SIEMENS

Data sheet

6ES7512-1DM03-0AB0



SIMATIC DP, CPU 1512SP-1 PN for ET 200SP, central processing unit with work memory 400 KB for program and 2 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

General information	
Product type designation	CPU 1512SP-1 PN
HW functional status	FS03
Firmware version	V3.1
• 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
SysLog	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V18 (FW V3.0) or higher; with older TIA Portal versions configurable as 6ES7 512-1DK01-0AB0
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)	0.48 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) 	400 kbyte
 integrated (for data) 	2 Mbyte
Load memory	

Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	02 00310
maintenance-free	Yes
CPU processing times	
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	
Number range	0 65 535
• Size, max.	400 kbyte
FC	
Number range	0 65 535
• Size, max.	400 kbyte
OB	
• Size, max.	400 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	
— 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 (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	
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
 Retentivity adjustable 	Yes

No
64 kbyte; max. 16 KB per block
of Royle, max. To RD per block
2 048; max. number of modules / submodules
2 040, max. humber of modules / submodules
32 kbyte; All inputs are in the process image
32 kbyte; All outputs are in the process image
52 kbyte, All outputs are in the process image
8 kbyte
8 kbyte
U NDYIC
8 kbyte
8 kbyte
32
52
288 byte; For input and output data respectively
2 560 byte; for central inputs and outputs; depending on configuration; 2 048
bytes for ET 200SP modules + 512 bytes for ET 200AL modules
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)
1
1
0
82; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules
64
16
1
the number of connectable PtP CMs is only limited by the number of available slots
Hardware clock
6 wk; At 40 °C ambient temperature, typically
10 s; Typ.: 2 s
16
Yes
Yes; Via CM DP module
Yes; Via CM DP module
Yes
Yes
Yes
1
1; Via CM DP module
No
Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45 3; 1. integr. + 2. via BusAdapter

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.	128; In total, up to 512 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.	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
— PROFINET Security Class	1
Update time for IRT	
— for send cycle of 250 μs	250 μs 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 μ s	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 μs : 375 μs , 625 μs 3 875 μs)
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	
• RS 485	
Number of ports	Yes; Via CM DP module
Protocols	Yes; Via CM DP module 1
110100010	
PROFIBUS DP master	
	1
PROFIBUS DP master	1 Yes

	- Number of compactions may	40: Of which 4 each recorded for EQ and UNU
Betwices - Equidatance No - Equidatance No - Isochronum mode No - Isochronum mode Yes - Advatorotideadivation of DP devices Yes - Advatorotideadivation of DP devices Yes - Numerical Stress Yes - Advatorotideadivation of DP devices Yes - Mutch of themet status LED Yes - Instantistion rate, max. 12 Mutchs Protocols 12 Mutchs Protocols 12 Mutchs - Number of connections rescret for ESHMI/veb 10 - Number of connections rescret for ESHMI/veb 10 - Number of connections vai integrated interfaces 88 - Rescretaring Yes - Mutch of connections vai integrated interfaces 80 - Number of connections vai integrated interfaces 80 - Mutch of connections vai integrated interfaces 80 - Mutch of connections vai integrated inte	Number of connections, max.	48; Of which 4 each reserved for ES and HMI
Services	• max. number of DP devices	
Isolation of DP devices No nutration (key) No Nutration (key) No Nutration (key) Yes PAOF hald No Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 via integrated interfaces of the CPU and connected CPs / CMs Nutration of connections, max. 128 vis: only via BusAdapter	Services	
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Interface by post PRUS PRUS (Element) Yes • 100 Mops Yes • Autoreognation Yes • Autoreognation Yes • Transmission rate, max. 12 Mobils Protocols Protocols Protocols Protocols • Transmission rate, max. 12 Mobils • Number of connections reserved for ES-MMWeeb 10 • Number of ST rouing paths 16 • Reclinatary mode Yes - Media redundancy Yes - MRP Interconnection, supported Yes, reduptement: IRT - MRP Interconnection, supported Yes, reduptement: IRT - Switchweer frame in line organs. 200 ms; For MRP, bumpless for MRPD - Switchweer fram on line break. Ypp. </td <td>-</td> <td>No</td>	-	No
BL45.(Enternet) Yes • 100 Mbps Yes • Autoropolation Yes • Autorosing Yes • Industrial Etheret status LED Yes • Transitistion rate, max 12 Mbb/ts Protocols 128, via integrated interfaces of the CPU and connected CPs / CMs • Number of connections rearved for ESAMU/web 10 • Number of SP routing paths 16 • MRP Yes • MRP for bowarding Yes • MRP for the rearved for the form rearved form rearved form rearved for the form rearved	 activation/deactivation of DP devices 	Yes
• Not Maps Yes • Autornspitation Yes • Autornspitation Yes • Industrial Enternet tabus LED Yes • Farsenrission rele, max. Yes • Transmission rele, max. Yes • PROFisate No • Number of connections, max. 128, via Integrated interfaces of the CPU and connected CPs / CMs • Number of connections inspirated interfaces 88 • Number of connections, singerated interfaces 88 • Number of connections, supported Yes • MRP interconnection, supported Yes • MRP Clent Yes indraylong into its Singerate • MRP interconnection, supported Yes; nortyelon with TLS V1.3 preselected • SittCC communication Yes • Sitter of stations in the ing, max. 50 Sitter communication Yes • Sitter of stations in the ing, max.	Interface types	
 Autonogoliation Yes Autocossing Yes Industrial Element status LED Yes Transmission rate, max. Tamsmission rate, max. PROFisate No Number of connections, max. Number of connections reserved for ES/HMI/veb Number of connections year integrated interfaces of the CPU and connected CPs / CMs Number of connections reserved for ES/HMI/veb Number of connections year CP/CM Number of strouting parts Testimation of ST routing parts Testimation of ST routing parts Number of strouting parts<!--</td--><td>RJ 45 (Ethernet)</td><td></td>	RJ 45 (Ethernet)	
Automating Yes Bit Addama Yes Bit Addama Yes Thannission rate, max. Yes PROFeasion Yes Profecoid Yes Profecoid Yes Number of connections, max. 128, via integrated interfaces of the CPU and connected CPs / CMs Number of connections integrated interfaces Bit Number of Strouting parts 128 Number of Strouting parts 128 Number of Strouting parts 128 Number of Strouting parts Yes Number of Strouting parts Yes Number of stations in the ring, max. 128 Strouting Yes, endy via BusAdapter	• 100 Mbps	Yes
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Process No PROFisade No Number of connections, max. 128: via integrated interfaces of the CPU and connected CPs / CMs Number of connections max. 128: via integrated interfaces of the CPU and connected CPs / CMs Number of connections via integrated interfaces 88 Number of connections per CPICM 32 Number of ST outing paths 16 Reducating model - - HSP Yes; only via BusAdapter - MRP Yes; only via BusAdapter - MRP futerconnection, supported Yes; as MPP futing node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Cleant - MRPD Yes; withP Automanager according to IEC 62439-2 Edition 3.0 - MRPD Yes; withP Automanager according to IEC 62439-2 Edition 3.0 - MRPD Yes; withP Automanager according to IEC 62439-2 Edition 3.0 - MRPD Yes; withP Automanager 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 - Bumber of stations in the ring, max. 50 Stataminication Yes Strounnunication Yes <	RS 485	
PROFisate No Number of connections, max. 128; via integrated interfaces of the CPU and connected CPs / CMs Number of connections, max. 128; via integrated interfaces of the CPU and connected CPs / CMs Number of connections via integrated interfaces 88 Number of connections per CP/CM 32 Number of connections per CP/CM 32 House of S7 colling paths 16 Redundancy Yes - MRP Yes; only via BusAdapter - MRP Yes; as MRP ring note according to IEC 62439-2 Edition 2.0, MRP Manager; MRR Cleint - MRP Yes; recryption with TLS V1.3 pre-selected - MRP Yes; recryption with TLS V1.3 pre-selected * PG/OP communication Yes; recryption with TLS V1.3 pre-selected * S7 communication Yes * S7 communication Yes * S7 communication Yes • User data per job. max. See online help (S7 communication, user data size) Open IE communication Yes • USP Optimulation • CP/IP Yes • Data length, max. See online help (S7 communication.<	Transmission rate, max.	12 Mbit/s
Number of connections 128: via integrated interfaces of the CPU and connected CPs / CMs Number of connections reserved for ES/MM/web 10 Number of connections reserved for ES/MM/web 10 Number of connections reserved for ES/MM/web 88 Number of connections reserved for ES/MM/web 10 Number of S7 routing paths 16 Reducations mode	Protocols	
• Number of connections, max. 128, via integrated interfaces of the CPU and connected CPs / CMs • Number of connections via integrated interfaces 88 • Media redundancy 10 • Media redundancy Yes - MRP Media redundancy - MRP Yes; only via BusAdapter - MRP interconnection, supported Yes; Requirement: IRT - Switchover time on line break, typ. 200 ms; For MRP, bumpless for MRPD - Number of stations in the ring, max. 50 SitMATIC communication Yes; encryption with TLS V1.3 pre-selected • S7 communication Yes • S7 communication Yes • User data per Job, max. See online help (S7 communication, user data size) Open Lie communication Yes • User data per Job, max. See onucle help (S7 communication, user da	PROFIsafe	No
• 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 Yes; only via BusAdapter - Media redundancy Yes; only via BusAdapter - MRP MRP - MRP Yes; a MRP ring node according to IEC 62439-2 Edition 3.0 - MRP Yes; a RMP ring node according to IEC 62439-2 Edition 3.0 - MRP Yes; a RMP ring node according to IEC 62439-2 Edition 3.0 - MRP Yes; a RMP ring node according to IEC 62439-2 Edition 3.0 - MRP interconnection, supported Yes; a Requirement: IRT - Switchover time on line break, typ. 200 ms; For MRP, bumpless for MRPD - Number of stations in the ring, max. 50 SMMEC communication Yes; encryption with TLS V1.3 pre-selected • S7 communication Yes; • GP(/P communication Yes • S7 communication Yes • S7 communication Yes • S7 communication Yes • Data length, max. Se online help (S7 communication, user data size)	Number of connections	
• Number of connections yie /PI/CM 32 • Number of S7 routing paths 16 Redundancy mode • • I-H-Sync forwarding Yes • Media redundancy Yes; only via BusAdapter • MRP Yes; only via BusAdapter • MRP Yes; only via BusAdapter • MRP Yes; and MRP interconnection, supported • MRP interconnection, supported Yes; as MRP fing node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client IRT - MRP interconnection, supported Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • MRPD Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • MRPD Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • MRPD Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • MRPD Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • MRPD Yes; as MRP fing node according to IEC 62439-2 Edition 3.0 • Sittocher time on line break, typ. 200 ms; Fer MRP, bumpless for MRPD • Number of stations in the ring, max. 50 Southourset Yes; • Data record routing Yes; • So communication, as server Yes; • User data length, max. Ge klayte • User data length, max. Ge klayte • Done TeCP (RC1006) Yes; <	Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
• Number of connections per CP/CM32• Number of S7 routing paths16• Hedra redundanry mode•- Media redundanryYes- Media redundanryYes; only via BusAdapter- Media redundanryYes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRPYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRP for communicationYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRP for communicationYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRP for communicationYes; as MRP ring node according to IEC 62439-2 Edition 3.0- MRP for communicationYes; as MRP noment: IRT- StroommunicationYes; as MRP pumpless for MRPD- Number of stations in the ring, max.50StroommunicationYes- Data regut max.Yes- Data length, max.64 kbyte- UDP muticastYes- Data length, max.2 kbyte; 1472 bytes for UDP broadcast- UDP muticastYes; Nument- Data length, max.2 kbyte; 1472 bytes for UDP broadcast- UDP muticastYes; Nument<	 Number of connections reserved for ES/HMI/web 	10
• Number of S7 routing paths 16 Redundancy mode	 Number of connections via integrated interfaces 	88
Redundancy mode Yes Media redundancy Yes - Mdla redundancy Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Clent - MRP Yes; SMRP Automanager according to IEC 62439-2 Edition 3.0 - MRP 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 Yes; encryption with TLS V1.3 pre-selected • S7 routing Yes • Data record routing Yes • S7 communication, as server Yes • S7 communication Yes • TCP/IP Yes • Data length, max. See online help (S7 communication, user data size) Open IE communication Yes • User data per job, max. See online help (S7 communication, user data size) Open IE communication Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • DDA Yes • Data length,	Number of connections per CP/CM	32
 H-Sync forwarding Yes Media redundancy Media redundancy Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client MRP Client Yes; MRP Automanager according to IEC 62439-2 Edition 3.0 MRP Client MRP Difference Yes; Requirement: IRT Switchover time on line break, typ. 200 ms; For MRP, bumpless for MRPD Number of stations in the ring, max. S0 SMATIC communication Yes; encryption with TLS V1.3 pre-selected S7 rommunication, as server Yes S7 communication, as server Yes S7 communication, as server Yes S7 communication, as server Yes S0 Open IE communication Yes See online help (S7 communication, user data size) Open IE communication Yes Source (RFC1006) Yes Source (RFC1006) Yes Data length, max. G4 kbyte UDP Data length, max. Source (Structure) Yes Data length, max. Source (Structure) Yes Data length, max. Structure) Yes Data length, max. Yes Source (Structure) <	Number of S7 routing paths	16
 H-Sync forwarding Yes Media redundancy Media redundancy Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client MRP Client Yes; MRP Automanager according to IEC 62439-2 Edition 3.0 MRP Client MRP Difference Yes; Requirement: IRT Switchover time on line break, typ. 200 ms; For MRP, bumpless for MRPD Number of stations in the ring, max. S0 SMATIC communication Yes; encryption with TLS V1.3 pre-selected S7 rommunication, as server Yes S7 communication, as server Yes S7 communication, as server Yes S7 communication, as server Yes S0 Open IE communication Yes See online help (S7 communication, user data size) Open IE communication Yes Source (RFC1006) Yes Source (RFC1006) Yes Data length, max. G4 kbyte UDP Data length, max. Source (Structure) Yes Data length, max. Source (Structure) Yes Data length, max. Structure) Yes Data length, max. Yes Source (Structure) <	Redundancy mode	
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	Media redundancy	
MRP Client MRP Client - MRPD 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 Yes; encryption with TLS V1.3 pre-selected • FGOP communication Yes; encryption with TLS V1.3 pre-selected • S7 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 Yes - Data length, max. 64 kbyte - several passive connections per port, supported Yes • IDP Yes - Data length, max. 64 kbyte • UDP Yes - Data length, max. 64 kbyte • UDP Yes • Data length, max. 2 kbyte; 1 472 bytes for UDP broadcast • UDP Yes • DAta length, max. 2 kbyte; 1 472 bytes for UDP broadcast • UDP (Yes Yes • DDS Yes; NamIciast circuits • UDP (Yes Yes • DDS Yes; Optional Web server Yes; Standar	— Media redundancy	Yes; only via BusAdapter
	— MRP	
- Switchover time on line break, typ.200 ms; For MRP, bumpless for MRPD- Number of stations in the ring, max.50SIMATIC communicationYes; encryption with TLS V1.3 pre-selected• S7 routingYes• Data record routingYes• Data record routingYes• S7 communication, as serverYes• User data per job, max.See online help (S7 communication, user data size)Open IE communicationYes- Data length, max.64 kbyte- several passive connections per port, supportedYes- Data length, max.64 kbyte- Data length, max.78 multicast circuits- Data length, max.74 yes- Data length, max.74 yes- Data length, max.74 yes- Data length, max.74 yes; max. 78 multicast circuits- DUPYes- DDP multicastYes- DASYes- DASYes- DASYes- Data length, max.74 yes- Data length, max.74 yes; max. 78 multicast circuits- DUPYes- DASYes- DASYes- DASYes- DASYes; OptionalWeb serverYes; Standard and user pages- HTTPSYes; Standard and user	- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
Number of stations in the ring, max. 50 SIMATIC communication Yes; encryption with TLS V1.3 pre-selected • 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 Yes • Data length, max. 64 kbyte - bata 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. 78 multicast circuits • UDP Yes • DNS Yes • DNS Yes • DNS Yes • DP Yes • LLDP Yes • LLDP Yes; Optional Web server Yes; Standard and user pages <	— MRPD	Yes; Requirement: IRT
SIMATIC communication Yes; encryption with TLS V1.3 pre-selected • PG/OP communication Yes; oncryption 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 • DTCP/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. 64 kbyte; 1 472 bytes for UDP broadcast - UDP multicast Yes; max. 78 multicast circuits • UDP Yes • DAGP Yes • DNS Yes • DRP Yes • DLP Yes; Optional Web server	— Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
• PG/OP communicationYes; encryption with TLS V1.3 pre-selected• S7 routingYes• Data record routingYes• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes- Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.64 kbyte• UDPYes- Data length, max.7 es- Data length, max.9 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DHCPYes• DDPYes• DDPYes• EncryptionYes (OptionalWeb serverYes; Optional• Web serverYes; Standard and user pages• web APIYes; Standard and user pages	- Number of stations in the ring, max.	50
• S7 routingYes• Data record routingYes• Data record routingYes• S7 communication, as serverYes• User data per job, max.See online help (S7 communication, user data size)• User data per job, max.See online help (S7 communication, user data size)• TCP/IPYes- Data length, max.64 kbyte- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDPYes- Data length, max.Yes; max. 78 multicast circuits- DHCPYes- DDFYes- DDFYes- DDFYes- DDPYes- DDFYes- DDFYes- DDFYes- DDFYes- DDFYes- DDFYes- DDFYes- DDFYes- DDPYes- DDFYes- DDFYes <tr< td=""><td>SIMATIC communication</td><td></td></tr<>	SIMATIC communication	
• Data record routingYes• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communicationYes• Data length, max.64 kbyte- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes• Data length, max.64 kbyte• DDPYes• Data length, max.90 Yes• DDPYes• DDPYes• DDPYes for UDP broadcast• UDPYes• DDCPYes• DDNSYes• DNSYes• DDPYes• DDPYes<	 PG/OP communication 	Yes; encryption with TLS V1.3 pre-selected
• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes• Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.64 kbyte• DDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DDRYes- Data length, max.Yes- Data length, max.Yes- Data length, max.Yes- Data length, max.Yes; max. 78 multicast circuits- DDP multicastYes; max. 78 multicast circuits- DDP multicastYes- DDRYes- DDRYes- DDRYes- DDPYes- DDPYes; OptionalVets serverYes; Standard and user pages• web APIYes; Standard and user pages	S7 routing	Yes
• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes• Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.64 kbyte• DDPYes- Data length, max.64 kbyte• DDPYes- Data length, max.64 kbyte• DDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast• UDPYes• DDFYes• DDFYes (Datalength)• DDF </td <td> Data record routing </td> <td>Yes</td>	 Data record routing 	Yes
User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- DuP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DCPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• Web APIYes; Standard and user pages	 S7 communication, as server 	Yes
Open IE communication Yes TCP/IP Data length, max. several passive connections per port, supported Yes ISO-on-TCP (RFC1006) Yes Data length, max. G4 kbyte Data length, max. G4 kbyte Data length, max. G4 kbyte UDP Yes Data length, max. 2 kbyte; 1 472 bytes for UDP broadcast UDP multicast Yes; max. 78 multicast circuits DDP multicast Yes NMP Yes SNMP Yes SNMP Yes ULDP Yes Yes	 S7 communication, as client 	Yes
• TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DHCPYes• DNSYes• DNSYes• DCPYes• DCPYes• EncryptionYes; OptionalWeb serverYes; Optional• HTTPYes; Standard and user pages• web APIYes; Standard and user pages	 User data per job, max. 	See online help (S7 communication, user data size)
- Data length, max.64 kbyte- several passive connections per port, supportedYes- ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte- UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits- UDP multicastYes- DHCPYes- DHCPYes- DNSYes- DCPYes- DCPYes- DCPYes- DCPYes- NTPYes (Dettioned)- EncryptionYes (Dettioned)Veb serverYes; Optional- HTTPYes; Standard and user pages- HTTPSYes; Standard and user pages- web APIYes; Standard and user pages		
- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• EncryptionYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	• TCP/IP	Yes
ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyteUDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• DCPYes• EncryptionYes; OptionalWeb serverYes; Optional• HTTPYes; Standard and user pages• Web APIYes; Standard and user pages	— Data length, max.	64 kbyte
- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DNSYes• SNMPYes• DCPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Optional• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	 — several passive connections per port, supported 	Yes
UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits- DHCPYes- DHCPYes- DNSYes- SNMPYes- DCPYes- DCPYes- DCPYes- EncryptionYes; OptionalWeb serverYes; Optional- HTTPYes; Standard and user pages- HTTPSYes; Standard and user pages- web APIYes; Standard and user pages	 ISO-on-TCP (RFC1006) 	Yes
- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Optional• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	— Data length, max.	64 kbyte
- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	• UDP	Yes
• DHCPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	— UDP multicast	
• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	• DHCP	Yes
• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	• DNS	Yes
• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages	• SNMP	Yes
• Encryption Yes; Optional Web server • HTTP Yes; Standard and user pages • HTTPS Yes; Standard and user pages • web API Yes; Standard and user pages	• DCP	Yes
Web server • HTTP Yes; Standard and user pages • HTTPS Yes; Standard and user pages • web API Yes; Standard and user pages	• LLDP	Yes
 HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages web API 	Encryption	Yes; Optional
HTTPS Yes; Standard and user pages web API	Web server	
• web API	• HTTP	Yes; Standard and user pages
	• HTTPS	Yes; Standard and user pages
- Number of sessions, max. 50	web API	
	- Number of sessions, max.	50
 number of simultaneous HTTP calls, max. 4 	 number of simultaneous HTTP calls, max. 	4

— HTTP request body, max.	131 072 byte
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_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, 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. — 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,	type "Reference namespace" 15 000
max. Alarms and Conditions 	Voc
Alarms and Conditions — Number of program alarms	Yes 100
— Number of program alarms — 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
number of subscriptions, max.	250
number of tags/attributes for subscriptions, max.	2 000
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.	5 000
Number of simultaneously active program alarms	
Number of program alarms	600
Number of alarms for system diagnostics	100
Number of alarms for motion technology objects	160

Test commissioning functions	
	Yes; Parallel online access possible for up to 5 engineering systems
Joint commission (Team Engineering) Status block	
	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Profiling	Yes
Status/control	
 Status/control variable 	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
 Number of variables, max. 	
 — of which status variables, max. 	200; per job
— of which control variables, max.	200; per job
Forcing	
Forcing	Yes
 Forcing, variables 	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	
• present	Yes
• Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4
Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
<u> </u>	Ven
RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
Monitoring of the supply voltage (PWR-LED)	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC
 Number of available Motion Control resources for technology objects 	program; selection guide via the TIA Selection Tool 1 120
Required Motion Control resources	
•	40
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
Positioning axis	
 — Number of positioning axes at motion control cycle of 4 ms (typical value) 	11
 — Number of positioning axes at motion control cycle of 8 ms (typical value) 	14
	14
of 8 ms (typical value)	14 Yes; Universal PID controller with integrated optimization
of 8 ms (typical value) Controller	
of 8 ms (typical value) Controller • PID_Compact	Yes; Universal PID controller with integrated optimization
of 8 ms (typical value) Controller • PID_Compact • PID_3Step	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min.	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes -30 °C; No condensation
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max.	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes -30 °C; No condensation 60 °C
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min.	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes -30 °C; No condensation 60 °C -30 °C; No condensation
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, max.	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes -30 °C; No condensation 60 °C
of 8 ms (typical value) Controller • PID_Compact • PID_3Step • PID-Temp Counting and measuring • High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min.	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes -30 °C; No condensation 60 °C -30 °C; No condensation

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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
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:	7/9/2024 🖸