SIEMENS

Data sheet

6AG2512-1DK01-4AB0



SIPLUS ET 200SP CPU 1512SP-1 PN rail based on 6ES7512-1DK01-0AB0 with conformal coating, -40...+70 °C, OT4 with ST1/2 (+85 °C for 10 minutes), no pluggable BusAdapter, central processing unit with work memory 200 KB for program and 1 MB for data, 1st interface, PROFINET IRT with 3-port switch, 48 ns bit performance, SIMATIC Memory Card required,

Fi	gu	re	si	mi	lar

General information	
Product type designation	CPU 1512SP-1 PN
based on	6ES7512-1DK01-0AB0
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 625 μs
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	see entry ID: 109746275
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 	5 ms
Input current	
Current consumption (rated value)	0.6 A
Current consumption, max.	0.9 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	
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)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	4 000, BIOCKS (OB, FB, FC, DB) and OD IS
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.	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
Number of delay alarm OBs	20
 Number of cyclic interrupt OBs 	20; With minimum OB 3x cycle of 500 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.	128 kbyte; Available retentive memory for bit memories, timers, counters, DBs,
-	and technology data (axes): 88 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

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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	o kuyte
•	0 khuta
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
 Number of subprocess images, max. 	32
Address space per module	
 Address space per module, max. 	288 byte; For input and output data respectively
Address space per station	
Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Hardware configuration	
Number of distributed IO systems	32; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• Via CM	1
Number of IO Controllers	
 integrated 	1
• Via CM	0
Rack	
Modules per rack, max.	80; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules; > 60 °C ambient temperature CPU + 32 modules + server module + 16 ET 200AL modules
 Quantity of operable ET 200SP modules, max. 	64; > 60 °C ambient temperature: 32 modules
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	
• Туре	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
	10 S, Typ. 2 S
Operating hours counter • Number	16
Clock synchronization	No.
• supported	Yes
• to DP, master	Yes; Via CM DP module
• on DP, device	Yes; Via CM DP module
• in AS, master	Yes
• in AS, device	Yes
 on Ethernet via NTP 	Yes
Interfaces	
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1; Via CM DP module
Optical interface	No
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
Number of ports	1
•	No
BusAdapter (PROFINET)	
Protocols	Voc IDv4
IP protocol	Yes; IPv4

	Vaa
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 — PG/OP communication	Yes
— Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	
— Prioritized startup	Yes; per user program Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	
- Number of connectable to 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	8; in total across all interfaces
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 μ s to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 μ s 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 µs: 375 µs, 625 µs 3
Undets first for DT	875 µs)
Update time for RT	050
— for send cycle of 250 μs	250 µs to 128 ms
— for send cycle of 500 μs	500 μs to 256 ms 1 ms to 512 ms
— for send cycle of 1 ms	
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms PROFINET IO Device	4 ms to 512 ms
Services — PG/OP communication	Vee
	Yes
— Isochronous mode — IRT	No Yes
— PROFlenergy — Shared device	Yes; per user program
 — Snared device — Number of IO Controllers with shared device, max. 	Yes 4
activation/deactivation of I-devices Asset management record	Yes; per user program
Asset management record Interface	Yes; per user program
Interface types • RS 485	Vas: Via CM DP module
	Yes; Via CM DP module
Number of ports Protocols	1
	Vac
 PROFIBUS DP master 	Yes
	Vee
PROFIBUS DP device SIMATIC communication	Yes
SIMATIC communication	Yes Yes
SIMATIC communication PROFIBUS DP master	Yes
SIMATIC communication PROFIBUS DP master Number of connections, max.	Yes 48; Of which 4 each reserved for ES and HMI
SIMATIC communication PROFIBUS DP master	Yes

− PecUP communication Yes − Equidiations No − advaluance No − advaluance/sectivation of DP devices Yes Interface types Yes 8.4.55 (Etherank) Yes • Autoropation Yes • Autoropation Yes • Autoropation Yes • Indextall Etherank statu Etherank 12 Matis Protocols Yes • Indextall Etherank statu Etherank 12 Matis Protocols Yes • Indextall Etherank statu Etherank 12 Value Protocols Yes • Number of connections, max. 12 Value • Number of connections, max. 12 Value integrated interfaces of the CPU and connected CP# / CMs • Number of connections within triggrate interfaces 88 • Number of connections 90 • Moda redundary. No • Meda redundary. <th></th> <th></th>		
	- PG/OP communication	Yes
	-	
Interface types R2L43 Elifements) I COMpts Yes I Additional Elimente status LED Yes Yes Yes		
RVA.6 (Internet) Ves • 100 Mopb Yes • Audoregotation Yes • Audoregotation Yes • Audoregotation Yes • Industrial Ethemist statu LED Yes • Ra Addresses 12 Mbit/s Protocols Protocols PROFIsate No • Number of connectors reserved for ES-MM/web 10 • Number of connectors per CP/CM 32 • Real redundancy No - MRP No • MRP No • MRP No • Stronting of the reserver Yes • Stronting prishte reserver Yes •		Yes
• (a) MapsYes• AutorospitationYes• AutorospitationYes• AutorospitationYes• Fast AssYes• Transmission rate, max12 MulticsProcessionImage: Second		
· AdvancegolationYes· AdvancegolationYes· Industrial Ethernet tabus LEDYes· Restation Ethernet Tabus YesYes· Restation Ethernet Tabus YesYes· Number of connections reserved for ESHMII/web10· Number of connections value regarded interfaces88· Number of connections reserved for ESHMII/web10· Number of connections value regarded interfaces88· Number of connections reserved for ESHMII/web10· Media redundancyNo- Media redundancyNo- Media redundancyNo- Media redundancyNo- Media redundancyNo- Media redundancyYes· Media redundancyYes· Media redundancyYes· Media redundancyYes· Media redundancyYes· Media redundancyYes· Media redundan	RJ 45 (Ethernet)	
• Kasoving Yes BS ABC Yes • Transmission rate, max. 12 Mbbbs • PROFease No • Number of connections, max. 128, via integrated interfaces of the CPU and connected CPs / CMs • Number of connections reserved for ESHMIveb 10 • Number of connections reserved for ESHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • Number of connections are represented for FSHMIveb 10 • MRP No 10 • MRP No 10 • MRP <		
inclusified Ethernet status EED Yes intransiston rate, max. 12.Mbit/s Protocis No Number of connections reserved for ES/MMIveb 10 intransition rate max. 128; via integrated interfaces of the CPU and connected CPs / CMs intransition of connections reserved for ES/MMIveb 10 intransition of connections via integrated interfaces of the CPU and connected CPs / CMs 10 intransition of connections via integrated interfaces of the CPU and connected CPs / CMs 10 interfaces of routing No 10 interfaces of routing No 10 interfaces of routing No No interfaces of routing Yes 10		
Image: Base State S		
• Transmission rate, max. 12 Mibits Protocols FROFIsarle No Number of connections, max. 128; via integrated interfaces of the CPU and connected CPs / CMs • Number of connections reserves for ES/HMIWeb 10 • Number of connections via integrated interfaces 88 • Number of connections, via protocol 32 • Number of connections, via protocol 32 • Number of S7 routing paths 16 • Pedivatery mode - - MRP No - MRP interconnection, supported No • PGIOP communication Yes; encryption with TLS V1.3 pre-selected • S7 communication, as server Yes • DBiOP communication Yes; encryption with TLS V1.3 pre-selected • S7 communication, as server Yes • Job are ford, max. See online help (S7 communication, user data size) Open Econnections per port, supported Yes • S0 communication Yes		Yes
Protocols No PROFIsale No Number of connections, max. 128; via integrated interfaces of the CPU and connected CPs / CMs Number of connections reserved for ES/HMI/veb 10 Number of connections via integrated interfaces 86 Number of stronding part CP/CM 32 I-Marce interconnection, supported No		
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• 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 strouting paths 16 Redundancy mode 16 • Hedia redundancy No • MeRP No • MRP No • MRP No • MRP No • MRP No • Strouting Yes; encryption with TLS V1.3 pre-selected • Strouting Yes • Strouting Yes • Data record routing Yes • Strouting Yes • User data per Job, max. See online help (ST communication, user data size) • OpenEl communication Yes • Strouting Yes • Data length, max. G4 klyte - everal passive connections per port, supported Yes • Strouting Yes • Data length, max. G4 klyte - Data length, max. G4 klyte - Data length, max. Yes • Dide Yes	PROFIsafe	No
• Number of connections reserved for ESAHM/web 10 • Number of connections paints 88 • Number of connections paints 10 • Redundancy 10 • H-Sync forwarding No • Media redundancy No - Media redundancy No - Media redundancy No - MRP No - MRP No - MRP No - MRPC No - MRPC No • PROFOCE communication Yes; encryption with TLS V1.3 pre-selected • ST outling Yes • ST outling Yes • ST outling as server Yes • ST outling Yes • ST outling Yes • ST communication, as clent Yes • User data per joh, max. See online help (\$7 communication, user data size) Open IE communication Yes • User data per joh, max. G4 kbyte • User data per joh, max. G4 kbyte • Data length, max. G4 kbyte • Data length, max. Yes • DDP multic		
• Number of connections via integrated interfaces88• Number of connections per CP/CM32• Number of S7 routing paths16Redundancy mode- Media redundancyNo- Media redundancyNo- MRPNo- MRP interconnection, supportedNo- MRP interconnection, supportedNo- MRP interconnection, supportedNo- MRP interconnection, se serverYes• PCIOP communicationYes• S7 routingYes• S7 continuicationYes• S7 continuication, as clientYes• S7 continuication, as clientYes• S7 continuication, as clientYes• Data tength, max.See online help (S7 communication, user data size)Open Lie continuicationYes• Data tength, max.Set klyte• Data length, max.Sktyte• Data length, max.Yes• Data length, max.Yes• Data length, max.Yes (Standard and user pages)• DUPYes• Data length, max.Yes (Standard and user pages)• DUPYes• DiscophicationYes (Standard and user pages)• DUPYes (Standard and user pages)• DUPYes (Standard and user pages)• DUPYes (Standard and user pages)• DUP </td <td></td> <td></td>		
• Number of connections per CPiCM32• Number of S7 routing paths16• H-Sync forwardingNo• Media redundancyNo- MRPNo- MRP (nerconnection, supported)No- MRP (nerconnection, supported)No• PRO(P communicationYes; encryption with TLS V1.3 pre-selected• S7 routingYes• PRO(P communication, as serverYes; encryption with TLS V1.3 pre-selected• S7 routingYes• S7 communication, as serverYes• S7 communication, as serverYes• Oral length, max.See online help (S7 communication, user data size)• Open IL communication, as clientYes• Data length, max.G4 kbyte• Data length, max.G4 kbyte• UDPYes• Data length, max.Key for UDP broadcast• UDPYes• DDP multicastYes, Max.6 multicast circuits• DDP multicastYes; Standard and user pages• DDP multicastYes; Standard and user pages• DHCPYes; Standard and user pages• DHCPYes; Standard and user pages• DPC Numine Internet requiredYes; Standard and user pages• DHCPYes; Standard and user pages• DHCPYes; Standard and user pages• DHCPYes; Standard and user pages• DHCPYe		
• Number of S7 routing paths 16 Readmancy mode • • H-Sync forwarding No • Media redundancy No • Media redundancy No • MRP No • MRP interconnection, supported No • MRP O No • MRP Communication Yes, encryption with TLS V1.3 pre-selected • S7 conting Yes • Data record routing Yes • S7 continuication, as server Yes • S7 conmunication, as clent Yes • S7 conmunication, as clent Yes • S7 communication, as clent Yes • S7 communication, as clent Yes • Data length, max. See ontione help (\$7 communication, user data size) Open IE communication Yes • Data length, max. G4 kbyte • Data length, max. Yes (Max. 5 multicast circuits • DUP Yes • Data length, max.	Ũ	
Redundancy mode No H-Sync forwarding Modia redundancy MRP Soft communication Yes, encryption with TLS V1.3 pre-selected S7 communication, as server Yes User data per job, max. See online help (S7 communication, user data size) Opent E communication Yes Ads length, max. See online help (S7 communication, user data size) Opent E communication Yes Ads length, max. Yes Ads length, max. Yes Ads length, max. Yes for UDP broadcast UDP Yes Max 5 multicast circuits DHCP Yes NMP Yes SMMP Yes ShMP Yes ShMP Yes (ptional Web server HTTP Yes (Standa	-	
H-Sync forwarding No Media redundancy No — Media redundancy No — MRP No — MRP interconnection, supported No — MRPD No Site and the second provided in the second pro		16
Media redundancy No — McBia redundancy No — MRP No — MRP interconnection, supported No — MRPD Yes; encryption with TLS V1.3 pre-selected • S7 communication, as server Yes; • S7 communication, as dient Yes • User data per job, max. See online help (S7 communication, user data size) Open IE communication Yes • User data per job, 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 • UDP Yes — Data length, max. 64 kbyte • UDP Yes • Data length, max. Yes; MattGata dricutis • DDRDP Yes • DDRDP Yes • DDRDP Yes • DNS Yes; Standard and user pages • Encryption <	-	
- Media redundancy No - MRP No - MRP Interconnection, supported No - MRPD No SIMATIC communication Yes; encryption with TLS V1.3 pre-selected • PG/GVP communication Yes • ST routing Yes • ST routing Yes • ST communication, as server Yes • ST communication, as client Yes • User data per job, max. See online help (S7 communication, user data size) Open Its communication Yes • TCP/IP 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 • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 12 kbyte; 1 472 bytes for UDP broadcast • UDP Yes • DAta length, max. 2 kbyte; 1 472 bytes for UDP broadcast • UDP Yes • DHCP Yes • DNS Yes; Standard and user pages • DLCP Yes; Standard and user pages	H-Sync forwarding	No
	Media redundancy	
	— Media redundancy	No
MRPD No SIMATIC communication Ves; encryption with TLS V1.3 pre-selected • PG/OP communication, as server Yes • Data record 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 • Data length, max. 64 kbyte • S0-on-TCP (RFC1006) Yes • Data length, max. 64 kbyte • DDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. Yes for UDP broadcast • UDP Yes • DDP multicast Yes • DHCP Yes • DHCP Yes • DHCP Yes • Encryption Yes • Encryption Yes	— MRP	No
SIMATIC communication Yes; encryption with TLS V1.3 pre-selected • FGOP communication Yes; encryption with TLS V1.3 pre-selected • S7 routing Yes • Data record routing Yes • S7 communication, as elent Yes • User data per job, max. See online help (S7 communication, user data size) Open IE communication Yes • TCP/IP Yes • Data length, max. 64 kbyte • USO - nTCP (RFC1006) Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP multicast Yes; Max. 5 multicast circuits • DDLP Yes • DDLP Yes • DNS Yes; Nax. 5 multicast circuits • DHCP Yes • DNS Yes; Optional Web server Yes; Optional • HITP Yes; Standard and user pages • Intry to authentication Yes; • DPC UA Client Yes • Application authentication Yes • DerociuA Yes • LIDP Yes; Small* license requir	 MRP interconnection, supported 	No
• 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 • TCP/IP Yes • Data length, max. 64 kbyte - Data length, max. 64 kbyte - Data length, max. 64 kbyte • DDP Yes - Data length, max. 64 kbyte • DDP Yes - Data length, max. 64 kbyte • DDP Yes - Data length, max. 2 kbyte; 1 472 bytes for UDP broadcast - UDP multicast Yes; Max. 5 multicast circuits • DHCP Yes • DNS Yes • DDP Yes • DCP Yes • Encryption Yes; Standard and user pages • HTTPS Yes; Standard and user pages • HTTPS Yes; Standard and user pages • PC UA Client Yes	— MRPD	No
• S7 routing Yes • Data record routing Yes • S7 communication, as server Yes • S7 communication, as dirent 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 • IDP Yes - Data length, max. 64 kbyte • UDP Yes - Data length, max. 2 kbyte; 1472 bytes for UDP broadcast - UDP multicast Yes • DDP Yes • DP Yes • DROP Yes • DROP Yes • DP Yes <td>SIMATIC communication</td> <td></td>	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- DupYes- Data length, max.64 kbyte- DupYes- Data length, max.7 yes- Data length, max.9 yes- Data length, max.9 yes- Dup multicastYes- Dup multicastYes <td> PG/OP communication </td> <td>Yes; encryption with TLS V1.3 pre-selected</td>	 PG/OP communication 	Yes; encryption with TLS V1.3 pre-selected
• 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 For PIP • 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. 64 kbyte • UDP Yes - Data length, max. 64 kbyte • UDP Yes - Data length, max. 2 kbyte; 1472 bytes for UDP broadcast - UDP multicast Yes; Max. 5 multicast circuits • DHCP Yes • DHCP Yes • DHCP Yes • DLP Yes; Optional Web server Yes; Standard and user pages • HTTPs Yes; Standard and user pages OPC UA Yes • Runtime license required Yes; Small* license required • OPC UA Yes • Runtime license required Yes	S7 routing	Yes
• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open III communication• 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.64 kbyte• DDPYes- Data length, max.64 kbyte• DDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits• DHCPYes• DNSYes• DNSYes• DNSYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverItTTP• HTTPSYes; Standard and user pages• DPC UAYes; Standard and user pagesOPC UAYes; Standard and user pages• OPC UA ClientYes; "Small" license required• OPC UA ClientYes; Standard and user pages• Application authenticationYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic1268rsa15, Basic2568rsa15, Basic2568rsa256- User authenticationYes- User authenticationYes- Number of connections, max.4	 Data record routing 	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 Data length, max. - Data length, max. 64 kbyte • UDP Yes - Data length, max. 64 kbyte - Data length, max. 64 kbyte - Data length, max. 64 kbyte - Data length, max. 74 kbyte; 1 472 bytes for UDP broadcast - UDP multicast Yes; Max. 5 multicast circuits • DHCP Yes • DNS Yes • DCP Yes • DCP Yes • LLDP Yes; Optional Web server Yes; Standard and user pages • HTTP Yes; Standard and user pages • HTTP Yes; Standard and user pages • HTTP Yes; Standard and user pages • OPC UA Client Yes <td> S7 communication, as server </td> <td>Yes</td>	 S7 communication, as server 	Yes
Open IE communication Yes • TCP/IP Yes • Data length, max. 64 kbyte • useveral passive connections per port, supported Yes • ISO-on-TCP (RFC1006) 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 multicast Yes; Max. 5 multicast circuits • DHCP Yes • DNS Yes • DNS Yes • DCP Yes • Encryption Yes; Optional Web server • HTTP Yes; Standard and user pages • HTTPS Yes; Standard and user pages • OPC UA • OPC UA Client • OPC UA Client • Application authentication - Security policies - Assize Soft - User authentication	 S7 communication, as client 	Yes
• TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes- several passive connections per port, supportedYes- Data length, max.64 kbyte- UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits- UDP multicastYes- DACPYes- DDCPYes- DCPYes- DCPYes- DCPYes- DCPYes- DCPYes- DCPYes- EncryptionYes; OptionalWeb server- ITTPSYes; Standard and user pages- OPC UA- Runtime license required• OPC UA ClientYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15,		See online help (S7 communication, user data size)
- Data length, max.64 kbyte- several passive connections per port, supportedYes- Several passive connections per port, supportedYes- Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits- DHCPYes- DHCPYes- DDSYes- DDSYes- DDCPYes- DDCPYes- DDCPYes- DDCPYes- DDCPYes- DDCPYes- DDCPYes- DDCPYes- EncryptionYes; OptionalWeb server- Runtime license required- PCUAYes; Standard and user pages- HTTPSYes; Standard and user pages- OPC UA ClientYes; Small" license required- OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Ba	Open IE communication	
several passive connections per port, supportedYes· ISO-on-TCP (RFC1006)YesData length, max.64 kbyte· UDPYesData length, max.2k kbyte; 1 472 bytes for UDP broadcastData length, max.2k kbyte; 1 472 bytes for UDP broadcastData length, max.2k kbyte; 1 472 bytes for UDP broadcastData length, max.Yes; Max. 5 multicast circuitsData length, max.Yes; Max. 5 multicast circuitsData length, max.Yes; Max. 5 multicast circuitsData length, max.Yes; Max. 5 multicast circuitsDATAYes; Max. 5 multicast circuitsDATAYes; Max. 5 multicast circuitsDATAYes; Standard and user pagesDATAYes; Standard and user pagesHTTPsYes; Standard and user pagesHTTPsYes; Standard and user pagesDATAYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rs	• TCP/IP	Yes
• 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. 5 multicast circuits- UDP multicastYes• DHCPYes• DNSYes• DNSYes• DCPYes• DCPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• PCC UAYes• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, B	— 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. 5 multicast circuits• DHCPYes• DHCPYes• DNSYes• DNSYes• DNSYes• DDPYes• HTTPYes• HTTPSYes; Standard and user pages• HTTPSYes; "Small" license required• OPC UAYes• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa256- User authentication"anonymous" or by user name & password- Number of connections, max.4	 — several passive connections per port, supported 	Yes
• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits• DHCPYes• DHCPYes• DNSYes• DNSYes• SNMPYes• DCPYes• DLPYes• DCPYes• DCPYes (Datast circuits)• DCPYes• DCPYes (Datast circuits)• HTTPYes; Optional• Web serverYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• OPC UAVes• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAsialable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Csha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	 ISO-on-TCP (RFC1006) 	Yes
- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits• DHCPYes; Max. 5 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• DCPYes• LLDPYes; Optional• EncryptionYes; OptionalVeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• PC UAYes; "Small" license required• OPC UA ClientYes; "Small" license required• Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa1	— Data length, max.	64 kbyte
- UDP multicastYes; Max. 5 multicast circuits• DHCPYes• DNSYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• CPC UAYes; Standard and user pages• CPC UAYes; Standard and user pages• OPC UA ClientYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	• UDP	Yes
• DHCPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalVeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• DPC UAYes; Standard and user pages• CPC UAYes; Standard and user pages• CPC UAYes; Standard and user pages• OPC UA ClientYes; "Small" license required• Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
• DNSYes• SNMPYes• DCPYes• LLDPYes (optional• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• PC UAYes; "Small" license required• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication'anonymous" or by user name & password- Number of connections, max.4	— UDP multicast	Yes; Max. 5 multicast circuits
• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb server• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• PC UAYes; "Small" license required• OPC UA ClientYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	• DHCP	Yes
• DCPYes• LLDPYes; Optional• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• DPC UAYes; Standard and user pages• Runtime license requiredYes; "Small" license required• OPC UAYes• Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	• DNS	Yes
• LLDPYes• EncryptionYes; OptionalWeb server• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• HTTPSYes; Standard and user pages• OPC UAYes; "Small" license required• OPC UA ClientYes; "Small" license required• Application authenticationYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	• SNMP	Yes
• EncryptionYes; OptionalWeb server• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pagesOPC UA• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	• DCP	Yes
Web server • HTTP Yes; Standard and user pages • HTTPS Yes; Standard and user pages OPC UA Yes; "Small" license required • Runtime license required Yes; "Small" license required • OPC UA Client Yes - 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	• LLDP	Yes
• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pagesOPC UA• Runtime license requiredYes; "Small" license required• OPC UA ClientYes- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- Number of connections, max.4	Encryption	Yes; Optional
• HTTPS Yes; Standard and user pages OPC UA • Runtime license required • Runtime license required Yes; "Small" license required • OPC UA Client Yes - 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	Web server	
OPC UA • Runtime license required Yes; "Small" license required • OPC UA Client Yes - 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	• HTTP	Yes; Standard and user pages
 Runtime license required Ves; "Small" license required OPC UA Client Application authentication Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication "anonymous" or by user name & password Number of connections, max. 		Yes; Standard and user pages
• OPC UA Client Yes - 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	OPC UA	
— Application authenticationYes— Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256— User authentication"anonymous" or by user name & password— Number of connections, max.4	 Runtime license required 	Yes; "Small" license required
- Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - User authentication "anonymous" or by user name & password - Number of connections, max. 4	OPC UA Client	Yes
	 Application authentication 	Yes
- Number of connections, max.	— Security policies	
	- User authentication	"anonymous" or by user name & password
- Number of nodes of the client interfaces, 1 000	- Number of connections, max.	4
	- Number of nodes of the client interfaces,	1 000

we are seen as the dimension	
recommended max.	200
 — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_U 	300
max.	
- Number of elements for one call of	20
OPC_UA_NameSpaceGetIndexList, max.	
 — 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
— Number of inputs/outputs when calling	20
OPC_UA_MethodCall, max. • OPC UA Server	Vac: Data access (read, write, subscribe), method call, sustem address space
Application authentication	Yes; Data access (read, write, subscribe), method call, custom address space Yes
— Application authentication — Security policies	
- Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— 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. 	20
— Sampling interval, min.	100 ms
— Publishing interval, min.	500 ms
— Number of server methods, max.	20
- Number of inputs/outputs per server method, max.	20
 Number of monitored items, recommended max. 	1 000; for 1 s sampling interval and 1 s send interval
- Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
	4 000
 Number of nodes for user-defined server interfaces, max. 	1 000
	Yes
max.	
Max.Alarms and Conditions	Yes
max. ● Alarms and Conditions — Number of program alarms	Yes 100
max. • Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics	Yes 100
max. • Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols	Yes 100 50
max. Alarms and Conditions Number of program alarms Number of alarms for system diagnostics Further protocols MODBUS 	Yes 100 50
max.	Yes 100 50 Yes; MODBUS TCP
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols MODBUS S7 message functions Number of login stations for message functions, max.	Yes 100 50 Yes; MODBUS TCP 32
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block,
max.	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
max.	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
max. Alarms and Conditions Number of program alarms Number of alarms for system diagnostics Further protocols MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering)	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step Number of breakpoints	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No
max. Alarms and Conditions Number of program alarms Number of alarms for system diagnostics Further protocols MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission(Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max.	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
max. Alarms and Conditions Number of program alarms Number of alarms for system diagnostics Further protocols MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. – of which status variables, max.	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max.	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. Forcing	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission(Team Engineering) Status block Single step Number of breakpoints Status/control variable • Variables Number of variables, max. — of which status variables, max. Forcing • Forcing	Yes 100 50 Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
max. Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics Further protocols • MODBUS S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commission(Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable · Variables · Number of variables, max. — of which status variables, max. Forcing • Forcing • Forcing • Forcing · Forcing · Forcing · Forcing	Yes Yes; MODBUS TCP Yes; MODBUS TCP 32 Yes 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job 200; per job 200; per job

- procent	Yes
presentNumber of entries, max.	1 000
- of which powerfail-proof	500
Traces	500
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
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
	program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	800
Required Motion Control resources	
— 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) 	5
 — Number of positioning axes at motion control cycle of 8 ms (typical value) 	10
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
PID_3Step	Yes; PID controller with integrated optimization for valves
PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring High-speed counter 	Yes
Isolation	
Isolation tested with	750 V DC (type test) and according to EN 50155 (routine test)
Standards, approvals, certificates	
Railway application	
• EN 50121-3-2	Yes; EMC for rail vehicles
• EN 50121-4	Yes; EMC for signal and telecommunications systems
• EN 50124-1	Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC
• EN 50125-1	Yes; Rail vehicles - see ambient conditions
• EN 50125-2	Yes; Stationary electrical equipment - see ambient conditions
• EN 50125-3	Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)
• EN 50155	Yes; Rail vehicles - temperature class OT4, ST1/ST2, horizontal mounting position
• EN 61373	Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B
• Fire protection acc. to EN 45545-2	Yes; For proof of conformity, see Service & Support
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-40 °C; = Tmin (incl. condensation/frost)
 horizontal installation, max. 	70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)
• vertical installation, min.	-40 °C; = Tmin
vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)
Relative humidity	

• With condensation, tested in accordance with IEC 60068-2-38, max. 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

Resistance	
Coolants and lubricants	
 Resistant to commercially available coolants and lubricants 	No
Use in stationary industrial systems	
 — to biologically active substances according to EN 60721-3-3 	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
 — to chemically active substances according to EN 60721-3-3 	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
 — to mechanically active substances according to EN 60721-3-3 	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles	
 — to biologically active substances according to EN 60721-3-5 	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
 — to chemically active substances according to EN 60721-3-5 	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
 — to mechanically active substances according to EN 60721-3-5 	Yes; Class 5S3 incl. sand, dust; *
Usage in industrial process technology	
 Against chemically active substances acc. to EN 60654-4 	Yes; Class 3 (excluding trichlorethylene)
 Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
 Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
 Coatings for printed circuit board assemblies acc. to EN 61086 	Yes; Class 2 for high reliability
 Protection against fouling acc. to EN 60664-3 	Yes; Type 1 protection
 Electronic equipment on rolling stock acc. to EN 50155 	Yes; Class PC2 protective coating acc. to EN 50155:2017
 Military testing according to MIL-I-46058C, Amendment 7 	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC- CC-830A	Yes; Conformal coating, Class A
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
 protection of confidential confiduration data 	Yes
 protection of confidential configuration data Protection level: Write protection 	Yes
Protection level: Write protection	Yes
Protection level: Write protectionProtection level: Read/write protection	Yes Yes
 Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection 	Yes
 Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header 	Yes Yes Yes
Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit	Yes Yes Yes adjustable minimum cycle time
 Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit 	Yes Yes Yes
Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions	Yes Yes Yes adjustable minimum cycle time adjustable maximum cycle time
Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width	Yes Yes Yes adjustable minimum cycle time adjustable maximum cycle time 100 mm
Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height	Yes Yes Yes adjustable minimum cycle time adjustable maximum cycle time 100 mm 117 mm
Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width	Yes Yes Yes adjustable minimum cycle time adjustable maximum cycle time 100 mm

Other	
Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776

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