## SIEMENS

## 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
Engineering with	
<ul> <li>Programming package</li> </ul>	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)	
• 24 V DC	No; 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
<ul> <li>integrated (for program)</li> </ul>	8 Mbyte
<ul> <li>integrated (for data)</li> </ul>	8 Mbyte
• expandable	No
Load memory	
expandable FEPROM	Yes; with Memory Card (FLASH)
<ul> <li>expandable FEPROM, max.</li> </ul>	64 Mbyte
<ul> <li>integrated RAM, max.</li> </ul>	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	180 uA: up to 40 °C
Backup current, typ.	180 μA; up to 40 °C
Backup current, max.	
<ul> <li>Backup time, max.</li> </ul>	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>	5 V DC to 15 V DC
CPU processing times	
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	
DB	
• Number, max.	10 000; Number range: 1 to 16000
	64 kbyte
• Size, max.	
• Size, max. FB	
	5 000; Number range: 0 to 7999
FB	
FB ● Number, max.	5 000; Number range: 0 to 7999
FB • Number, max. • Size, max.	5 000; Number range: 0 to 7999

<ul> <li>Size, max.</li> </ul>	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>	8; OB 10-17
<ul> <li>Number of delay alarm OBs</li> </ul>	4; OB 20-23
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	9; OB 30-38 (shortest cycle that can be set = 500 $\mu$ s)
<ul> <li>Number of process alarm OBs</li> </ul>	8; OB 40-47
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55-57
<ul> <li>Number of isochronous mode OBs</li> </ul>	4; OB 61-64
<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
<ul> <li>additional within an error OB</li> </ul>	2
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
IEC counter • present	Yes
<ul><li> present</li><li> Type</li></ul>	SFB
<ul><li> present</li><li> Type</li><li> Number</li></ul>	
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> </ul>	SFB Unlimited (limited only by RAM capacity)
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> <li>Number</li> </ul>	SFB
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> <li>Number</li> <li>Retentivity</li> </ul>	SFB Unlimited (limited only by RAM capacity) 2 048
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> <li>Number</li> <li>Retentivity</li> <li>– adjustable</li> </ul>	SFB Unlimited (limited only by RAM capacity) 2 048 Yes
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> <li>Number</li> <li>Retentivity <ul> <li>adjustable</li> <li>lower limit</li> </ul> </li> </ul>	SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0
<ul> <li>present</li> <li>Type</li> <li>Number</li> <li>S7 times</li> <li>Number</li> <li>Retentivity</li> <li>– adjustable</li> </ul>	SFB Unlimited (limited only by RAM capacity) 2 048 Yes

Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Туре	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 kbyte; Size of bit memory address area
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
<ul> <li>Number of clock memories</li> </ul>	8; in 1 memory byte
Local data	
• adjustable, max.	32 kbyte
• preset	16 kbyte
Address area	
I/O address area	
Inputs	16 kbyte
Outputs	16 kbyte
Process image	
<ul> <li>Inputs, adjustable</li> </ul>	16 kbyte
Outputs, adjustable	16 kbyte
<ul> <li>Inputs, default</li> </ul>	512 byte
• Outputs, default	512 byte
• consistent data, max.	244 byte
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	15
Digital channels	
• Inputs	131 072
— of which central	131 072
Outputs	131 072
— of which central	131 072
Analog channels	
Inputs	8 192
— of which central	8 192
Outputs	8 192
— of which central	8 192
or miler contrai	

Hardware configuration	
Number of expansion units, max.	21
connectable OPs	95
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
<ul> <li>Number of connectable IM 463s, max.</li> </ul>	4; IM 463-2
Number of DP masters	
• integrated	1
● via CP	10; CP 443-5 Extended
● via IM 467	4
<ul> <li>Mixed mode IM + CP permitted</li> </ul>	No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode
• via interface module	1; IF 964-DP
<ul> <li>Number of pluggable S5 modules (via adapter capsule in central device), max.</li> </ul>	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
<ul> <li>PROFIBUS and Ethernet CPs</li> </ul>	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	
<ul> <li>required slots</li> </ul>	2
<b>T</b>	
Time of day Clock	
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Resolution	1 ms
Resolution     Resolution	1 ms
<ul> <li>Deviation per day (buffered), max.</li> <li>Deviation per day (unbuffered), max.</li> </ul>	1.7 s; Power off
Deviation per day (unbuffered), max.	8.6 s; For power On
Operating hours counter	16
Number	16 0 to 15
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
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
• 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 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	
1. Interface Interface type	Integrated
	Integrated RS 485 / PROFIBUS + MPI
Interface type	
Interface type Physics	RS 485 / PROFIBUS + MPI
Interface type Physics Isolated	RS 485 / PROFIBUS + MPI Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.	RS 485 / PROFIBUS + MPI Yes 150 mA
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI	RS 485 / PROFIBUS + MPI Yes MPI: 44, DP: 32 Yes Yes Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections	RS 485 / PROFIBUS + MPI Yes MPI: 44, DP: 32 Yes Yes Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max.	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services — PG/OP communication	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services - PG/OP communication - Routing	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services - PG/OP communication - Routing - Global data communication	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes Yes
Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols  • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services	RS 485 / PROFIBUS + MPI Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes Yes Yes Yes
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PROFIBUS DP master	
<ul> <li>Number of connections, max.</li> </ul>	32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
• Transmission rate, max.	12 Mbit/s
<ul> <li>Number of DP slaves, max.</li> </ul>	32
Services	
— 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
— Equidistance	Yes
— Isochronous mode	Yes
- SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave	Yes
communication)	
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
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
PROFIBUS DP slave	
<ul> <li>Number of connections</li> </ul>	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
• Transmission rate, max.	12 Mbit/s
<ul> <li>automatic baud rate search</li> </ul>	No
<ul> <li>Address area, max.</li> </ul>	32; Virtual slots
<ul> <li>User data per address area, max.</li> </ul>	32 byte
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes; with interface active
— S7 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	
— Inputs	244 byte
— Outputs	244 byte

2. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	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"
Number of connection resources	96
Interface types	
Number of ports	2
<ul> <li>integrated switch</li> </ul>	Yes
Media redundancy	
• supported	Yes
<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms
<ul> <li>Number of stations in the ring, max.</li> </ul>	50
Protocols	
<ul> <li>PROFINET IO Controller</li> </ul>	Yes
PROFINET IO Device	Yes
PROFINET CBA	Yes
<ul> <li>PROFIBUS DP master</li> </ul>	No
<ul> <li>PROFIBUS DP slave</li> </ul>	No
<ul> <li>Open IE communication</li> </ul>	Yes
• Web server	Yes
<ul> <li>Point-to-point connection</li> </ul>	No
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— S7 communication	Yes

— Isochronous mode	Yes; Only with IRT and the High Performance option
— Open IE communication	Yes
— Shared device	Yes
— Prioritized startup	Yes
— Number of IO devices with prioritized	32
startup, max.	
— Number of connectable IO Devices, max.	256
— Of which IO devices with IRT, max.	64
— of which in line, max.	64
<ul> <li>— Number of IO Devices with IRT and the option "high flexibility"</li> </ul>	256
— of which in line, max.	61
<ul> <li>— Number of connectable IO Devices for RT, max.</li> </ul>	256
— of which in line, max.	256
— Activation/deactivation of IO Devices	Yes
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8
<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	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
<ul> <li>Device replacement without swap medium</li> </ul>	Yes
— Send cycles	250 $\mu s,$ 500 $\mu s,$ 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 $\mu s$ to 4 ms in 125 $\mu s$ frame
— Updating time	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.	8 kbyte
— Outputs, max.	8 kbyte
— User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— S7 communication	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	Yes
— Prioritized startup	Yes

— Shared device	Yes
— Number of IO Controllers with shared	2
device, max.	-
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.	94
	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532,
<ul> <li>Local port numbers used at the system end</li> </ul>	65533, 65534, 65535
<ul> <li>Keep-alive function, supported</li> </ul>	Yes
3. Interface	
Interface type	Pluggable interface module (IF)
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	150 mA
automatic detection of transmission rate	No
Number of connection resources	32
Protocols	
● MPI	No
<ul> <li>PROFIBUS DP master</li> </ul>	Yes
PROFIBUS DP slave	Yes
PROFIBUS DP master	
<ul> <li>Number of connections, max.</li> </ul>	32
• Transmission rate, max.	12 Mbit/s
<ul> <li>Number of DP slaves, max.</li> </ul>	125
Services	
— 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
Lyunaistalloc	

— 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	
— 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	
<ul> <li>Number of connections</li> </ul>	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
<ul> <li>automatic baud rate search</li> </ul>	No
<ul> <li>Address area, max.</li> </ul>	32; Virtual slots
<ul> <li>User data per address area, max.</li> </ul>	32 byte
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes
— S7 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	
— Inputs	244 byte
— Outputs	244 byte
Protocols	
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs

— Number of connections, max.	94
— Data length, max.	32 kbyte
- several passive connections per port,	Yes
supported	
<ul> <li>ISO-on-TCP (RFC1006)</li> </ul>	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
- Number of connections, max.	94
— Data length, max.	32 kbyte; 1452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	94
— Data length, max.	1 472 byte
Web server	
● supported	Yes
<ul> <li>User-defined websites</li> </ul>	Yes
<ul> <li>Number of HTTP clients</li> </ul>	5
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
Equidistance	Yes
Number of DP masters with isochronous mode	2
User data per isochronous slave, max.	244 byte
shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127
max. cycle	32 ms
Communication functions	
PG/OP communication	Yes
<ul> <li>Number of connectable OPs without message processing</li> </ul>	95
<ul> <li>Number of connectable OPs with message</li> </ul>	95; When using Alarm_S/SQ and Alarm_D/DQ
processing	
Data record routing	Yes
Global data communication	
• supported	Yes
<ul> <li>Number of GD loops, max.</li> </ul>	16
<ul> <li>Number of GD packets, transmitter, max.</li> </ul>	16
<ul> <li>Number of GD packets, receiver, max.</li> </ul>	32
<ul> <li>Size of GD packets, max.</li> </ul>	54 byte
<ul> <li>Size of GD packet (of which consistent), max.</li> </ul>	1 variable
S7 basic communication	
• supported	Yes
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	1 variable
S7 communication	

• supported	Yes
• as server	Yes
• as client	Yes
<ul> <li>User data per job, max.</li> </ul>	64 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	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
<ul> <li>User data per job (of which consistent), max.</li> </ul>	240 byte
<ul> <li>Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.</li> </ul>	64/64
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
PROFINET CBA (at set setpoint communication load)	
<ul> <li>Setpoint for the CPU communication load</li> </ul>	20 %
<ul> <li>Number of remote interconnection partners</li> </ul>	32
<ul> <li>Number of functions, master/slave</li> </ul>	150
<ul> <li>Total of all master/slave connections</li> </ul>	6 000
<ul> <li>Data length of all incoming connections master/slave, max.</li> </ul>	65 000 byte
<ul> <li>Data length of all outgoing connections master/slave, max.</li> </ul>	65 000 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
<ul> <li>Data length per connection, max.</li> </ul>	2 000 byte
Remote interconnections with acyclic transmission	
— Sampling frequency: Sampling time, min.	200 ms; Depending on preset communication load, number of interconnections and data length used
<ul> <li>— Number of incoming interconnections</li> </ul>	500
<ul> <li>— Number of outgoing interconnections</li> </ul>	500
<ul> <li>— Data length of all incoming interconnections, max.</li> </ul>	16 000 byte
<ul> <li>— Data length of all outgoing interconnections, max.</li> </ul>	16 000 byte
— Data length per connection, max.	2 000 byte
Remote interconnections with cyclic transmission	
— Transmission frequency: Transmission	1 ms; Depending on preset communication load, number of
interval, min.	interconnections and data length used
— Number of incoming interconnections	300
<ul> <li>— Number of outgoing interconnections</li> </ul>	300

Dete leveth of all incoming	4 800 byte
<ul> <li>— Data length of all incoming interconnections, max.</li> </ul>	
— Data length of all outgoing	4 800 byte
interconnections, max.	
— Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	
<ul> <li>— Number of stations that can log on for HMI variables (PN OPC/iMap)</li> </ul>	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
PROFIBUS proxy functionality	
— supported	Yes; 32 PROFIBUS slaves max. connectable
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• overall	96
<ul> <li>usable for PG communication</li> </ul>	95
— reserved for PG communication	1
— adjustable for PG communication, max.	0
<ul> <li>usable for OP communication</li> </ul>	95
— reserved for OP communication	1
— adjustable for OP communication, max.	0
<ul> <li>usable for S7 basic communication</li> </ul>	94
- reserved for S7 basic communication	0
<ul> <li>— adjustable for S7 basic communication, max.</li> </ul>	0
<ul> <li>usable for S7 communication</li> </ul>	94
— reserved for S7 communication	0
— adjustable for S7 communication, max.	0
<ul> <li>usable for routing</li> </ul>	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

<ul> <li>Number of instances for alarm 8 and S7 communication blocks, max.</li> </ul>	4 000
• preset, max.	600
Process control messages	Yes
Number of archives that can log on simultaneously	32
(SFB 37 AR_SEND)	
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	
• with 100 ms grid, max.	1
• with 500, 1000 ms grid, max.	10
Test commissioning functions	
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
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers,
	counters
<ul> <li>Number of variables, max.</li> </ul>	70; Status/control
Forcing	
• Forcing	Yes
<ul> <li>Forcing, variables</li> </ul>	Inputs/outputs, bit memories, distributed I/Os
<ul> <li>Number of variables, max.</li> </ul>	512
Diagnostic buffer	
• present	Yes
<ul> <li>Number of entries, max.</li> </ul>	3 200
— adjustable	Yes
— preset	120
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	103
• ATEX	ATEX II 3G Ex nA IIC T4 Gc
Ambient conditions	
Ambient temperature during operation	
• min.	0° 0
• max.	60 °C
Configuration	
Configuration software	
• STEP 7	Yes
Programming	
Command set	see instruction list
Nesting levels	7
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
<ul> <li>System functions (SFC)</li> </ul>	see instruction list
<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Number of simultaneously active SFCs	
— 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
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> <li>Block encryption</li> </ul>	Yes Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	900 g
last modified:	12/24/2018