

***** Replacement part ***** SIMATIC S7-400, CPU 414-3 Central processing unit with: work memory 1.4 MB, (700 KB code, 700 KB data), 1st interface MPI/DP 12 Mbit/s, 2nd interface PROFIBUS DP, 3rd interface plug-in IFM module

General information	
Product type designation	CPU 414-3
Firmware version	V4.0
Product function	
• Isochronous mode	Yes
Engineering with	
• Programming package	STEP 7 V5.2 SP1 HF3 or higher with HW update
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	80 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1 A
from backplane bus 5 V DC, max.	1.2 A
from backplane bus 24 V DC, max.	Total current consumption of the components connected to the MPI/DP interfaces, but no more than 150 mA per interface
Power loss	
Power loss, typ.	4.5 W
Storage	
Type of memory	RAM
Work memory	
• integrated	1.4 Mbyte
• integrated (for program)	700 kbyte
• integrated (for data)	700 kbyte
• expandable	No
Load memory	
• expandable FEPRM	Yes; with Memory Card (FLASH)
• expandable FEPRM, max.	64 Mbyte
• integrated RAM, max.	256 kbyte
• expandable RAM	Yes; with Memory Card (RAM)
• expandable RAM, max.	16 Mbyte
Backup	
• present	Yes
• with battery	Yes; all data
• without battery	No
Battery	
Backup battery	
• Backup current, typ.	550 µA
• Backup current, max.	1 530 µA
• Backup time, max.	144 d
• Feeding of external backup voltage to CPU	5 V DC to 15 V DC
CPU processing times	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.06 µs
for fixed point arithmetic, typ.	0.06 µs
for floating point arithmetic, typ.	0.18 µs
CPU-blocks	

DB	
• Number, max.	4 095; DB 0 reserved
• Size, max.	64 kbyte
FB	
• Number, max.	2 048
• Size, max.	64 kbyte
FC	
• Number, max.	2 048
• Size, max.	64 kbyte
OB	
• Number, max.	see instruction list
• Size, max.	64 kbyte
• Number of time alarm OBs	4
• Number of delay alarm OBs	4
• Number of cyclic interrupt OBs	4
• Number of process alarm OBs	4
• Number of multicomputing OBs	1
Nesting depth	
• per priority class	24
• additional within an error OB	1
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— can be set	Yes
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
S7 timer	
• Number	2 048
Retentivity	
— adjustable	Yes
— preset	No times retentive
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
Flag	
• Size, max.	8 kbyte
• Retentivity available	Yes; From MB 0 to MB 8 191
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Local data	
• adjustable, max.	16 kbyte
• preset	8 kbyte
Address area	
I/O address area	
• Inputs	8 kbyte
• Outputs	8 kbyte
Process image	
• Inputs, adjustable	8 kbyte

• Outputs, adjustable • Inputs, default • Outputs, default • consistent data, max. • Access to consistent data in process image	8 kbyte 256 byte 256 byte 244 byte Yes
Subprocess images	
• Number of subprocess images, max.	15
Digital channels	
• Inputs — of which central • Outputs — of which central	65 536 65 536 65 536 65 536
Analog channels	
• Inputs — of which central • Outputs — of which central	4 096 4 096 4 096 4 096
Hardware configuration	
Number of expansion units, max.	21; of which 6 ER with K-bus
connectable OPs	31 without message processing, 8 with message processing
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	
• Number of connectable IMs (total), max. • Number of connectable IM 460s, max. • Number of connectable IM 463s, max.	6 6 4; IM 463-2
Number of DP masters	
• integrated • via CP • via IM 467 • Mixed mode IM + CP permitted • via interface module • Number of pluggable S5 modules (via adapter capsule in central device), max.	2 10; CP 443-5 Extended 4 No; IM 467 cannot be used jointly with CP 443-5 Ext. 1; IF 964-DP 6
Number of operable FMs and CPs (recommended)	
• FM • CP, PtP • CP, LAN • PROFIBUS and Ethernet CPs	Limited by number of slots and number of connections CP 440: Limited by number of slots; CP 441: limited by number of connections Limited by number of slots and number of connections 14; incl. CP 443-5 Ext. and IM 467
Slots	
• required slots	2
Time of day	
Clock	
• Hardware clock (real-time) • retentive and synchronizable • Resolution • Deviation per day (buffered), max. • Deviation per day (unbuffered), max.	Yes Yes 1 ms 1.7 s; Power on 8.6 s; Power off
Operating hours counter	
• Number • Number/Number range • Range of values • Granularity • retentive	8 0 to 7 0 to 32767 hours 1 h Yes
Clock synchronization	
• supported • to MPI, master • on MPI, device • to DP, master • on DP, device	Yes Yes Yes Yes Yes

• in AS, master • in AS, device • to IF 964 DP	Yes Yes Yes; as Master or Slave
1. Interface	
Interface type	MPI/PROFIBUS DP
Isolated	Yes
Interface types	
• RS 485 • Output current of the interface, max.	Yes 150 mA
Protocols	
• MPI • PROFIBUS DP master • PROFIBUS DP device	Yes Yes Yes
MPI	
• Number of connections • Transmission rate, max.	32 12 Mbit/s
Services	
— PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication	Yes Yes Yes Yes Yes
PROFIBUS DP master	
• Number of connections, max. • Transmission rate, max. • max. number of DP devices	16 12 Mbit/s 32
Services	
— PG/OP communication — Routing — S7 basic communication — S7 communication — Equidistance — SYNC/FREEZE — activation/deactivation of DP devices — Direct data exchange (slave-to-slave communication)	Yes Yes Yes Yes Yes Yes Yes Yes
Address area	
— Inputs, max. — Outputs, max.	2 kbyte 2 kbyte
User data per DP device	
— Inputs, max. — Outputs, max. — Slots, max. — per slot, max.	244 byte 244 byte 244 128 byte
PROFIBUS DP device	
• Number of connections • GSD file • Transmission rate, max. • Address area, max. • User data per address area, max. — of which consistent, max.	16 http://www.siemens.com/profibus-gsd 12 Mbit/s 32 32 byte 32 byte
Services	
— PG/OP communication — Routing	Yes Yes
Transfer memory	
— Inputs — Outputs	244 byte 244 byte
2. Interface	
Interface type	PROFIBUS DP

Isolated	Yes
Interface types	
• RS 485	Yes
• Output current of the interface, max.	150 mA
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
PROFIBUS DP master	
• Number of connections, max.	16
• Transmission rate, max.	12 Mbit/s
• max. number of DP devices	96
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— activation/deactivation of DP devices	Yes
— Direct data exchange (slave-to-slave communication)	Yes
Address area	
— Inputs, max.	6 kbyte
— Outputs, max.	6 kbyte
User data per DP device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP device	
• 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
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
3. Interface	
Interface type	pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP
Protocols	
SIMATIC communication	
• S7 routing	Yes
Isochronous mode	
Equidistance	Yes
User data per isochronous slave, max.	244 byte
shortest clock pulse	1 ms
max. cycle	32 ms
Communication functions	
PG/OP communication	Yes
• Number of connectable OPs with message processing	8
• Number of connectable OPs without message processing	31
Global data communication	
• supported	Yes
• Number of GD loops, max.	8
• Number of GD packets, transmitter, max.	8

• Number of GD packets, receiver, max.	16
• Size of GD packets, max.	64 byte
• Size of GD packet (of which consistent), max.	1 variable
S7 basic communication	
• supported	Yes; in MPI mode via: SFC X_SEND, X_RCV, X_GET and X_PUT; in DP master mode via: SFC I_GET and I_PUT
• 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
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	
• overall	32
• usable for PG communication — reserved for PG communication	1
• usable for OP communication — reserved for OP communication	1
S7 message functions	
Number of login stations for message functions, max.	8
Symbol-related messages	Yes
Program alarms	Yes
simultaneously active Alarm_S blocks, max.	100; 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.	300
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	16
Number of messages	
• overall, max.	512
• in 100 ms grid, max.	128
• in 500 ms grid, max.	256
• in 1000 ms grid, max.	512
Number of additional values	
• with 100 ms grid, max.	1
• with 500, 1000 ms grid, max.	10
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	4
Status/control	
• Status/control variable	Yes
• 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.	256
Diagnostic buffer	
• present	Yes

• Number of entries, max.	3 200		
— can be set	Yes		
— preset	120		
Configuration			
Configuration software			
• STEP 7	Yes		
Programming			
• Command set	see instruction list		
• Nesting levels	8		
• 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		
— D_ACT_DP	4		
— RD_REC	8		
— WR_REC	8		
— WR_PARM	8		
— PARM_MOD	1		
— WR_DPARM	2		
— DPNRM_DG	8		
— RDSYSST	8; 1 to 8		
— DP_TOPOL	1		
Number of simultaneously active SFBs			
— RDREC	8		
— WRREC	8		
Know-how protection			
• User program protection/password protection	Yes		
Dimensions			
Width	50 mm		
Height	290 mm		
Depth	219 mm		
Weights			
Weight, approx.	1 070 g		
Classifications			
		Version	Classification
	eClass	14	27-24-22-07
	eClass	12	27-24-22-07
	eClass	9.1	27-24-22-07
	eClass	9	27-24-22-07
	eClass	8	27-24-22-07
	eClass	7.1	27-24-22-07
	eClass	6	27-24-22-07
	ETIM	10	EC000236
	ETIM	9	EC000236
	ETIM	8	EC000236
	ETIM	7	EC000236
	IDEA	4	3565

Approvals / Certificates

General Product Approval



[China RoHS](#)



Maritime application



[CCS \(China Classification Society\)](#)

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