyte
expandable	No
Load memory	
expandable FEPROM	Yes; with Memory Card (FLASH)
 expandable FEPROM, max. 	64 Mbyte
integrated RAM, max.	1 Mbyte
expandable RAM	Yes; with Memory Card (RAM)
• expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
• with battery	Yes; all data
without battery	No
Battery	
Backup battery	

Backup current, typ.	180 μA; up to 40 °C
Backup current, max.	850 μΑ
Backup time, max.	Dealt with in the module data manual with the secondary conditions and the factors of influence
 Feeding of external backup voltage to CPU 	5 V DC to 15 V DC
CPU processing times	0 1 2 0 1 0 1 2 0
for bit operations, typ.	12.5 ns
for word operations, typ.	12.5 ns
for fixed point arithmetic, typ.	12.5 ns
for floating point arithmetic, typ.	25 ns
CPU-blocks	20110
DB	
	10 000: Number range: 1 to 16000
Number, max. Size max.	10 000; Number range: 1 to 16000
• Size, max.	64 kbyte
	F 000: Number reason 0 to 7000
Number, max. Size may.	5 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC - Number may	5 000: Number renge: 0 to 7000
Number, max.	5 000; 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 (shortest cycle that can be set = 500 μs)
 Number of process alarm OBs 	8; OB 40-47
 Number of DPV1 alarm OBs 	3; OB 55-57
 Number of isochronous mode OBs 	4; OB 61-64
 Number of multicomputing OBs 	1; OB 60
 Number of background OBs 	1; OB 90
 Number of startup OBs 	3; OB 100-102
 Number of asynchronous error OBs 	9; OB 80-88
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
 per priority class 	24
 additional within an error OB 	2
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
counting range / of S7 counters / initial value	0
— counting range / of S7 counters / full-scale value	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	2 048
Retentivity	
	Yes
— adiustable	
— adjustable — preset	No times retentive
— preset	No times retentive
— preset Time range	
preset Time range — time range / of the S7 timers / initial value	10 ms
— preset Time range	

• Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	- Control of the cont
Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
Flag	Total Working and load montery (was backer)
• Size, max.	16 kbyte; Size of bit memory address area
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; in 1 memory byte
Local data	
 data volume / as local data / adjustable / maximum 	32 kbyte
 data volume / as local data / preset 	16 kbyte
Address area	
I/O address area	
• Inputs	16 kbyte
Outputs	16 kbyte
Process image	
 Inputs, adjustable 	16 kbyte
 Outputs, adjustable 	16 kbyte
• Inputs, default	512 byte
Outputs, default	512 byte
consistent data, max.	244 byte
Access to consistent data in process image	Yes
Subprocess images	45
Number of subprocess images, max. District of same also	15
Digital channels	404.070
• Inputs	131 072 131 072
— of which central	131 072
Outputs — of which central	131 072
Analog channels	131 072
• Inputs	8 192
— of which central	8 192
Outputs	8 192
— of which central	8 192
Hardware configuration	
Number of expansion units, max.	21
connectable OPs	95
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	
Number of connectable IMs (total), max.	6
• Number of connectable IM 460s, max.	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 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in
a via interface module	PROFINET IO mode
via interface module Number of pluggable S5 modules (via adapter capsule in	1; IF 964-DP
 Number of pluggable S5 modules (via adapter capsule in central device), max. 	6
Number of IO Controllers	
• integrated	1
• via CP	4; Max. 4 in the central controller; no mixed operation of different CP 443-1
	types in PROFINET IO mode
Number of operable FMs and CPs (recommended)	
• FM	Limited by number of slots or number of connections
● CP, PtP	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections
PROFIBUS and Ethernet CPs	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	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; For 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 MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes Yes
to DP, slavein AS, master	Yes
in AS, masterin AS, slave	Yes
in AS, slave on Ethernet via NTP	Yes; As client
• to IF 964 DP	Yes
Time difference in system when synchronizing via	
Ethernet, max.	10 ms
• MPI, max.	200 ms
Interfaces	
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP
	(optionally pluggable)
Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP
Number of other interfaces	1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
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
PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
MPI	
Number of connections	44; If a diagnostics repeater is used on the line, the number of connection
Transmission rate, may	resources on the line is reduced by 1 12 Mbit/s
Transmission rate, max. Services	12 IVIIVIS
— PG/OP communication	Yes
— PG/OP confindingation — Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	Yes
	Yes
 — S7 communication, as server 	
— S7 communication, as server PROFIBUS DP master	
	32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
PROFIBUS DP master	
PROFIBUS DP master ◆ Number of connections, max.	resources on the line is reduced by 1

D0/0D	v
— PG/OP communication	Yes
— Routing	Yes; S7 routing
 Global data communication 	No
 — S7 basic communication 	Yes
— S7 communication	Yes
 S7 communication, as client 	Yes
 S7 communication, as server 	Yes
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
Direct data exchange (slave-to-slave	Yes
communication)	V
— DPV1	Yes
Address area	2 khyto
— Inputs, max. — Outputs, max.	2 kbyte
	2 kbyte
User data per DP slave	244 byte
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	22
Number of connections	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
Transmission rate, max.	12 Mbit/s
automatic baud rate search	No
Address area, max.	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
Direct data exchange (slave-to-slave	No
communication) — DPV1	No
	No
Transfer memory	244 byta
— Inputs	244 byte
— Outputs	244 byte
2. Interface	PROFILET
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes
Autocrossing	Yes
product function / at the 2nd interface / change of the IP address at runtime	Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF"
Interface types	5. 5. 0. 11 _00.11
• RJ 45 (Ethernet)	Yes
Number of ports	2
·	Yes
integrated switch Protocols	165
Protocols • PROFINET IO Controller	Voc
PROFINET IO Controller PROFINET IO Povice	Yes
PROFINET IO Device	Yes
PROFINET CBA PROFIBUS DP master	Yes No.

PROFIBUS DP slave	No
Open IE communication	Yes
Web server	Yes
Point-to-point connection	No
Media redundancy	Yes
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	TOO WINES
— PG/OP communication	Yes
— S7 communication	Yes
— Isochronous mode	
— Shared device	Yes; Only with IRT and the High Performance option Yes
— Prioritized startup	Yes
Number of IO devices with prioritized startup, max.	32
Number of connectable IO Devices, max.	256
Of which IO devices with IRT, max.	64
— of which in line, max.	64
 Number of IO Devices with IRT and the option "high flexibility" 	256
— of which in line, max.	61
Number of connectable IO Devices for RT, max.	256
— of which in line, max.	256
Activation/deactivation of IO Devices	Yes
Number of IO Devices that can be simultaneously	8
activated/deactivated, max.	
 — IO Devices changing during operation (partner ports), supported 	Yes
 Number of IO Devices per tool, max. 	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
 Device replacement without swap medium 	Yes
— Send cycles	250 μ s, 500 μ s, 1 ms, 2 ms, 4 ms additionally with IRT with high performance:
— Updating time	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	additional and the transfer of
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data consistency, max.	1 024 byte
PROFINET IO Device	1 02 1 5 3 10
Services	
— PG/OP communication	Yes
— PG/OP confindingation — S7 communication	Yes
— S7 communication — Isochronous mode	No
— Isochronous mode — IRT	Yes
Prioritized startup	Yes
·	
— Shared device	Yes
Number of IO Controllers with shared device, max. Transfer memory.	2
Transfer memory	4.440 histor Don IO Controller with the controller
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— number of submodules / at the 2nd interface / as PROFINET IO device / maximum deta valume / at the 2nd interface / as not date not	64
 — data volume / at the 2nd interface / as net data per submodule / as PROFINET IO device / maximum 	1 024 byte
PROFINET CBA	
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
 Number of connections, max. 	94
 Local port numbers used at the system end 	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534,
Keep-alive function, supported	65535 Yes

3. Interface	
Interface type	Pluggable interface module (IF)
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Isolated	Yes
automatic detection of transmission rate	No
Interface types	140
• RS 485	Yes
Output current of the interface, max.	150 mA
Protocols	
• MPI	No
PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
PROFIBUS DP master	
 Number of connections, max. 	32
 Transmission rate, max. 	12 Mbit/s
 Number of DP slaves, max. 	125
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
Global data communication	No
S7 basic communication	Yes
— S7 communication	Yes
	Yes
— S7 communication, as client	
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
 Direct data exchange (slave-to-slave 	Yes
communication)	
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
 data volume / at the 3rd interface / as DP master / as user data for inputs/outputs per distributed I/O DP slave / maximum 	244 byte
 data volume / at the 3rd interface / as DP master / as user data for inputs per distributed I/O DP slave / maximum 	244 byte
 data volume / at the 3rd interface / as DP master / as reference data for outputs per distributed I/O DP slave / maximum 	244 byte
 Number of slots per interface, max. 	244
 data volume / at the 3rd interface / as DP master / as user data for inputs/outputs per distributed I/O DP slave / per slot / maximum 	128 byte
PROFIBUS DP slave	
number of possible connections / at the 3rd interface / as DP slave	32
GSD file	http://support.automation.siemens.com/WW/view/en/113652
transfer rate / at the 3rd interface / as DP slave / maximum	12 Mbit/s
automatic baud rate search	No
• number of address ranges / at the 3rd interface / as DP slave / maximum	32; Virtual slots
 data volume / at the 3rd interface / as DP slave / as user data per address range / maximum 	32 byte
 data volume / at the 3rd interface / as DP slave / as consistent reference data per address range / maximum 	32 byte
Services	

- Clobe data communication No - ST posts communication Ves - ST communication, as client Ves - ST communication, as ceiver Ves - Direct data exchange (aleve-to-slave on Communication), and the Communication of	Pouting	Voc: with interface active
	— Routing	Yes; with interface active
- SY communication, as client - SY communication, as client - SY communication, as server - Direct data exchange (clieve-st-plave on Direct data exchange on Direct data		
- S7 communication, as client - S7 communication, as server - Direct data exchange (slave-to-slave on the communication) - DPV1 - Transfer memory - Inputs - Outputs - Unputs - Inputs - Outputs - Switchcover time on line ibreak, bp Switchcover time on line ibreak, bp Number of stations in the ring, max Sol SIMATIC communication - ST routing - Open It communication - TCP IP - Number of connections, max Data length, max Several passive commedians per port, supported - ISO-on-TCP (RCTO00) - Number of connections, max Data length, max UDP - Number of connections, max Data length, max UDP - Number of connections, max Data length, max UDP - Number of connections, max Data length, max UDP - Number of connections, max Data length, max Data length, max UDP - Number of connections, max Data length, max Data len		
- S7 communication, as server - Direct data exchange (slave-to-slave communication) - DPV1 - Transfer memory - Imputs -		
Direct data exchange (slave to slave communication) DPV1 No Trainafer immory Inputs 244 byte Outputs 244 byte Protocols Redundancy mode Media redundancy Switchover time on line break, typ Number of stations in the ring, max Size of Communication Size of Communication TCP/IP Number of connections, max Serial bength, max several passive connections, get port, supported IN Size of Communication Number of connections, max Data length, max several passive connections, max Data length, max Size of Communication Number of connections, max Data length, max UDP Number of connections, max Data length, max Size of Communication Number of connections, max Data length, max Data length, max UDP Number of connections, max Data length, max Data length, max Size of Communication Number of connections, max Data length, max		
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Coupuis Coup	•	244 byta
Redundancy mode Moda redundancy Switchover time on line break, typ. 200 ms 50		
Redundancy mode Media redundancy — Switchover time on line break, typ. — Number of stations in the ring, max. Si Trouting Sy Trouting Sy Trouting Yes Open IE communication • SY Trouting Yes Number of connections, max. — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1008) — Number of connections, max. — but a length, max. — but a length, max. — UDP — Number of connections, max. — Data length, max. — 1 472 byte Web senver • supported • User-defined websites • Number of ITTP clients Sochronous mode? service / in the event of clock synchronization / equidistance — Support Suphabar of Promisers with isochronous mode User data per isochronous slave, max. 244 byte sochronous mode? at storests cycle time sochronous mode? at storests cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at storests cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 1 mis, 0.5 ms wilthout use of SFC 126, 127 sochronous mode? at preatest cycle time 2 mumber of CD packets, max. 1 fl 1 Number of CD packets, transmitter, max. 1 fl 2 Number of CD packets, transmitter, max. 1 fl 3 type of Species, receiver, max. 5 byte 5 byte 1 variable S7 basic communication • user of CD packets, transmitter, max. 1 variable S7 communication • user of CD packets, receiver, max. 5 byte 1 variable S7 communication • userver of CD packets, max. 5 byte 6 byte 7	·	Z44 Dyle
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- Switchover time on line break, typ. 200 ms - Number of stations in the ring, max. 50 SIMATIC communication • S7 routing Yes Open IE communication • TOP/IP - Number of connections, max. 94 - ISO-on-TCP (RFC1006) Yes. Vais integrated PROFINET interface and loadable FBs 94 • ISO-on-TCP (RFC1006) Yes. Vais integrated PROFINET interface and loadable FBs 94 • ISO-on-TCP (RFC1006) Yes. Vais integrated PROFINET interface or CP 443-1 and loadable FBs 94 • ISO-on-TCP (RFC1006) Yes. Vais integrated PROFINET interface or CP 443-1 and loadable FBs 94 • ISO-on-TCP (RFC1006) Yes. Vais integrated PROFINET interface or CP 443-1 and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 95 • Number of Connections, max. 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • UDP Yes, via integrated PROFINET interface and loadable FBs 94 • Ves Severer • Supported • User defined websites • Number of Connectable PS without necessary 95 • Number of OP masters with isochronous mode 2 2 User data per isochronous slave, max. 244 byte • Subported • Number of CD packets, transmitter, max. 16 • Number of OD packets, transmitter, max. 16 • Number of OD packets, max. 32 • Size of OD packets, receiver, max. 32 • Size of OD packets, receiver, max. 32 • Size of OD packets, reasmitter, max. 16 • Number of OD packets, max. 47 • Ves • Subported • User data per job, of which consistent), max. 1 variable • Size of Size of Size of Which consistent), max. 1 variable	·	
- Number of stations in the ring, max. SiMATIC communication STORING STORING Popen IE communication TCPIP Number of connections, max. - Data length, max. State of Connections, max. - Several passive connections per port, supported SiSo-on-TCP (RFC1006) Number of connections, max. - Data length, max. Data length, max. State of Connections, max. - Data length, max. Data length, max. State of Connections, max. - State of Connections, max. - State of Connections, max. - State of HTTP clients State of State of Connections, max. State of State of State of Connections, max. State of State of State of State of Connections, max. State of State of State of State of Connections, max. State of St		200 ms
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Open IE communication **TCP/IP** - Number of connections, max. - Data length, max. - Several passive connections per port, supported **ISO-on-TCP (RPC1006)** - Number of connections, max. - Data length, max. - Data length, max. - Data length, max. - Data length, max. **UDP** - Number of connections, max. - Data length, max. - Ves, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integrated PROFINET interface or CP 443-1 and loadable FBs **Yes, via integra		Voc
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• as server Yes	service / in the event of clock synchronization / equidistance support Number of DP masters with isochronous mode User data per isochronous slave, max. isochronous mode / at shortest cycle time isochronous mode / at greatest cycle time communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • communication function / S7 basic communication • User data per job, max.	2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte
	service / in the event of clock synchronization / equidistance support Number of DP masters with isochronous mode User data per isochronous slave, max. isochronous mode / at shortest cycle time isochronous mode / at greatest cycle time communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. S7 basic communication communication function / S7 basic communication User data per job, max. User data per job (of which consistent), max.	2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte
V	service / in the event of clock synchronization / equidistance support Number of DP masters with isochronous mode User data per isochronous slave, max. isochronous mode / at shortest cycle time isochronous mode / at greatest cycle time communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • communication function / S7 basic communication • User data per job, max. • User data per job (of which consistent), max.	2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
• as client Yes	service / in the event of clock synchronization / equidistance support Number of DP masters with isochronous mode User data per isochronous slave, max. isochronous mode / at shortest cycle time isochronous mode / at greatest cycle time communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packet, max. Size of GD packet (of which consistent), max. S7 basic communication communication function / S7 basic communication User data per job, max. User data per job (of which consistent), max.	2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes

User data per job, max.	64 kbyte
User data per job (of which consistent), max.	462 byte; 1 variable
65 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 CPU, max. 	64/64
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 functions, master/slave	150
Total of all master/slave connections	6 000
Data length of all incoming connections master/slave, max. Data length of all cuttoring connections master/clave.	65 000 byte
Data length of all outgoing connections master/slave, max.	65 000 byte
Number of device-internal and PROFIBUS interconnections Pate law at the of devices internal and PROFIBUS	1 000
Data length of device-internal und PROFIBUS interconnections, max. Pata langth and appropriate and a properties.	16 000 byte
Data length per connection, max.	2 000 byte
performance data / PROFINET CBA / remote interconnection /	•
— Sampling interval, min.	200 ms; Depending on preset communication load, number of interconnections and data length used
 Number of incoming interconnections 	500
 Number of outgoing interconnections 	500
 Data length of all incoming interconnections, max. 	16 000 byte
 Data length of all outgoing interconnections, max. 	16 000 byte
 data volume / as user data for remote interconnections / in the case of acyclic transmission / with PROFINET CBA / per connection / maximum 	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
 number of remote connections to input variables / with PROFINET CBA / with cyclic transfer / maximum 	300
 number of remote connections to output variables / with cyclical transfer / with PROFINET CBA / maximum 	300
 data volume / as user data for remote interconnections with input variables / with cyclical transfer / with PROFINET CBA / maximum 	4 800 byte
 data volume / as user data for remote interconnections with output variables / with cyclical transfer / with PROFINET CBA / maximum 	4 800 byte
 data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum 	450 byte
performance data / PROFINET CBA / HMI variables via PROF	INET / acyclic / header
— Number of stations that can log on for HMI variables (PN OPC/iMap)	2x PN OPC/1x iMap
HMI variable updating	500 ms
Number of HMI variables	1 500
Data length of all HMI variables, max.	48 000 byte
performance data / PROFINET CBA / PROFIBUS proxy function	·
— supported	Yes; 32 PROFIBUS slaves max. connectable
Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• overall	96
	95
 usable for PG communication 	
usable for PG communication — reserved for PG communication	1
	1 0
— reserved for PG communication	

adjustable for OD communication, may	0
— adjustable for OP communication, max.• usable for S7 basic communication	94
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, max.	0
usable for S7 communication	94
— reserved for S7 communication	0
adjustable for S7 communication, max.	0
 usable for routing 	47
— reserved for routing	0
— adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 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.	1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks
Alarm 8-blocks	Yes
 Number of instances for alarm 8 and S7 communication blocks, max. 	4 000
• preset, max.	600
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	32
Number of messages	
• overall, max.	1 024
• in 100 ms grid, max.	128
• in 500 ms grid, max.	512
• in 1000 ms grid, max.	1 024
Number of additional values	1 027
	1
with 100 ms grid, max. with 500, 1000 ms grid, max.	10
• with 500, 1000 ms grid, max.	10
Test commissioning functions	V 11 1 40 : 11 1
Status block	Yes; Up to 16 simultaneously
Single step	Yes
Number of breakpoints	16
Status/control	
Status/control variable	Yes; Up to 16 variable tables
 Variables 	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	70; Status/control
Forcing	
Forcing	Yes
 Forcing, variables 	Inputs/outputs, bit memories, distributed I/Os
Number of variables, max.	512
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	3 200
— adjustable	Yes
— preset	120
Service data	
test-/initiation function / service data readable	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
	100
	Vec
RCM (formerly C-TICK)	Yes
KC approval EAC (formerly Gost-R)	Yes Yes Yes

Use in hazardous areas	
• ATEX	ATEX II 3G Ex nA IIC T4 Gc
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
configuration / header	
Configuration software	
• STEP 7	Yes
configuration / programming / header	
Command set	see instruction list
Nesting levels	7
 Access to consistent data in process image 	Yes
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
configuration / programming / number of simultaneously a	active SFC / header
— DPSYC_FR	2; SFC 11; per interface
— D_ACT_DP	8; SFC 12; per interface
— RD_REC	8; SFC 59; per interface
- WR_REC	8; SFC 58; per interface
— WR_PARM	8; SFC 55; per interface
— PARM_MOD	1; SFC 57; per interface
- WR_DPARM	2; SFC 56; per interface
— DPNRM_DG	8; SFC 13; per interface
— RDSYSST	8; SFC 51
— DP_TOPOL	1; SFC 103; per interface
configuration / programming / number of simultaneously a	active SFB / header
— RDREC	8; SFB 52; per interface, but not more than 32 across all external interfaces
— WRREC	8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	900 g

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