## **SIEMENS**

## **Data sheet**

## 6ES7414-3FM07-0AB0



SIMATIC S7-400, CPU414F-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 414F-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
<ul><li>expandable RAM</li></ul>	Yes; with Memory Card (RAM)
expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
<ul><li>with battery</li></ul>	Yes; all data
<ul><li>without battery</li></ul>	No

attery	
Backup battery	
Backup current, typ.	180 μA; up to 40 °C
Backup current, max.	850 μA
Backup time, max.	Dealt with in the module data manual with the secondary conditions an
	the factors of influence
<ul> <li>Feeding of external backup voltage to CPU</li> </ul>	5 V DC to 15 V DC
PU 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
PU-blocks	01.0118
DB	0.000 N. J. 40000
Number, max.	6 000; Number range: 1 to 16000
Size, max.	64 kbyte
FB	
<ul><li>Number, max.</li></ul>	3 000; Number range: 0 to 7999
Size, max.	64 kbyte
FC	
<ul><li>Number, max.</li></ul>	3 000; Number range: 0 to 7999
Size, max.	64 kbyte
OB	
<ul><li>Number, max.</li></ul>	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>	4; OB 10-13
<ul> <li>Number of delay alarm OBs</li> </ul>	4; OB 20-23
Number of cyclic interrupt OBs	4; OB 32, 33, 34, 35 (shortest cycle that can be set = 500 μs)
Number of process alarm OBs	4; OB 40-43
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55-57
Number of isochronous mode OBs	3; OB 61-63
Number of multicomputing OBs	1; OB 60
Number of background OBs	1; OB 90
Number of startup OBs	2; OB 100, 102
Number of startup GBs     Number of asynchronous error OBs	9; OB 80-88
Number of asynchronous error OBs	2; OB 121, 122
Nesting depth	2, 00 121, 122
	24
per priority class     delition of within an arrang OP	24
additional within an error OB	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
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	, , , , , , , , , , , , , , , , , , ,
Number	2 048
Retentivity	- V IV

P 4 14	V
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	No times retentive
Time range	40
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	Yes
• present	SFB
Type  Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	Offiliatilited (illimited offly by NAWI Capacity)
Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
Flag	Total working and load memory (with backup battery)
• Size, max.	8 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	
adjustable, max.	16 kbyte
• preset	8 kbyte
Address area	
I/O address area	
• Inputs	8 kbyte
Outputs	8 kbyte
Process image	
Inputs, adjustable	8 kbyte
Outputs, adjustable	8 kbyte
<ul><li>Inputs, default</li></ul>	256 byte
Outputs, default	256 byte
<ul> <li>consistent data, max.</li> </ul>	244 byte
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
Subprocess images	
Number of subprocess images, max.	15
Digital channels	
<ul><li>Inputs</li></ul>	65 536
— of which central	65 536
<ul><li>Outputs</li></ul>	65 536
— of which central	65 536
Analog channels	
• Inputs	4 096
— of which central	4 096
• Outputs	4 096
— of which central	4 096
Hardware configuration	
Number of expansion units, max.	21
connectable OPs	63
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	6
Number of connectable IMs (total), max.      Number of connectable IM 460s, max.	6
Number of connectable IM 460s, max.     Number of connectable IM 463s, max.	
Number of connectable IM 463s, max.  Number of DP masters	4; IM 463-2
• 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
- mixed mode har - or permitted	PROFINET IO mode

Number of pluggable S5 modules (via adapter	1; IF 964-DP 6
capsule in central device), max.	
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 slot 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
me of day	
Clock	
Hardware clock (real-time)	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
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	
<ul><li>supported</li></ul>	Yes
• to MPI, master	Yes
<ul><li>to MPI, slave</li></ul>	Yes
• to DP, master	Yes
<ul><li>to DP, slave</li></ul>	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
terfaces	
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)
Interface	
Interface type	MPI/PROFIBUS DP
solated	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	

<del>-</del>	connection resources on the line is reduced by 1
Transmission rate, max.  Carriage	12 Mbit/s
Services	Voc
— 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	
<ul> <li>Number of connections, max.</li> </ul>	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
Number of DP slaves, max.	32
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— Routing	Yes; S7 routing
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	Yes
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>S7 communication, as server</li> </ul>	Yes
— Equidistance	Yes
<ul> <li>Isochronous mode</li> </ul>	Yes
— SYNC/FREEZE	Yes
<ul> <li>Activation/deactivation of DP 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	
<ul><li>User data per DP slave, max.</li></ul>	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>	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	
<ul><li>— PG/OP communication</li></ul>	Yes; with interface active
— Routing	Yes; with interface active
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	No
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
— S7 communication, as server	Yes
<ul> <li>Direct data exchange (slave-to-slave</li> </ul>	No
communication)	
— DPV1	No
Transfer memory	

Innuta	244 byta
— Inputs	244 byte
— Outputs	244 byte
2. Interface	DDOCINET
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes Yes
Autocrossing	
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	
<ul> <li>PROFINET IO Controller</li> </ul>	Yes
PROFINET IO Device	Yes
PROFINET CBA	Yes
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes
Web server	Yes
Point-to-point connection	No
Media redundancy	Yes
PROFINET IO Controller	
<ul> <li>Transmission rate, max.</li> </ul>	100 Mbit/s
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— S7 communication	Yes
<ul> <li>Isochronous mode</li> </ul>	Yes; Only with IRT and the High Performance option
<ul> <li>Shared device</li> </ul>	Yes
<ul> <li>Prioritized startup</li> </ul>	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
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	256
— of which in line, max.	256
<ul> <li>Activation/deactivation of IO Devices</li> </ul>	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
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO Devices changing during operation (partner ports) are supported
<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	The second secon
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data consistency, max.	1 024 byte
PROFINET IO Device	

Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— S7 communication	Yes
<ul><li>— Isochronous mode</li></ul>	No
— IRT	Yes
<ul> <li>Prioritized startup</li> </ul>	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
<ul> <li>User data per submodule, max.</li> </ul>	1 024 byte
PROFINET CBA	
acyclic transmission	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
Output current of the interface, max.	150 mA
Protocols	100 1111
• MPI	No
PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
PROFIBUS DP master	103
Number of connections, max.	16
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	96
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
— Global data communication	No Yea
— 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 communication)</li> </ul>	Yes
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	6 kbyte
— Inputs, max.  — Outputs, max.  User data per DP slave	6 kbyte 6 kbyte

<ul> <li>User data per DP slave, max.</li> </ul>	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>	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	
<ul><li>— PG/OP communication</li></ul>	Yes
— Routing	Yes; with interface active
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	No
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>S7 communication, as server</li> </ul>	Yes
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	No
— 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
SIMATIC communication	
S7 routing	Yes
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	62
<ul><li>— Data length, max.</li></ul>	32 kbyte
<ul> <li>several passive connections per port, supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable
	FBs
<ul> <li>Number of connections, max.</li> </ul>	62
— Data length, max.	32 kbyte; 1 452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	62
B 1 1 "	4 470   1
— Data length, max.	1 472 byte
Web server	
Web server • supported	Yes
Web server	Yes Yes
Web server	Yes
Web server     • supported     • User-defined websites     • Number of HTTP clients  Isochronous mode	Yes Yes 5
Web server     • supported     • User-defined websites     • Number of HTTP clients  Isochronous mode  Equidistance	Yes Yes Yes
Web server  • supported • User-defined websites • Number of HTTP clients  Isochronous mode  Equidistance  Number of DP masters with isochronous mode	Yes Yes 5 Yes 2
Web server  • supported • User-defined websites • Number of HTTP clients  Isochronous mode  Equidistance  Number of DP masters with isochronous mode  User data per isochronous slave, max.	Yes Yes 5  Yes 2 244 byte
Web server  • supported • User-defined websites • Number of HTTP clients  Isochronous mode  Equidistance  Number of DP masters with isochronous mode  User data per isochronous slave, max. shortest clock pulse	Yes Yes 5  Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127
Web server  • supported • User-defined websites • Number of HTTP clients  Isochronous mode  Equidistance  Number of DP masters with isochronous mode  User data per isochronous slave, max. shortest clock pulse max. cycle	Yes Yes 5  Yes 2 244 byte
Web server  • supported • User-defined websites • Number of HTTP clients  Isochronous mode  Equidistance  Number of DP masters with isochronous mode  User data per isochronous slave, max. shortest clock pulse	Yes Yes 5  Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127

<ul> <li>Number of connectable OPs without message</li> </ul>	
	63
processing	62: When using Alarm S/SO and Alarm D/DO
<ul> <li>Number of connectable OPs with message processing</li> </ul>	63; When using Alarm_S/SQ and Alarm_D/DQ
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.  Sing of GD packets may.	16
Size of GD packets, max.	54 byte
Size of GD packet (of which consistent), max.	1 variable
S7 basic communication	·
<ul><li>supported</li></ul>	Yes
<ul> <li>User data per job, max.</li> </ul>	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
Number of simultaneous AG-SEND/AG-RECV	24/24
orders per CPU, max.	
Standard communication (FMS)	
• 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
<ul> <li>Number of functions, master/slave</li> </ul>	150
Total of all master/slave connections	4 500
Data length of all incoming connections	45 000 byte
master/slave, max.	
- Data langth of all outgoing connections	45 000 byta
Data length of all outgoing connections master/slave, max.	45 000 byte
	45 000 byte 1 000
master/slave, max.  • Number of device-internal and PROFIBUS	·
master/slave, max.  • Number of device-internal and PROFIBUS interconnections  • Data length of device-internal und PROFIBUS	1 000
master/slave, max.  • Number of device-internal and PROFIBUS interconnections  • Data length of device-internal und PROFIBUS interconnections, max.	1 000 16 000 byte
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.	1 000 16 000 byte
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission	1 000 16 000 byte 2 000 byte 200 ms; Depending on preset communication load, number of
<ul> <li>master/slave, max.</li> <li>Number of device-internal and PROFIBUS interconnections</li> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> <li>Data length per connection, max.</li> <li>Remote interconnections with acyclic transmission  — Sampling interval, min.</li> <li>Number of incoming interconnections</li> </ul>	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250
<ul> <li>master/slave, max.</li> <li>Number of device-internal and PROFIBUS interconnections</li> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> <li>Data length per connection, max.</li> <li>Remote interconnections with acyclic transmission  — Sampling interval, min.</li> <li>Number of incoming interconnections</li> </ul>	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections,	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections, max.  — Data length of all outgoing interconnections,	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250 8 000 byte
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  — Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections, max.  — Data length of all outgoing interconnections, max.  — Data length per connection, max.	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250 8 000 byte  8 000 byte
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections, max.  — Data length of all outgoing interconnections, max.	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250 8 000 byte  8 000 byte
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections, max.  — Data length of all outgoing interconnections, max.  — Data length per connection, max.  Remote interconnections with cyclic transmission  — Transmission frequency: Transmission interval, min.	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used 250 250 8 000 byte  8 000 byte  2 000 byte  1 ms; Depending on preset communication load, number of
<ul> <li>master/slave, max.</li> <li>Number of device-internal and PROFIBUS interconnections</li> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> <li>Data length per connection, max.</li> <li>Remote interconnections with acyclic transmission  <ul> <li>Sampling interval, min.</li> <li>Number of incoming interconnections</li> <li>Number of outgoing interconnections</li> <li>Data length of all incoming interconnections, max.</li> <li>Data length of all outgoing interconnections, max.</li> <li>Data length per connection, max.</li> </ul> </li> <li>Remote interconnections with cyclic transmission  <ul> <li>Transmission frequency: Transmission interval, min.</li> <li>Number of incoming interconnections</li> </ul> </li> </ul>	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used  250  250  8 000 byte  8 000 byte  1 ms; Depending on preset communication load, number of interconnections and data length used
master/slave, max.  Number of device-internal and PROFIBUS interconnections  Data length of device-internal und PROFIBUS interconnections, max.  Data length per connection, max.  Remote interconnections with acyclic transmission  — Sampling interval, min.  Number of incoming interconnections  — Number of outgoing interconnections  — Data length of all incoming interconnections, max.  — Data length of all outgoing interconnections, max.  — Data length per connection, max.  Remote interconnections with cyclic transmission  — Transmission frequency: Transmission interval, min.	1 000  16 000 byte  2 000 byte  200 ms; Depending on preset communication load, number of interconnections and data length used  250  250  8 000 byte  8 000 byte  1 ms; Depending on preset communication load, number of interconnections and data length used  300

<ul> <li>Data length of all outgoing interconnections,</li> </ul>	4 800 byte
max.	4501.4
— 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
<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
usable for OP communication	63
— reserved for OP communication	1
adjustable for OP communication, max.	0
usable for S7 basic communication	62
reserved for S7 basic communication	0
adjustable for S7 basic communication, max.	0
adjustable for S7 basic communication, max.      usable for S7 communication	62
reserved for S7 communication	0
— adjustable for S7 communication, max.	0
usable for routing	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)
	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes
Number of login stations for message functions, max.	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Number of login stations for message functions, max.  Symbol-related messages	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages  simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  • Number of instances for alarm 8 and S7	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  process control messages  Number of archives that can log on simultaneously (SFB	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages  SCAN procedure  Program alarms  Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 500 ms grid, max.	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  in 1000 ms grid, max.  Number of additional values	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 500 ms grid, max.  in 1000 ms grid, max.  with 100 ms grid, max.	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16 512 128 256 512
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  win 1000 ms grid, max.  with 100 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  with 500, 1000 ms grid, max.  Test commissioning functions	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  win 500 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  with 500, 1000 ms grid, max.  Test commissioning functions  Status block	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512  1 10  Yes; Up to 16 simultaneously
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages  Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  win 500 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  with 500, 1000 ms grid, max.  Test commissioning functions  Status block Single step	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512  1 10
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 100 ms grid, max.  with 100 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  status block Single step Number of breakpoints	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512  1 10  Yes; Up to 16 simultaneously
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  process control messages Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 1000 ms grid, max.  with 100 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  Test commissioning functions  Status block Single step Number of breakpoints  Status/control	Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512  1 10  Yes; Up to 16 simultaneously Yes 16
Number of login stations for message functions, max.  Symbol-related messages SCAN procedure Program alarms Process diagnostic messages simultaneously active Alarm-S blocks, max.  Alarm 8-blocks  Number of instances for alarm 8 and S7 communication blocks, max.  preset, max.  Process control messages Number of archives that can log on simultaneously (SFB 37 AR_SEND)  Number of messages  overall, max.  in 100 ms grid, max.  in 100 ms grid, max.  with 100 ms grid, max.  with 100 ms grid, max.  with 500, 1000 ms grid, max.  status block Single step Number of breakpoints	Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 1 200 300 Yes 16  512 128 256 512  1 10  Yes; Up to 16 simultaneously Yes

<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>	256
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	
• 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
— 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
_	1; SFC 57; per interface
— PARM_MOD	1; SFC 57; per interface 2; SFC 56; per interface
— PARM_MOD — WR_DPARM	2; SFC 56; per interface
— PARM_MOD — WR_DPARM — DPNRM_DG	2; SFC 56; per interface 8; SFC 13; per interface
— PARM_MOD  — WR_DPARM  — DPNRM_DG  — RDSYSST	2; SFC 56; per interface 8; SFC 13; per interface 8; SFC 51
— PARM_MOD — WR_DPARM — DPNRM_DG	2; SFC 56; per interface 8; SFC 13; per interface

— WRREC	8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	900 g
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