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Data sheet 6ES7414-4HM14-0AB0



Figure similar

********** Replacement part ********* SIMATIC S7-400H, CPU 414H Central processing unit for S7-400H and S7-400F/FH, 4 interfaces: 1 MPI/DP, 1 DP and 2 for sync modules, 2.8 MB memory (1.4 MB data/1.4 MB program)

General information	
Product type designation	CPU 414-4H
HW functional status	1
Firmware version	V4.5
Engineering with	
● Programming package	STEP 7 V5.3 SP2 or higher with HW update
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	25 µs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.4 A
from backplane bus 5 V DC, max.	1.7 A
from backplane bus 24 V DC, max.	150 mA; Per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	6 W
Storage	
Type of memory	RAM
Work memory	
● integrated	2.8 Mbyte
● integrated (for program)	1.4 Mbyte
● integrated (for data)	1.4 Mbyte
● expandable	No
Load memory	
● expandable FEPROM	Yes
● expandable FEPROM, max.	64 Mbyte
● integrated RAM, max.	256 kbyte
● 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.	190 µA; Valid up to 40°C

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● Backup current, max.	660 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
CPU processing times	
for bit operations, typ.	0.045 µs
for word operations, typ.	0.045 µs
for fixed point arithmetic, typ.	0.045 µs
for floating point arithmetic, typ.	0.135 µs
CPU-blocks	
DB	
● Number, max.	4 095; Number range: 1 to 4095
● Size, max.	64 kbyte
FB	
● Number, max.	2 048; Number range: 0 to 2047
● Size, max.	64 kbyte
FC	
● Number, max.	2 048; Number range: 0 to 2047
● Size, max.	64 kbyte
OB	
● 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
Nesting depth	
● per priority class	24
● additional within an error OB	1
Counters, 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
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
● Retentivity preset	MB 0 to MB 15
● Number of clock memories	8; in 1 memory byte
Local data	

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● adjustable, max.	16 kbyte
● preset	8 kbyte
Address area	
I/O address area	
● Inputs	8 kbyte
● Outputs	8 kbyte
Process image	
● Inputs, adjustable	8 kbyte
● Outputs, adjustable	8 kbyte
● Inputs, default	256 byte
● Outputs, default	256 byte
● consistent data, max.	244 byte
● Access to consistent data in process image	Yes
Subprocess images	
● Number of subprocess images, max.	15
Digital channels	
● Inputs	65 536
— of which central	65 536
● Outputs	65 536
— of which central	65 536
Analog channels	
● Inputs	4 096
— of which central	4 096
● Outputs	4 096
— of which central	4 096
Hardware configuration	
Number of expansion units, max.	21
connectable OPs	31 without message processing, 8 with message processing
Multicomputing	No
Interface modules	
● Number of connectable IMs (total), max.	6
● Number of connectable IM 460s, max.	6
● Number of connectable IM 463s, max.	4; Single mode only
Number of DP masters	
● integrated	2
● via CP	10
● Mixed mode IM + CP permitted	No
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	
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; Power on
Operating hours counter	
● Number	8
● Number/Number range	0 to 7
● Range of values	0 to 32767 hours
● Granularity	1 h
● retentive	Yes
Clock synchronization	

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● 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
Time difference in system when synchronizing via	
● MPI, max.	200 ms
Interfaces	
Number of RS 485 interfaces	2
Number of other interfaces	0
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 device	No
MPI	
● Number of connections	32
● Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
PROFIBUS DP master	
● Number of connections, max.	16
● Transmission rate, max.	12 Mbit/s
● max. number of DP devices	32
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— Equidistance	No
— SYNC/FREEZE	No
— activation/deactivation of DP devices	No
— Direct data exchange (slave-to-slave communication)	No
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 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
2. Interface	
Interface type	PROFIBUS DP
Isolated	Yes

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Interface types	
● RS 485	Yes
● Output current of the interface, max.	150 mA
Protocols	
● PROFIBUS DP master	Yes
● PROFIBUS DP device	No
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	No
— S7 basic communication	No
— S7 communication	Yes
— Equidistance	No
— SYNC/FREEZE	No
— activation/deactivation of DP devices	No
— Direct data exchange (slave-to-slave communication)	No
Address area	
— Inputs, max.	6 kbyte
— Outputs, max.	6 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
3. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization submodule IF 960 6ES7960-1AA04-0XA0 or 6ES7960-1AB04-0XA0
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization submodule IF 960 6ES7960-1AA04-0XA0 or 6ES7960-1AB04-0XA0
Protocols	
SIMATIC communication	
● S7 routing	Yes
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	No
S7 basic communication	
● supported	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	24/24

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CPU, max.	
Standard communication (FMS)	
● supported	Yes; Via CP and loadable FB
Number of connections	
● overall	32
● 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.	8
Symbol-related messages	No
Program alarms	Yes
simultaneously active Alarm_S blocks, max.	100
Alarm 8-blocks	Yes
● Number of instances for alarm 8 and S7 communication blocks, max.	1 200
● preset, max.	900
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	16
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	

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— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Number of simultaneously active SFCs	
— RD_REC	8
— WR_REC	8
— WR_PARM	8
— PARM_MOD	1
— WR_DPARM	2
— DPNRM_DG	8
— RDSYSST	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.	995 g

Classifications

	Version	Classification
eClass	16	27-24-22-07
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
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval					EMV
UL		RCM	China RoHS	Manufacturer Declaration	RCM

EMV	For use in hazardous locations

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RCM ATEX IECEx FM UL IECEx

For use in hazardous locations		Functional Saftey	Maritime application		
Type Examination Certificate	ATEX	Type Examination Certificate	BUREAU VERITAS	DNV	PRS

Maritime application		
RINA	RMRS	CCS (China Classification Society)

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