SIEMENS

Data sheet 6AG1517-4HQ10-4AB0

SIPLUS S7-1500 CPU 1517H-4 PN based on 6ES7517-4HQ10-0AB0 with conformal coating, 0...+60 °C, central processing unit with 4 MB work memory for program and 50 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd interface: PROFINET 4th/5th interface: H-SYNC, SIMATIC Memory Card required

General information	
Product type designation	CPU 1517H-4 PN
Firmware version	
● FW update possible	Yes
based on	6ES7517-4HQ10-0AB0
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
● SysLog	Yes
Redundancy	
● stand-alone operation	No
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
● Mains/voltage failure stored energy time	5 ms
● Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	1.4 A
Current consumption, max.	1.9 A
Inrush current, max.	1.9 A; Rated value
I^2t	0.5 $A^2 \cdot s$
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	30 W
Power loss	
Power loss, typ.	22 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
● integrated (for program)	4 Mbyte
● integrated (for data)	50 Mbyte
Load memory	
● Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
● maintenance-free	Yes
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns

for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	8 ns
CPU-blocks	
Number of elements (total)	20 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
● Number range	Number range: 1 to 59 999
● Size, max.	16 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
● Number range	0 ... 65 535
● Size, max.	1 Mbyte
FC	
● Number range	0 ... 65 535
● Size, max.	1 Mbyte
OB	
● Size, max.	1 Mbyte
● Number of free cycle OBs	100
● Number of time alarm OBs	20
● Number of delay alarm OBs	20
● Number of cyclic interrupt OBs	20; with minimum OB 3x cycle of 1 ms
● Number of process alarm OBs	50
● Number of DPV1 alarm OBs	3
● Number of startup OBs	100
● Number of asynchronous error OBs	4
● Number of synchronous error OBs	2
● Number of diagnostic alarm OBs	1
Nesting depth	
● per priority class	24
Counters, timers and their retentivity	
S7 counter	
● Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
● Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
● Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
● Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	2.5 Mbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data: 2.25 MB
Extended retentive data area (incl. timers, counters, flags), max.	50 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
● Size, max.	16 kbyte
● Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
● Retentivity adjustable	Yes
● Retentivity preset	No
Local data	
● per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	8 192; max. number of modules / submodules
I/O address area	

● Inputs	32 kbyte; All inputs are in the process image
● Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	16 kbyte
— Outputs (volume)	16 kbyte
Subprocess images	
● Number of subprocess images, max.	31
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET, but also by the connection of I/O via IE/PB-Links.
Number of IO Controllers	
● integrated	1
Rack	
● Modules per rack, max.	9; CPU + 2 PS + 6 CP
Time of day	
Clock	
● Type	Hardware clock
● Backup time	6 wk; At 40 °C ambient temperature, typically
● Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	
● Number	16
Clock synchronization	
● supported	Yes
● on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	3
1. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X1
● Number of ports	2
● integrated switch	Yes
Protocols	
● IP protocol	Yes; IPv4
● PROFINET IO Controller	Yes
● PROFINET IO Device	No
● SIMATIC communication	Yes; Only Server
● Open IE communication	Yes; Optionally also encrypted
● Web server	Yes
● Media redundancy	Yes
PROFINET IO Controller	
Services	
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes; per user program
— Number of connectable IO Devices, max.	256
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
— PROFINET Security Class	1
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
2. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X2
● Number of ports	2
● integrated switch	Yes
Protocols	
● IP protocol	Yes; IPv4
● PROFINET IO Controller	No

● PROFINET IO Device	No
● SIMATIC communication	Yes; Only Server
● Open IE communication	Yes; Optionally also encrypted
● Web server	Yes
● Media redundancy	No
3. Interface	
Interface types	
● RJ 45 (Ethernet)	Yes; X3
● Number of ports	1
● integrated switch	No
Protocols	
● IP protocol	Yes; IPv4
● SIMATIC communication	Yes; Only Server
● Open IE communication	Yes; Optionally also encrypted
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
5. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
Interface types	
RJ 45 (Ethernet)	
● 100 Mbps	Yes
● 1000 Mbps	Yes; only possible at the X3 interface of the CPU
● Autonegotiation	Yes
● Autocrossing	Yes
● Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	No
Number of connections	
● Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs
● Number of connections reserved for ES/HMI/web	10
● Number of connections via integrated interfaces	288
● Number of S7 routing paths	64
Redundancy mode	
● PROFINET system redundancy (S2)	Yes
● PROFINET system redundancy (R1)	Yes
Media redundancy	
— Media redundancy	Yes; only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
— MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	No
— Switchover time on line break, typ.	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
SIMATIC communication	
● PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
● S7 routing	Yes
● S7 communication, as server	Yes
● S7 communication, as client	No
Open IE communication	
● TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
● ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
● UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; max. 128 multicast circuits
● DHCP	No

● DNS	Yes
● SNMP	Yes
● DCP	Yes
● LLDP	Yes
● Encryption	Yes; Optional
Web server	
● HTTP	No
● HTTPS	Yes; only via Web API
● web API	Yes
— Number of sessions, max.	200
— number of simultaneous HTTP calls, max.	4
— HTTP request body, max.	131 072 byte
OPC UA	
● Runtime license required	Yes; "Large" license required per CPU
● OPC UA Client	No
● OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
— Application authentication	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
— User authentication	"anonymous" or by user name & password
— GDS support (certificate management)	No
— Number of sessions, max.	32
— Number of subscriptions per session, max.	25
— Sampling interval, min.	25 ms
— Publishing interval, min.	25 ms
— Number of server methods, max.	100; max. 20 concurrently running jobs each for asynchronous instructions OPC_UA_ServerMethodPre (V1.1) and OPC_UA_ServerMethodPost (V1.1)
— Number of inputs/outputs per server method, max.	20
— Number of monitored items, recommended max.	25 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
— Number of nodes for user-defined server interfaces, max.	30 000
● Alarms and Conditions	No
Further protocols	
● MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	64
number of subscriptions, max.	750
number of tags/attributes for subscriptions, max.	120 000
Program alarms	Yes
Number of configurable program messages, max.	20 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	20 000
Number of simultaneously active program alarms	
● Number of program alarms	2 000
● Number of alarms for system diagnostics	1 000
Test commissioning functions	
Joint commission (Team Engineering)	Yes
Status block	Yes; Up to 16 simultaneously
Single step	No
Number of breakpoints	20; Breakpoints are only supported in RUN-Solo status
Profiling	Yes
Status/control	
● Status/control variable	Yes
● Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
● Number of variables, max.	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	

● Forcing	Yes
● Forcing, variables	Peripheral inputs/outputs
● Number of variables, max.	200
Diagnostic buffer	
● present	Yes
● Number of entries, max.	3 200
— of which powerfail-proof	1 000
Traces	
● Number of configurable Traces	8
● Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
● RUN/STOP LED	Yes
● ERROR LED	Yes
● MAINT LED	Yes
● STOP ACTIVE LED	Yes
● Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	No
Controller	
● PID_Compact	Yes; Universal PID controller with integrated optimization
● PID_3Step	Yes; PID controller with integrated optimization for valves
● PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Standards, approvals, certificates	
Ecological footprint	
● environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	488 kg
— global warming potential, (during production) [CO2 eq]	78.3 kg
— global warming potential, (during operation) [CO2 eq]	417 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-8.12 kg
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
● horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
● vertical installation, min.	0 °C; = Tmin (incl. condensation/frost)
● vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
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)
Relative humidity	
● With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	

— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
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	
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
— 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 60654-4	Yes; Class 3 (excluding trichlorethylene)
— 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 ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
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	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
Know-how protection	
● User program protection/password protection	Yes
● Copy protection	No
● Block protection	Yes
Access protection	
● protection of confidential configuration data	Yes
● Password for display	Yes
● Protection level: Write protection	Yes
● Protection level: Read/write protection	Yes
● Protection level: Write protection for Failsafe	No
● Protection level: Complete protection	Yes
● User administration	Yes; device-wide and centralized
● Number of users	100
● Number of groups	100
● Number of roles	50
Cycle time monitoring	
● lower limit	adjustable minimum cycle time
● upper limit	adjustable maximum cycle time
Dimensions	
Width	210 mm

Height	147 mm
Depth	129 mm

Weights

Weight, approx.	1 806 g; Interface modules: 2x 18 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

Approvals / Certificates

General Product Approval			Environment
CE EG-Konf.	UKCA	China RoHS	EPD

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