Data sheet

6ES7416-5HS06-0AB0



SIMATIC S7-400H, CPU 416-5H, central processing unit for S7-400H and S7-400F/FH, 5 interfaces: 1x MPI/DP, 1x DP, 1x PN and 2 for sync modules, 16 MB memory (10 MB data/6 MB program)

General information	
Product type designation	CPU 416-5H PN/DP
HW functional status	1
Firmware version	V6.0
Product function	
Isochronous mode	No
Engineering with	
Programming package	As of STEP 7 V5.5 SP2 with HF1
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	0 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.6 A
from backplane bus 5 V DC, max.	1.9 A
from backplane bus 24 V DC, max.	150 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	7.5 W
Memory	
Type of memory	RAM
Work memory	
• integrated	16 Mbyte
integrated (for program)	6 Mbyte
integrated (for data)	10 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
expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
with battery	Yes; all data
without battery	No
Battery	
Backup battery	
 Backup current, typ. 	180 μA; Valid up to 40°C

 Backup current, max. 	1 000 μΑ
 Backup time, max. 	Dealt with in the module data manual with the secondary conditions and the factors of influence
 Feeding of external backup voltage to CPU 	5 V DC to 15 V DC
CPU processing times	3 V DO 10 10 V DO
for bit operations, typ.	12.5 ns
for word operations, typ.	12.5 ns
for fixed point arithmetic, typ.	12.5 ns
for floating point arithmetic, typ.	25 ns
CPU-blocks	20110
DB	
Number, max.	16 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	OH RDYIC
Number, max.	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	OH NOYLO
Number, max.	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
Number, max.	see instruction list
• Size, max.	64 kbyte
Number of free cycle OBs	1; OB 1
Number of fine alarm OBs	8; OB 10-17
Number of delay alarm OBs	4; OB 20-23
Number of cyclic interrupt OBs	9; OB 30-38
Number of process alarm OBs	8; OB 40-47
Number of DPV1 alarm OBs	3; OB 55-57
Number of startup OBs	2; OB 100, 102
Number of asynchronous error OBs	9; OB 80-88
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
per priority class	24
additional within an error OB	2
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
-	
— aujusiable	Yes
— adjustable — lower limit	Yes 0
•	
— lower limit	0
— lower limit— upper limit	0 2 047
— lower limit— upper limit— preset	0 2 047
lower limit upper limit preset Counting range	0 2 047 Z 0 to Z 7
lower limit upper limit preset Counting range lower limit	0 2 047 Z 0 to Z 7
lower limit upper limit preset Counting range lower limit upper limit	0 2 047 Z 0 to Z 7
lower limit upper limit preset Counting range lower limit upper limit IEC counter	0 2 047 Z 0 to Z 7 0 999
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter ● present	0 2 047 Z 0 to Z 7 0 999
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type	0 2 047 Z 0 to Z 7 0 999 Yes SFB
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number	0 2 047 Z 0 to Z 7 0 999 Yes SFB
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity)
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity)
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable — lower limit	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable — lower limit — upper limit	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0 2 047
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable — lower limit — upper limit — upper limit — upper limit — preset	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0 2 047
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable — lower limit — upper limit — upper limit — preset Time range	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0 2 047 No times retentive
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable — lower limit — upper limit — upper limit — upper limit — preset Time range — lower limit	0 2 047 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0 2 047 No times retentive

Number Number Control teachers and their retentivity Retentive data area fired times, counters, flags), max. Retentive data area fired times, counters, flags), max. Retentively available Retentively available Retentively preset All to 184 byte Retentively preset Retentively p	• Type	SFB
Retentive data area (ind. timers, counters, flags), max. Flore data (ind. timers) Flore		
Reterribre data area (incl. timers, counters, flags), max. Total working and load memory (with backup battery)		Chiminod (minod only by 10 an outputity)
Flag Size, max Federativity preset Mis 16 384 byte Retentivity preset Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 15 Number of Lock memories Mis 10 to Mis 10		Total working and load memory (with backup battery)
1924 byte		Total Horning and load monory (War backap backery)
Retentivity preset Retentivity Ret	-	16 384 byte
Relativity preset Number of clock memories Relativity preset Address area Outputs		
Number of clock memories	•	MB 0 to MB 15
Address area	• •	8; in 1 memory byte
Address area	Local data	
Address area ID address area Inputs 16 kbyte 1	adjustable, max.	64 kbyte
Figure F	• preset	32 kbyte
• Inputs	Address area	
	I/O address area	
Process image	• Inputs	16 kbyte
Inputs, adjustable 16 kbyte	Outputs	16 kbyte
Outputs, adjustable inputs, default inputs	Process image	
Inputs, default Outputs, default Outputs, default Outputs, default Outputs, default Outputs Outp	 Inputs, adjustable 	16 kbyte
Outputs, default	 Outputs, adjustable 	16 kbyte
Consistent data, max. Access to consistent data in process image Subprocess images Number of subprocess images, max. Inputs Inputs Outputs Ou	• Inputs, default	1 024 byte
Access to consistent data in process image Number of subprocess images, max. Is Digital channels Inputs Outputs Outputs Inputs	 Outputs, default 	1 024 byte
Subprocess images Number of subprocess images, max. Is Inputs	• consistent data, max.	244 byte
Number of subprocess images, max. Digital channels	Access to consistent data in process image	Yes
Inputs	Subprocess images	
Inputs		15
Outputs 131 072 Outputs 131 072 Analog channels Inputs 8 192 Outputs 8 192 Hardware configuration Number of expansion units, max. 21 connectable OPs 95 Multicomputing No Interface modules Number of connectable IM 460s, max. 6 Number of connectable IM 460s, max. 4; Single mode only Number of DP masters integrated 2 via CP 10; CP 443-5 Extended No Number of IC Controllers integrated 0 via CP 10; CP 443-5 Extended No via interface module 0 Number of IC Controllers integrated 1 via CP 0 No Number of IC Controllers integrated 1 via CP 0 No Number of IC Controllers integrated 1 via CP 0 No See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master Stots required slots 2 Time of day	Digital channels	
Outputs		
Analog channels Inputs 8 192 — of which central 8 192 — Outputs 8 192 — of which central 8 192 — Outputs 8 192 — of which central 8 192 — of which central 8 192 — of which central 8 192 — the provided of expansion units, max. 21 connectable OPs 95 Multicomputing No Interface modules • Number of connectable IMs (total), max. 6 • Number of connectable IMs (total), max. 6 • Number of connectable IM 460s, max. 4; Single mode only Number of DP masters • integrated 2 • via CP 10; CP 443-5 Extended • via interface module No • via interface module 1D 0 Number of IO Controllers • integrated 1 • via CP 0 Number of Operable FMs and CPs (recommended) • FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master Time of day	— of which central	
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- of which central 8 192 Outputs 8 192 - of which central 8 192 - of which central 8 192 Hardware configuration Number of expansion units, max. 21 connectable OPs 95 Multicomputing No Interface modules • Number of connectable IMs (total), max. 6 • Number of connectable IM 460s, max. 4; Single mode only Number of DP masters • integrated 2 • via CP 10; CP 443-5 Extended • via interface module 0 Number of IO Controllers • integrated 0 • wia interface module 0 Number of IO Controllers • integrated 1 • via CP 0 Number of IO Controllers • integrated 1 • via CP 0 Number of IO Controllers • integrated 1 • via CP 0 Number of operable FMs and CPs (recommended) • FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • CP, PtP See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master Slots • required slots 2 Time of day		0.400
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Hardware configuration Number of expansion units, max. 21 connectable OPs 95 Multicomputing Interface modules • Number of connectable IMs (total), max. • Number of connectable IM 460s, max. • Number of connectable IM 463s, max. • Number of connectable IM 463s, max. • Number of DP masters • integrated • via CP • Mixed mode IM + CP permitted • via interface module • Mixed mode IM + CP permitted • via interface module • Integrated • via CP • Mixed mode IM + CP permitted • via interface module • Number of ID controllers • integrated • via CP • O Number of operable FMs and CPs (recommended) • FM • See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master Time of day		
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number of slots and number of connections • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master Slots • required slots 2 Time of day		
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• required slots 2 Time of day		THE OF WHICH HIGH. TO OF AS DE HIGSTOR
Time of day		2
	·	

 Hardware clock (real-time) 	
	Yes
retentive and synchronizable	Yes
Resolution	1 ms
Deviation per day (buffered), max. Periodical and day (sub-ffered), max.	1.7 s; Power off
Deviation per day (unbuffered), max.	8.6 s; Power on
Operating hours counter • Number	16
	0 to 15
Number/Number range Pagga of values	
Range of valuesGranularity	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2 ³ 1 - 1 hours 1 h
retentive	Yes
Clock synchronization	165
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes; As client
Time difference in system when synchronizing via	100,710 0.001
• Ethernet, max.	10 ms; Via NTP
• MPI, max.	200 ms
Interfaces	
Number of RS 485 interfaces	2
Number of other interfaces	2; Fiber-optic interface
Optical interface	No
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	No
	No
PROFIBUS DP slave	44; If a diagnostics repeater is used on the line, the number of connection
PROFIBUS DP slave 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
PROFIBUS DP slave MPI Number of connections Transmission rate, max.	44; If a diagnostics repeater is used on the line, the number of connection
 PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services 	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes Yes Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes Yes Yes Yes Yes Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max.	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max.	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max. Number of DP slaves, max.	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max. Number of DP slaves, max. Services	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max. Number of DP slaves, max. Services — PG/OP communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max. Number of DP slaves, max. Services — PG/OP communication — Routing	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes Yes Yes Yes Yes Yes Yes Yes 32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s 32 Yes Yes
PROFIBUS DP slave MPI Number of connections Transmission rate, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server PROFIBUS DP master Number of connections, max. Transmission rate, max. Number of DP slaves, max. Services — PG/OP communication — Routing — Global data communication	44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes No No Yes

 S7 communication, as server 	Yes
— Equidistance	No
— Isochronous mode	No
— SYNC/FREEZE	No
Activation/deactivation of DP slaves	No
 Direct data exchange (slave-to-slave communication) 	No
— DPV1	Yes
Address area	100
— 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	No configuration of CPU as DP slave
2. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	No
Number of connection resources	96
Interface types	
• RJ 45 (Ethernet)	Yes
 Number of ports 	2
integrated switch	Yes
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	No
PROFINET CBA	No
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes
Web server	No
Point-to-point connection	No
Media redundancy	Yes
PROFINET IO Controller	400 M %
Transmission rate, max.	100 Mbit/s
Services	Voc
— PG/OP communication	Yes
— S7 communication	Yes
— Isochronous mode	No Voc: Single made only
— Shared device	Yes; Single mode only
— Prioritized startup	No
Number of connectable IO Devices, max.	256; In redundant mode via both interfaces 256
— Number of connectable IO Devices for RT, max.— of which in line, max.	256
Of which in line, max. Activation/deactivation of IO Devices	No
— Activation/deactivation of IO Devices — IO Devices changing during operation (partner)	No
ports), supported	NO
Device replacement without swap medium	Yes
— Send cycles	250 μs, 500 μs, 1 ms, 2 ms, 4 ms
— Updating time	250 µs to 512 ms, minimum value depends on the number of configured user
A.I.	data and the configured single or redundant mode
Address area	Olibuda
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte

User data consistency, max.	1 024 byte
Open IE communication	1 VZT Dylc
Number of connections, max.	94
Local port numbers used at the system end	0, 20, 21, 25, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
3. Interface	
Interface type	PROFIBUS DP
Number of connection resources	32
Interface types	
• RS 485	Yes
Output current of the interface, max.	150 mA
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
PROFIBUS DP master	
Number of connections, max.	32
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	125
Services	
— PG/OP communication	Yes
— Routing	Yes
Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
 S7 communication, as client 	Yes
— S7 communication, as server	Yes
— Equidistance	No
Isochronous mode	No
— SYNC/FREEZE	No
 Activation/deactivation of DP slaves 	No
Direct data exchange (slave-to-slave)	No
communication)	
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
 User data per DP slave, max. 	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0
5. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0
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	No
Isochronous mode	
Equidistance	No
communication functions / header	
PG/OP communication	Yes
 Number of connectable OPs without message processing 	95
 Number of connectable OPs with message processing 	95; When using Alarm_S/SQ and Alarm_D/DQ
Data record routing	Yes
Global data communication	
• supported	No
S7 basic communication	
communication function / S7 basic communication	No
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
User data per job, max.	64 kbyte
 User data per job (of which consistent), max. 	462 byte; 1 variable
S5 compatible communication	
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)
User data per job, max.	8 kbyte
 User data per job (of which consistent), max. 	240 byte
Number of simultaneous AG-SEND/AG-RECV orders per	64/64
CPU, max.	
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	
• overall	96
 usable for PG communication 	
 reserved for PG communication 	1
 adjustable for PG communication, max. 	0
 usable for OP communication 	
 reserved for OP communication 	1
 adjustable for OP communication, max. 	0
 usable for S7 basic communication 	
 reserved for S7 basic communication 	0
 adjustable for S7 basic communication, max. 	0
 usable for S7 communication 	
 reserved for S7 communication 	0
 adjustable for S7 communication, max. 	0
 usable for routing 	
 reserved for routing 	0
adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	No
SCAN procedure	No
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 	10 000

blocks, max.	
• preset, max.	1 200
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	64
Test commissioning functions	
Status block	Yes
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
Forcing	
• Forcing	Yes
Forcing, variables	Inputs/outputs, bit memories, distributed I/Os
 Number of variables, max. 	512
Diagnostic buffer	
• present	Yes
Number of entries, max.	3 200
— adjustable	Yes
— preset	120
Service data	
• can be read out	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
 Limit class A, for use in industrial areas 	Yes
 Limit class B, for use in residential areas 	No
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 	Von
	Yes
System functions (SFC)	see instruction list
System functions (SFC)	see instruction list
System functions (SFC)System function blocks (SFB)	see instruction list
System functions (SFC)System function blocks (SFB)Programming language	see instruction list see instruction list
 System functions (SFC) System function blocks (SFB) Programming language LAD 	see instruction list see instruction list Yes
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD 	see instruction list see instruction list Yes Yes
 System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL 	see instruction list see instruction list Yes Yes Yes
 System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL 	see instruction list see instruction list Yes Yes Yes Yes Yes
 System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC 	see instruction list see instruction list Yes Yes Yes Yes Yes Yes
 System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC GRAPH 	see instruction list see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes
System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC GRAPH HiGraph® configuration / programming / number of simultaneously active — RD_REC	see instruction list see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes
System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active.	see instruction list see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC GRAPH HiGraph® configuration / programming / number of simultaneously active — RD_REC WR_REC WR_PARM	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header 8 8
System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC GRAPH HiGraph® configuration / programming / number of simultaneously active — RD_REC WR_REC WR_PARM	see instruction list see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A Sec SFC / header 8 8 8
● System functions (SFC) ● System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG	see instruction list see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A SFC / header 8 8 8 8 1
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A B B B B B B B B B B B B B B B B B B B
● System functions (SFC) ● System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
 System functions (SFC) System function blocks (SFB) Programming language LAD FBD STL SCL CFC GRAPH HiGraph® configuration / programming / number of simultaneously active RD_REC WR_REC WR_PARM PARM_MOD WR_DPARM DPNRM_DG RDSYSST 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG — RDSYSST — DP_TOPOL configuration / programming / number of simultaneously active — RDREC 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG — RDSYSST — DP_TOPOL configuration / programming / number of simultaneously active 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG — RDSYSST — DP_TOPOL configuration / programming / number of simultaneously active — RDREC — WRREC Know-how protection 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG — RDSYSST — DP_TOPOL configuration / programming / number of simultaneously active — RDREC — WRREC Know-how protection ■ User program protection/password protection 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header 8 8 8 1 2 8 8 1 2 8 8 8 1 Yes Yes
 System functions (SFC) System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph® configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD — WR_DPARM — DPNRM_DG — RDSYSST — DP_TOPOL configuration / programming / number of simultaneously active — RDREC — WRREC Know-how protection 	see instruction list Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header 8 8 8 1 2 8 8 1 2 8 8 8 1 8 8 8 8 8 8

Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	995 g

last modified: 9/7/2023 🖸