SIEMENS

Data sheet

6ES7512-1DK01-0AB0



SIMATIC DP, CPU 1512SP-1 PN FOR ET 200SP, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 200 KB FOR PROGRAM AND 1 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 3 PORT SWITCH, 48 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY, BUSADAPTER NECESSARY FOR PORT 1 AND 2

General information	
Product type designation	CPU 1512SP-1 PN
HW functional status	FS01
Firmware version	V1.8
Engineering with	
 STEP 7 TIA Portal configurable/integrated as of version 	V13 SP1 Update 4
Configuration control	
via dataset	Yes
Control elements	
Mode selector switch	1
Supply voltage	
Type of supply voltage	24 V DC
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)	0.6 A
Inrush current, max.	4.7 A; Rated value
l²t	0.14 A ² ·s
Power	
Infeed power to the backplane bus	8.75 W
Power loss	E C.W.
Power loss, typ.	5.6 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC Memory Card required	Yes
Work memory	
integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
CPU-blocks	
Number of elements (total)	2 000
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	1.0
Number range	0 65 535
• Size, max.	200 kbyte
FC	
Number range	0 65 535
• Size, max.	200 kbyte
OB	
• Size, max.	200 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20

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Number of delay alarm OBs	20
 Number of cyclic interrupt OBs 	20
 Number of process alarm OBs 	50
 Number of DPV1 alarm OBs 	3
 Number of isochronous mode OBs 	1
 Number of technology synchronous alarm OBs 	2
 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 in total (incl. times, counters,	128 kbyte; Available retentive memory for bit memories, timers,
flags), max.	counters, DBs, and technology data (axes): 88 KB
Flag	
• Number, max.	16 kbyte
Number of clock memories	8; 8 clock memory bits, 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	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	
— 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.	32 byte; For input and output data respectively
Address space per station	
Address space per station, max.	1 280 byte; for central inputs and outputs; depending on configuration
Hardware configuration	
Number of distributed IO systems	20
Number of DP masters	
• Via CM	1
Number of IO Controllers	
• integrated	1
• Via CM	0
Rack	
Modules per rack, max.	64; CPU + 64 modules + server module (mounting width max. 1 m)
Rack, number of rows, 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

• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	Yes

Interfaces	
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1; Via CM DP module
With optical interface	Yes; Via bus adapter BA 2x SCRJ

1. Interface	
Interface types	
 Number of ports 	3; 1. integr. + 2. via BusAdapter
 integrated switch 	Yes
RJ 45 (Ethernet)	Yes; X1
Bus adapter (PROFINET)	Yes; Applicable BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC
Functionality	
PROFINET IO Controller	Yes
 PROFINET IO Device 	Yes
 SIMATIC communication 	Yes
 Open IE communication 	Yes
Web server	Yes

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Yes; Via CM DP module
Yes
Yes
Yes

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	
Number of connections	
Number of connections, max.	88

Media redundancy

 Number of connections reserved for ES/HMI/web 	10
 Number of connections via integrated interfaces 	88
 Number of S7 routing paths 	16
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	Yes
— Open IE communication	Yes
— IRT	Yes
— MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— PROFlenergy	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	128; In total, up to 253 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
— Number of connectable IO Devices for RT,	128
max.	
— of which in line, max.	128
 Number of IO Devices that can be 	8
simultaneously activated/deactivated, max.	
 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 625 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 μs 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	
— 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
— S7 routing	Yes
— Isochronous mode	No
Open IE communication	Yes
— IRT	Yes
— MRP	Yes
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared 	4
device, max.	
SIMATIC communication	
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	
• 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.	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
PROFIBUS DP master	
Number of connections, max.	48
Services	
— PG/OP communication	Yes
— S7 routing	Yes
 Data record routing 	Yes
— Isochronous mode	No
— Equidistance	No

- Activation/deactivation of DP slaves Further protocols • MODBUS • MODBUS • Switchover time on line break, typ. • Number of stations in the ring, max. Society of Stations of Stations of the station of Stations of St	Further protocols • MODBUS • MODBUS • Model a redundancy • Switchover time on line break, typ. • Number of stations in the ring, max. Solitochronous operation (application synchronized up to terminal) Softmonous of configurable alarms for message functions, max. Softmonous operation (application synchronized up to softmonous) Softmonous of configurable alarms for system diagnostics • Number of reserved alarms for system diagnostics • Number of reserved alarms for Motion Control technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 3 engineering systems Yes; up to 8 simultaneously Situtus block Yes; up to 8 simultaneously Situtus lock Yes up to 8 simultaneously Situtus control • Status/control variable • Variables • Variables • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Diagnostic buffer • present Yes	— Number of DP slaves	125
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Traces		Joint commission (Team Engineering) Status block Single step Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof	yes; up to 8 simultaneously No Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 1 000

Interrupts/diagnostics/status information Diagnostics indication LED Yes RUN/STOP LED Yes • ERROR LED Yes MAINT LED Yes Monitoring of the supply voltage (PWR-LED) Yes Connection display LINK TX/RX Supported technology objects Motion Control Yes Speed-controlled axis 6; Requirement: There must be no other motion technology - Number of speed-controlled axes, max. objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Positioning axis 6; Requirement: There must be no other motion technology — Number of positioning axes, max. 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; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Controller Yes; Universal PID controller with integrated optimization PID_Compact • PID_3Step Yes; PID controller with integrated optimization for valves • PID-Temp Yes; PID controller with integrated optimization for temperature Counting and measuring Yes High-speed counter Ambient conditions Ambient temperature during operation 0°C • horizontal installation, min. 60 °C • horizontal installation, max. 0°C • vertical installation, min. 50 °C • vertical installation, max. Ambient temperature during storage/transportation -40 °C • min.

• max.

70 °C

Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection	Yes
Copy protection	Yes
 Block protection 	Yes
Access protection	
Protection level: Write protection	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Complete protection 	Yes
Cycle time monitoring	
• 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.	310 g

12.05.2016

last modified: