## SIEMENS

## Data sheet

## 6ES7512-1SM03-0AB0



SIMATIC DP, CPU 1512SP F-1 PN for ET 200SP, central processing unit with 600 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for port 1 and 2

General information	
Product type designation	CPU 1512SP F-1 PN
HW functional status	FS03
Firmware version	V3.1
<ul> <li>FW update possible</li> </ul>	Yes
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
<ul> <li>Isochronous mode</li> </ul>	Yes; only with PROFINET; with minimum OB 6x cycle of 500 µs
• SysLog	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V18 (FW V3.0) or higher; with older TIA Portal versions configurable as 6ES7512-1SK01-0AB0
Configuration control	
via dataset	Yes
Control elements	
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	10 ms
Input current	
Current consumption (rated value)	0.48 A
Current consumption, max.	0.7 A
Inrush current, max.	1.34 A; Rated value
l²t	0.3 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	8.05 W
Power loss	
Power loss, typ.	3.5 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2 Mbyte
Load memory	

• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	52 Objic
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	2 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	600 kbyte
FC	
Number range	0 65 535
• Size, max.	600 kbyte
OB	
• Size, max.	600 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
Number of delay alarm OBs	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 250 µs
<ul> <li>Number of process alarm OBs</li> </ul>	50
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	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
Number of diagnostic alarm OBs	1
Nesting depth	
<ul> <li>per priority class</li> </ul>	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	256 kbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 216 KB
Flag	
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
<ul> <li>Retentivity adjustable</li> </ul>	Yes

Retentivity preset	No
Ketentivity preset     Local data	
per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	2 040, max. number of modules / submodules
Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	Undy to
— 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
- Address space per station, max.	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.	82; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules
<ul> <li>Quantity of operable ET 200SP modules, max.</li> </ul>	64
<ul> <li>Quantity of operable ET 200AL modules, max.</li> </ul>	16
<ul> <li>Number of lines, max.</li> </ul>	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
Operating hours counter	
Number	16
Clock synchronization	
supported	Yes
• to DP, master	Yes; Via CM DP module
• on DP, device	Yes; Via CM DP module
• in AS, master	Yes
• in AS, device	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1; Via CM DP module
Optical interface	No
1. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
Number of ports	3; 1. integr. + 2. via BusAdapter
integrated switch	Yes

BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	
Services	
— Isochronous mode	Yes
— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul> <li>Of which IO devices with IRT, max.</li> </ul>	64
- Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
— PROFINET Security Class	1
Update time for IRT	
— for send cycle of 250 μs	250 $\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 $\mu s$ of the isochronous OB is decisive
— for send cycle of 500 $\mu$ s	500 µs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
<ul> <li>With IRT and parameterization of "odd" send cycles</li> </ul>	Update time = set "odd" send clock (any multiple of 125 $\mu s$ : 375 $\mu s$ , 625 $\mu s$ 3 875 $\mu s$ )
Update time for RT	
— for send cycle of 250 µs	250 µs to 128 ms
— for send cycle of 500 µs	500 µs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	Yes
- PROFlenergy	Yes; per user program
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
<ul> <li>activation/deactivation of I-devices</li> </ul>	Yes; per user program
<ul> <li>Asset management record</li> </ul>	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RS 485	
Number of ports	Yes; Via CM DP module
Protocols	Yes; Via CM DP module 1
110100010	
PROFIBUS DP master	
	1
PROFIBUS DP master	1 Yes

	- Number of connections	49: Of which 4 people reconverting for EQ and LIM
Benicas         PROFIBUS or PROFINET	Number of connections, max.	48; Of which 4 each reserved for ES and HMI
Services         -           -         Equidations         No           -         activation/indexiduation of DP devices         Yes           -         activation/indexiduation of DP devices         Yes           -         activation/indexiduation of DP devices         Yes           -         Control         Yes           -         Activation/indexiduation         Yes           -         Activation	• max. number of DP devices	
− lisothronous mode         No           − achterionideactivation of OP devices         Yes           FLASE (Elements)         Yes           FLASE (Elements)         Yes           A vidonegotation         Yes           A vidonegotation reserved for ESNMM/veo         10           A vivother of connections, max.         128, vido interfaces of the CPU and connected CPP / CMs           A vivother of connections of vidonegotation treserved for ESNMM/veo         10           A vivother of connections of vidon graph         Yes           A vivother of connections of vidon graph         Yes           A vivother of connections of vidon graph         Yes           A vivother of connections vidon graph         Yes           A vivother of connections vidon graph         Yes           A vidonegotation searved for ESNMM/veo         10           A vivother of connections vidon graph         Yes           A vidon graph         Yes           A vidon graph         Yes           A vidon	Services	
− lisothronous mode         No           − achterionideactivation of OP devices         Yes           FLASE (Elements)         Yes           FLASE (Elements)         Yes           A vidonegotation         Yes           A vidonegotation reserved for ESNMM/veo         10           A vivother of connections, max.         128, vido interfaces of the CPU and connected CPP / CMs           A vivother of connections of vidonegotation treserved for ESNMM/veo         10           A vivother of connections of vidon graph         Yes           A vivother of connections of vidon graph         Yes           A vivother of connections of vidon graph         Yes           A vivother of connections vidon graph         Yes           A vivother of connections vidon graph         Yes           A vidonegotation searved for ESNMM/veo         10           A vivother of connections vidon graph         Yes           A vidon graph         Yes           A vidon graph         Yes           A vidon	— Equidistance	No
Interface by period           RJ 45 (Ellowens)           - 100 Mpg         Yes           - Muthingplation         Yes           - Transmission rate, max         12 Motifs           Profilation         Yes; V2.4 / V2.8           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, par CPCA4         22           - Number of connections, par CPCA4         23           - Number of connections, par CPCA4         24           - Number of connections, par CPCA4         24           - Number of connections, par CPCA4         26           - Number of connections, par CPCA4         27           - Number of connections, par CPCA4         28           - Number of connections, par CPCA4         29           - MPP         Yes, MPP Interconnectorin, supported           - MRP         Yes           - MRP Connunciation         Yes, rency We		No
BJ45.(Eltement)     Yes       • 100 Mbps     Yes       • Autocrossing     Yes       • Autocrossing     Yes       • Industral Eltement status LED     Yes       • Transmission rate, max.     12 Mbb/ts       Protocols     Protocols       Protocols     128, via integrated interfaces of the CPU and connected CPs / CMs       • Number of connections reaved for ESHMUweb     10       • Number of ST coulting paths     16       Refundancy mode     Yes       - MRP interconnection, supported     Yes: MDP Autominager according to IEC 62439-2 Edition 2.0, MRP Manager: MBP Ring node according to IEC 62439-2 Edition 3.0       - MRPC     Yes: MDP Autominager according to IEC 62439-2 Edition 3.0       - MRPC     Yes: antMP ring node according to IEC 62439-2 Edition 3.0       - MRPC     Yes: antMP ring node according to IEC 62439-2 Edition 3.0       - Structure or statures in the ring, max.     20       - Nutribut of statures in the ring, max.     20       - Structure or statures	<ul> <li>activation/deactivation of DP devices</li> </ul>	Yes
BJ.45 (Effement)     Ves       • 100 Mbps     Yes       • Autorogalation     Yes       • Autorogalation     Yes       • Autorosing     Yes       • Individe Effective status LED     Yes       • Resides     •       • Transmission rate, max.     12 Mbb/s       Protocols     •       • Number of connections vai integrated interfaces     10       • Number of connections vai integrated interfaces     88       • Number of connections reserved for ESi+Milveb     10       • Number of connections reserved for ESi+Milveb     10       • Number of connections vai integrated interfaces     88       • Number of connections reserved for ESi+Milveb     10       • Number of connections are reserved for ESi+Milveb     10       • Number of connections vai integrated interfaces     88       • Number of connections are reserved for ESi+Milveb     10       • Number of connections vai integrated interfaces     88       • Number of connections vai integrated interfaces     88       • Number of connections vai integrated interfaces     10       • Number of connections vai integrated interfaces     10       • Number of connections reserved for ESi+Milveb     10       • Medi redundancy     Yes: NiP Autommager according to EC 62439-2 Edition 2.0, MRP Manager: NiP Connection 3.0       • MRP inte	Interface types	
• YesYes• AutorosonigYes• AutorosonigYes• AutorosonigYes• AutorosonigYes• Consumption of the status LEDYes• RadesYes• Transmission rate, max.Yes, V2.4 / V2.6Number of connections reserved for ES/HMI/web10• Number of connections and regrated interfaces of the CPU and connected CPs / CMs• Number of connections and regrated interfaces88• Number of status parts10• RegratementspartYes, only via BushAdopter- MRPYes, WEP Automanager according to IEC 62439-2 Edition 2.0 MBP Manager, MRP Client- MRP interconnection, supportedYes, NRP Automanager according to IEC 62439-2 Edition 3.0- Souther of stations in the fing, max.50BMATC communicationYes, encryption with TLS V1.3 pre-selected• FOC/P communication, as serverYes•		
YesAutocrossingYesIndustrial Element status EDYesR5 46YesFramension rate, max.Yeb V2.4 / V2.6PhoDisato connections, max.Yes, V2.4 / V2.6Number of connections may integrated interfaces of the CPU and connected CPs / CMsNumber of connections rais integrated interfaces88Number of connections via integrated interfaces88Number of admonstrais per CPCIM22Int-Syn for twardingYes, inty via BusAdopterInt-Syn for twardingYes, inty via BusAdopterInt-MRPMRP CleftMRP CleftYes, inty via BusAdopterInt-MRPYes, inty via BusAdopterInt-MRPYes, inty via BusAdopterInt-MRPYes, inty via BusAdopterInt-MRPYes, inty via BusAdopterIntegrate of stations in the ring, max.200 mm; For MRP, bumpless for MRPDIntegrate of stations in the ring, max.88Integrate of stations in the ring, max.Se on inter help (S7 communication, user data size)Integrate of stations in the ring, max.Se on inter help (S7 communication, user data size)Integrate of p		Yes
• Autocosing         Yes           • Industrial Ethemet status LED         Yes           • Transmission rate, max.         12. Mult/s           • Protecois         -           • Transmission rate, max.         Yes, V2.4 / V2.6           • Number of connections reserved for ES/HMI/veb         10           • Number of connections regranded for ES/HMI/veb         10           • Number of connections angranded for ES/HMI/veb         10           • Number of connections angrand interfaces         86           • Number of connections angrand interfaces         96           • MRP Dimensionance         90           • MRP Dinenconnection supprot <td></td> <td>Yes</td>		Yes
R5495     12 Mbl/3       PROFisate     Yes; V2 4 / V2 6       Number of connections, max.     128; via integrated interfaces of the CPU and connected CPs / CMs       • Number of connections reserved for ES/MN/web     10       • Number of connections reserved for ES/MN/web     10       • Number of connections reserved for ES/MN/web     10       • Number of connections integrated interfaces     88       • Number of connections integrated interfaces     88       • Number of connections integrated interfaces     88       • Number of strouting paths     10       Redurating mode     10       • Media redundancy     Yes       - MRP     Yes; infly via BusAdapter       - MRP     Yes; infly numanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Cleant       - MRP     Yes; infly numanager according to IEC 62439-2 Edition 3.0       - MRPD     Yes; infly numanager according to IEC 62439-2 Edition 3.0       - MRPD     Yes; Requirement: IRT       - Switchover time on line break, typ.     200 mr; For MRP, bumpiess for MRPD       - Switchover time on line break, typ.     200 mr; For MRP, bumpiess for MRPD       - Switchover time on line break, typ.     200 mr; For MRP, bumpiess for MRPD       - Switchover time on line break, typ.     200 mr; For MRP, bumpiess for MRPD       - Switchover time on line break, typ.     50       SWATIC co	-	Yes
	C C	Yes
Protocis         Yes; V2.4 / V2.6           Number of connections, max.         128; via integrated interfaces of the CPU and connected CPs / CMs           Number of connections rule, integrated interfaces         88           Number of connections per CPCM         32           Number of connections per CPCM         32           Number of connections per CPCM         32           Number of St routing paths         16           Redurdancy mode         -           - HAge forwarding         Yes; only via BusAdapter           - MRP         Yes; NPA Automonager according to IEC 62439-2 Edition 2.0, MRP Manager. MRP Cleart           - MRP         Yes; MPA Automonager according to IEC 62439-2 Edition 3.0           - MRP         Yes; NPA Automonager according to IEC 62439-2 Edition 3.0           - MRP         Yes; Requirement: IRT           - MRPD         Yes; Requirement: IRT           - MRPD         Yes; Requirement: IRT           - SMATIC communication         Yes; requirement: IRT           - Softwarding         Yes           - Data lengh, max. <td< td=""><td>RS 485</td><td></td></td<>	RS 485	
PROFisate     Yes; V2.4 / V2.8       Number of connections, max.     128; via integrated interfaces of the CPU and connected CPs / CMs       Number of connections reserved for ESHNI/web     10       Number of connections via integrated interfaces     88       Number of connections per CPCM     32       Number of s7 roting paths     16       Redurdancy mode     -       - MRP     Yes; MRP Automanager according to EC 62439-2 Edition 2.0, MRP Manager; MRP Client       - MRP     Yes; an MPP Automanager according to EC 62439-2 Edition 3.0       - MRP Interconnection, supported     Yes; as MRP Automanager according to EC 62439-2 Edition 3.0       - MRP Client     Yes; as MRP Automanager according to EC 62439-2 Edition 3.0       - MRP Client     Yes; as Requirement. IRT       - Switchover time on line break, typ.     200 ms; For MRP, bumpless for MRPD       - Mumber of stations in the ring, max.     50       SIAATUC communication     Yes; encryption with TLS V1.3 pre-selected       • S7 communication     Yes       • S7 communication, as server     Yes       • S7 communication     Yes       • S7 communication     Yes       • S7 communication     Yes       • Data length, max.     See online help (S7 communication, user data size)       Open E communication     Yes       • DCPIP     Yes       • Data length	Transmission rate, max.	12 Mbit/s
Number of connections, max,         128, via integrated interfaces of the CPU and connected CPs / CMs           Number of connections reserved for ES/MMi/web         10           Number of connections reserved for ES/MMi/web         10           Number of connections per CP/CM         32           Number of S7 routing paths         16           Redindency mode	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 via integrated interfaces     98     Media redundancy     - MEdia redundancy     - MEdia redundancy     - MRP     Media redundancy     - MRP Views     - MRP interconnection, supported     - MRP Otent     - MRP interconnection, supported     - MRP Otent     - MRP interconnection, supported     - MRP, Durpless for MRP Automanager according to IEC 62439-2 Edition 3.0     - MRP Otent     - MRP interconnection, supported     - MRP, Durpless for MRPD     - Number of stations in the ring, max.     50 SMMTCiccommunication     - PG/OP communication     - Ves; recryption with TLS V1.3 pre-selected     - S7 communication     - Ves     - S7 communication     - Ves     - S7 communication     - Otal length, max.     - See online help (S7 communication, user data size)  Open IE communication     - S7 c	PROFIsafe	Yes; V2.4 / V2.6
• Number of connections reserved for ESAHM/web     10       • Number of connections via integrated interfaces     88       • Number of connections per CP/CM     32       • Number of stronting paths     16 <b>Redundancy mode</b> -       • IH-Sync forwarding     Yes       Media redundancy     Yes       • MRP     Yes       • MRP     Yes; only via BusAdapter       • MRP     Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Clints       • MRP     Yes; Requirement: IRT       • Sittomore time on line break, typ.     200 ms; For MRP, bumples for MRPD       • Number of stations in the ring, max.     50       Sittomore time on line break, typ.     200 ms; For MRP, bumples for MRPD       • PG/CP Communication     Yes; encryption with TLS V1.3 pre-selected       • S7 communication     Yes       • S7 communication, as server     Yes       • User data per Job, max.     See online help (S7 communication, user data size)       Open IE communication     Yes       • Data length, max.     4k ktyte       • UDP     Yes       • Data length, max.     2k ktyte       • UDP     Yes       • Data length, max.     4k ktyte       • UDP     Yes       • Data length, max.     2k ktyte       • DDA	Number of connections	
• Number of connections yie /PI/CM     32       • Number of S7 routing paths     16       Redundancy mode     Yes       • I-Ksync forwarding     Yes       Media redundancy     Yes; only via BusAdapter       - MRP     Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client       - MRP     Yes; Requirement: IRT       - MRPD     Yes; Requirement: IRT       - Switchover time on line break, typ.     200 ms; For MRP, bumpless for MRPD       - Number of stations in the ring, max.     50       SMATIC communication     Yes; requirement: IRT       • PG/OP communication     Yes; reprystion with TLS V1.3 pre-selected       • S7 routing     Yes       • Data tect or duruting     Yes       • User data per job, max.     64 kbyte       • User data per job, max.     64 kbyte       • IDP     Yes       • Data length, max.     64 kbyte       • UDP     Yes       • Data length, max.     64 kbyte       • UDP     Yes       • Data length, max.     64 kbyte       • DUP     Yes       • DAS     Yes	<ul> <li>Number of connections, max.</li> </ul>	128; via integrated interfaces of the CPU and connected CPs / CMs
• Number of connections per CP/CM32• Number of ST routing paths16• Hedundanny mode•• Media redundancyYes• Media redundancyYes (MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client• MRPYes; an MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; as MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; as MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; Requirement: IRT• Switchover time on line break, typ.200 ms; For MRP, bumpless for MRPD• Number of stations in the ring, max.50SIMMTIC communicationYes; encryption with TLS V1.3 pre-selected• ST contingYes• PG/GP communicationYes• ST communication as serverYes• ST communication as enverYes• ST communication as clientYes• ICP/IPYes• Data length, max.64 kkyte• serveral passive connections per port, supportedYes• ICP/IPYes• Data length, max.2 kkyte; 1 472 bytes for UDP broadcast• UDPYes• Data length, max.2 kkyte; 1 472 bytes for UDP broadcast• DUPYes• Data length, max.Yes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes <td< td=""><td><ul> <li>Number of connections reserved for ES/HMI/web</li> </ul></td><td>-</td></td<>	<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	-
• Number of connections per CP/CM32• Number of ST routing paths16• Hedundanny mode•• Media redundancyYes• Media redundancyYes (MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client• MRPYes; an MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; as MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; as MRP ing node according to IEC 62439-2 Edition 3.0• MRPYes; Requirement: IRT• Switchover time on line break, typ.200 ms; For MRP, bumpless for MRPD• Number of stations in the ring, max.50SIMMTIC communicationYes; encryption with TLS V1.3 pre-selected• ST contingYes• PG/GP communicationYes• ST communication as serverYes• ST communication as enverYes• ST communication as clientYes• ICP/IPYes• Data length, max.64 kkyte• serveral passive connections per port, supportedYes• ICP/IPYes• Data length, max.2 kkyte; 1 472 bytes for UDP broadcast• UDPYes• Data length, max.2 kkyte; 1 472 bytes for UDP broadcast• DUPYes• Data length, max.Yes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes• DDPYes <td< td=""><td><ul> <li>Number of connections via integrated interfaces</li> </ul></td><td>88</td></td<>	<ul> <li>Number of connections via integrated interfaces</li> </ul>	88
• Number of S7 routing paths         16           Redundancy mode            • H-Sync forwarding         Yes           Media redundancy         Yes; only via BusAdapter           • MRP         Yes; only via BusAdapter           • MRP         Yes; mRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Clent           • MRP Interconnection, supported         Yes; as MRP ing node according to IEC 62439-2 Edition 3.0           • MRPD         Yes; as MRP ing node according to IEC 62439-2 Edition 3.0           • MRPD         Yes; as MRP ing node according to IEC 62439-2 Edition 3.0           • MRPD         Yes; as MRP ing node according to IEC 62439-2 Edition 3.0           • MRPD         Yes; as MRP not provide the ing max.           • So Untuber of stations in the ring, max.         50           SIMATIC communication         Yes; incryption with TLS V1.3 pre-selected           • S7 communication, as server         Yes           • Data record routing         Yes           • So contrubunication, as clent         Yes           • TCP/IP         Yes           • Data length, max.         64 kbyte           • Data length, max.         2 kbyte; 1 472 bytes for UDP broadcast           • UDP         Yes           • DAta length, max.         2 kbyte; 1 472 bytes for UDP broadcast	-	32
Redundancy mode     Yes       Media redundancy     Yes; only via BusAdapter	-	16
<ul> <li>H-Sync forwarding</li> <li>Yes</li> </ul> Media redundancy <ul> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client</li> <li>MRP interconnection, supported</li> <li>Yes; a MRP ing node according to IEC 62439-2 Edition 3.0</li> <li>MRPD</li> <li>Yes; a MRP ing node according to IEC 62439-2 Edition 3.0</li> <li>MRPD</li> <li>Yes; a MRP ing node according to IEC 62439-2 Edition 3.0</li> <li>MRPD</li> <li>Yes; a MRP ing node according to IEC 62439-2 Edition 3.0</li> <li>MRPD</li> <li>Yes; Requirement: IRT</li> <li>Switchover time on line break, typ.</li> <li>200 ms; For MRP, bumpless for MRPD</li> <li>Number of stations in the ring, max.</li> <li>50</li> </ul> <li>SMATIC communication</li> <li>Yes; encryption with TLS V1.3 pre-selected</li> <li>\$7 routing</li> <li>Yes</li> <li>Data record routing</li> <li>Yes</li> <li>S7 communication, as server</li> <li>Yes</li> <li>S7 communication, as client</li> <li>Yes</li> <li>User data per job, max.</li> <li>See online help (S7 communication, user data size)</li> <li>Dent IE communication</li> <li>Yes</li> <li>Yes</li> <li>Data length, max.</li> <li>G4 ktyte</li> <li>SIO-on-TCP (RC 1006)</li> <li>Yes</li> <li>Data length, max.</li> <li>G4 ktyte</li> <li>UDP</li> <li>Yes</li> <li>Data length, max.</li> <li>Ktyte; 1472 bytes for UDP broadcast</li> <li>UDP</li> <li>Data length, max.</li>		
Media redundancy     Yes; only via BusAdapter      MRP     Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client      MRP interconnection, supported     Yes; as MRP ring node according to IEC 62439-2 Edition 3.0      MRPD     Yes; as MRP ring node according to IEC 62439-2 Edition 3.0      MRPD     Yes; as MRP ring node according to IEC 62439-2 Edition 3.0      MRPD     Yes; Requirement: IRT      Switchover time on line break, typ.     200 ms; For MRP, bumpless for MRPD      Number of stations in the ring, max.     50       SIMATIC communication     Yes; encryption with TLS V1.3 pre-selected       S7 communication, as server     Yes       S7 communication, as client     Yes       S7 communication, as client     Yes       S7 communication, as client     Yes      Sta length, max.     64 kbyte      Sta length, max.     64 kbyte      Data length, max.     64 kbyte      DDP multicast     Yes      Data length, max.     64 kbyte      DDP multicast     Yes      DDP multicast     Yes      DDP multicast     Yes	H-Sync forwarding	Yes
MRPYes: MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP ClientMRPDYes: Requirement: IRTSwitchover time on line break, typ.200 ms; For MRP, bumpless for MRPDNumber of stations in the ring, max.50SIMATIC communicationYes: encryption with TLS V1.3 pre-selected• S7 routingYes• Data record routingYes• S1 communication, as serverYes• S7 communication, as serverYes• S7 communication, as clientYes• S7 communication, as clientYes• Data length, max.See online help (S7 communication, user data size)Open IE communicationYes- Data length, max.64 kbyte- Data length, max.64 kbyte; 1472 bytes for UDP broadcast- UDPYes- Data length, max.2 byte; 1472 bytes for UDP broadcast- UDP multicastYes; max.78 multicast circuits• DHCPYes• DATAYes; Standard and user pages• DICPYes; Standard and user pages• UDPYes; Standard and user pages• UTPYes; Standard and user pages• Web APIYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages• Number of sessions, max.50	Media redundancy	
MRP Client     MRP Client       - MRPD     Yes; as MRP ring node according to IEC 62439-2 Edition 3.0       - MRPD     Yes; requirement IRT       - Switchover time on line break, typ.     200 ms; For MRP, bumpless for MRPD       - Number of stations in the ring, max.     50       SIMATIC communication     Yes; encryption with TLS V1.3 pre-selected       • S7 routing     Yes       • Data record routing     Yes       • S7 communication, as server     Yes       • S7 communication, as server     Yes       • S7 communication, as client     Yes       • S7 communication, as client     Yes       • S7 communication, as client     Yes       • ICP/IP     Yes       • Obtal record routing     Yes       • Data length, max.     64 kbyte       • Data length, max.     64 kbyte       • DDP     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       • DP multicast     Yes       • DATA length, max.     64 kbyte       • DDP     Yes       • DDP multicast     Yes <td< td=""><td>— Media redundancy</td><td>Yes; only via BusAdapter</td></td<>	— Media redundancy	Yes; only via BusAdapter
	— MRP	
MRPD     Yes; Requirement: IRT       Switchover time on line break, typ.     200 ms; For MRP, bumpless for MRPD       Number of stations in the ring, max.     50       SIMATIC communication     Yes; encryption with TLS V1.3 pre-selected       • FG/OP communication     Yes; encryption with TLS V1.3 pre-selected       • S7 routing     Yes       • Data record routing     Yes       • S7 communication, as server     Yes       • S7 communication, as client     Yes       • User data per job, max.     See online help (S7 communication, user data size)       Open IE communication     Yes       • Data length, max.     64 kbyte       - several passive connections per port, supported     Yes       • UDP     Yes       • Data length, max.     64 kbyte       • UDP     Yes       • Data length, max.     64 kbyte       • DDP     Yes       • Data length, max.     2 kbyte; 1472 bytes for UDP broadcast       • UDP     Yes       • Data length, max.     2 kbyte; 1472 bytes for UDP broadcast       • UDP     Yes       • DAS     Yes       • DAS     Yes       • DDP     Yes       • DAS     Yes       • DIP     Yes       • DIP     Yes       • SNMP     Yes	- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
Switchover time on line break, typ.200 ms; For MRP, bumpless for MRPD Number of stations in the ring, max.50SMATIC communicationVes; encryption with TLS V1.3 pre-selected• CPC/OP communicationYes; encryption with TLS V1.3 pre-selected• S7 routingYes• Data record routingYes• S7 communication, as serverYes• 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- 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. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DLCPYes• DLCPYes• DLCPYes• DLCPYes• DLCPYes• DLCPYes• DLCPYes• EncryptionYes; Standard and user pages• HTTPYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages• Number of sessions, max.50		
Number of stations in the ring, max.     50       SIMULTC 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       • 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     Yes       • DACP     Yes       • DNS     Yes       • DNS     Yes       • SNMP     Yes       • LLDP     Yes       • Encryption     Yes; Optional       Web server     Yes; Standard and user pages       • HTTP     Yes; Standard and user pages       • Web API     -       • Number of sessions, max.     50	— Switchover time on line break, typ.	
• PG/OP communicationYes; encryption with TLS V1.3 pre-selected• S7 routingYes• Data record routingYes• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes- Data length, max.64 kbyte- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.78 multicast circuits• UDPYes- Data length, max.78 multicast circuits• DHCPYes• DDP multicastYes• DDPYes• DDPYes• DCPYes• DCPYes• DLDPYes• DCPYes• EncryptionYes (OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web API Number of sessions, max.50		
• S7 routingYes• Data record routingYes• Data record routingYes• S7 communication, as serverYes• User data per job, max.See online help (S7 communication, user data size)• User data per job, max.See online help (S7 communication, user data size)• Open IE communicationSee online help (S7 communication, user data size)• TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• DopYes- Data length, max.64 kbyte• DupYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast• UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DNSYes• DDPYes• DLPYes• LLDPYes• DLPYes• DLPYes; Standard and user pages• web APIItres• web APIItres• Number of sessions, max.50	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 E communicationYes- Data length, max.64 kbyte- Several passive connections per port, supportedYes- Store (RFC1006)Yes- Data length, max.64 kbyte- Data length, max.78 multicast circuits- Data length, max.78 multicast circuits- DUPYes- Dut DP multicastYes; max. 78 multicast circuits• DDCPYes• DDCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages	PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• DDPYes- Data length, max.94 kbyte• DDPYes• DATA length, max.94 kbyte• DDPYes• DDP multicastYes; max. 78 multicast circuits• DDPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages	S7 routing	Yes
• S7 communication, as clientYes• User data per job, max.See online help (S7 communication, user data size)Open IE communication• TCP/IPYes• Data length, max.64 kbyte- bata length, max.64 kbyte- Data length, max.24 kbyte; 14 72 bytes for UDP broadcast- UDPYes- Data length, max.24 kbyte; 14 72 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits- DHCPYesDNSYesSNMPYes- DCPYes- DCPYes- EncryptionYes; OptionalWeb serverYes; Standard and user pages- HTTPSYes; Standard and user pages- web APIYes; Standard and user pages- Number of sessions, max.50	<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/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.64 kbyte- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes- DHCPYesSNMPYes• DNSYes• DCPYes• DCPYes• DLPYes• DCPYes• DCPYes optionalWeb serverYes; OptionalWeb serverYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages• web APIYes; Standard and user pages	<ul> <li>S7 communication, as server</li> </ul>	Yes
Open IE communication       Yes         • 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.       2 kbyte; 1 472 bytes for UDP broadcast         - UDP multicast       Yes; max. 78 multicast circuits         • DHCP       Yes         • DNS       Yes         • DCP       Yes         • DCP       Yes         • LDP       Yes         • DLP       Yes         • DHCP       Yes         • DHCP       Yes         • DLP       Yes; Optional         Web server       Yes; Standard and user pages         • web API       -         - Number of sessions, max.	<ul> <li>S7 communication, as client</li> </ul>	Yes
TCP/IPYes- Data length, max.64 kbyte- several passive connections per port, supportedYes• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• DNSYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• web APIYes; Standard and user pages• web API50	• User data per job, max.	See online help (S7 communication, user data size)
- Data length, max.64 kbyte- several passive connections per port, supportedYes- ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte- DDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits- UDP multicastYes- DHCPYes• DHCPYes• DHCPYes• DNSYes• DNSYes• DCPYes• DCPYes• DCPYes• DCPYes• EncryptionYes (DuralVeb serverYes; Optional• HTTPYes; Standard and user pages• Web APIYes; Standard and user pages• web APIStandard and user pages• multicar of sessions, max.50	Open IE communication	
- several passive connections per port, supported       Yes         - ISO-on-TCP (RFC1006)       Yes         - Data length, max.       64 kbyte         • UDP       Yes         - Data length, max.       2 kbyte; 1 472 bytes for UDP broadcast         - UDP multicast       Yes; max. 78 multicast circuits         • DHCP       Yes         • DHCP       Yes         • DNS       Yes         • DNS       Yes         • DCP       Yes         • LLDP       Yes         • Encryption       Yes; Optional         Web server       Yes; Standard and user pages         • HTTPS       Yes; Standard and user pages         • web API       -         - Number of sessions, max.       50	• TCP/IP	Yes
<ul> <li>ISO-on-TCP (RFC1006)</li> <li>Data length, max.</li> <li>UDP</li> <li>Data length, max.</li> <li>Data length, max.</li> <li>2 kbyte; 1 472 bytes for UDP broadcast</li> <li>UDP multicast</li> <li>Ves; max. 78 multicast circuits</li> <li>DHCP</li> <li>Yes</li> <li>DNS</li> <li>SNMP</li> <li>Ves</li> <li>SNMP</li> <li>Ves</li> <li>UDP</li> <li>Ves</li> <li>Encryption</li> <li>Ves; Optional</li> <li>Web server</li> <li>HTTP</li> <li>HTTPS</li> <li>Web API</li> <li>Number of sessions, max.</li> <li>Sol</li> </ul>	— Data length, max.	64 kbyte
- Data length, max.64 kbyte• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DHCPYes• DNSYes• SNMPYes• DCPYes• LDDPYes• LDPYes• EncryptionYes; Optional• Web serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages• Number of sessions, max.50	- several passive connections per port, supported	Yes
• UDPYes- Data length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Optional• HTTPSYes; Standard and user pages• Web APIYes; Standard and user pages• number of sessions, max.50	ISO-on-TCP (RFC1006)	Yes
Data length, max.2 kbytes for UDP broadcast- UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIStandard and user pages• Number of sessions, max.50	— Data length, max.	64 kbyte
UDP multicastYes; max. 78 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APISol- Number of sessions, max.50	• UDP	Yes
• DHCP         Yes           • DNS         Yes           • SNMP         Yes           • DCP         Yes           • DCP         Yes           • LLDP         Yes           • Encryption         Yes; Optional           Web server         Yes; Standard and user pages           • HTTPS         Yes; Standard and user pages           • web API         Yes; Standard and user pages           - Number of sessions, max.         50	— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
• DNSYes• SNMPYes• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages- Number of sessions, max.50	— UDP multicast	Yes; max. 78 multicast circuits
• SNMP         Yes           • DCP         Yes           • LLDP         Yes           • Encryption         Yes; Optional           • Web server         Yes; Standard and user pages           • HTTPS         Yes; Standard and user pages           • Web API         Yes; Standard and user pages           • Number of sessions, max.         50	• DHCP	Yes
• DCPYes• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• web APIYes; Standard and user pages- Number of sessions, max.50	• DNS	Yes
• LLDPYes• EncryptionYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• web API Number of sessions, max.50	• SNMP	Yes
• Encryption     Yes; Optional       Web server        • HTTP     Yes; Standard and user pages       • HTTPS     Yes; Standard and user pages       • web API        - Number of sessions, max.     50	• DCP	Yes
Web server         • HTTP       Yes; Standard and user pages         • HTTPS       Yes; Standard and user pages         • web API       - Number of sessions, max.         50       50	• LLDP	Yes
• HTTP     Yes; Standard and user pages       • HTTPS     Yes; Standard and user pages       • web API     -       - Number of sessions, max.     50	Encryption	Yes; Optional
<ul> <li>HTTPS</li> <li>web API</li> <li>Number of sessions, max.</li> <li>50</li> </ul>	Web server	
web API     — Number of sessions, max. 50	• HTTP	Yes; Standard and user pages
- Number of sessions, max. 50	• HTTPS	Yes; Standard and user pages
	• web API	
<ul> <li>number of simultaneous HTTP calls, max.</li> <li>4</li> </ul>	- Number of sessions, max.	50
	- number of simultaneous HTTP calls, max.	4

— HTTP request body, max.	131 072 byte
OPC UA	
Runtime license required	Yes; "Small" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
- Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
<ul> <li>Number of connections, max.</li> </ul>	4
<ul> <li>Number of nodes of the client interfaces, recommended max.</li> </ul>	1 000
<ul> <li>— Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I max.</li> </ul>	300
<ul> <li>— Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.</li> </ul>	20
<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, max.</li> </ul>	1
<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
<ul> <li>— Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> </ul>	20
OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
<ul> <li>Application authentication</li> </ul>	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
— 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>	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
<ul> <li>Number of server methods, max.</li> </ul>	20
<ul> <li>Number of inputs/outputs per server method, max.</li> </ul>	20
<ul> <li>— Number of monitored items, recommended max.</li> <li>— Number of server interfaces, max.</li> </ul>	4 000; for 1 s sampling interval and 1 s send interval 10 of each "Server interfaces" / "Companion specification" type and 20 of the
— Number of nodes for user-defined server interfaces,	type "Reference namespace" 15 000
max. <ul> <li>Alarms and Conditions</li> </ul>	Voc
Alarms and Conditions     — Number of program alarms	Yes 100
— Number of program alarms     — Number of alarms for system diagnostics	50
Further protocols	
MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	32
number of subscriptions, max.	250
number of tags/attributes for subscriptions, max.	2 000
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	5 000
Number of simultaneously active program alarms	
Number of program alarms	600
Number of alarms for system diagnostics	100
Number of alarms for motion technology objects	160

Fest commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 5 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Profiling	Yes
Status/control	
Status/control variable	Yes; without fail-safe
Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
<ul> <li>Number of variables, max.</li> </ul>	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
Forcing	Yes; without fail-safe
<ul> <li>Forcing, variables</li> </ul>	peripheral inputs/outputs (without fail-safe)
<ul> <li>Number of variables, max.</li> </ul>	200
Diagnostic buffer	
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4
Memory size per trace, max.	512 kbyte
nterrupts/diagnostics/status information	
Diagnostics indication LED	Nee.
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes
<ul> <li>Connection display LINK TX/RX</li> </ul>	Yes
	Yes
	Yes; Note: The number of technology objects affects the cycle time of the PLC
upported 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
upported technology objects	Yes; Note: The number of technology objects affects the cycle time of the PLC
upported technology objects Motion Control • Number of available Motion Control resources for technology objects	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per positioning axis	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20
upported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources — per speed-controlled axis — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per probe	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20
upported technology objects Motion Control   Number of available Motion Control resources for technology objects  Required Motion Control resources  per speed-controlled axis  per positioning axis  per synchronous axis  per external encoder  per output cam  per cam track  per probe  Positioning axis	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 40 80 160 80 20 160 40
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per probe         • Positioning axis         — number of positioning axes at motion control cycle of 4 ms (typical value)	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 40 80 160 80 20 160 40 11
<ul> <li>upported technology objects</li> <li>Motion Control</li> <li>Number of available Motion Control resources for technology objects</li> <li>Required Motion Control resources <ul> <li>per speed-controlled axis</li> <li>per positioning axis</li> <li>per output cam</li> <li>per output cam</li> <li>per probe</li> </ul> </li> <li>Positioning axis <ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul>	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40
<ul> <li>upported technology objects</li> <li>Motion Control</li> <li>Number of available Motion Control resources for technology objects</li> <li>Required Motion Control resources <ul> <li>per speed-controlled axis</li> <li>per positioning axis</li> <li>per positioning axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam track</li> <li>per probe</li> </ul> </li> <li>Positioning axis <ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul>	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 40 80 20 160 40 11 14
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per output cam         — per probe         • Positioning axis         — per probe         • Positioning axis         — per probe         • Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per probe         • Positioning axis         — per probe         • Positioning axis         — per probe         • Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID_3Step	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization Yes; PID controller with integrated optimization for valves
<ul> <li>upported technology objects</li> <li>Motion Control</li> <li>Number of available Motion Control resources for technology objects</li> <li>Required Motion Control resources <ul> <li>per speed-controlled axis</li> <li>per positioning axis</li> <li>per positioning axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam track</li> <li>per probe</li> </ul> </li> <li>Positioning axis <ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> <li>Controller <ul> <li>PID_Compact</li> <li>PID_Temp</li> </ul> </li> </ul>	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per output cam         — per or and track         — per probe         • Positioning axis         — per output cam         — per probe         • Positioning axis         — Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID_Temp         Counting and measuring	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per output cam         — per output cam         — per probe         • Positioning axis         — per output cam         — per probe         • Positioning axis         — Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per output cam         — per output cam         — per probe         • Positioning axis         — per output cam         — per probe         • Positioning axis         — Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
upported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per output cam         — per output cam         — per probe         • Positioning axis         — per output cam         — per probe         • Positioning axis         — Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Supported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per output cam         — per probe         • Positioning axis         — ner output cam         — per probe         • Positioning axis         — number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
Supported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per output cam         — per probe         • Positioning axis         — Number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID_Temp         Counting and measuring         • High-speed counter         Standards, approvals, certificates         Highest safety class achievable in safety mode	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes
Supported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per output cam         — per probe         • Positioning axis         — per probe         • Positioning axis         — number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter         Standards, approvals, certificates         Highest safety class achievable in safety mode         • Performance level according to ISO 13849-1	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes Yes
Supported technology objects         Motion Control         • Number of available Motion Control resources for technology objects         • Required Motion Control resources         — per speed-controlled axis         — per positioning axis         — per synchronous axis         — per external encoder         — per cam track         — per probe         • Positioning axis         — number of positioning axes at motion control cycle of 4 ms (typical value)         — Number of positioning axes at motion control cycle of 8 ms (typical value)         Controller         • PID_Compact         • PID-Temp         Counting and measuring         • High-speed counter         Standards, approvals, certificates         Highest safety class achievable in safety mode         • Performance level according to ISO 13849-1         • SIL acc. to IEC 61508	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 1 120 40 80 160 80 20 160 40 11 14 Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature Yes PLe SIL 3

<ul> <li>— High demand/continuous mode: PFH in accordance with SIL3</li> </ul>	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
<ul> <li>horizontal installation, min.</li> </ul>	-30 °C; No condensation
<ul> <li>horizontal installation, max.</li> </ul>	60 °C
<ul> <li>vertical installation, min.</li> </ul>	-30 °C; No condensation
<ul> <li>vertical installation, max.</li> </ul>	50 °C
Altitude during operation relating to sea level	
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— CFC	Yes; either CFC or failsafe functionality
— 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 configuration data</li> </ul>	Yes
Protection level: Write protection	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Write protection for Failsafe</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
User administration	Yes; device-wide
programming / cycle time monitoring / header	
lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g
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