SIEMENS

Data sheet

6ES7510-1SK03-0AB0



SIMATIC DP, CPU 1510SP F-1 PN for ET 200SP, central processing unit with 300 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for port 1 and 2

Figure similar

Product type designation HW functional status Firmware version	CPU 1510SP F-1 PN
HW functional status	CPU 1510SP F-1 PN
Firmware version	FS01
	V3.0
FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
 Module swapping during operation (hot swapping) 	Yes; Multi-hot swapping
Isochronous mode	Yes; only with PROFINET; with minimum OB 6x cycle of 500 µs
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7510-1SJ01-0AB0
Configuration control	
via dataset	Yes
Control elements	
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	10 ms
Input current	
Current consumption (rated value)	0.51 A
Current consumption, max.	0.7 A
Inrush current, max.	1.34 A; Rated value
l²t	0.3 A²·s
Power	
Infeed power to the backplane bus	8.05 W
Power loss	
Power loss, typ.	3.5 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
Load memory	

Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	v.
maintenance-free	Yes
CPU processing times	0.5
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	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 DBs with absolute addressing, the max. size is 64 KB
FB	1 Mbyte, 1 of bbs with absolute addressing, the max. Size is 04 Kb
Number range	0 65 535
• Size, max.	300 kbyte
FC	ood kbyte
Number range	0 65 535
• Size, max.	300 kbyte
• Size, max.	ood ruyto
• Size, max.	300 kbyte
Number of free cycle OBs	100
Number of fime alarm OBs	20
Number of delay alarm OBs	20
Number of delay alarm obs Number of cyclic interrupt OBs	
Number of cyclic interrupt OBs Number of process alarm OBs	20; With minimum OB 3x cycle of 250 μs 50
Number of DPV1 alarm OBs	3
Number of Br V Falanti Obs Number of isochronous mode OBs	1
	2
Number of technology synchronous alarm OBs Number of startup OBs	
Number of startup OBsNumber of asynchronous error OBs	100
Number of asynchronous error OBs	2
•	1
Number of diagnostic alarm OBs Necting depth	
Nesting depth	24: Up to 9 passible for E blocks
• per priority class	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	0.040
• Number	2 048
Retentivity	Voo
— adjustable	Yes
IEC counter	Any (and timeted by the main
Number Potentivity	Any (only limited by the main memory)
Retentivity	Voo
— adjustable	Yes
S7 times	2.040
Number Patentivity	2 048
Retentivity	Voc
— adjustable	Yes
IEC timer	Any (and timeted by the main
Number Potenti it.	Any (only limited by the main memory)
Retentivity	V
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	256 kbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 216 KB
Flag	ocalitors, DDS, and technology data (axes). 210 ND
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	o, a slock memory bit, grouped into one slock memory byte
Retentivity adjustable	Yes
■ INCIGITITIVITY augustable	166

Retentivity preset	No
Retentivity preset Local data	110
	64 khyte: may 16 KB per block
per priority class, max. Address area	64 kbyte; max. 16 KB per block
	0.040 many graphs of graphs as for a distant for the graphs as for a distant for a
Number of IO modules	2 048; 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	0.11.4
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Address space per module	
Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Hardware configuration	
Number of distributed IO systems	32; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• Via CM	1
Number of IO Controllers	
• integrated	1
• Via CM	0
Rack	
Modules per rack, max.	82; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules
 Quantity of operable ET 200SP modules, max. 	64
 Quantity of operable ET 200AL modules, max. 	16
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
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
• to DP, master	Yes; Via CM DP module
• on DP, device	Yes; Via CM DP module
• in AS, master	Yes
• in AS, device	Yes
• on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1; Via CM DP module
Optical interface	No
1. Interface	INU
Interface types	Voc. V1 D2: ont. V1 D1 and V1 D2 via Dual depter D4 2: D145
RJ 45 (Ethernet) Number of parts	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
Number of ports integrated quitab	3; 1. integr. + 2. via BusAdapter
integrated switch	Yes

BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols	100, companio Dao nagroto. DA 24 1040, DA 24 1 0, DA 24 1912
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— Isochronous mode	Yes
Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i,
Of which IO devices with IDT	PROFIBUS or PROFINET
Of which IO devices with IRT, max. Number of connectable IO Devices for RT, may.	64
Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; in total across all interfaces
 Number of IO Devices per tool, max. 	8
— 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
Update time for IRT	
— for send cycle of 250 μs	$250~\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 μs of the isochronous OB is decisive
— for send cycle of 500 μs	$500~\mu s$ to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of $625~\mu s$ of the isochronous OB is decisive
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
 With IRT and parameterization of "odd" send cycles 	Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s 3 875 μ s)
Update time for RT	οι ο μο _γ
— for send cycle of 250 μs	250 μs to 128 ms
— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
Shared device	Yes
Number of IO Controllers with shared device, max.	4
— number of 10 Controllers with shared device, max. — activation/deactivation of I-devices	Yes; per user program
— Asset management record	Yes; per user program
Asset management record Interface	1 cos, por usor program
Interface types	
• RS 485	Yes; Via CM DP module
	1
Number of ports Protocols	
Protocols a DDOFIBLIS DD moster	Voo
PROFIBUS DP master PROFIBUS DP dovices	Yes
PROFIBUS DP device SIMATIC communication	Yes
SIMATIC communication PROFIDE OF Transfer	Yes
PROFIBUS DP master	

 Number of connections, max. 	48; Of which 4 each reserved for ES and HMI
 max. number of DP devices 	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Cardina	FROFIBUS UI FROFINET
Services	Ver
— PG/OP communication	Yes
— Equidistance	No
— Isochronous mode	No
activation/deactivation of DP devices	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
 Autonegotiation 	Yes
 Autocrossing 	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	
Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
 Number of connections reserved for ES/HMI/web 	10
Number of connections via integrated interfaces	88
Number of connections per CP/CM	32
Number of S7 routing paths	16
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
— Media redundancy	Yes; only via BusAdapter
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;
	MRP Client
 MRP interconnection, supported 	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
 Switchover time on line break, typ. 	200 ms; For MRP, bumpless for MRPD
 Number of stations in the ring, max. 	50
SIMATIC communication	
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
S7 routing	Yes
Data record routing	Yes
S7 communication, as server	Yes
S7 communication, as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	occommendation, accordate circo
• TCP/IP	Yes
— Data length, max.	64 kbyte
several passive connections per port, supported	Yes
Several passive confinections per port, supported ISO-on-TCP (RFC1006)	Yes
— Data length, max. ● UDP	64 kbyte
	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; max. 78 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Small" license required

OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
 User authentication 	"anonymous" or by user name & password
 Number of connections, max. 	4
 Number of nodes of the client interfaces, recommended max. 	1 000
— Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_U max.	300
 Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. 	20
 Number of elements for one call of OPC_UA_MethodGetHandleList, max. 	100
 Number of simultaneous calls of the client instructions for session management, per connection, max. 	1
 Number of simultaneous calls of the client instructions for data access, per connection, max. 	5
 Number of registerable nodes, max. 	5 000
 Number of registerable method calls of OPC_UA_MethodCall, max. 	100
 Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	20
OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
 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) 	Yes
— Number of sessions, max.	32
 Number of accessible variables, max. 	50 000
 Number of registerable nodes, max. 	10 000
 Number of subscriptions per session, max. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
 Number of server methods, max. 	20
 Number of inputs/outputs per server method, max. 	20
 Number of monitored items, recommended max. 	4 000; 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. 	15 000
Alarms and Conditions	Yes
 Number of program alarms 	100
Number of alarms for system diagnostics	50
Further protocols	
• MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	2 500
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
Number of breakpoints	8
Status/control	
Status/control variable	Yes; without fail-safe
• Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
Number of variables, max.	

- of with osotrol variables, max. 200, per job Forcing		000,
Focing F	— of which status variables, max.	200; per job
Forcing, virtibles Forcing, virt		200, per job
Proceing variables Number of variables, max. Prosent Number of variables, max. - of which powerfail-proof Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of positioning of the supply voltage (PWR-LED) Number of variable Motion Control resources for technology objects Notion Control Number of available Motion Control resources for technology objects Notion Control Number of positioning axis Per profice Per control resources Per grade-controlled axis Per per contract Per control resources Per	- V	V
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Number of entiries, max.	·	
Traces Number of configurable Traces Number of available Molino Control resources for fechnology objects Number of available Molino Control resources for fechnology objects Number of available Molino Control resources for fechnology objects Number of available Molino Control resources for fechnology objects Number of available Molino Control resources Number of available Molino Control resources for fechnology objects Number of available Molino Control resources Number of positioning axis Number of positioning axis Number of positioning axis Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axis at motion control cycle of in sin (typical value) Number of positioning axi	·	
Traces Number of configurable Traces 4; Up to 512 KB of data per trace are possible		
Number of configurable Traces		500
Diagnostics indication IEED RINNSTOP LED REROR LED ROWNSTOP LED REROR LED Pes Monitoring of the supply voltage (PWR-LED) Connection display LINK TXXX Supported tochnology objects Motion Control Number of available Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for technology objects Required Motion Control resources Required Motion Control resources Per presed-controlled axis Per speed-controlled axis Per speed-controlled axis Per external encoder Per couput cam Per control tam Per control tam Per control tam Per probe Positioning axis Putmber of positioning axes at motion control cycle Positioning axis Putmber of positioning axes at motion control cycle PhD Step PUD Temp PiD Compact PiD Compact PiD Compact PiD Compact PiD Compact PiD Controller with integrated optimization for valves Per promaining a measuring Pigh-speed counter Pes Stundards, approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Controller Pid Stundards, approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Pus Stundards, approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Pus Stundards approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Pus Stundards, approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Pus Stundards, approxis, certificates Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Pus Stundards, approxis, certificates Highest safety class achievable in safety mode Proposition of Fibral Propriets and the p		
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Motion Control Number of available Motion Control resources for technology objects Number of available Motion Control resources for technology objects Number of available Motion Control resources for technology objects Required Motion Control resources	• ERROR LED	Yes
Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects Required Motion Control resources for technology objects Required Motion Control resources for technology objects Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 Required Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 1	MAINT LED	Yes
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Motion Control Number of available Motion Control resources for technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1120 Number of available Motion Control resources Per speed-controlled axis Per prosed Controlled axis Per speed-controlled axis Per synchronous axis Per external encoder Per output cam Per cann track Per probe Positioning axis Number of positioning axes at motion control cycle of 4 ms (typical value) Number of positioning axes at motion control cycle of 8 ms (typical value) Number of spistioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact PID_Step PID_Temp Counting and measuring High-speed counter Standards, approvals, certificates Highest safety dassa achievable in safety mode Performance level according to ISO 13849-1 Sill. ac to IEC 61508 Probability of failure (for service life of 20 years and repair time of 100 hours) Low demand mode: PFDavg in accordance with Sill.3 Ambient conditions Ambient conditions Ambient conditions Ambient conditions Ambient langlation, min. Nortical installation, min. Nortical installation altitude above sea level Natical and the desired in a selevel Natical installation altitude above sea level Natical installation altitude above sea level Natical installation altitude above sea level Natical installation in a sea level Natical installation altitude above sea level Natical installation in installation installation in installation installation in installation installa	Connection display LINK TX/RX	Yes
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configuration / header	· · · · ·	
		5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / programming / header	configuration / header	
	configuration / programming / header	

Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
 Copy protection 	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	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	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

last modified: 7/13/2024 🖸