Data sheet

6ES7511-1AK00-0AB0



Spare part SIMATIC S7-1500, CPU 1511-1 PN, Central processing unit with Work memory 150 KB for program and 1 MB for data, 1st interface, PROFINET IRT with 2-port switch, 60 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1511-1 PN
HW functional status	FS06
Firmware version	V1.8
Product function	
• Isochronous mode	Yes; With minimum OB 6x cycle of 625 µs
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V13 SP1 Update 4
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	6
Mode selector switch	1
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
Input current	
Current consumption (rated value)	0.7 A
Inrush current, max.	1.9 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	10 W
Power consumption from the backplane bus (balanced)	5.5 W
Power loss	
Power loss, typ.	5.7 W
Memory	
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	150 kbyte
• integrated (for data)	1 Mbyte
Load memory	
 Plug-in (SIMATIC Memory Card), max. 	32 Gbyte
Backup	
maintenance-free	Yes

CPU processing times	
	60 ns
	72 ns
7 71	96 ns
1 21	384 ns
CPU-blocks	00+110
	2 000; Blocks (OB, FB, FC, DB) and UDTs
DB	2 000, Blooks (OB, 1 B, 1 O, BB) and OB 10
	1 60 999; subdivided into: number range that can be used by the user: 1
	59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
FB	
Number range	0 65 535
● Size, max.	150 kbyte
FC	
Number range	0 65 535
● Size, max.	150 kbyte
OB	
	150 kbyte
•	100
	20
	20
	20
·	50
	3
	1
0, ,	2
	100
	4
	2
3 11 1 3	1
Nesting depth	24
1 1 2	24
Counters, timers and their retentivity	
S7 counter	2.040
	2 048
Retentivity — adjustable	Yes
IEC counter	165
	Any (only limited by the main memory)
Retentivity	Any (only limited by the main memory)
·	Yes
S7 times	
	2 048
Retentivity	
·	Yes
IEC timer	
	Any (only limited by the main memory)
Retentivity	, , , , , , , , , , , , , , , , , , , ,
·	Yes
Data areas and their retentivity	
	128 kbyte; In total; available retentive memory for bit memories, timers,
	counters, DBs, and technology data (axes): 88 KB
Flag	
	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
- Italiasi si sissitiisiisi	
Data blocks	
Data blocks	Yes
Data blocks Retentivity adjustable Retentivity preset	Yes No
Data blocks • Retentivity adjustable • Retentivity preset Local data	

Address area	
Number of IO modules	1 024; 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)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	20
Number of DP masters	
Via CM	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
Pack	inserted in total
Rack Modules per rack, may	32; CPU + 31 modules
Modules per rack, max.Number of lines, max.	32; CPU + 31 modules 1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available
The of does	slots
Time of day	
Clock	Handissan alask
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max. Operating hours counter	10 s; Typ.: 2 s
Number	16
Clock synchronization	10
• supported	Yes
• in AS, master	Yes
• in AS, device	Yes
on Ethernet via NTP	Yes
Interfaces	163
Number of PROFINET interfaces	1
Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols	1 63
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	100
Services	
— PG/OP communication	Yes
FG/OF confindingation Isochronous mode	Yes
— Isocnronous mode — IRT	Yes
	Yes
— PROFlenergy	
— Prioritized startup	Yes; Max. 32 PROFINET devices

- Number of connectable (D Devices, rax.) - Of which 10 devices with 1RT, max. - Number of connectable (I) Devices for RT, max. - Number of connectable (I) Devices for RT, max. - Number of 10 Devices per tool, max. - Number of 10 Devices per tool, max. - Updating times - Updating times - Updating times - Updating times - To read cycle of 250 µs - For send cycle of 1 ma - For send cycle of 1 ma - For send cycle of 1 ma - For send cycle of 2 ms - With IRT and parametrization of "odd" send cycles - Update time of RT - For send cycle of 250 µs - For send cycle of 1 ms - For send cycle of 2 ms - For send cycle of 4 ms - For send cycle of 5 ms - For send cycle of		
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activatorideactivated, max. Number of 10 Devices par tool, max. Number of 10 Devices par tool, max. The minimum value of the update time also depends on communication share set for PROFINET 10, on the number of 10 Devices, and on the quantity of configured user dots of the continuous of Devices, and on the quantity of configured user dots. For send cycle of 250 µs — for send cycle of 100 µs — for send cycle of 1 ms — for send cycle of 4 ms — with IRT and parameterization of "odd" send cycles Update sime for RT — for send cycle of 250 µs — for send cycle of 350 µs — for send cycle of 4 ms — FROFINET KD Device Services — PCIOP communication — isochronous mode — isochronous mode — No — isochronous mode — No — isochronous mode — No — IRT — PROFIce is the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous GB is decisive Update sime for RT — for send cycle of 4 ms — services — PCIOP communication — Yes — PROFIce is the case of IRT with isochronous mode, the minimum update time of 250 µs of the isochronous GB is decisive Interface by the case of IRT with isochronous mode, the minimum update for the isochronous GB is decisive Interface by the case of IRT with isochronous mode, the minimum update for the isochronous GB is decisive Interface by the case of IRT with isochronous of Bis decisive Interface by the case of IRT with isochronous of Bis decisive Interface by the case of IRT with isochronous of Bis decisive Interface by the case of IRT with isochronous of Bis decisive Interface by the case of IRT with isochronous of Bis decisive Interface by the case	·	
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- for send cycle of 250 µs - for send cycle of 500 µs - for send cycle of 500 µs - for send cycle of 100 µs - for send cycle of 100 µs - for send cycle of 1 ms - for send cycle of 1 ms - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 4 ms - with IRT and parameterization of "odd" send cycle - for send cycle of 2 ms - with IRT and parameterization of "odd" send cycle - for send cycle of 2 ms - with IRT and parameterization of "odd" send cycle - for send cycle of 500 µs - for send cycle of 500 µs - for send cycle of 100 µs - for send cycle of 1 ms - for send cycle of 4 ms - for send cycle of 500 µs -	Undate fires for IDT	configured user data
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for send cycle of 2 ms	•	·
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PROFINET IO Device Services - PG(OP communication Yes No No PROFInency Yes	•	
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- Shared device - Number of IO Controllers with shared device, max. Intorface types RJ 45 (Ethernet) • 100 Mbps	— IRT	Yes
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 Number of S7 routing paths Media redundancy — MRP — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP — Data length, max. 16 Redundancy manager and/or MRP client; max. number of devices in the ring; 50 Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring; 50 Yes S0 SIMATIC communication Yes See online help (S7 communication, user data size) 		
Redundancy mode Media redundancy - MRP Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 - Switchover time on line break, typ. 200 ms - Number of stations in the ring, max. 50 SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as server • S7 communication, as client • User data per job, max. See online help (S7 communication, user data size) Open IE communication • TCP/IP - Data length, max. 64 kbyte		
Media redundancy - MRP Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring; 50 - Switchover time on line break, typ. Number of stations in the ring, max. 50 SIMATIC communication • \$7 routing • \$7 communication, as server • \$7 communication, as server • \$7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring; 50 200 ms 50 Yes • \$7 communication Yes • \$7 communication, user data size)		16
	Redundancy mode	
in the ring: 50 — Switchover time on line break, typ. 200 ms — Number of stations in the ring, max. SIMATIC communication • S7 routing 9 S7 communication, as server 9 S7 communication, as client 9 User data per job, max. Open IE communication • TCP/IP 9 Data length, max. in the ring: 50 200 ms 50 200 ms 50 Yes 50 Yes 9 See online help (S7 communication, user data size)	Media redundancy	
- Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. 200 ms 50 See online help (S7 communication, user data size) Yes 64 kbyte	— MRP	
— Number of stations in the ring, max. SIMATIC communication S7 routing S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. S0 Yes Yes Yes Yes See online help (S7 communication, user data size) Yes 64 kbyte	 Switchover time on line break, typ. 	200 ms
SIMATIC communication Strouting Str	•	50
 S7 routing S7 communication, as server S7 communication, as client Yes User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. 64 kbyte 		
 S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. Yes Yes G4 kbyte 		Yes
 S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. Yes 64 kbyte 	•	
 User data per job, max. Open IE communication TCP/IP — Data length, max. See online help (S7 communication, user data size) Yes 64 kbyte 		
Open IE communication ● TCP/IP — Data length, max. Yes 64 kbyte		
TCP/IP Data length, max. Yes 64 kbyte		See unline help (57 communication, user data size)
— Data length, max. 64 kbyte	·	
— several passive connections per port, supported Yes		64 kbyte
	— several passive connections per port, supported	Yes

• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user-defined pages
• HTTPS	Yes; Standard and user-defined pages
Further protocols	
• MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000
Number of simultaneously active program alarms	
Number of program alarms	300
Number of alarms for system diagnostics	100
Number of alarms for motion technology objects	80
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 5 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Status/control	110
Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	inputoroutputo, memory sito, 555, distributed 700, unioro, counters
of which status variables, max.	200; per job
of which status variables, max. — of which control variables, max.	200; per job
Forcing	200, per job
G	Poriobaral inputa/autauta
Forcing, variablesNumber of variables, max.	Peripheral inputs/outputs
Diagnostic buffer	200
-	Yes
• present	
Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes
 Speed-controlled axis 	
 Number of speed-controlled axes, max. 	6; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
 Positioning axis 	
 Number of positioning axes, max. 	6; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
 Synchronized axes (relative gear synchronization) — Number of axes, max. 	3; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool

External encoders	
Number of external encoders, max.	6; Requirement: There must be no other motion technology objects created;
— Number of external encoders, max.	note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
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	
High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
 Copy protection 	Yes
Block protection	Yes
Access protection	
 Password for display 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
• lower limit	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	430 g

last modified:

7/13/2024