

Siemens
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Figure similar

SIMATIC DP, CPU 1514SP-2 PN for ET 200SP, central processing unit with 600 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, including server module (6ES7193-6PA00-0AA0); SIMATIC Memory Card required, BusAdapter required for 1st interface

General information	
Product type designation	CPU 1514SP-2 PN
HW functional status	FS04
Firmware version	V4.0
• 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 375 µs
• SysLog	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
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)	0.48 A
Current consumption, max.	0.7 A
Inrush current, max.	1.34 A; Rated value
I ² t	0.3 A ² ·s
Power	
Infeed power to the backplane bus	8.05 W
Power loss	
Power loss, typ.	3.5 W
Storage	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes

Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
• maintenance-free	Yes
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
CPU-blocks	
Number of elements (total)	8 000; 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.	3.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
• Number range	0 ... 65 535
• Size, max.	600 kbyte
FC	
• Number range	0 ... 65 535
• Size, max.	600 kbyte
OB	
• Size, max.	600 kbyte
• 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 250 µs
• 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	
— can be set	Yes
IEC counter	
• Number	Any (only limited by the main memory)
Retentivity	
— can be set	Yes
S7 timer	
• 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.	512 kbyte; In total; available retentive memory for bit memories, timers,

	counters, DBs, and technology data (axes): 472 KB
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)	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.	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	64; 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	2
• 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	2
Number of PROFIBUS interfaces	1; Via CM DP module
Optical interface	Yes; Via SIMATIC BusAdapter
1. Interface	
Interface types	
• RJ 45 (Ethernet) • Number of ports • integrated switch • BusAdapter (PROFINET)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45 2; via BusAdapter Yes Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy	Yes; IPv4 Yes Yes Yes Yes; Optionally also encrypted Yes Yes
PROFINET IO Controller	
Services	
— Isochronous mode — Direct data exchange — IRT — Dynamic Frame Packing (DFP) — PROFINergy — Prioritized startup — Number of connectable IO Devices, max. — Of which IO devices with IRT, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — Number of IO Devices that can be simultaneously activated/deactivated, max. — Number of IO Devices per tool, max. — Updating times — PROFINET Security Class	Yes Yes; Requirement: IRT and isochronous mode (MRPD optional) Yes Yes Yes; per user program Yes; Max. 32 PROFINET devices 256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET 64 256 256 8; in total across all interfaces 8 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 1
Update time for IRT	
— for send cycle of 250 µs — for send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 4 ms — With IRT and parameterization of "odd" send cycles	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 µs of the isochronous OB is decisive 500 µs to 8 ms 1 ms to 16 ms 2 ms to 32 ms 4 ms to 64 ms Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
— for send cycle of 250 µs — for send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 4 ms	250 µs to 128 ms 500 µs to 256 ms 1 ms to 512 ms 2 ms to 512 ms 4 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode — IRT — Dynamic Frame Packing (DFP) — PROFINergy — Prioritized startup — Shared device	No Yes No Yes; per user program Yes Yes

— Number of IO Controllers with shared device, max.	4
— activation/deactivation of I-devices	Yes; per user program
— Asset management record	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only

2. Interface

Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• 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	No
PROFINET IO Controller	
Services	
— Isochronous mode	No
— Direct data exchange	No
— IRT	No
— Dynamic Frame Packing (DFP)	No
— PROFINergy	Yes; per user program
— Prioritized startup	No
— Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
— Number of connectable IO Devices for RT, max.	32
— of which in line, max.	32
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
— IO Devices changing during operation (partner ports), supported	Yes
— 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
— PROFINET Security Class	1
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	No
— Dynamic Frame Packing (DFP)	No
— PROFINergy	Yes; per user program
— Prioritized startup	No
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4
— activation/deactivation of I-devices	Yes; per user program
— Asset management record	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes

PROFIBUS DP master	
- Number of connections, max. - max. number of DP devices	48; Of which 4 each reserved for ES and HMI 125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Services	
— Equidistance	No
— Isochronous mode	No
— activation/deactivation of DP devices	Yes
Interface types	
RJ 45 (Ethernet)	
100 Mbps - Autonegotiation - Autocrossing - Industrial Ethernet status LED	Yes Yes Yes Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	No
Number of connections	
- Number of connections, max. - Number of connections reserved for ES/HMI/web - Number of connections via integrated interfaces - Number of connections per CP/CM - Number of S7 routing paths	192; via integrated interfaces of the CPU and connected CPs / CMs 10 128 32 16
Redundancy mode	
- PROFINET system redundancy (S2) - PROFINET system redundancy (R1) - H-Sync forwarding	No No Yes
Media redundancy	
— Media redundancy — MRP — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — Number of stations in the ring, max.	Yes; only via BusAdapter Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50
SIMATIC communication	
- PG/OP communication - S7 routing - Data record routing - S7 communication, as server - S7 communication, as client - User data per job, max.	Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes Yes See online help (S7 communication, user data size)
Open IE communication	
- TCP/IP - Data length, max. - several passive connections per port, supported - ISO-on-TCP (RFC1006) - Data length, max. - UDP - Data length, max. - UDP multicast - DHCP - DNS - SNMP - DCP - LLDP - Encryption	Yes 64 kbyte Yes Yes 64 kbyte Yes 2 kbyte; 1 472 bytes for UDP broadcast Yes; max. 118 multicast circuits Yes Yes Yes Yes Yes Yes Yes; Optional
Web server	

- HTTP
- HTTPS
- web API
 - Number of sessions, max.
 - number of simultaneous HTTP calls, max.
 - HTTP request body, max.

Yes; Standard and user pages
 Yes; Standard and user pages

 100
 4
 131 072 byte

OPC UA

- Runtime license required
- OPC UA Client
 - Application authentication
 - Security policies
 - User authentication
 - Number of connections, max.
 - Number of nodes of the client interfaces, recommended max.
 - Number of elements for one call of OPC-UA-NodeGetHandleList/OPC-UA_ReadList/OPC-UA_WriteList, max.
 - Number of elements for one call of OPC-UA-NameSpaceGetIndexList, max.
 - Number of elements for one call of OPC-UA-MethodGetHandleList, max.
 - Number of simultaneous calls of the client instructions for session management, per connection, max.
 - Number of simultaneous calls of the client instructions for data access, per connection, max.
 - Number of registerable nodes, max.
 - Number of registerable method calls of OPC-UA-MethodCall, max.
 - Number of inputs/outputs when calling OPC-UA-MethodCall, max.
- OPC UA Server
 - Application authentication
 - Security policies
 - User authentication
 - GDS support (certificate management)
 - Number of sessions, max.
 - Number of accessible variables, max.
 - Number of registerable nodes, max.
 - Number of subscriptions per session, max.
 - Sampling interval, min.
 - Publishing interval, min.
 - Number of server methods, max.
 - Number of inputs/outputs per server method, max.
 - Number of monitored items, recommended max.
 - Number of server interfaces, max.
 - Number of nodes for user-defined server interfaces, max.
- Alarms and Conditions
 - Number of program alarms
 - Number of alarms for system diagnostics

Yes; "Medium" license required
 Yes; Data Access (registered Read/Write), Method Call
 Yes
 Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
 "anonymous" or by user name & password
 10
 2 000
 300
 20
 100
 1
 5
 5 000
 100
 20
 Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
 Yes
 available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
 "anonymous" or by user name & password
 Yes
 48
 100 000
 20 000
 50
 100 ms
 100 ms
 50; max. 20 concurrently running jobs each for asynchronous instructions OPC-UA-ServerMethodPre and OPC-UA-ServerMethodPost
 20
 4 000; for 1 s sampling interval and 1 s send interval
 10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
 30 000
 Yes
 200
 100

Further protocols

- MODBUS

Yes; MODBUS TCP

S7 message functions

- Number of login stations for message functions, max.
- number of subscriptions, max.
- number of tags/attributes for subscriptions, max.
- Program alarms

64
 500
 8 000
 Yes

Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	10 000
Number of simultaneously active program alarms • Number of program alarms • Number of alarms for system diagnostics • Number of alarms for motion technology objects	1 000 200 160
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	Yes
Number of breakpoints	8
Profiling	Yes
Status/control	
• Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max.	Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
Forcing	
• Forcing • Forcing, variables • Number of variables, max.	Yes Peripheral inputs/outputs 200
Diagnostic buffer	
• present • Number of entries, max. — of which powerfail-proof	Yes 3 200 500
Traces	
• Number of configurable Traces • Memory size per trace, max.	4 512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED • ERROR LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • Connection display LINK TX/RX	Yes Yes Yes Yes Yes
Supported technology objects	
Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam 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)	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40 11 20
Controller • PID_Compact • PID_3Step • PID-Temp	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Counting and measuring	

• High-speed counter	Yes		
Standards, approvals, certificates			
Ecological footprint			
• environmental product declaration	Yes		
Global warming potential			
— global warming potential, (total) [CO2 eq]	83.2 kg		
— global warming potential, (during production) [CO2 eq]	22.3 kg		
— global warming potential, (during operation) [CO2 eq]	61.8 kg		
— global warming potential, (after end of life cycle) [CO2 eq]	-0.949 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.	-30 °C; No condensation		
• horizontal installation, max.	60 °C		
• vertical installation, min.	-30 °C; No condensation		
• vertical installation, max.	50 °C		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual		
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	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	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	100 mm		
Height	117 mm		
Depth	75 mm		
Weights			
Weight, approx.	265 g		
Classifications			
		Version	Classification

eClass	16	27-24-26-07
eClass	14	27-24-26-07
eClass	12	27-24-26-07
eClass	9.1	27-24-26-07
eClass	9	27-24-26-07
eClass	8	27-24-26-07
eClass	7.1	27-24-26-07
eClass	6	27-24-26-07
ETIM	10	EC001603
ETIM	9	EC001603
ETIM	8	EC001603
ETIM	7	EC001603
IDEA	4	3565
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

[Miscellaneous](#)



[Miscellaneous](#)



General Product Approval

For use in hazardous locations



[TUEV](#)

[China RoHS](#)

[Manufacturer Declaration](#)



[CCC-Ex](#)

For use in hazardous locations

[FM](#)



[Type Examination Certificate](#)

[CCC-Ex](#)

[Miscellaneous](#)



For use in hazardous locations

Maritime application

[CCC-Ex](#)



[NK / Nippon Kaiji Kyokai](#)

Maritime application

other

Environment



[CCS \(China Classification Society\)](#)



[PROFINET](#)



Environment



