## SIEMENS

## Data sheet

## 6ES7414-3EM07-0AB0



SIMATIC S7-400, CPU 414-3 PN/DP Central processing unit with: Work memory 4 MB, (2 MB code, 2 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 414-3 PN/DP
Firmware version	V7.0
Product function	
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
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	15 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	
<ul> <li>integrated</li> </ul>	4 Mbyte
<ul> <li>integrated (for program)</li> </ul>	2 Mbyte
<ul> <li>integrated (for data)</li> </ul>	2 Mbyte
expandable	No
Load memory	
<ul> <li>expandable FEPROM</li> </ul>	Yes; with Memory Card (FLASH)
<ul> <li>expandable FEPROM, max.</li> </ul>	64 Mbyte
<ul> <li>integrated RAM, max.</li> </ul>	512 kbyte
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 μΑ; up to 40 °C
Backup current, max.	850 µA
Backup time, max.	Dealt with in the module data manual with the secondary conditions and
• Dackup time, max.	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.	18.75 ns
for word operations, typ.	- 18.75 ns
for fixed point arithmetic, typ.	18.75 ns
for floating point arithmetic, typ.	37.5 ns
CPU-blocks	
DB	
	6 000: Number range: 1 to 16000
Number, max.	6 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB • Number, max.	3 000; Number range: 0 to 7999
Size, max.	64 kbyte
• Size, max. FC	
Number, max.	3 000; Number range: 0 to 7999
• Number, max. • Size, max.	64 kbyte
OB	04 KByte
Number, max.	see instruction list
• Size, max.	64 kbyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	
	4; OB 10-13
Number of delay alarm OBs	4; OB 20-23
Number of cyclic interrupt OBs	4; OB 32, 33, 34, 35 (shortest cycle that can be set = $500 \ \mu$ s)
Number of process alarm OBs	4; OB 40-43
Number of DPV1 alarm OBs	3; OB 55-57
Number of isochronous mode OBs	3; OB 61-63
Number of multicomputing OBs	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
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
<ul> <li>per priority class</li> </ul>	24
<ul> <li>additional within an error OB</li> </ul>	1
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	
• present	Yes
•Туре	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	2 048
Retentivity	

− adjustable     Fes       − lover limit     0       − upper limit     2 047       − preset     No times retentive       Tore range     10 ms       − lover limit     9 990 s       EEC timer     9 990 s       • present     Ves       • present     Ves       • present     Unlimited (imited only by RAM capacity)       Data areas and their retentivity     Total working and load memory (with backup battery)       Pata areas and their retentivity     Total working and load memory (with backup battery)       Pata areas and their retentivity     Total working and load memory (with backup battery)       Fling     •       • Star, max,     8 kbyte: Star of bit memory address area       • Retentivity available     Yes       • Retentivity preset     MB to MB 15       • Number of clock memories     8, in 1 memory byte       Local data     I kbyte       • uputs     8 kbyte       • uputs     8 kbyte       • uputs, adjustable     8 kbyte       • uputs, default     256 byte       • uputs, default     256 byte       • uputs, default     256 byte       • uputs, default     65 536       • outputs, default     65 536       • outputs, default     65 536       • outp	adjustable	Van
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IEC time       Yes         • present       Yes         • type       SFB         • Number       Unlimited (limited only by RAM capacity)         Data areas and their retentivity       Total working and load memory (with backup battery)         Flag       * Retentived ata area (incl. timers, counters, flags), max.         * Retentivity available       Yes         • Retentivity preset       8 kbyte: Size of bit memory address area         • Retentivity preset       MB 0 to MB 15         • Number of clock memories       8: in 1 memory byte         Local data       *         • adjustable, max.       16 kbyte         • preset       8 kbyte         Address area       *         # oputs       8 kbyte         • Outputs       8 kbyte         • Outputs       8 kbyte         • oputs, default       256 byte         • outputs       65 536         - of which central       65 536         - of which central       65 536         - of which central       4 096	— lower limit	
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Analog channels         • Inputs       4 096         - of which central       4 096         • Outputs       4 096         - of which central       4 096         Hardware configuration       4 096         Number of expansion units, max.       21         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		
• Inputs4 096- of which central4 096• Outputs4 096- of which central4 096Hardware configuration21Number of expansion units, max.21MulticomputingYes; 4 CPUs max. (with UR1 or UR2)Interface modules		65 536
- of which central4 096• Outputs4 096- of which central4 096- of which central4 096Hardware configurationNumber of expansion units, max.21Number of expansion units, max.21MulticomputingYes; 4 CPUs max. (with UR1 or UR2)Interface modules		
Outputs 4 096     — of which central 4 096     Hardware configuration     Number of expansion units, max. 21     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		
- of which central     4 096       Hardware configuration       Number of expansion units, max.     21       Multicomputing     Yes; 4 CPUs max. (with UR1 or UR2)       Interface modules     • Number of connectable IMs (total), max.       • Number of connectable IMs (total), max.     6       • Number of connectable IM 460s, max.     6	— of which central	4 096
Hardware configuration       Number of expansion units, max.     21       Multicomputing     Yes; 4 CPUs max. (with UR1 or UR2)       Interface modules     • Number of connectable IMs (total), max.       • Number of connectable IM 460s, max.     6	Outputs	4 096
Number of expansion units, max.       21         Multicomputing       Yes; 4 CPUs max. (with UR1 or UR2)         Interface modules       • Number of connectable IMs (total), max.         • Number of connectable IM 460s, max.       6	— of which central	4 096
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	Hardware configuration	
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 expansion units, max.	21
Interface modules         • Number of connectable IMs (total), max.       6         • Number of connectable IM 460s, max.       6		Yes; 4 CPUs max. (with UR1 or UR2)
Number of connectable IMs (total), max.     Number of connectable IM 460s, max.     6		· · · · · · · · · · · · · · · · · · ·
Number of connectable IM 460s, max.		6
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     PROFINET IO mode	• IVIIXed mode IM + CP permitted	
via interface module     1; IF 964-DP	• via interface module	
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Number of pluggable S5 modules (via adapter	6
capsule in central device), max.	0
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 and 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	
<ul> <li>required slots</li> </ul>	2
Time of day	
Clock	
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
<ul> <li>retentive and synchronizable</li> </ul>	Yes
Resolution	1 ms
<ul> <li>Deviation per day (buffered), max.</li> </ul>	1.7 s; Power off
<ul> <li>Deviation per day (unbuffered), max.</li> </ul>	8.6 s; For power On
Operating hours counter	
Number	16
Number/Number range	0 to 15
<ul> <li>Range of values</li> </ul>	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
<ul> <li>on Ethernet via NTP</li> </ul>	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	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
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— 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 resources on the line is reduced by 1
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
<ul> <li>Number of DP slaves, max.</li> </ul>	32
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
<ul> <li>Global data communication</li> </ul>	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
<ul> <li>Activation/deactivation of DP slaves</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 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	
Number of connections	16
• 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; with interface active
— Routing	Yes; with interface active
<ul> <li>Global data communication</li> </ul>	No
— S7 basic communication	No
- S7 communication	Yes
<ul> <li>— S7 communication, as client</li> </ul>	Yes
- S7 communication, as server	Yes
— Direct data exchange (slave-to-slave	No
communication)	
— DPV1	No
Transfer memory	
— Inputs	244 byte

— Outputs	244 byte
2. Interface	
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"
Interface types	
RJ 45 (Ethernet)	Yes
<ul> <li>Number of ports</li> </ul>	2
<ul> <li>integrated switch</li> </ul>	Yes
Protocols	
PROFINET IO Controller	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
Media redundancy	Yes
PROFINET IO Controller	
<ul> <li>Transmission rate, max.</li> </ul>	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 communication	Yes
<ul> <li>— Isochronous mode</li> </ul>	Yes; Only with IRT and the High Performance option
— Shared device	Yes
— Prioritized startup	Yes
<ul> <li>— Number of IO devices with prioritized startup, max.</li> </ul>	32
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	256
<ul> <li>— Of which IO devices with IRT, max.</li> </ul>	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
— Number of connectable IO Devices for RT, max.	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>	
— 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 μs, 500 μs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 μs to 4 ms in 125 μs 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

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— S7 communication	Yes
— Isochronous mode	No
— IRT	Yes
— Prioritized startup	Yes
— Shared device	Yes
<ul> <li>— Number of IO Controllers with shared device,</li> </ul>	2
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	
<ul> <li>acyclic transmission</li> </ul>	Yes
cyclic transmission	Yes
Open IE communication	
Number of connections, max.	62
Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 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)
Isolated	Yes
automatic detection of transmission rate	No
Interface types	
• RS 485	Yes
<ul> <li>Output current of the interface, max.</li> </ul>	150 mA
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>	16
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
<ul> <li>Number of DP slaves, max.</li> </ul>	96
Services	
— PG/OP communication	Yes
- Routing	Yes; S7 routing
— Global data communication	No
— S7 basic communication	Yes
- S7 basic communication	Yes
	Yes
- S7 communication, as client	
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes
- SYNC/FREEZE	Yes
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	Yes
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	6 kbyte
— Outputs, max.	6 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	120 5910
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
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
— 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</li> </ul>	No
communication)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Protocols	
Redundancy mode	
Media redundancy	
<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms
— Number of stations in the ring, max.	50
	50
— Number of stations in the ring, max.	50 Yes
— Number of stations in the ring, max. SIMATIC communication	
<ul> <li>— Number of stations in the ring, max.</li> <li>SIMATIC communication</li> <li>• S7 routing</li> </ul>	
<ul> <li>— Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication</li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication         <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication         <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port,</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication         <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication         <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication         <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication         <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port,</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication         <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication         <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> <li>ISO-on-TCP (RFC1006)</li> </ul> </li> </ul>	Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv.
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>Data length, max.</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>UDP</li> <li>Number of connections, max.</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server</li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server <ul> <li>supported</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server</li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server <ul> <li>supported</li> <li>User-defined websites</li> <li>Number of HTTP clients</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte Yes Yes
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> </ul> </li> <li>ISO-on-TCP (RFC1006) <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>UDP <ul> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server <ul> <li>supported</li> <li>User-defined websites</li> <li>Number of HTTP clients</li> </ul> </li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte Yes Yes 5
<ul> <li>Number of stations in the ring, max.</li> <li>SIMATIC communication         <ul> <li>S7 routing</li> </ul> </li> <li>Open IE communication         <ul> <li>TCP/IP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>several passive connections per port, supported</li> <li>ISO-on-TCP (RFC1006)</li> <li>Number of connections, max.</li> <li>Data length, max.</li> <li>UDP</li> <li>Number of connections, max.</li> <li>Data length, max.</li> </ul> </li> <li>Web server</li> <li>supported</li> <li>User-defined websites</li> <li>Number of HTTP clients</li> <li>Isochronous mode</li> <li>Equidistance</li> </ul>	Yes Yes; via integrated PROFINET interface and loadable FBs 62 32 kbyte Yes Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 62 32 kbyte; 1 452 bytes via CP 443-1 Adv. Yes; via integrated PROFINET interface and loadable FBs 62 1 472 byte Yes Yes 5
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Number of connectable OPs with message processing	63; When using Alarm_S/SQ and Alarm_D/DQ
processing Data record routing	Yes
Global data communication	
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.	54 byte
<ul> <li>Size of GD packet (of which consistent), max.</li> </ul>	1 variable
S7 basic communication	1 Valiable
supported	Yes
User data per job, max.	76 byte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	1 variable
S7 communication	
supported	Yes
• as server	Yes
• as client	Yes
User data per job, max.	64 kbyte
<ul> <li>User data per job, max.</li> <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
<ul> <li>User data per job, max.</li> </ul>	8 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	240 byte
Standard communication (FMS)	240 0910
supported	Yes; Via CP and loadable FB
PROFINET CBA (at set setpoint communication load)	
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	4 500
Data length of all incoming connections	45 000 byte
master/slave, max.	45 000 byte
<ul> <li>Data length of all outgoing connections master/slave, 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
<ul> <li>Data length per connection, max.</li> </ul>	2 000 byte
Remote interconnections with acyclic transmission	
— 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
— Data length per connection, max.	2 000 byte
Remote interconnections with cyclic transmission	
<ul> <li>Transmission frequency: Transmission interval, min.</li> </ul>	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
<ul> <li>— Data length per connection, max.</li> </ul>	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
<ul> <li>— HMI variable updating</li> </ul>	500 ms
<ul> <li>— Number of HMI variables</li> </ul>	1 000
<ul> <li>Data length of all HMI variables, max.</li> </ul>	32 000 byte
PROFIBUS proxy functionality	
— supported	Yes; 32 PROFIBUS slaves max. connectable
<ul> <li>Data length per connection, max.</li> </ul>	240 byte; Slave-dependent
Number of connections	
overall	64
<ul> <li>usable for PG communication</li> </ul>	63
<ul> <li>reserved for PG communication</li> </ul>	1
<ul> <li>adjustable for PG communication, max.</li> </ul>	0
<ul> <li>usable for OP communication</li> </ul>	63
<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>	62
<ul> <li>reserved for S7 basic communication</li> </ul>	0
<ul> <li>adjustable for S7 basic communication, max.</li> </ul>	0
<ul> <li>usable for S7 communication</li> </ul>	62
<ul> <li>reserved for S7 communication</li> </ul>	0
<ul> <li>adjustable for S7 communication, max.</li> </ul>	0
<ul> <li>usable for routing</li> </ul>	31
— reserved for routing	0
— adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	63; Max. 63 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.	400; 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</li> </ul>	1 200
communication blocks, max.	
• preset, max.	300
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	16
Number of messages	
• overall, max.	512
• in 100 ms grid, max.	128
• in 500 ms grid, max.	256
<ul> <li>in 1000 ms grid, max.</li> </ul>	512
Number of additional values	
<ul> <li>with 100 ms grid, max.</li> </ul>	1
• with 500, 1000 ms grid, max.	10
Test commissioning functions	
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
<ul> <li>Forcing, variables</li> </ul>	Inputs/outputs, bit memories, distributed I/Os

<ul> <li>Number of variables, max.</li> </ul>	256
Diagnostic buffer	
• present	Yes
<ul> <li>Number of entries, max.</li> </ul>	3 200
— adjustable	Yes
— preset	120
Service data	
<ul> <li>can be read out</li> </ul>	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• ATEX	ATEX II 3G Ex nA IIC T4 Gc
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Configuration	
Configuration software	
STEP 7	Yes
Programming	
Command set	see instruction list
Nesting levels	7
Access to consistent data in process image	Yes
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Programming language	
— LAD	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
	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
	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
— WRREC	interfaces 8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
	Yes
<ul> <li>User program protection/password protection</li> </ul>	100

<ul> <li>Block encryption</li> </ul>	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	900 g
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