SIEMENS

Data sheet

6ES7514-2DN03-0AB0



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

Figure similar

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		
l²t	0.3 A ² ·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)	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
0:	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 A Number range	0 65 525
Number rangeSize, max.	0 65 535 600 kbyte
FC	600 kbyte
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 cycle interrupt OBs Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	1
	2
Number of technology synchronous alarm OBs Number of startup OBs	100
Number of startup OBs Number of saynehraneus error OBs	
Number of asynchronous error OBsNumber of synchronous error OBs	4
•	2
Number of diagnostic alarm OBs Nesting don'th	1
Nesting depth	24
per priority class Counters, timers and their retentivity	24
-	
S7 counter • Number	2 048
Retentivity	2 040
— adjustable	Yes
— aujustable IEC counter	165
Number	Any (only limited by the main memory)
Retentivity	Any (only limited by the main memory)
— adjustable	Yes
— aujustable S7 times	100
• Number	2 048
Retentivity	2010
— adjustable	Yes
— aujustable IEC timer	
Number	Any (only limited by the main memory)
Retentivity	, any total minimous by the month monthly)
— 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	The state of the s
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	o, o stock montery on, groupout into one oldok montely byte
Retentivity adjustable	Yes
- reconstrict adjustable	

Retentivity preset	No	
Retentivity preset Local data	No	
per priority class, max.	64 kbyte; max. 16 KB per block	
Address area	64 kbyte, max. 16 KB per block	
Number of IO modules	8 192; max. number of modules / submodules	
I/O address area	0 132, max. number of modules / submodules	
• Inputs	32 kbyte; All inputs are in the process image	
• Outputs	32 kbyte; All outputs are in the process image	
per integrated IO subsystem	32 kbyte, All outputs are in the process image	
— Inputs (volume)	8 kbyte	
Outputs (volume)	8 kbyte	
per CM/CP	o najio	
— 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	40	
Number Clock synchronization	16	
supported	Yes	
to DP, master	Yes; Via CM DP module	
• on DP, device	Yes; Via CM DP module 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)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45	
Number of ports	2; via BusAdapter	
integrated switch	Yes	

BusAdapter (PROFINET)	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	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			
— 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.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET		
Of which IO devices with IRT, max.	64		
 Number of connectable IO Devices for RT, max. 	256		
— of which in line, max.	256		
 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		
 — PROFINET Security Class 	1		
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 375 μs of the isochronous OB is decisive		
— for send cycle of 500 μs	500 μs to 8 ms		
— 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 $\mu s;$ 375 $\mu s,$ 625 μs 3 875 $\mu s)$		
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			
— Isochronous mode	No		
— IRT	Yes		
— PROFlenergy	Yes; per user program		
— 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		
2. Interface			
Interface types			
RJ 45 (Ethernet)	Yes; X2		
Number of ports	1		
integrated switch	No		
Protocols			
	Voca IDud		
IP protocol	Yes; IPv4		
IP protocolPROFINET IO Controller	Yes		

SIMATIC communication	Voc	
SIMATIC communication Yes Yes You Optionally also communication		
Open IE communication Web parters	Yes; Optionally also encrypted	
Web server	Yes	
Media redundancy	No	
PROFINET IO Controller		
Services — Isochronous mode	No	
Direct data exchange	No	
— Direct data exchange — IRT	No	
— PROFlenergy	Yes; per user program No	
— Prioritized startup		
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	
 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	
— PROFlenergy	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. 	48; Of which 4 each reserved for ES and HMI	
• max. number of DP devices	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	Yes	
Autonegotiation	Yes	
Autocrossing	Yes	
Industrial Ethernet status LED		
	Yes	
RS 485	Yes	
	Yes 12 Mbit/s	
RS 485		
RS 485 • Transmission rate, max.		

 Number of connections, max. 	192; 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 	128	
 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		
• 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. 118 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	
• web API		
Number of sessions, max.	100	
 number of simultaneous HTTP calls, max. 	4	
— HTTP request body, max.	131 072 byte	
OPC UA		
Runtime license required	Yes; "Medium" 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. 	10	
 Number of nodes of the client interfaces, recommended max. 	2 000	
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 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, 	1	

max.		
 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 20	
 Number of inputs/outputs when calling OPC_UA_MethodCall, max. 		
OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), 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) 	Yes	
— Number of sessions, max.	48	
Number of accessible variables, max.	100 000	
Number of registerable nodes, max.	20 000	
Number of subscriptions per session, max.	50	
— Sampling interval, min.	100 ms	
Publishing interval, min.	100 ms	
Number of server methods, max.	50; max. 20 concurrently running jobs each for asynchronous instructions OPC_UA_ServerMethodPre and OPC_UA_ServerMethodPost	
Number of inputs/outputs per server method, max.	20	
— Number of monitored items, recommended max.— Number of server interfaces, max.	4 000; for 1 s sampling interval and 1 s send interval 10 of each "Server interfaces" / "Companion specification" type and 20 of the	
 Number of nodes for user-defined server interfaces, max. 	type "Reference namespace" 30 000	
Alarms and Conditions	Yes	
Number of program alarms	200	
	100	
Number of alarms for system diagnostics	100	
Further protocols		
- MODBLIS	Voc. MODRIE TOD	
MODBUS S7 maggars functions	Yes; MODBUS TCP	
S7 message functions		
S7 message functions Number of login stations for message functions, max.	64	
S7 message functions Number of login stations for message functions, max. number of subscriptions, max.	64 500	
S7 message functions Number of login stations for message functions, max. number of subscriptions, max. number of tags/attributes for subscriptions, max.	64 500 8 000	
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	
S7 message functions Number of login stations for message functions, max. number of subscriptions, max. number of tags/attributes for subscriptions, max. Program alarms Number of configurable program messages, max.	64 500 8 000 Yes 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH	
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Number of login stations for message functions, max. number of subscriptions, max. number of tags/attributes for subscriptions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step	64 500 8 000 Yes 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 10 000 1 000 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) Yes	
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Number of login stations for message functions, max. number of subscriptions, max. number of tags/attributes for subscriptions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Profiling	64 500 8 000 Yes 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 10 000 1 000 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) Yes 8	
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Number of login stations for message functions, max. number of subscriptions, max. number of tags/attributes for subscriptions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Profiling Status/control Status/control Number of variables, max. of which status variables, max. of which control variables, max.	64 500 8 000 Yes 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 10 000 1 000 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) Yes 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	
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Secure Boot safely removing data Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • 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	PROFINET Security Class	1
safely removing data Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. • vertical installation, max. • vertical installation, max. • vertical installation, max. • vertical installation altitude above sea level • Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	signed firmware update	Yes
Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. • vertical installation relating to sea level • Installation altitude above sea level, max. • 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	Secure Boot	Yes
Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. 50 °C Altitude during operation relating to sea level • Installation altitude above sea level, max. 5000 m; Restrictions for installation altitudes > 2000 m, see manual	safely removing data	Yes
 horizontal installation, min. horizontal installation, max. 60 °C vertical installation, min. vertical installation, max. O °C No condensation vertical installation, max. C Altitude during operation relating to sea level Installation altitude above sea level, max. 5000 m; Restrictions for installation altitudes > 2 000 m, see manual 	Ambient conditions	
 horizontal installation, max. vertical installation, min. vertical installation, max. °C; No condensation vertical installation, max. To °C Altitude during operation relating to sea level Installation altitude above sea level, max. 5000 m; Restrictions for installation altitudes > 2 000 m, see manual 	Ambient temperature during operation	
 vertical installation, min. vertical installation, max. O °C; No condensation O °C Altitude during operation relating to sea level Installation altitude above sea level, max. 000 m; Restrictions for installation altitudes > 2 000 m, see manual 	• horizontal installation, min.	-30 °C; No condensation
 vertical installation, max. 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 	 horizontal installation, max. 	60 °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	• vertical installation, min.	-30 °C; No condensation
• Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	·	50 °C
configuration / header		5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
	configuration / header	

configuration / programming / header	
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
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
Classifications	

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	9	EC001603
ETIM	8	EC001603
ETIM	7	EC001603
IDEA	4	3565

Version

Approvals / Certificates

General Product Approval







Miscellaneous

UNSPSC

<u>KC</u>

15



32-15-17-05

Classification

For use in hazardous locations



<u>FM</u>

CCC-Ex





Miscellaneous

For use in hazard-ous locations

Marine / Shipping

CCC-Ex









NK / Nippon Kaiji Ky-okai

Marine / Shipping

other

Environment



CCS (China Classification Society)



PROFINET





last modified:

12/19/2024

