## 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
<ul> <li>Module swapping during operation (hot swapping)</li> </ul>	Yes; Multi-hot swapping
Isochronous mode	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 $\mu s$
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	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	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	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 <sup>2</sup> ·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	
<ul> <li>integrated (for program)</li> </ul>	200 kbyte
<ul> <li>integrated (for data)</li> </ul>	1 Mbyte
Load memory	
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	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
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 500 µs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	1
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of startup OBs</li> </ul>	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
<ul> <li>Number of diagnostic alarm OBs</li> </ul>	1
Nesting depth	
<ul> <li>per priority class</li> </ul>	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	
<ul> <li>per priority class, max.</li> </ul>	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	
<ul> <li>Number of subprocess images, max.</li> </ul>	32
Address space per module	
<ul> <li>Address space per module, max.</li> </ul>	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	
<ul> <li>integrated</li> </ul>	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
<ul> <li>Quantity of operable ET 200SP modules, max.</li> </ul>	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
<ul> <li>on Ethernet via NTP</li> </ul>	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 $\mu$ s to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 $\mu$ 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
<ul> <li>— Snared device</li> <li>— Number of IO Controllers with shared device, max.</li> </ul>	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
<ul> <li>PROFIBUS DP master</li> </ul>	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		
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, max.         10           Number of connections, percent of S7 routing paths         10           Returndamy model         32           • Number of s7 routing paths         10           Media redundancy         No           - MRP         No           - MRP Communication         Ves; encryption with TLS V1.3 pre-selected           • S7 continuncation, as givent         Yes           • S7 continuncation, as dient         Yes           • CPDIP         Yes           • Obta length, max.         See online help (S7 communication, user data size)           OpenLie communication         Yes           • Data length, max.         See online help (S7 communication, user data size)           OpenLie connections per port, supported         Yes           • Dote         Yes		12 Mbit/s
Number of connections, max.         128, via integrated interfaces of the CPU and connected CPs / CMs           Number of connections reserved for ESHMI/web         10           Number of connections reserved for ESHMI/web         10           Number of connections pro CPCM         32           Number of connections pro CPCM         32           Number of S7 routing parts         16           Redundancy mode         -           - Hodia redundancy         No           - MRP         No           - MRP         No           - MRP Interconnection, supported         No           - MRP Interconnection, supported         No           - S7 conting         Yes           * PGOP communication         Yes           * S7 communication         Yes           * S7 communication, as ever         Yes           * Open Economunication         Yes           * S7 communication, as ever         Yes           * Open Economunication         Yes           * S7 communication         Yes           * Open Economunication         Yes           * Open Economunication         Yes           * Open Economunication         Yes           * Open Economunication         Yes           * Open Economunicat	Protocols	
• 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 <ul> <li>H-Sync forwarding</li> <li>Modia redundancy</li> <li>MRP</li> <li>Soft communication</li> <li>Yes, encryption with TLS V1.3 pre-selected</li> <li>S7 communication, as server</li> <li>Yes</li> <li>User data per job, max.</li> <li>See online help (S7 communication, user data size)</li> <li>Opent E communication</li> <li>Yes</li> <li>Ads length, max.</li> <li>See online help (S7 communication, user data size)</li> <li>Opent E communication</li> <li>Yes</li> <li>Ads length, max.</li> <li>Yes</li> <li>Ads length, max.</li> <li>Yes</li> <li>Ads length, max.</li> <li>Yes for UDP broadcast</li> <li>UDP</li> <li>Yes Max 5 multicast circuits</li> <li>DHCP</li> <li>Yes</li> <li>NMP</li> <li>Yes</li> <li>SMMP</li> <li>Yes</li> <li>ShMP</li> <li>Yes</li> <li>ShMP</li> <li>Yes (ptional</li> <li>Web server</li> <li>HTTP</li> <li>Yes (Standa</li></ul>	-	
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	<ul> <li>MRP interconnection, supported</li> </ul>	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><ul> <li>PG/OP communication</li> </ul></td> <td>Yes; encryption with TLS V1.3 pre-selected</td>	<ul> <li>PG/OP communication</li> </ul>	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	<ul> <li>Data record routing</li> </ul>	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><ul> <li>S7 communication, as server</li> </ul></td> <td>Yes</td>	<ul> <li>S7 communication, as server</li> </ul>	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	<ul> <li>S7 communication, as client</li> </ul>	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	<ul> <li>— several passive connections per port, supported</li> </ul>	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	<ul> <li>ISO-on-TCP (RFC1006)</li> </ul>	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
<ul> <li>Runtime license required</li> <li>Ves; "Small" license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>"anonymous" or by user name &amp; password</li> <li>Number of connections, max.</li> </ul>		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	<ul> <li>Runtime license required</li> </ul>	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
	<ul> <li>Application authentication</li> </ul>	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

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recommended max.	200
<ul> <li>— Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_U</li> </ul>	300
max.	
- Number of elements for one call of	20
OPC_UA_NameSpaceGetIndexList, max.	
<ul> <li>— Number of elements for one call of OPC_UA_MethodGetHandleList, max.</li> </ul>	100
<ul> <li>Number of simultaneous calls of the client instructions for session management, per connection,</li> </ul>	1
max.	
<ul> <li>Number of simultaneous calls of the client instructions for data access, per connection, max.</li> </ul>	5
<ul> <li>— Number of registerable nodes, max.</li> </ul>	5 000
<ul> <li>— Number of registerable method calls of OPC_UA_MethodCall, max.</li> </ul>	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
<ul> <li>— GDS support (certificate management)</li> </ul>	Yes
<ul> <li>— Number of sessions, max.</li> </ul>	32
<ul> <li>Number of accessible variables, max.</li> </ul>	50 000
<ul> <li>Number of registerable nodes, max.</li> </ul>	10 000
<ul> <li>— Number of subscriptions per session, max.</li> </ul>	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
<ul> <li>Number of monitored items, recommended max.</li> </ul>	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
<ul> <li>Number of nodes for user-defined server interfaces, max.</li> </ul>	1 000
	Yes
max.	
<ul><li>Max.</li><li>Alarms and Conditions</li></ul>	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. <ul> <li>Alarms and Conditions</li> <li>Number of program alarms</li> <li>Number of alarms for system diagnostics</li> </ul> Further protocols <ul> <li>MODBUS</li> </ul>	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. <ul> <li>Alarms and Conditions <ul> <li>Number of program alarms</li> <li>Number of alarms for system diagnostics</li> </ul> </li> <li>Further protocols <ul> <li>MODBUS</li> </ul> </li> <li>S7 message functions</li> <li>Number of login stations for message functions, max.</li> <li>Program alarms</li> <li>Number of configurable program messages, max.</li> </ul> <li>Number of loadable program messages in RUN, max.</li> <li>Test commission (Team Engineering)</li> <li>Status block</li> <li>Single step</li> <li>Number of breakpoints</li> <li>Status/control</li>	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. <ul> <li>Alarms and Conditions <ul> <li>Number of program alarms</li> <li>Number of alarms for system diagnostics</li> </ul> </li> <li>Further protocols <ul> <li>MODBUS</li> </ul> </li> <li>S7 message functions</li> <li>Number of login stations for message functions, max.</li> <li>Program alarms</li> <li>Number of configurable program messages, max.</li> </ul> <li>Number of loadable program messages in RUN, max.</li> <li>Test commission (Team Engineering)</li> <li>Status block</li> <li>Single step</li> <li>Number of breakpoints</li> <li>Status/control</li> <li>Status/control variable</li> <li>Variables</li> <li>Number of variables, max.</li> <li>– of which status variables, max.</li>	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
<ul><li>present</li><li>Number of entries, max.</li></ul>	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
<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	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
<ul> <li>Number of available Motion Control resources for technology objects</li> </ul>	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	
<ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	5
<ul> <li>— Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	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 <ul> <li>High-speed counter</li> </ul>	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	
<ul> <li>horizontal installation, min.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost)
<ul> <li>horizontal installation, max.</li> </ul>	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	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	No
Use in stationary industrial systems	
<ul> <li>— to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>— to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>— to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles	
<ul> <li>— to biologically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
<ul> <li>— to chemically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>— to mechanically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5S3 incl. sand, dust; *
Usage in industrial process technology	
<ul> <li>Against chemically active substances acc. to EN 60654-4</li> </ul>	Yes; Class 3 (excluding trichlorethylene)
<ul> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	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	
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high reliability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
<ul> <li>Electronic equipment on rolling stock acc. to EN 50155</li> </ul>	Yes; Class PC2 protective coating acc. to EN 50155:2017
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	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	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
<ul> <li>protection of confidential confiduration data</li> </ul>	Yes
<ul> <li>protection of confidential configuration data</li> <li>Protection level: Write protection</li> </ul>	Yes
Protection level: Write protection	Yes
<ul><li>Protection level: Write protection</li><li>Protection level: Read/write protection</li></ul>	Yes Yes
<ul> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> </ul>	Yes
<ul> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> <li>programming / cycle time monitoring / header</li> </ul>	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
<ul> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> <li>programming / cycle time monitoring / header</li> <li>lower limit</li> <li>upper limit</li> </ul>	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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