SIEMENS

Data sheet

6ES7416-2FN05-0AB0

SIMATIC S7-400, CPU 416F-2, Central processing unit with: Work memory 5.6 MB, (2.8 MB code, 2.8 MB data), 1st interface MPI/DP 12 Mbit/s, 2nd interface PROFIBUS DP, Can be used with software package Distributed Safety as of V5.2+SP2



Figure similar

General information	
Product type designation	CPU 416F-2
HW functional status	03
Firmware version	V5.3
Engineering with	
 Programming package 	STEP 7 V5.3 SP2 or higher with hardware update, Distributed Safety V5.2 SP2 or higher
CiR – Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	10 µs
Supply voltage	
Rated value (DC)	
• 24 V DC	No; Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	0.9 A
from backplane bus 5 V DC, max.	1.1 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.	4.5 W
Power loss, max.	5 W
Memory	
Type of memory	other
Work memory	
• integrated	5.6 Mbyte
 integrated (for program) 	2.8 Mbyte
• integrated (for data)	2.8 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. 	125 μA; up to 40 °C
 Backup current, max. 	550 μΑ
• Backup time, max.	See reference manual, module data, Chapter 3.3
 Feeding of external backup voltage to CPU 	5 V DC to 15 V DC
CPU processing times	
for bit operations, typ.	30 ns
for word operations, typ.	30 ns
for fixed point arithmetic, typ.	30 ns
for floating point arithmetic, typ.	90 ns
CPU-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	
 Number, max. 	5 000; 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 time alarm OBs 	8; OB 10-17
 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 μ s)
 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 multicomputing OBs 	1; OB 60
 Number of background OBs 	1; OB 90
 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	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Туре	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
	0

— upper limit	2 047
— preset	No times retentive
•	
Time range	10 ms
— lower limit	9 990 s
— upper limit IEC timer	9 990 2
	Yes
• present	
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	Total working and load memory (with backup battery)
Flag	
• Number, max.	16 kbyte; Size of bit memory address area
 Retentivity available 	Yes
Retentivity preset	MB 0 to MB 15
 Number of clock memories 	8; in 1 memory byte
Local data	
• adjustable, max.	32 kbyte
• preset	16 kbyte
Address area	
I/O address area	
Inputs	16 kbyte
Outputs	16 kbyte
of which distributed	
— MPI/DP interface, inputs	2 kbyte
	· J · -
— MPI/DP interface outputs	2 kbyte
— MPI/DP interface, outputs	2 kbyte 8 kbyte
— DP interface, inputs	8 kbyte
 DP interface, inputs DP interface, outputs 	
— DP interface, inputs — DP interface, outputs Process image	8 kbyte 8 kbyte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable 	8 kbyte 8 kbyte 16 kbyte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable 	8 kbyte 8 kbyte 16 kbyte 16 kbyte
 — DP interface, inputs — DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image Subprocess images	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte Yes
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image Subprocess images Number of subprocess images, max. 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image Subprocess images Number of subprocess images, max. 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte Yes 15
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image Subprocess images Number of subprocess images, max. Digital channels Inputs 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte Yes 15 131 072
 DP interface, inputs DP interface, outputs Process image Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default consistent data, max. Access to consistent data in process image Subprocess images Number of subprocess images, max. 	8 kbyte 8 kbyte 16 kbyte 16 kbyte 512 byte 512 byte 244 byte Yes 15

— 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	63
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	2
• via CP	10; CP 443-5 Extended
● via IM 467	4
 Mixed mode IM + CP permitted 	No; IM 467 not suitable for use with CP 443-5 Ext. and CP 443-1 EX4x, EX20, GX20 (in PROFINET IO mode)
• via interface module	0
 Number of pluggable S5 modules (via adapter capsule in central device), max. 	6
Number of IO Controllers	
integrated	0
• via CP	4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller
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 connections
 PROFIBUS and Ethernet CPs 	14; Of which 10 CPs max. or IMs as DP master, 4 PROFINET controller maximum
Slots	
• required slots	1
Time 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
• to MPI, slave	Yes
• to DP, master	Yes
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
 on Ethernet via NTP 	No; Via CP
• to IF 964 DP	No
Time difference in system when synchronizing via	
• MPI, max.	200 ms
1.1. 6	
Interfaces Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP
1. Interface	
Interface type	Integrated
Physics	RS 485 / PROFIBUS + MPI
Isolated	Yes
Isolated Power supply to interface (15 to 30 V DC), max.	Yes 150 mA
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources	Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols	Yes 150 mA MPI: 44, DP: 32
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI	Yes 150 mA MPI: 44, DP: 32 Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master	Yes 150 mA MPI: 44, DP: 32 Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave	Yes 150 mA MPI: 44, DP: 32 Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave	Yes 150 mA MPI: 44, DP: 32 Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max.	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services — PG/OP communication	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services — PG/OP communication — Routing	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services — PG/OP communication — Routing — Global data communication	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes Yes Yes
Isolated Power supply to interface (15 to 30 V DC), max. Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave MPI • Number of connections • Transmission rate, max. Services - PG/OP communication - Routing - Global data communication - S7 basic communication	Yes 150 mA MPI: 44, DP: 32 Yes Yes Yes 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s Yes Yes Yes Yes Yes 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
 Number of DP slaves, max. 	32
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes
- SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
 — Direct data exchange (slave-to-slave communication) 	Yes
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	
Number of connections	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
— S7 routing	Yes; with interface active
— Global data communication	No

— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
 — Direct data exchange (slave-to-slave communication) 	No
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte

2. Interface			
Interface type	Integrated		
Physics	RS 485 / PROFIBUS		
Isolated	Yes		
Power supply to interface (15 to 30 V DC), max.	150 mA		
Number of connection resources	32		
Protocols			
 PROFIBUS DP master 	Yes		
 PROFIBUS DP slave 	Yes		
PROFIBUS DP master			
 Number of connections, max. 	32		
• Transmission rate, max.	12 Mbit/s		
 Number of DP slaves, max. 	125		
Services	Services		
— PG/OP communication	Yes		
— Routing	Yes; S7 routing		
— Global data communication	No		
— S7 basic communication	Yes		
— S7 communication	Yes		
— S7 communication, as client	Yes		
— S7 communication, as server	Yes		
— Equidistance	Yes		
— Isochronous mode	Yes		
- SYNC/FREEZE	Yes		
— Activation/deactivation of DP slaves	Yes		
— Direct data exchange (slave-to-slave	Yes		
communication)			
— DPV1	Yes		
Address area			
— Inputs, max.	8 kbyte		
— Outputs, max.	8 kbyte		

User data per DP slave	
— User data per DP slave, max.	244 byte
·	244 byte
— Inputs, max.	244 byte
— Outputs, max.	•
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	
Number of connections	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
 Transmission rate, max. 	12 Mbit/s
 Address area, max. 	32
• User data per address area, max.	32 byte
— of which consistent, max.	32 byte
Services	
— Routing	Yes; with interface active
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Protocols	
Open IE communication	
	Via CP 443-1 and loadable FB
• ISO-on-TCP (RFC1006)	
 ISO-on-TCP (RFC1006) — Data length, max. 	1452 bytes via CP 443-1 Adv.
— Data length, max.	
— Data length, max. Isochronous mode	1452 bytes via CP 443-1 Adv.
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up 	1452 bytes via CP 443-1 Adv.
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127
 Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle <u>Communication functions</u> PG/OP communication Number of connectable OPs without message 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms
 Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication Number of connectable OPs without message processing 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 63 63; When using Alarm_S/SQ and Alarm_D/DQ
 — Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle <u>Communication functions</u> PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 63 63; When using Alarm_S/SQ and Alarm_D/DQ
 — Data length, max. Isochronous mode Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 63 63; When using Alarm_S/SQ and Alarm_D/DQ Yes
 Data length, max. <u>Isochronous mode</u> Isochronous operation (application synchronized up to terminal) Equidistance Number of DP masters with isochronous mode User data per isochronous slave, max. shortest clock pulse max. cycle Communication functions PG/OP communication Number of connectable OPs without message processing Number of connectable OPs with message processing Data record routing Global data communication supported 	1452 bytes via CP 443-1 Adv. Yes; For PROFIBUS only Yes 2 244 byte 1 ms; 0.5 ms without use of SFC 126, 127 32 ms Yes 63 63; When using Alarm_S/SQ and Alarm_D/DQ Yes Yes

 Number of GD packets, receiver, max. 	32
 Size of GD packets, max. 	54 byte
 Size of GD packet (of which consistent), max. 	1 variable
S7 basic communication	
• supported	Yes
 User data per job, max. 	76 byte
 User data per job (of which consistent), max. 	1 variable
S7 communication	
 supported 	Yes
• as server	Yes
• as client	Yes
 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 FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
 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 CPU, max. 	64/64
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Web server	
• supported	No
Number of connections	
• overall	64
 usable for PG communication 	63
- reserved for PG communication	1
— adjustable for PG communication, max.	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, 	0
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

Number of login stations for message functions, max. 63; Max, 63 with Alarm, SKSQ and Alarm_DDQ. (OPs); max, 8 with Alarm, Alarm, 8, Natri, 8, Notify and Notify_8 (e.g. WinCC) Symbol-related messages Yes SCAN procedure Yes Process diagnostic messages Yes simultaneously active Alarm-S blocks, max. 1000; Simultaneously active alarm_S/SQ blocks or alarm_DIDQ Aarm 8-blocks Yes • Number of instances for alarm 8 and S7 600 ormunication blocks, max. 600 • preset, max. 600 Process diagnostic messages Yes • Number of instances for alarm 8 and S7 600 ormunication blocks, max. 600 • preset, max. 600 Process dignas. 1024 Number of archives that can log on simultaneously 32 SFB 37 AR_SEND) 32 Number of archives that can log on simultaneously 1024 Number of additional values 1024 • in 000 ms grid, max. 1024 • with 100 ms grid, max. 10 Status block Yes; Up to 2 simultaneously Single step Yes Number of breakpoints 4 Status/control variable Inputs/outputs, memory bits, DBs, distributed I/Os, timers, countrers • Number	S7 message functions																																																																																														
SCAN procedureYesProgram alarmsYesProcess diagnostic messagesYesSimultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks1000 Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocksAlarm 8-blocksYes• Number of instances for alarm 8 and S7 communication blocks, max.600• Process control messagesYes• Number of instances for alarm 8 and S7 communication blocks, max.600• Process control messagesYes• Number of anchives that can log on simultaneously (SFB 37 AR, SEND)32Number of nessagesYes• overall, max.1024• in 100 ms grid, max.1024• with 100 ms grid, max.1024• with 100 ms grid, max.1024• with 100 ms grid, max.10• with 500, 1000 ms grid, max.10• with 500, 1000 ms grid, max.10• Status/control variableYes• Number of variables, max.70; Status/control• Status/control variableYes• Number of variables, max.70; Status/control• Number of variables, max.512• Number of variables, max.512• Status/control variables, max.512• Number of variables, max.512• Forcing, variablesYes• Number of entries, max.3200• Procesic bufferYes• preseti700 <td< td=""><td>Number of login stations for message functions, max.</td><td></td></td<>	Number of login stations for message functions, max.																																																																																														
Program alarms Yes Process diagnostic messages Yes simultaneously active Alarm-S blocks, max. 1000; 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. 600 • preset, max. 600 Process control messages Yes Number of archives that can log on simultaneously (SFB 37 AR SEND) 32 Number of messages Yes • overall, max. 1024 • in 100 ms grid, max. 1024 • with 100 ms grid, max. 1024 • with 100 ms grid, max. 10 • with 100 ms grid, max. 10 • with 500, 1000 ms grid, max. 10 • Status block Yes; Up to 2 simultaneously Single step Yes; Up to 16 variable tables • Variables Iputs/outputs, memory bits, DBs, distributed I/Os, timers, counters • Number of variables, max. 70; Status/control F	Symbol-related messages	Yes																																																																																													
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• Number of instances for alarm 8 and S7 communication blocks, max.4000• preset, max.600• Process control messagesYes• Number of archives that can log on simultaneously (SFB 37 AR_SEND)Yes• Number of messages1024• overall, max.1024• in 100 ms grid, max.128• in 100 ms grid, max.1024• in 100 ms grid, max.1024• with 100 ms grid, max.1024• with 500, floor sgrid, max.10• Status blockYes; Up to 2 simultaneouslySingle stepYes; Up to 2 simultaneously• Number of breakpoints4• Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/control• ForcingYes• Forcing, variables, max.70; Status/control• Forcing, variables, max.512• Forcing, variables, max.512• Forcing, variables, max.512• Forcing, variables, max.3200• Number of variables, max.3200• Number of entries, max.3200• adjustableYes• number of entries, max.3200• adjustableYes• matus of entries, max.3200 <tr <tr="">• adjustableYes<!--</td--><td>simultaneously active Alarm-S blocks, max.</td><td>· · · · · · · · · · · · · · · · · · ·</td></tr> <tr><td>Induction blocks, max.600Process control messagesYesNumber of archives that can log on simultaneously (SFB 37 AR, SEND)32Number of messages1024• overall, max.1024• in 100 ms grid, max.128• in 500 ms grid, max.1024• in 100 ms grid, max.1024• with 500, ms grid, max.1024• with 500, ms grid, max.10• with 500, ms grid, max.10• with 500, noor sgrid, max.10• status blockYes: Up to 2 simultaneouslyStatus blockYes: Up to 2 simultaneouslySingle stepYes• Number of breakpoints4• Variablesrouters• Number of variables, max.70: Status/control• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.512• ForcingYes• Number of variables, max.512• Diagnostic bufferYes• Prorcing, variables, max.3200• Number of entries, max.3200• Number of entries, max.3200• adjustableYes• nagustableYes• Number of entries, max.3200• adjustableYes• adjustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagus</td><td>Alarm 8-blocks</td><td>Yes</td></tr> <tr><td>Process control messages Yes Number of archives that can log on simultaneously (SFB 37 AR_SEND) 32 Number of messages 1024 • overall, max. 1024 • in 100 ms grid, max. 512 • in 100 ms grid, max. 1024 • in 100 ms grid, max. 1024 • with 100 ms grid, max. 1024 • with 500, 1000 ms grid, max. 1024 • with 500, 1000 ms grid, max. 10 • with 500, 1000 ms grid, max. 10 • status block Yes; Up to 2 simultaneously Single step Yes Status block 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 Yes • Number of variables, max. 122 • Number of variables, max. 1512 • Number of variables, max. 512 • Number of variables, max. 512 • Number of variables, max. 3200 • Number of entries, max. 3200 • adjust</td><td></td><td>4 000</td></tr> <tr><td>Number of archives that can log on simultaneously (SFB 37 AR_SEND)32Number of messages1024• overall, max.1024• in 100 ms grid, max.512• in 100 ms grid, max.1024• in 100 ms grid, max.1024• with 100 ms grid, max.1• with 500, 1000 ms grid, max.1• with 500, 1000 ms grid, max.10• with 500, 1000 ms grid, max.10• status blockYes; Up to 2 simultaneouslyStatus blockYes; Up to 2 simultaneouslySingle stepYes• Number of breakpoints4• Status/controlYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; 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Up to 2 simultaneously Single step Yes Number of breakpoints 4 Status/control 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 Yes • Forcing Yes • Forcing Yes • Number of variables, max. 512 Diagnostic buffer Yes • present Yes • Number of entries, max. 3 200 - adjustable Yes • present Yes • present Yes • Number of entries, max. 3 200 • preset 120</td><td>● in 500 ms grid, max.</td><td>512</td></tr> <tr><td>• with 100 ms grid, max.1• with 500, 1000 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 2 simultaneouslySingle stepYesNumber of breakpoints4Status/controlYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing, variables, max.512• Number of variables, max.512Diagnostic bufferYes• number of variables, max.3 200- adjustableYes• Number of entries, max.120</td><td>• in 1000 ms grid, max.</td><td>1 024</td></tr> <tr><td>• with 500, 1000 ms grid, max.10Test commissioning functionsYes; 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T. T.</td><td>— adjustable</td><td>Yes</td></tr> <tr><td>Service data</td><td>— preset</td><td>120</td></tr> <tr><td></td><td>Service data</td><td></td></tr>	simultaneously active Alarm-S blocks, max.	· · · · · · · · · · · · · · · · · · ·	Induction blocks, max.600Process control messagesYesNumber of archives that can log on simultaneously (SFB 37 AR, SEND)32Number of messages1024• overall, max.1024• in 100 ms grid, max.128• in 500 ms grid, max.1024• in 100 ms grid, max.1024• with 500, ms grid, max.1024• with 500, ms grid, max.10• with 500, ms grid, max.10• with 500, noor sgrid, max.10• status blockYes: Up to 2 simultaneouslyStatus blockYes: Up to 2 simultaneouslySingle stepYes• Number of breakpoints4• Variablesrouters• Number of variables, max.70: Status/control• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.512• ForcingYes• Number of variables, max.512• Diagnostic bufferYes• Prorcing, variables, max.3200• Number of entries, max.3200• Number of entries, max.3200• adjustableYes• nagustableYes• Number of entries, max.3200• adjustableYes• adjustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagus	Alarm 8-blocks	Yes	Process control messages Yes Number of archives that can log on simultaneously (SFB 37 AR_SEND) 32 Number of messages 1024 • overall, max. 1024 • in 100 ms grid, max. 512 • in 100 ms grid, max. 1024 • in 100 ms grid, max. 1024 • with 100 ms grid, max. 1024 • with 500, 1000 ms grid, max. 1024 • with 500, 1000 ms grid, max. 10 • with 500, 1000 ms grid, max. 10 • status block Yes; 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Status/controlForcingYes• Forcing, variablesInputs, outputs, bit memories, peripheral inputs, peripheral outputs• Number of variables, max.512• presentYes• number of entries, max.3200- adjustableYes- adjustableYes• number of entries, max.3200- adjustableYes• presentYes• Number of entries, max.3200- adjustableYes• number of entries, max.Yes• Number of entries, max.120	Status/control		counters• Number of variables, max.70; Status/controlForcing70; Status/control• Forcing, variablesYes• Number of variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3 200- adjustableYes- preset120			ForcingYes• Forcing, variablesInputs, outputs, bit memories, peripheral inputs, peripheral outputs• Number of variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3 200- adjustableYes- preset120	Variables		• ForcingYes• Forcing, variablesInputs, outputs, bit memories, peripheral inputs, peripheral outputs• Number of variables, max.512Diagnostic buffer• presentYes• Number of entries, max.3 200- adjustableYes- preset120	 Number of variables, max. 	70; Status/control	• Forcing, variablesInputs, outputs, bit memories, peripheral inputs, peripheral outputs• Number of variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3 200- adjustableYes- preset120	Forcing		• Number of variables, max. 512 Diagnostic buffer Yes • present Yes • Number of entries, max. 3 200 - adjustable Yes - preset 120	• Forcing	Yes	Diagnostic buffer • present Yes • Number of entries, max. 3 200 - adjustable Yes - preset 120	 Forcing, variables 	Inputs, outputs, bit memories, peripheral inputs, peripheral outputs	• present Yes • Number of entries, max. 3 200 - adjustable Yes - preset 120	 Number of variables, max. 	512	 Number of entries, max. adjustable preset 120 	Diagnostic buffer		— adjustable Yes — preset 120	• present	Yes	— preset 120	Number of entries, max.	3 200	P. T. T.	— adjustable	Yes	Service data	— preset	120		Service data	
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Induction blocks, max.600Process control messagesYesNumber of archives that can log on simultaneously (SFB 37 AR, SEND)32Number of messages1024• overall, max.1024• in 100 ms grid, max.128• in 500 ms grid, max.1024• in 100 ms grid, max.1024• with 500, ms grid, max.1024• with 500, ms grid, max.10• with 500, ms grid, max.10• with 500, noor sgrid, max.10• status blockYes: Up to 2 simultaneouslyStatus blockYes: Up to 2 simultaneouslySingle stepYes• Number of breakpoints4• Variablesrouters• Number of variables, max.70: Status/control• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.512• ForcingYes• Number of variables, max.512• Diagnostic bufferYes• Prorcing, variables, max.3200• Number of entries, max.3200• Number of entries, max.3200• adjustableYes• nagustableYes• Number of entries, max.3200• adjustableYes• adjustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagustableYes• nagus	Alarm 8-blocks	Yes																																																																																													
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• 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
	2; SFC 56; per interface
— WR_DPARM	

— DPNRM_DG	8; SFC 13; per interface
— RDSYSST	8
- DP_TOPOL	1; SFC 103; per interface
Number of simultaneously active SFBs	
— RDREC	8; SFB 52; per interface, but not more than 32 across all external interfaces
— WRREC	8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
 User program protection/password protection 	Yes
Dimensions	
Width	25 mm
Width Height	25 mm 290 mm
Height	290 mm
Height Depth	290 mm