6ES7516-3AP03-0AB0

Data sheet



SIMATIC S7-1500, CPU 1516-3 PN/DP, central processing unit with 2 MB work memory for program and 7.5 MB for data 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required *** approvals and certificates according to entry 109816732 at support.industry.siemens.com to be considered! ***

General information	
Product type designation	CPU 1516-3 PN/DP
HW functional status	FS01
Firmware version	V3.0
Product function	
I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 375 μs (distributed) and 1 ms (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7516-3AN02-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.87 A
Current consumption, max.	1.08 A
Inrush current, max.	1.15 A; Rated value
l²t	0.6 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.7 W
Power loss	
Power loss, typ.	8.4 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

intervated (for program)	O Mhyda
• integrated (for program)	2 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	22 Chute
Plug-in (SIMATIC Memory Card), max. Packup	32 Gbyte
Backup • maintenance-free	Yes
	Tes
CPU processing times	-
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
CPU-blocks	
Number of elements (total)	8 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	7.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	1 Mbyte
FC	
Number range	0 65 535
• Size, max.	1 Mbyte
OB	
• Size, max.	1 Mbyte
 Number of free cycle OBs 	100
 Number of time alarm OBs 	20
 Number of delay alarm OBs 	20
 Number of cyclic interrupt OBs 	20; With minimum OB 3x cycle of 250 μs
Number of process alarm OBs	50
 Number of DPV1 alarm OBs 	3
 Number of isochronous mode OBs 	3
 Number of technology synchronous alarm OBs 	2
Number of startup OBs	100
 Number of asynchronous error OBs 	4
 Number of synchronous error OBs 	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
• Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB
Extended retentive data area (incl. timers, counters, flags), max.	7.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
• Size, max.	16 kbyte

Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	o, o clock memory bit, grouped into one clock memory byte
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	8 192; 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) per CM/CP	8 kbyte
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	- ·,· ·
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration
	of distributed I/O via PROFINET or PROFIBUS communication
	modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can
	be inserted in total
Number of IO Controllers	
• integrated	2
Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter • Number	16
Clock synchronization	10
• supported	Yes
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
• integrated switch	Yes
Protocols • IP protocol	Ves: IPv/I
IP protocolPROFINET IO Controller	Yes; IPv4 Yes
PROFINET TO Controller PROFINET TO Device	Yes
SIMATIC communication	Yes

Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes
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	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
 Of which IO devices with IRT, max. Number of connectable IO Devices for RT, 	64 256
max.	230
— of which in line, max.	256
Number of IO Devices that can be	8; in total across all interfaces
simultaneously 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 375 μs of the isochronous OB is decisive
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
 With IRT and parameterization of "odd" send cycles 	Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s 3 875 μ s)
Update time for RT	μο σ σ. σ μογ
— 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	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— Shared device	Yes
 Number of IO Controllers with shared device, 	4
max.	Voc: per liger program
activation/deactivation of I-devices Asset management record.	Yes; per user program
Asset management record Interface	Yes; per user program
2. Interface	
Interface types	V V0
RJ 45 (Ethernet)	Yes; X2
Number of ports integrated quiteb	1 Na
• integrated switch	No
Protocols • IP protocol	Vec: IDv4
IP protocol PROFINET IO Controller	Yes; IPv4 Yes
PROFINET TO Controller PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communicationWeb server	Yes; Optionally also encrypted Yes
	Yes No
Media redundancy PROFINET IO Controller	INU
Services	
— PG/OP communication	Yes

	N.
— Isochronous mode	No
 Direct data exchange 	No
— IRT	No
— PROFlenergy	Yes; per user program
 Prioritized startup 	No
 Number of connectable IO Devices, max. 	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
 Number of connectable IO Devices for RT, max. 	32
— of which in line, max.	32
 Number of IO Devices that can be 	8; in total across all interfaces
simultaneously 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 RT	quantity of configurations and
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	- III
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	
·	No Van
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4
activation/deactivation of I-devices	Yes; per user program
Asset management record	Yes; per user program
	res, per user program
3. Interface	
Interface types	
• RS 485	Yes; X3
Number of ports	1
Protocols	
Protocols • PROFIBUS DP master	Yes
Protocols PROFIBUS DP master PROFIBUS DP slave	Yes No
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication	Yes
Protocols PROFIBUS DP master PROFIBUS DP slave	Yes No Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master	Yes No Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet)	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections, max. Number of connections reserved for ES/HMI/web	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Period communication Equidistance Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

Media redundancy - Media redundancy - MRP - MRP - MRP interconnection, supported - MRPO - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication - PG/OP communication - PGrop communication - Sor routing - Data record routing - Sor communication, as server - Sor communication, as server - Sor communication, as server - Sor communication - TCPIRP - Data length, max. - several passive connections per port, supported - ISO-on-TCP (RPC1006) - Data length, max. - UDP multicast - DHCP - Encryption - Sor communication - Yes - Stationary - Sor communication, as server - Sor communication, as client - See online help (S7 communication, user data size) - Yes - Stationary - Yes - Stationary - Sor communication - See online help (S7 communication, user data size) - Detailength, max. - See online help (S7 communication, user data size) - See online help (S7 communication, user data size) - See online help (S7 communication, user data size) - Detailength, max. - See online help (S7 communication, user data size) - See online help (S7 communication, user data size) - See online help (S7 communication, user data size) - See online help (S7 communication, user data size) - Yes - Stationary - S
Manager; MRP Client - MRPD - Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • ST routing • ST communication, as server • ST communication, as client • User data per job, max. - See online help (S7 communication, user data size) Open IE communication • TCP/IP - Data length, max several passive connections per port, supported • ISO - TCP (RFC1006) - Data length, max UDP multicast • DHCP • DATA length, max UDP multicast • DHCP • DNS • SMMP • DCP • LLDP • Encryption • Encryption with TLS V1.3 pre-selected • Yes; encryption with TLS V1.3 pre-selected • Yes; encryption with TLS V1.3 pre-selected • Yes • See online help (S7 communication, user data size) Open IE communication, user data size) Fyes • Open IE communication • TCP/IP - Data length, max several passive connections per port, supported • ISO-on-TCP (RFC1006) - Data length, max UDP multicast • UDP - Data length, max UDP multicast • PKS • DNS - Yes • SMMP • PCP • LLDP • PCP • LLDP • Encryption Ves: Standard and user pages Fyes: Standard and user pages
- Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • S7 routing • Data record routing • S7 communication, as scriver • S7 communication, as scriver • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max several passive connections per port, supported • ISO-on-TCP (RFC1006) - Data length, max UDP multicast • DHCP • DNS • SMMP • DNS • SMMP • DCP • LLDP • Encryption Web server • HTTP • RITTP • RITTPS OPE UA Client - Application authentication - Security policies - Security policies - Number of loades of the client interfaces, recommended max. - Number of elements for one call of OPC_UA_Notedeclist/IOC - ST Communication Yes; encryption with TLS V1.3 pre-selected Yes encryption Security PLO PRE-SECHANG Security PLO PRE-SECHANG Security PLO PRE-SECHANG Security PLO PRE-SECHANG Se
Number of stations in the ring, max. SIMATIC communication Yes; encryption with TLS V1.3 pre-selected - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - PG/OP communication, as server Yes - ST communication, as server Yes - ST communication, as client Yes - ST communication See online help (ST communication, user data size)
SIMATIC communication PG/OP communication ST routing Data record routing ST communication, as server ST communication, as server ST communication, as server ST communication, as client User data per job, max. See online help (S7 communication, user data size) Pen IE communication TCP/IP Data length, max. See online help (S7 communication, user data size) Pen IE communication TCP/IP Data length, max. See online help (S7 communication, user data size) Pen IE communication TCP/IP ST CARROW SEE SEE SEE SEE SEE SEE SEE SEE SEE SE
PG/OP communication S7 routing Pare record routing Pare sommunication, as server Pare S7 communication, as client Pare S87 communication Pare data per job , max. Pare S89 conline help (S7 communication, user data size) Popel IE communication Pare S89 conline help (S7 communication, user data size) Popel IE communication Pare S89 conline help (S7 communication, user data size) Popel IE communication Pare S89 conline help (S7 communication, user data size) Popel IE communication Pare S89 conline help (S7 communication, user data size) Popel IE communication Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S89 conline help (S7 communication, user data size) Pare S80 conline help (S7 communication, user data size) Pare S80 conline help (S7 communication) user data size) Pare S80 conline help (S7 communication) user data size) Pare S80 conline help (S7 communication) user data size) Pare S80 conline help (S7 communication) user data size) Pare S80 conline help (S8 conline help
• S7 routing • Data record routing • S7 communication, as server • S7 communication, as client • User data per job, max. • User data per job, max. Open IE communication • TCP/IP — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. — Open IE communication • TCP/IP — Data length, max. — Several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. • G4 kbyte • UDP — Data length, max. • 2 kbyte; 1 472 bytes for UDP broadcast • UDP multicast • DHCP • Yes • DNS • Yes • DNS • SNMP • Pes • DCP • LLDP • Encryption Web server • HTTP • Yes; Standard and user pages • HTTP • Yes; Standard and user pages • PHTTP • Yes; Standard and user pages • OPC UA • Runtime license required • OPC UA Client — Application authentication — Security policies — User authentication — Security policies — User authentication — Number of connections, max. — Number of connections, max. — Number of olements for one call of OPC_UA_NeadList/C • OPC UA_Number of elements for one call of OPC_UA_NeadList/C • OPC_UA_Number of elements for one call of OPC_UA_NeadList/C • OPC_UA_Number of elements for one call of OPC_UA_NeadList/C
Data record routing S7 communication, as server S7 communication, as client User data per job, max. See online help (S7 communication, user data size) Pen IE communication TCP/IP Data length, max. See online help (S7 communication, user data size) Pen IE communication TCP/IP Data length, max. Seeval passive connections per port, supported SISO-on-TCP (RFC1006) Data length, max. Seeval passive connections per port, supported SISO-on-TCP (RFC1006) Data length, max. Seeval passive connections per port, yes Supported Seeval passive connections per port, yes Seeval passive connection per port, yes Seeval passive connections per port, yes Seeval passive connection, and passive connection per port, yes Seeval passive connection, and passive connection per port, yes Seeval passive connection, and passive connection per port, yes Seeval passive connection, and passive connection, and passive connection per port, yes Seeval passive connection, and passive connection, and passive connection per port, yes Seeval passive connection, and passive
• S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. — Data length, max. — Data length, max. — Several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. — UDP W Yes — Data length, max. — UDP multicast — UDP multicast • Yes; max. 118 multicast circuits • DHCP • DNS • SNMP • Yes • DNS • SNMP • DCP • Encryption Web server • HTTP • Yes; Standard and user pages • HTTPS • Yes; Standard and user pages OPC UA • Runtime license required • OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of connections, max communication on the page on the page of the password Yes and the page of the password 10 200 300
Solution Security Pressure Pr
User data per job, max. Open IE communication * TCP/IP - Data length, max several passive connections per port, supported * ISO-on-TCP (RFC1006) - Data length, max UDP - Data length, max UDP - Data length, max UDP multicast - UDP multicast - UDP multicast - UDP - DATA - D
Open IE communication TCP/IP Data length, max. Several passive connections per port, supported I SO-on-TCP (RFC1006) Data length, max. UDP Data length, max. Set kbyte Tes Data length, max. UDP Data length, max. Set kbyte Tes Data length, max. Set kbyte; 1 472 bytes for UDP broadcast Tes; max. 118 multicast circuits DHCP Tes DNS Tes SNMP Tes DCP Tes DCP Tes DCP Tes Standard and user pages Tes; Standard and user pag
TCP/IP Data length, max. Several passive connections per port, supported ISO-on-TCP (RFC1006) Data length, max. Supported IDP Data length, max. Supported Data length, max. Supported Dupp Data length, max. Supported Data length, max. Supporte
Data length, max several passive connections per port, supported I ISO-on-TCP (RFC1006) Data length, max UDP Data length, max UDP multicast Ves; max. 118 multicast circuits DHCP Yes DNS SNMP Yes SNMP Yes LLDP Yes LLDP Yes LLDP Yes LLDP Yes UNDP multicast Ves; Optional Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages USER standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Security policies Ves; "Medium" license required Ves; Data Access (registered Read/Write), Method Call Yes; Data Access (registered Read/Write), Method Call Security policies Vesi manual policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of nodes of the client interfaces, recommended max Number of leements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
supported ISO-on-TCP (RFC1006) Data length, max. UDP Data length, max. UDP Data length, max. UDP yes Data length, max. UDP multicast Yes; max. 118 multicast circuits DHCP SMMP DCP LLDP Encryption Web server HTTP HTTPS Pes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Pes (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 Web recommended max. Number of lements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
ISO-on-TCP (RFC1006) Data length, max. UDP Yes Data length, max. UDP Yes Data length, max. UDP Yes LUDP Yes Deferming the provided set of the client interfaces, recommended max. UDP multicast Yes, max. 118 multicast circuits Yes, max. 118 multicast circuits Yes, max. 118 multicast circuits Yes Yes Yes Yes Yes Yes Yes Y
- Data length, max. • UDP - Data length, max. - UDP multicast - DHCP • DNS • SNMP • DCP • Encryption Web server • HTTP • HTTP • Runtime license required • OPC UA Client - Application authentication - Security policies - Security policies - User authentication - Number of connections, max. - Number of connections, max. - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C • UDP hroadcast - Yes; max. 118 multicast circuits Yes; max. 118 multicast circuits Yes Yes • Available security policies - Security policies - Security policies - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C - Data debyte for UDP broadcast Yes; max. 118 multicast circuits Yes Yes • Available security policies - Security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - User authentication - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
UDP Data length, max. Data length, max. DIP multicast DHCP DNS SNMP DCP LLDP LLDP Encryption Web server HTTP HTTP HTTP Syes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies DSC Ves Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Ves; max. 118 multicast circuits Yes Yes Yes Yes Yes Yes Standard and user pages Yes; "Medium" license required Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 10 300 300
- Data length, max UDP multicast - DHCP - DNS - DNS - SNMP - DCP - DCP - LLDP - LLDP - LLDP - Encryption Web server - HTTP - Yes; Standard and user pages - HTTPS - Yes; Standard and user pages - HTTP - Yes; Standard and user pages - HTTPS - Yes; Standard and user pages - OPC UA Runtime license required - OPC UA Client - Application authentication - Security policies - Security policies - User authentication - Number of connections, max Number of connections, max Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C - DNS - Ves; Medium' license required - Ves; "Medium" license required - Yes; "Medium" license required - Ves; Data Access (registered Read/Write), Method Call - Yes - Basic256Sha256 - User authentication - Number of connections, max Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
- UDP multicast DHCP DNS SNMP ENCRYPTION HTTP HTTP Runtime license required OPC UA Client Application authentication Security policies - Security policies - User authentication Number of connections, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C PNS NMP Yes Yes Yes Yes Yes Yes Yes Ye
DHCP DNS Yes SNMP DCP LLDP Yes Encryption Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages OPC UA Runtime license required OPC UA Client — Application authentication — Security policies — Security policies — User authentication — Number of connections, max. — Number of nodes of the client interfaces, recommended max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes (Pes)
DNS SNMP SNMP DCP Yes LLDP Yes Encryption Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Security policies User authentication Number of connections, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes Standard and user pages Yes; Standard and user pages Yes Standard anduser Yes Standard and user pages
DCP LLDP Yes Encryption Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Wes authentication Number of connections, max. Number of ledements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes Yes; Standard and user pages Yes; Standa
DCP LLDP Yes Encryption Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Web server Yes; "Medium" license required Yes; "Medium" license required Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Nes Yes Yes; "Medium" license required Yes; Data Access (registered Read/Write), Method Call Yes Tannaymous" or by user name & password 10 2 000 300
 Encryption Yes; Optional Web server HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages OPC UA Runtime license required OPC UA Client Application authentication Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
● HTTP ● HTTPS Pes; Standard and user pages Yes; Standard and user pages OPC UA ● Runtime license required ● OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of nodes of the client interfaces, recommended max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Pyes; Standard and user pages Yes; Data Coulons Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Sha256 2 000 3000 3000
● HTTP ● HTTPS Pes; Standard and user pages Yes; Standard and user pages OPC UA ● Runtime license required ● OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of nodes of the client interfaces, recommended max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Pyes; Standard and user pages Yes; Data Coulons Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Sha256 2 000 3000 3000
 HTTPS OPC UA Runtime license required OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes; Medium" license required Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 2 000
OPC UA Runtime license required OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Runtime license required Yes; "Medium" license required Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 10 2 000 300
 Runtime license required OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 2 000 300
 OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Yes; Data Access (registered Read/Write), Method Call Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 2 000 300
 Application authentication Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
— Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 — User authentication — Number of connections, max. — Number of nodes of the client interfaces, recommended max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 2 000 300
Basic256Sha256 - User authentication "anonymous" or by user name & password - Number of connections, max. 10 - Number of nodes of the client interfaces, recommended max. - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C 300
 User authentication "anonymous" or by user name & password Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
 Number of connections, max. Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
 Number of nodes of the client interfaces, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
recommended max. — Number of elements for one call of 300 OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
— Number of elements for one call of 300 OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C
max.
Number of elements for one call of20
OPC_UA_NameSpaceGetIndexList, max.
— Number of elements for one call of 100
OPC_UA_MethodGetHandleList, max.
Number of simultaneous calls of the client instructions for session management, per
connection, max.
Number of simultaneous calls of the client
instructions for data access, per connection, max.
Number of registerable nodes, max.5 000
— Number of registerable method calls of OPC_UA_MethodCall, max.
— Number of inputs/outputs when calling 20 OPC_UA_MethodCall, max.
,
 OPC UA Server Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
Condition (A&C), Custom Address Space
Condition (A&C), Custom Address Space — Application authentication Yes

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GDS support (certificate management)	Yes
Number of sessions, max.	48
 Number of accessible variables, max. 	100 000
Number of registerable nodes, max.	20 000
Number of subscriptions per session, max.	50
— Sampling interval, min.	100 ms
— Publishing interval, min.— Number of server methods, max.	100 ms 50
Number of server methods, max. Number of inputs/outputs per server method.	20
max.	20
 Number of monitored items, recommended max. 	4 000; 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
Number of nodes for user-defined server	of the type "Reference namespace" 30 000
interfaces, max.	V.
Alarms and Conditions	Yes
Number of program alarms	200
Number of alarms for system diagnostics	100
Further protocols	Voc. MODBLIS TOD
MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	64
Program alarms	Yes
Number of configurable program messages, max.	10 000; 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	1 000
Number of alarms for system diagnostics	200
 Number of alarms for motion technology objects 	160
Test commissioning functions	
Test commissioning functions	Yes; Parallel online access possible for up to 8 engineering systems
Test commissioning functions Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No
Test commissioning functions Joint commission (Team Engineering) Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Test commissioning functions Joint commission (Team Engineering) Status block Single step	Yes; Up to 8 simultaneously (in total across all ES clients) No
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints	Yes; Up to 8 simultaneously (in total across all ES clients) No
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control	Yes; Up to 8 simultaneously (in total across all ES clients) No 8
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable	Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables	Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max.	Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
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.	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
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. — of which control variables, max.	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
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. — of which control variables, max. Forcing	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 Yes Peripheral inputs/outputs
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. — of which control variables, max. Forcing • Forcing	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
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. — of which control variables, max. Forcing • Forcing • Forcing, variables	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 Yes Peripheral inputs/outputs
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. — of which control variables, max. Forcing • Forcing • Forcing, variables • Number of variables, max.	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 Yes Peripheral inputs/outputs
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. — of which control variables, max. Forcing • Forcing • Forcing • Forcing, variables • Number of variables, max. Diagnostic buffer	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 Yes Peripheral inputs/outputs 200
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof	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 Yes Peripheral inputs/outputs 200 Yes
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. — of which control variables, max. Forcing • Forcing • Forcing, variables • Number of variables, max. Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof Traces	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof	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 Yes Peripheral inputs/outputs 200 Yes 3 200
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. — of which control variables, max. Forcing • Forcing • Forcing, variables • Number of variables, max. Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof Traces	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500
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. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible Yes Yes
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes
Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes
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. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED RROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX	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 Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes

Number of available Motion Control resources for	2 400
technology objects	
 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	10
3	11
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	· · ·
Number of positioning axes at motion control	20
cycle of 8 ms (typical value)	20
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
_ :	
PID_3Step PID_Target PI	Yes; PID controller with integrated optimization for valves
PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-30 °C; No condensation
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the
• Horizontal installation, max.	display is switched off
 vertical installation, min. 	-30 °C; No condensation
vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
• vertical installation, max.	display is switched off
Ambient temperature during storage/transportation	display is switched on
	-40 °C
• min.	
• max.	70 °C
Altitude during operation relating to sea level	
 Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
configuration / programming / header Programming language	Yes
configuration / programming / header Programming language — LAD	Yes Yac
configuration / programming / header Programming language — LAD — FBD	Yes
configuration / programming / header Programming language — LAD — FBD — STL	Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL	Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC	Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH	Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection	Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH	Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection	Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection	Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection	Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection	Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions Width	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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 Depth	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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 Depth Weights	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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 Depth	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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 Depth Weights Weight, approx.	Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — CFC — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data • Password for display • 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 Depth Weights	Yes