SIEMENS

Data sheet

6AG1416-3ES07-7AB0



SIPLUS S7-400 CPU 416-3 PN/DP based on 6ES7416-3ES07-0AB0 with conformal coating, -25...+70 °C, central processing unit with: work memory 16 MB, (8 MB code, 8 MB data), interfaces 1st interface MPI/DP 12 Mbps, (X1), 2nd interface ETHERNET/PROFINET (X5) 3rd interface IF 964-DP plug-in (IF1)

Figure similar

General information	
Product type designation	CPU 416-3 PN/DP
HW functional status	01
Firmware version	V7.0
based on	6ES7416-3ES07-0AB0
Product function	
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
 Programming package 	STEP 7 V5.5 or higher with HSP 262
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	10 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.3 A
from backplane bus 5 V DC, max.	1.6 A
from backplane bus 24 V DC, max.	300 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	6.5 W
Memory	
Type of memory	RAM
Work memory	
integrated	16 Mbyte
integrated (for program)	8 Mbyte
integrated (for data)	8 Mbyte
expandable	No
Load memory	
 expandable FEPROM 	Yes; with Memory Card (FLASH)
 expandable FEPROM, max. 	64 Mbyte
integrated RAM, max.	1 Mbyte
expandable RAM	Yes; with Memory Card (RAM)
expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
with battery	Yes; all data
without battery	No
Battery	

Backup battery	
Backup current, typ.	180 µA; up to 40 °C
Backup current, max.	850 µA
Backup time, max.	Dealt with in the module data manual with the secondary conditions and the factors of influence
 Feeding of external backup voltage to CPU 	5 V DC to 15 V DC
PU 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
PU-blocks	
DB	
Number, max.	10 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
Number, max.	5 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	V
Number, max. Size may	5 000; Number range: 0 to 7999
• Size, max.	64 kbyte
OB Number may	see instruction list
Number, max. Size may	see instruction list 64 kbyte
Size, max.Number of free cycle OBs	1; OB 1
Number of time alarm OBs	8; OB 10-17
Number of time alarm OBs Number of delay alarm OBs	4; OB 20-23
Number of cyclic interrupt OBs	9; OB 30-38 (shortest cycle that can be set = 500 μs)
Number of cyclic interrupt OBs Number of process alarm OBs	8; OB 40-47
Number of DPV1 alarm OBs	3; OB 55-57
Number of isochronous mode OBs	4; OB 61-64
Number of isocial foliation in the control of isocial foliati	1; OB 60
Number of matternipuling OBs Number of background OBs	1; OB 90
Number of startup OBs	3; OB 100-102
Number of startap GBs Number of asynchronous error OBs	9; OB 80-88
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	<u> </u>
per priority class	24
additional within an error OB	2
ounters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	0.010
Number Potentials	2 048
Retentivity	V
— adjustable	Yes
— preset	No times retentive
Time range	10 mg
— lower limit	10 ms
— upper limit IEC timer	9 990 s

a present	Voc
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
Flag	40 lbs to 0ing of hit many and done
Size, max. Determinists available.	16 kbyte; Size of bit memory address area
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories Local data	8; in 1 memory byte
	22 khyta
adjustable, max.	32 kbyte
preset Address area	16 kbyte
I/O address area	16 kbyte
• Inputs	
Outputs Process image.	16 kbyte
Process image • Inputs, adjustable	16 kbyte
Outputs, adjustable	16 kbyte
Inputs, default	512 byte
Outputs, default	512 byte
consistent data, max.	244 byte
Access to consistent data in process image	Yes
Subprocess images	100
Number of subprocess images, max.	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
Hardware configuration	
Number of expansion units, max.	21
connectable OPs	95
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	
 Number of connectable IMs (total), max. 	6
 Number of connectable IM 460s, max. 	6
Number of connectable IM 463s, max.	4; IM 463-2
Number of DP masters	
• integrated	1
• via CP	10; CP 443-5 Extended
• via IM 467	4
 Mixed mode IM + CP permitted 	No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode
via interface module	1; IF 964-DP
Number of pluggable S5 modules (via adapter capsule in	6
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 or number of connections
• CP, PtP	CP 440: Limited by number of slots; CP 441: Limited by number of slots and
- DDOCIDUO and Etherman OD-	number of connections
PROFIBUS and Ethernet CPs	14; In total max. 10 CPs as DP master and PROFINET controller, of which up

	to 10 IMa or CDa on DD master and up to 4 CDa on DDOCINET controller
Slots	to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller
required slots	2
Fime of day	
Clock	
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Resolution	1 ms
Deviation per day (buffered), max.	1.7 s; Power off
Deviation per day (unbuffered), max.	8.6 s; For power On
Operating hours counter	
Number	16
Number/Number range	0 to 15
Range of values	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours
Granularity	1 h
• retentive	Yes
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• on MPI, device	Yes
• to DP, master	Yes
• on DP, device	Yes
• in AS, master	Yes
• in AS, device	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
nterfaces	
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-
Trainbor of outer interfaces	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 device	Yes
MPI	
Number of connections	44; 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.	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
max. number of DP devices	32
manifest of DI dolloo	

Conjecc	
Services	Von
— PG/OP communication	Yes S7 routing
— Routing	Yes; S7 routing
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
 — S7 communication, as client 	Yes
 S7 communication, as server 	Yes
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	Yes
 activation/deactivation of DP devices 	Yes
Direct data exchange (slave-to-slave	Yes
communication) — DPV1	Yes
	res
Address area	2 leberto
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP device	244 byte
— user data per DP device, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
1st interface / PROFIBUS DP device / header	
Number of connections	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
 Transmission rate, max. 	12 Mbit/s
 automatic baud rate search 	No
 Address area, max. 	32; Virtual slots
 User data per address area, max. 	32 byte
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes; with interface active
— Routing	Yes; with interface active
 Global data communication 	No
 S7 basic communication 	No
— S7 communication	Yes
 S7 communication, as client 	Yes
 S7 communication, as server 	Yes
 Direct data exchange (slave-to-slave 	No
communication)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
2. Interface	
Interface type	PROFINET
Interface type Isolated	Yes
Isolated automatic detection of transmission rate	Yes Yes; Autosensing
Isolated	Yes Yes; Autosensing Yes
Isolated automatic detection of transmission rate	Yes Yes; Autosensing Yes Yes
Isolated automatic detection of transmission rate Autonegotiation	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported	Yes Yes; Autosensing Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF"
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet)	Yes Yes; Autosensing Yes Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports	Yes Yes; Autosensing Yes Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes 2
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types RJ 45 (Ethernet) Number of ports integrated switch	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes 2 Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes 2 Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	Yes Yes; Autosensing Yes Yes Yes Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF" Yes 2 Yes

PROFIBUS DP master	No
PROFIBUS DP device	No
Open IE communication	Yes
Web server	Yes
Point-to-point connection	No
Media redundancy	Yes
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 communication	Yes
— Isochronous mode	Yes; Only with IRT and the High Performance option
— Shared device	Yes
 Prioritized startup 	Yes
 Number of IO devices with prioritized startup, max. 	32
 Number of connectable IO Devices, max. 	256
 Of which IO devices with IRT, max. 	64
— of which in line, max.	64
 Number of IO Devices with IRT and the option "high flexibility" 	256
— of which in line, max.	61
 Number of connectable IO Devices for RT, max. 	256
— of which in line, max.	256
 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 IO Devices changing during operation (partner ports), supported 	Yes
 Number of IO Devices per tool, max. 	8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO Devices changing during operation (partner ports) are supported
Device replacement without swap medium	Yes
— Send cycles	250 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
— S7 communication	Yes
— Isochronous mode	No
— IRT	Yes
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
— User data per submodule, max.	1 024 byte
PROFINET CBA	
acyclic transmission	Yes
•	Yes
cyclic transmission	
cyclic transmission Open IE communication	
	94
Open IE communication	

. 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	
• MPI	No
PROFIBUS DP master	Yes
PROFIBUS DP device	Yes
PROFIBUS DP master	
Number of connections, max.	32
Transmission rate, max.	12 Mbit/s
max. number of DP devices	125
Services	120
	Voc
— PG/OP communication	Yes You S7 routing
— Routing	Yes; S7 routing
— Global data communication	No
 S7 basic communication 	Yes
— S7 communication	Yes
 S7 communication, as client 	Yes
 S7 communication, as server 	Yes
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	Yes
 activation/deactivation of DP devices 	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 device	·
— user data per DP device, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
3rd interface / PROFIBUS DP device / header	20
 number of possible connections / at the 3rd interface / as DP slave 	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
transfer rate / at the 3rd interface / as DP slave /	12 Mbit/s
maximum	12 minus
automatic baud rate search	No
Address area, max.	32; Virtual slots
data volume / at the 3rd interface / as DP slave / as user data per address range / maximum	32 byte
— data volume / at the 3rd interface / as DP slave / as consistent reference data per address range / maximum	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes; with interface active
Global data communication	No
— S7 basic communication	No V
— S7 communication	Yes
 — S7 communication, as client 	Yes
 S7 communication, as server 	Yes

Direct data exchange (slave-to-slave	No
communication)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Protocols	
Redundancy mode	
Media redundancy	
 Switchover time on line break, typ. 	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
Number of connections, max.	94
— Data length, max.	32 kbyte
 several passive connections per port, supported 	Yes
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
Number of connections, max.	94
— Data length, max.	32 kbyte; 1 452 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
 User-defined websites 	Yes
Number of HTTP clients	5
Isochronous mode	
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
shortest clock pulse max. cycle	1 ms; 0.5 ms without use of SFC 126, 127 32 ms
shortest clock pulse max. cycle communication functions / header	32 ms
shortest clock pulse max. cycle communication functions / header PG/OP communication	32 ms Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing	32 ms Yes 95
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing	32 ms Yes 95
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte
shortest clock pulse max. cycle communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. S7 basic communication supported User data per job, max. User data per job (of which consistent), max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • as server • as client	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packets, max. Size of GD packet (of which consistent), max. S7 basic communication supported User data per job, max. User data per job (of which consistent), max. S7 communication supported as server as client User data per job, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes Yes Yes Yes Yes Yes Yes
shortest clock pulse max. cycle communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packets, max. Size of GD packet (of which consistent), max. S7 basic communication supported User data per job, max. User data per job (of which consistent), max. S7 communication supported as server as client User data per job, max. User data per job (of which consistent), max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Number of connectable OPs with message processing Data record routing Global data communication supported Number of GD loops, max. Number of GD packets, transmitter, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. S7 basic communication supported User data per job, max. User data per job (of which consistent), max. S7 communication supported as server as client User data per job, max. User data per job (of which consistent), max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes Yes 462 byte; 1 variable
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • as server • as client • User data per job, max. • User data per job (of which consistent), max. S5 compatible communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes Yes Yes Yes Yes Yes Yes Yes Yes Y
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • as server • as client • User data per job, max. • User data per job (of which consistent), max. S5 compatible communication • supported • User data per job, max. • User data per job, max. • User data per job, max.	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes Yes 462 byte; 1 variable Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5 8 kbyte
shortest clock pulse max. cycle communication functions / header PG/OP communication • Number of connectable OPs without message processing • Number of connectable OPs with message processing Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • as server • as client • User data per job, max. • User data per job (of which consistent), max. S5 compatible communication • supported	Yes 95 95; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes 16 16 32 54 byte 1 variable Yes 76 byte 1 variable Yes Yes Yes Yes Yes Yes Yes Yes Yes Y

CPU, max.	
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
communication functions / PROFINET CBA (with set target commu	nication load) / header
Setpoint for the CPU communication load	20 %
Number of remote interconnection partners	32
number of master/device functions	150
total of all master/device connections	6 000
 data length of all incoming master/device connections, max. 	65 000 byte
 data length of all outgoing master/device connections, max. 	65 000 byte
 Number of device-internal and PROFIBUS interconnections 	1 000
 Data length of device-internal und PROFIBUS interconnections, max. 	16 000 byte
Data length per connection, max.	2 000 byte
performance data / PROFINET CBA / remote interconnection /	with acyclic transfer / header
— Sampling interval, min.	200 ms; Depending on preset communication load, number of interconnections and data length used
 Number of incoming interconnections 	500
 Number of outgoing interconnections 	500
 Data length of all incoming interconnections, max. 	16 000 byte
 Data length of all outgoing interconnections, max. 	16 000 byte
 — data volume / as user data for remote interconnections / in the case of acyclic transmission / with PROFINET CBA / per connection / maximum 	2 000 byte
performance data / PROFINET CBA / remote interconnection /	with cyclic transfer / header
Transmission frequency: Transmission interval, min.	1 ms; Depending on preset communication load, number of interconnections
	and data length used 300
Number of incoming interconnections	300
Number of outgoing interconnections	
— Data length of all incoming interconnections, max.	4 800 byte
Data length of all outgoing interconnections, max.	4 800 byte
 — data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum 	450 byte
performance data / PROFINET CBA / HMI variables via PROF	INET / acyclic / header
 Number of stations that can log on for HMI variables (PN OPC/iMap) 	2x PN OPC/1x iMap
 HMI variable updating 	500 ms
 Number of HMI variables 	1 500
 Data length of all HMI variables, max. 	48 000 byte
performance data / PROFINET CBA / PROFIBUS proxy function	onality / header
— supported	Yes; 32 PROFIBUS slaves max. connectable
Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
overall	96
usable for PG communication	95
— reserved for PG communication	1
— adjustable for PG communication, max.	0
usable for OP communication	95
— reserved for OP communication	1
adjustable for OP communication, max.	0
usable for S7 basic communication	94
reserved for S7 basic communication	0
adjustable for S7 basic communication, max.	0
usable for S7 communication	94
usable for S7 communication reserved for S7 communication	0
— adjustable for S7 communication, max.	0
usable for routing	47
— reserved for routing	0
— adjustable for routing, max.	0
67 message functions	

Number of login stations for message functions, max.	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes
SCAN procedure	Yes
Program alarms	Yes
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks
Alarm 8-blocks	Yes
 Number of instances for alarm 8 and S7 communication blocks, max. 	4 000
• preset, max.	600
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	32
Number of messages	
• overall, max.	1 024
• in 100 ms grid, max.	128
• in 500 ms grid, max.	512
• in 1000 ms grid, max.	1 024
Number of additional values	
• with 100 ms grid, max.	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	ro, otatuo/control
• Forcing	Yes
Forcing, variables	Inputs/outputs, bit memories, distributed I/Os
Number of variables, max.	512
Diagnostic buffer	JIE .
	Yes
presentNumber of entries, max.	
	3 200
— adjustable	Yes
— preset	120
Service data	· ·
• can be read out	Yes
Standards, approvals, certificates	
CE mark	Yes
EAC (formerly Gost-R)	Yes
Ambient conditions	
Ambient temperature during operation	
● min.	-25 °C; = Tmin
• max.	70 °C; = Tmax
Altitude during operation relating to sea level	
and the second s	
 Installation altitude above sea level, max. 	5 000 m
 Installation altitude above sea level, max. Ambient air temperature-barometric pressure-altitude 	
	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tma: -10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K)
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K)
Ambient air temperature-barometric pressure-altitude Relative humidity With condensation, tested in accordance with IEC 60068-	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m) 100 %; RH incl. condensation / frost (no commissioning in bedewed state),
Ambient air temperature-barometric pressure-altitude Relative humidity With condensation, tested in accordance with IEC 60068-2-38, max.	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m) 100 %; RH incl. condensation / frost (no commissioning in bedewed state),
Ambient air temperature-barometric pressure-altitude Relative humidity With condensation, tested in accordance with IEC 60068-2-38, max. Resistance	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m) 100 %; RH incl. condensation / frost (no commissioning in bedewed state),
Ambient air temperature-barometric pressure-altitude Relative humidity With condensation, tested in accordance with IEC 60068-2-38, max. Resistance Use in stationary industrial systems — to biologically active substances according to EN	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax -10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m) 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna);

60721-3-3	
Use on ships/at sea	
to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
 to mechanically active substances according to EN 60721-3-6 	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
 Against chemically active substances acc. to EN 60654-4 	Yes; Class 3 (excluding trichlorethylene)
 Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
 Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
 Protection against fouling acc. to EN 60664-3 	Yes; Type 1 protection
Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC- CC-830A 	Yes; Conformal coating, Class A
configuration / header	
Configuration software	
• STEP 7	Yes
configuration / programming / header	
Command set	see instruction list
Nesting levels	7
Access to consistent data in process image	Yes
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
configuration / programming / number of simultaneously active	e SFC / header
— DPSYC_FR	2; SFC 11; per interface
— D_ACT_DP	8; SFC 12; per interface
— RD_REC	8; SFC 59; per interface
— WR_REC	8; SFC 58; per interface
— WR_PARM	8; SFC 55; per interface
— PARM_MOD	1; SFC 57; per interface
— WR_DPARM	2; SFC 56; per interface
— DPNRM_DG	8; SFC 13; per interface
— RDSYSST	8; SFC 51
— DP_TOPOL	1; SFC 103; per interface
configuration / programming / number of simultaneously active	·
— RDREC	8; SFB 52; per interface, but not more than 32 across all external interfaces
— WRREC	8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
•	

Weights	
Weight, approx.	900 g
last modified:	5/29/2024 🗗