SIEMENS

Data sheet

6AG1414-5HM06-7AB0



SIPLUS S7-400 CPU 414-5H based on 6ES7414-5HM06-0AB0 with conformal coating, -25...+70 °C, central processing unit for S7-400H and S7-400F/FH, 5 interfaces: 1x MPI/DP, 1x DP, 1x PN and 2 for SYNC modules, 4 MB memory (2 MB data/2 MB program)

Figure similar

General information	
Product type designation	CPU 414-5H PN/DP
HW functional status	1
Firmware version	V6.0
based on	6ES7414-5HM06-0AB0
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	4 Mbyte
integrated (for program)	2 Mbyte
integrated (for data)	2 Mbyte
expandable	No
Load memory	
expandable FEPROM	Yes; with Memory Card (FLASH)
 expandable FEPROM, max. 	64 Mbyte
integrated RAM, max.	512 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.	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
PU processing times	
for bit operations, typ.	18.75 ns
for word operations, typ.	18.75 ns
for fixed point arithmetic, typ.	18.75 ns
for floating point arithmetic, typ.	37.5 ns
PU-blocks	
DB	
Number, max.	6 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
Number, max.	3 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC . Number may	2 000; Number range: 0 to 7000
Number, max. Size may.	3 000; Number range: 0 to 7999
• Size, max.	64 kbyte
Number, max.	see instruction list
Number, max. Size, max.	64 kbyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	4; OB 10-13
Number of time diam OBs Number of delay alarm OBs	4; OB 20-23
Number of cyclic interrupt OBs	4; OB 32-35
Number of process alarm OBs	4; OB 40-43
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	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
• Number	Unlimited (limited only by RAM capacity)
S7 times	0.040
Number	2 048
Detection.	
Retentivity	Voc
— adjustable	Yes
— adjustable — preset	Yes No times retentive
— adjustable — preset Time range	No times retentive
— adjustable — preset Time range — lower limit	No times retentive 10 ms
— adjustable — preset Time range — lower limit — upper limit	No times retentive
adjustable preset Time range lower limit upper limit IEC timer	No times retentive 10 ms 9 990 s
— adjustable — preset Time range — lower limit — upper limit	No times retentive 10 ms

Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
Flag	
• Size, max.	8 192 byte
 Retentivity available 	Yes
 Retentivity preset 	MB 0 to MB 15
Number of clock memories	8; in 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	8 kbyte
Inputs, default	256 byte
Outputs, default	256 byte
consistent data, max. Access to consistent data in process image.	244 byte
Access to consistent data in process image Subprocess images	Yes
Subprocess images	16
Number of subprocess images, max. Digital channels	15
• Inputs	65 536
— of which central	65 536
Outputs	65 536
— of which central	65 536
Analog channels	30 000
• 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	63
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; CP 443-5 Extended
 Mixed mode IM + CP permitted 	No
via interface module	0
Number of IO Controllers	
• integrated	1
• via CP	0
Number of operable FMs and CPs (recommended)	0 14 1 15 6 1 27 12211
• 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
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• Possilution	1 mg
Resolution Deviation per day (buffered), may	1 ms 1.7 s; Power off
Deviation per day (unbuffered), max. Deviation per day (unbuffered), max.	8.6 s; Power on
Deviation per day (unbuffered), max. Operating hours counter	0.0 3, 1 OWEI OII
Number	16
Number/Number range	0 to 15
Range of values	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours
Granularity	1 h
• retentive	Yes
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• on MPI, device	Yes
• to DP, master	Yes
• on DP, device	Yes
• in AS, master	Yes
• in AS, device	Yes
on Ethernet via NTP	Yes; As client
Time difference in system when synchronizing via	
• 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	MANAGEMAN
Interface type	MPI/PROFIBUS DP
Isolated	Yes
Interface types	Von
RS 485 Output current of the interface, may	Yes
Output current of the interface, max. Protocols	150 mA
Protocols • MPI	Yes
PROFIBUS DP master	Yes
PROFIBUS DP device	No
MPI	
Number of connections	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
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
PROFIBUS DP master	40 K
Number of connections, max.	16; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
Transmission rate, max.	12 Mbit/s
max. number of DP devices	32
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 - SYNCFREEZE - activationo(seachastion of IDP devices - Direct data sochange (slave-to-slave communication) - DPV1 - Yes - Address area - Inpols, max Outputs, max Outputs, max Outputs, max User data por DP device, max Inpols, max Lyndis, m		
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- Direct data exchange (slave-boslave communication) - DPV1		
communication) — DPV1 Yes Address area — Inputs, max. 2 kbyte — Upputs, max. 2 kbyte 1 thinterface / DP meater / payload data per DP Device / Insection — upputs, max. 244 byte — Outputs, max. 244 byte — Slots, max. 244 byte — per sich max. 244 byte — per sich max. 244 byte — per sich max. 244 byte — PROFIBUS DP slave — Number of connections No configuration of CPU as DP slave 2 Interface — Interface a type — PROFINET — Incident of transmission rate — Yes — Autonogotiation of transmission rate — Yes — Autonogotiation — Yes — RU AS (Internet) — Number of ports — Interface kypes — PROFINET IO Controller — PROFINET IO Controller — PROFINET IO Device — PROFINET IO Service — PROFINET IO Device — PROFINET IO Service — PROFINET IO Device — PROFINET IO Device — PROFINET IO Device — PROFINET IO Device — PROFINET IO Service — PROFINET IO Service — PROFINET IO Service — PROFINET IO Device — PROFINET		No
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- Outputs, max Stots, max Stots, max Per stot, max Per stot, max Per stot, max Per stot, max Number of connection of the stot per stot	•	•
Slots, max.		
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- Prioritized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max Activation/deactivation of IO Devices - IO Devices changing during operation (partner ports), supported - Device replacement without swap medium - Send cycles - Updating time Address area - Inputs, max Inputs, max Outputs, max User data consistency, max User data consistency, max Open IE communication		
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 — Number of connectable IO Devices for RT, max. — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time Address area — Inputs, max. — Outputs, max. — User data consistency, max. Open IE communication No <l< td=""><td>·</td><td></td></l<>	·	
 — of which in line, max. — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time Address area — Inputs, max. — Outputs, max. — User data consistency, max. — User data consistency, max. Open IE communication No Piss 250 μs, 500 μs, 1 ms, 2 ms, 4 ms edundant mode Administration 8 kbyte 8 kbyte 1 024 byte Open IE communication		
 — Activation/deactivation of IO Devices — IO Devices changing during operation (partner ports), supported — Device replacement without swap medium — Send cycles — Updating time — Updating time — Send the configured single or redundant mode Address area — Inputs, max. — Outputs, max. — User data consistency, max. — User data consistency, max. — Open IE communication 		
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 — Send cycles — Updating time Address area — Inputs, max. — Outputs, max. — User data consistency, max. Open IE communication 250 μs, 500 μs, 1 ms, 2 ms, 4 ms 8 kbyte configured single or redundant mode 8 kbyte configured single or redundant mode 8 kbyte configured single or redundant mode 1 024 byte 	ports), supported	
— Updating time 250 µs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode Address area — Inputs, max. — Outputs, max. — User data consistency, max. Open IE communication		
Address area - Inputs, max. 8 kbyte - Outputs, max. 8 kbyte - User data consistency, max. 1 024 byte Open IE communication	•	
 — Inputs, max. — Outputs, max. — User data consistency, max. Open IE communication 8 kbyte 1 024 byte	— Updating time	
 Outputs, max. User data consistency, max. Open IE communication 8 kbyte 1 024 byte 	Address area	
— User data consistency, max. 1 024 byte Open IE communication	— Inputs, max.	8 kbyte
Open IE communication	— Outputs, max.	8 kbyte
	— User data consistency, max.	1 024 byte
Number of connections, max. 62		
	Number of connections, max	62

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	PROFINIA PR
Interface type	PROFIBUS DP
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
 S7 communication, as client 	Yes
 S7 communication, as server 	Yes
— Equidistance	No
— Isochronous mode	No
— SYNC/FREEZE	No
 activation/deactivation of DP devices 	No
 Direct data exchange (slave-to-slave communication) 	No
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	6 kbyte
— Outputs, max.	6 kbyte
User data per DP slave	
— user data per DP device, 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.	62
— Data length, max.	32 kbyte
— several passive connections per port, supported	Yes Vec: Via integrated PROFINET interface or CR 4/3 1 and leadable ERs
ISO-on-TCP (RFC1006) Number of connections, may	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
Number of connections, max. Data length may.	62 23 khyto: 1 453 hytoxyia CD 443 1 Adv
— Data length, max.	32 kbyte; 1 452 bytes via CP 443-1 Adv.

LIDD	Very site interested DDOCINET interface and leadelle ED
• UDP	Yes; via integrated PROFINET interface and loadable FBs 62
— Number of connections, max.— Data length, max.	
— Data length, max. Web server	1 472 byte
supported	No
Isochronous mode	INU
Equidistance	No
communication functions / header	INU
PG/OP communication	Yes
Number of connectable OPs without message processing	63
Number of connectable OPs with message processing	63; When using Alarm_S/SQ and Alarm_D/DQ
Data record routing	Yes
Global data communication	100
• 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 CPU, max. 	64/64
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	
• overall	64
 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.	63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	No
SCAN procedure	No
	No
Program alarms	Yes
Process diagnostic messages	Yes Yes
Process diagnostic messages simultaneously active Alarm-S blocks, max.	Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks
Process diagnostic messages simultaneously active Alarm-S blocks, max. Alarm 8-blocks	Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes
Process diagnostic messages simultaneously active Alarm-S blocks, max. Alarm 8-blocks Number of instances for alarm 8 and S7 communication blocks, max.	Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 2 500
Process diagnostic messages simultaneously active Alarm-S blocks, max. Alarm 8-blocks • Number of instances for alarm 8 and S7 communication	Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 2 500 900
Process diagnostic messages simultaneously active Alarm-S blocks, max. Alarm 8-blocks Number of instances for alarm 8 and S7 communication blocks, max.	Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks Yes 2 500

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.	256
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
Standards, approvals, certificates	
CE mark	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; @ 60°C for UL/ATEX/FM and safety-related application
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
 Installation altitude above sea level, max. 	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); with "F-System" applications max. +2 000 m above sea level permissible
Relative humidity	
 With condensation, tested in accordance with IEC 60068- 2-38, max. 	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	Voc. Class 6D2 mold and furnal angree (avaluation forms). Class 6D2
to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology — Against chemically active substances acc. to EN	Yes; Class 3 (excluding trichlorethylene)
60654-4 — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
 Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and 	* The supplied plug covers must remain in place over the unused interfaces during operation!

ANSI/ISA-71.04	
Conformal coating	
 Coatings for printed circuit board assemblies acc. to EN 61086 	Yes; Class 2 for high reliability
 Protection against fouling acc. to EN 60664-3 	Yes; Type 1 protection
 Military testing according to MIL-I-46058C, Amendment 7 	Yes; Discoloration of coating possible during service life
 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC- CC-830A 	Yes; Conformal coating, Class A
configuration / header	
Configuration software	
• STEP 7	Yes
configuration / programming / header	
 Command set 	see instruction list
 Nesting levels 	7
 Access to consistent data in process image 	Yes
 System functions (SFC) 	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
configuration / programming / number of simultaneously activ	ve SFC / header
- RD_REC	8
— WR_REC	8
— WR_PARM	8
— PARM_MOD	1
— WR_DPARM	2
— DPNRM_DG	8
— RDSYSST	8
— DP_TOPOL	1
configuration / programming / number of simultaneously activ	ve SFB / header
— RDREC	8
— WRREC	8
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	995 g

last modified:

5/29/2024