## SIEMENS

## Data sheet

## 6ES7511-1AK01-0AB0



\*\*\* Spare part \*\*\* SIMATIC S7-1500, CPU 1511-1 PN, central processing unit with work memory 150 KB for program and 1 MB for data, 1st interface: PROFINET IRT with 2-port switch, 60 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1511-1 PN
HW functional status	FS03
Firmware version	V2.9
Product function	
<ul> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 625 $\mu s$ (distributed) and 1 ms (central)
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.7 A
Inrush current, max.	1.9 A; Rated value
l²t	0.02 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	10 W
Power consumption from the backplane bus (balanced)	5.5 W
Power loss	
Power loss, typ.	5.7 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
<ul> <li>integrated (for program)</li> </ul>	150 kbyte

<ul> <li>integrated (for data)</li> </ul>	1 Mbyte
Load memory	
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
	<u>00</u>
for bit operations, typ.	60 ns
for word operations, typ.	72 ns
for fixed point arithmetic, typ.	96 ns
for floating point arithmetic, typ.	384 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	150 kbyte
FC	
Number range	0 65 535
• Size, max.	150 kbyte
OB	
• Size, max.	150 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	100
Number of time alarm OBs	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
Number of cyclic interrupt OBs	20; With minimum OB 3x cycle of 500 µs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	2
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
Number of startup OBs	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	-
Nesting depth	
per priority class	24
Counters, timers and their retentivity	2.
S7 counter	0.040
Number	2 048
Retentivity	N
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	N
— adjustable	Yes
S7 times	
• Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	128 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB
Extended retentive data area (incl. timers, counters, flags),	1 Mbyte; When using PS 6 0W 24/48/60 V DC HF
max.	
Flag	
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte

6ES75111AK010AB0 Page 2/7

Data blocks	
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
<ul> <li>per priority class, max.</li> </ul>	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	1 024; max. number of modules / submodules
I/O address area	
Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	22
<ul> <li>Number of subprocess images, max.</li> </ul>	32
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	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
<ul> <li>Modules per rack, max.</li> </ul>	32; CPU + 31 modules
<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
<ul> <li>Deviation per day, max.</li> </ul>	10 s; Typ.: 2 s
Operating hours counter	
• Number	16
Clock synchronization	Vac
<ul> <li>supported</li> <li>in AS, master</li> </ul>	Yes
• in AS, master • in AS, slave	Yes
• on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
<ul> <li>SIMATIC communication</li> </ul>	Yes
Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	

6ES75111AK010AB0 Page 3/7

Services	
— PG/OP communication	Yes
<ul> <li>— Isochronous mode</li> </ul>	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 256 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
<ul> <li>— Number of connectable IO Devices for RT.</li> </ul>	128
max.	
- of which in line, max.	128
<ul> <li>— Number of IO Devices that can be</li> </ul>	8; in total across all interfaces
simultaneously activated/deactivated, max.	
<ul> <li>— Number of IO Devices per tool, max.</li> </ul>	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 µs to 4 ms; Note: In the case of IRT with isochronous mode, the
	minimum update time of 625 µs of the isochronous OB is decisive
— for send cycle of 500 μs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the
for and such of 4 and	minimum update time of 625 µs of the isochronous OB is decisive
— 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</li> </ul>	Update time = set "odd" send clock (any multiple of 125 $\mu$ s: 375 $\mu$ s, 625
cycles	μs 3 875 μs)
Update time for RT	050 1 400
— 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
<ul> <li>— Isochronous mode</li> </ul>	No
— IRT	Yes
— PROFlenergy	Yes; per user program
<ul> <li>— Shared device</li> </ul>	Yes
<ul> <li>— Number of IO Controllers with shared device,</li> </ul>	4
max.	
<ul> <li>activation/deactivation of I-devices</li> </ul>	Yes; per user program
<ul> <li>Asset management record</li> </ul>	Yes; per user program
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autorregenation     Autocrossing	Yes
Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	No
Number of connections	
Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10
<ul> <li>Number of connections via integrated interfaces</li> </ul>	64
<ul> <li>Number of S7 routing paths</li> </ul>	16
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
— Media redundancy	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP
	Manager; MRP Client

- MRP interconnection, supported     - MRP interconnection, supported     - Wes, as MRP ing nond according to IEC 02439-2 Edition 3.0     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04439-2     Vies, as MRP ing nond according to IEC 04449-2     Vies, as MRP ing nond according to IEC 04449-2     Vies, as MRP ing nond according to IEC 04449-2     Vies, as MRP ing nond according to IEC 04449-2     Vies, as MRP ing nond according to IEC 04449-2     Vies, as MRP in according to IE		
<ul> <li>Svitchover functions in the ring, max.</li> <li>SVATIC communication</li> <li>FGOF Communication, as event</li> <li>Yes</li> <li>ST communication, as event</li> <li>Yes</li> <li>ST communication, as event</li> <li>Yes</li> <li>Stream of the communication, as event</li> <li>Yes</li> <li>Seconization, as event</li> <li>Yes</li> <li>Seconization, as event</li> <li>Yes</li> <li>Seconization as event</li> <li>Yes</li> <li>Seconization, max.</li> <li>Seconization, m</li></ul>	<ul> <li>MRP interconnection, supported</li> </ul>	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
	— MRPD	Yes; Requirement: IRT
SIMATIC communication       Yes: encryption with TLS V1.3 pre-selected         • FCOP Domunication, as ever       Yes         • S7 communication, as ever       Yes         • S7 communication, as ever       Yes         • User data per job, max.       See online help (S7 communication, user data size)         Open El communication       Yes         • TCPHP       Yes         • CDeal length, max.       64 kbyle         • UDP       Yes         • State service       Yes         • Data length, max.       64 kbyle         • UDP       Yes         • Data length, max.       24 kbyle, 1472 bytes for UDP broadcast         • UDP multicast       Yes         • DLOP       Yes         • Encryption       Yes. Coptonal         Web sever       Yes         • HTTPS       Yes. Shandard and user pages         • PCCUA       Yes         • Number of concerctons, max.       Yes         • Number of concerctons, max.       1000         • Application authentication       Yes <td><ul> <li>— Switchover time on line break, typ.</li> </ul></td> <td>200 ms; For MRP, bumpless for MRPD</td>	<ul> <li>— Switchover time on line break, typ.</li> </ul>	200 ms; For MRP, bumpless for MRPD
PCOP communication     Yes, encyption with TLS V1.3 pre-selected     S7 communication, as server     Yes     S7 communication, as server     Yes     S7 communication, as server     Yes     Ves	<ul> <li>— Number of stations in the ring, max.</li> </ul>	50
<ul> <li>S7 racking</li> <li>S7 racking</li> <li>S8 communication, as event</li> <li>S8 continuctation, as event</li> <li>S9 continuincation, as event</li> <li>S9 control (S9 contr</li></ul>	SIMATIC communication	
<ul> <li>S7 routing</li> <li>Y8 routing</li> <li>Y8 routinuclation, as ever</li> <li>Y8 routinuclation</li> <li>Y8 routinuclation</li></ul>	<ul> <li>PG/OP communication</li> </ul>	Yes; encryption with TLS V1.3 pre-selected
<ul> <li>S7 communication, as server</li> <li>S7 communication, as server</li> <li>S7 communication, as server</li> <li>S7 communication, as server</li> <li>S8 contine help (S7 communication, user data size)</li> <li>Open Ecommunication</li> <li>TGP/IP</li> <li>Biolon-TCP (RPC1008)</li> <li>S8 control (RPC100</li></ul>	S7 routing	
<ul> <li>S7 communication, as client</li> <li>User data per job, max.</li> <li>See online help (S7 communication, user data size)</li> <li>Open Ecommunication</li> <li>TCP/IP</li> <li>Data length, max.</li> <li>BitSO-on-TCP (RF-1066)</li> <li>Colata length, max.</li> <li>BitSO-on-TCP (RF-1066)</li> <li>Sise length, max.</li> <li>BitSO-On-TCP (RF-1066)</li> <li>Ves.</li> <li>Sise length</li> <li>Ves.</li> <li>Sise length</li> <li>Ves.</li> <li>Standard and user pages</li> <li>Ves.</li> <li>Standard and user pages</li> <li>Ves.</li> <li>Ves.</li> <li>Ves.<td>-</td><td></td></li></ul>	-	
User data per joh, max.         See online help (S7 communication, user data size)           Open IE communication         ************************************		
Open IIE communication         Ves                • TCP/P		
• TCP/IP     Yes       • Obla length, max.     64 kbyle       • usco-or:CP(IRFC1006)     Yes       • Data length, max.     64 kbyle       • UDP     Yes       • Data length, max.     64 kbyle       • UDP     Yes       • Data length, max.     64 kbyle       • UDP     Yes       • DDP multicast     Yes, Max. 5 multicast circuits       • DHCP     Yes       • DNS     Yes       • SNMP     Yes       • DDCP     Yes       • DTTPS     Yes: Standard and user pages       • HTTPS     Yes: Standard and user pages       • PCU A     Yes       • PCU A     Yes       • PCU A     Yes       • PCU A     Yes       • Partime license required     Yes       • PCU A     Yes       • Augitation authemitication     Yes       • Available security policies: None, Basic128Raa15, Basic256Raa15, Basic256Raa15, Basic256Raa16, Basic25		See online help (S7 continunication, user data size)
- Data length, max.     -	•	Vee
<ul> <li>- several passive connections per port, supported</li> <li>- Social length, max.</li> <li>- Data length, max.</li> <li>- Partition license required</li> <li>- Ves.</li> <li>- Rentitine license required</li> <li>- Ves.</li> <li>- Security policies</li> <li>- Data advantant length, max.</li> <li>- Number of elements for one call of OPC_UA, NedeSetHandeListOPC_UA, ReadListOPC, max.</li> <li>- Number of session management, per connection, max.</li> <li>- Number of sessio</li></ul>		
supported supported ves suppor	-	•
ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyle- UDP multicastYes- Data length, max.2 kbyte. 1472 bytes for UDP broadcast- UDP multicastYes- DNSYes- Number of lengen sequiredYes- Application authenticationYes- Application authenticationYes- Security policiesNone, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa256- User authenticationYes- Number of elements for one call of OPC_UA_NameSpaceSecHendexList, max.20- Number of elements for one call of OPC_UA_NameSpaceSecHendexList, max.5 000- Number of elements for one call of OPC_UA_NameSpaceSecHendexList, max.5 000- Number of elements for one call of OPC_UA_MatheredSpaceSecHendexList, max.5 000- Number of elements for one call of OPC_UA_MatheredSpaceSecHendexList, max.5 000- Number of elements for one call of OPC_UA_MatheredSpaceSecHendexList, max.5 000- Number of elements		Yes
Data length, max.64 kbyte• UDPYes- Oata length, max.2 kbyte; 1 472 bytes for UDP broadcast- UDP multicastYes; Max. 5 multicast circuits- UDP multicastYes; Max. 5 multicast circuits• DNSYes• DNSYes• DNPYes• SNMPYes• DCPYes• DCPYes• DCPYes• DCPYes• DCPYes• DCPYes• EncryptionYes; Standard and user pages• HTTPSYes; Standard and user pages• OPC UAYes• Runtime itcense requiredYes; Small* license required• OPC UA ClientYes• Runtime itcense requiredYes• Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic2665- User authentication*anonymous* or by user name & password- Number of nomections, max.4- number of nomections, max.1000• Number of elements for one call of OPC_UA_NendSeceEntedexList, max.0- Number of elements for one call of OPC_UA_NendSecEntedexList, max.100• Number of elements for one call of OPC_UA_NendSecEntedexList, max.5000• Number of inputational so the client5• Number of inputational so the client100• OPC_UA_MendSecEntedexList, max.5000• Number of inputational so the client5• Number of inputational so the client5• Number of inputational so the client100• OPC_UA_MendSecEntedexListe		Vee
UDPYes Outo length, max.2 koyle: 1422 bytes for UDP broadcast UDP multicastYes, Yax. 5 multicast circuits DHCPYes DNSYes DNSYes DNSYes DNSYes DNSYes DNSYes DNSYes DNSYes DOPYes DOPYes DOPYes Number of enclaredYes; Standard and user pages OPC UAYes; Standard and user pages OPC UA ClientYes; Standard and user pages Application authenticationYes; Standard and user pages Application authenticationYes; Standard and user pages OPC UA ClientYes; Standard and user pages Number of connections, max.4 Number of connections, max.4 number of neinens for one call of OPC_UA_NenseQaceCellendexList, max.300 Number of elements for one call of OPC_UA_NenseQaceCellendexList, max.300 Number of elements for one call of OPC_UA_NenseQaceCellendexList, max.1 number of simultaneous calls of the client 		
<ul> <li>Data length, max.</li> <li>UDP multicast</li> <li>VDP multicast</li> <li>VDP multicast</li> <li>VBS</li> <li>DNS</li> <li>Ves</li> <li>SNNP</li> <li>Ves</li> <li>SNNP</li> <li>Ves</li> <li>SNNP</li> <li>Ves</li> <li>Some context of the second se</li></ul>	-	
UDP multicastYes; Max. 5 multicast circuits• DHCPYes• DNSYes• SNMPYes• DCPYes• LDPYes• DCPYes; OptionalWeb serverYes; Standard and user pages• HTTPYes; Standard and user pages• DCC UA ClientYes; Standard and user pages• OPC UAYes; Standard and user pages• OPC UAYes; Standard and user pages• OPC UA ClientYes; Standard and user pages• Number of connections, max.4• Number of connections, max.4• Number of elements for one call of20OPC_UA, NodeGetHandleList, max.100• Number of elements for one call of20OPC_UA, NodeGetHandleList, max.5000• number of simultaneous calls of the client1• number of simultaneous calls of the client5000• Number of registerable nodes, max.5000• Number of registerable nodes, max.5000• Number of registerable nodes and the client5000• Number of registerable nodes, max.5000• Number of simultaneous calls of the client5000• Number of registerable nodes, max.5000 <td></td> <td></td>		
• DHCPYes• DNSYes• DCPYes• DCPYes• LLDPYes• LLDPYes• HTTPYes, Standard and user pages• HTTPYes, Standard and user pages• HTTPYes, Standard and user pages• DPC UAYes• Runtime license requiredYes• Runtime license requiredYes• Runtime license requiredYes• CPC UAYes• Runtime license requiredYes• Application authenticationYes- Security policiesBasic2656has15, Basic256fksa15, Basic256fksa15, Basic256fksa15, Basic266fksa16- User authenticationYes- Number of connections, max.4- number of nodes of the client interfaces, recommended max.1000- Number of elements for one call of OPC_UA, NoteGetHandList, max.100- Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.100- number of simultaneous calls of the client instructions for data access, per connection, max.5000- number of nightaneous calls of the client instructions for data access, per connection, max.5000- Number of registerable modes, max.5000- Number of nightaneous calls of the client instructions for data access, per connection, max.5000- Number of nightaneous calls of the client instructions for data access, per connection, max.5000- Number of nightaneous calls of the client instructions for data access, per connection, max.5000- Number of nightaneous calls of the client instructions for da	-	2 kbyte; 1 472 bytes for UDP broadcast
• DNSYes• SIMPYes• LDPYes• LDPYes• LDPYes• ILDPYes• ILDPYes• ILTPYes• MITPYes• Mutime license requiredYes• OPC UAYes• OPC UAYes• Coultine license requiredYes• Coultine license requiredYes• OPC UAYes• Coultine license requiredYes• Coultine license requiredYes• Number of connections, max.4- Number of elements for one call of OPC_UA_NodesetHandleList/OPC_UA_ReadListor max.300• Number of elements for one call of OPC_UA_NodesetHandleList, max.1- Number of elements for one call of OPC_UA_MethodSetHandleList, max.1- number of simultaneous calls of the client instructions for data access, per connection, max.1- Number of registerable nodes, max.5000- Number of registerable method calls of OPC_UA_MethodSetHandleList, max.1- Number of registerable nodes, max.5000- Number of registerable nodes, max.5000- Number of registerable nodes, max.5000- Number of registerable method calls of OPC_UA_MethodSetHandleList, max.1- Number	— UDP multicast	Yes; Max. 5 multicast circuits
• SNMPYes• DCPYes• LDPYes• EncryptionYes; OptionalWeb server•• HTTPYes; Standard and user pages• HTTPSYes; Standard and user pages• OPC UA•• Runtime license requiredYes; "Small" license required• OPC UA ClientYes• Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa16- User authenticationYes- number of nodes of the client interfaces, recommended max.4- number of of elements for one call of OPC_UA, NadeSedeHandleList, max.000- Number of elements for one call of OPC_UA, NadeSedeHandleList, max.000- Number of elements for one call of OPC_UA, NadeSedeHandleList, max.100- number of simultaneous calls of the client instructions for data access, pre connection, max.5- number of elements for one call of OPC_UA, NameSpaceEntidexList, max.00- number of simultaneous calls of the client instructions for data access, pre connection, max.5- number of elements for one call of OPC_UA, MethodCall, max.5000- Number of registerable mothod calls of OPC_UA, MethodCall, max.5000- Number of registerable mothod calls of OPC_UA, MethodCall, max.5000- Number of registerable mothod calls of OPC_UA, MethodCall, max.7- Number of registerable mothod calls of OPC_UA, MethodCall, max.7- Number of registerable mothod calls of OPC_UA, MethodCall, max.5000 <tr< td=""><td>• DHCP</td><td>Yes</td></tr<>	• DHCP	Yes
DCP     LDP     Ves LDP     Ves LDP     Ves.Standard and user pages     Ves.Ves.Standard and user pages     Ves.Ves.Ves.Ves.Ves.Ves.Ves.Ves.Ves.Ves.	• DNS	Yes
• LLDPYes Sc OptionalWeb server• HTTP• HTTPS• HTTPS• NTPS• CPC UA• Runtime license required• OPC UA Client• CPC UA Client• CPC UA Client• Security policies- Application authentication- Security policies- Number of nodes of the client interfaces, recommended max Number of elements for one call of OPC_UA_NameSpaceEdHandListoPC_UA_ReadListor max Number of elements for one call of OPC_UA_NameSpaceEdHandList, max Number of elements for one call of OPC_UA_NetHodCall, max Number of elements for one call of OPC_UA_NameSpaceEdHandList, max Number of elements for one call of OPC_UA_NetHodCall, max Number of elements for one call of OPC_UA_NetHodCall, max Number of registerable mothed calls of OPC_UA_MetHodCall, max Number of registerable mothed calls of OPC_UA_MetHodCall, max Number of registerable mothed calls of OPC_UA_MetHodCall, max Number of registerable mothed calls of OP	• SNMP	Yes
Encryption     Ves; Optional     Web server      HTTP     HTTP     HTTP     HTTP     HTTP     Ves; Standard and user pages     Ves; Standard and user pages     Ves; Standard and user pages     OPC UA     USE	• DCP	Yes
	• LLDP	Yes
Web server         • HTTP       Yes; Standard and user pages         • PCP UA       Yes; Standard and user pages         • OPC UA Client       Yes; "Small" license required         • OPC UA Client       Yes; "Small" license required         • Application authentication       Yes         - Application authentication       Yes         - Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256         - User authentication       "anonymous" or by user name & password         - Number of condections, max.       4         - number of nodes of the client interfaces, recommended max.       1 000         - Number of elements for one call of OPC_UA_NedeGetHandleList/OPC_UA_ReadList/ max.       300         - Number of elements for one call of OPC_UA_MethodCetHandleList, max.       100         - number of elements for one call of OPC_UA_MethodCetHandleList, max.       100         - number of elements for one call of 100       100         OPC_UA_MethodCetHandleList, max.       5         - number of registerable nodes, max.       5         - Number of registerable method calls of 100       00         OPC_UA_MethodCall, max.       5         - Number of registerable nodes, max.       5         - Number of registerable nodes       space		Yes: Optional
• HTTP       Yes; Standard and user pages         • PTTPS       Yes; Standard and user pages         OPC UA       • Runtime license required         • OPC UA Client       Yes; "Small" license required         • Application authentication       Yes         - Application authentication       Yes         - Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256         - User authentication       "anonymous" or by user name & password         - Number of connections, max.       4         - number of codes of the client interfaces, recommended max.       1000         - Number of elements for one call of OPC_UA_NoneGetHandleList/OPC_UA_ReadList/C max.       300         - Number of elements for one call of OPC_UA_MethodGetHandleList, max.       1         - number of simultaneous calls of the client instructions for data access, per connection, max.       1         - Number of registerable nodes, max.       5         - Number of registerable nodes, max.       5000         - Number of registerable nodes, max.       5         - Number of registerable nodes, max.       5         - Number of registerable method calls of the client       5         - Number of registerable method calls of the client       100         - OPC_UA_MethodCall, max.       5000 <t< td=""><td></td><td></td></t<>		
• HTTPS       Yes; Standard and user pages         OPC UA       Fundime license required       Yes; "Small" license required         • OPC UA Client       Yes; "Small" license required       Yes; "Small" license required         • Application authentication       Yes         - Application authentication       Yes         - Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Sha256         - User authentication       "anonymous" or by user name & password         - Number of connections, max.       4         - number of nodes of the client interfaces, recommended max.       1000         - Number of elements for one call of OPC_UA_NodeSetHandleList/OPC_UA_ReadList, max.       20         - Number of elements for one call of OPC_UA_MethodGetHandleList, max.       1         - number of simultaneous calls of the client instructions for session management, per connection, max.       5         - number of simultaneous calls of the client instructions for data access, per connection, max.       5         - Number of registerable nodes,		Vec: Standard and user pages
OPC UA       • Runtime license required       Yes; "Small" license required         • OPC UA Client       Yes         - Application authentication       Yes         - Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256         - User authentication       "anonymous" or by user name & password         - Number of connections, max.       4         - number of oldes of the client interfaces, recommended max.       1000         - Number of elements for one call of OPC_UA_NeedEtHandleList/OPC_UA_ReadList/Omax.       20         - Number of elements for one call of OPC_UA_MedGetHandleList, max.       100         - number of simultaneous calls of the client instructions for session management, per connection, max.       100         - number of simultaneous calls of the client instructions for session management, per connection, max.       5000         - Number of registerable modes, max.       5000         - Number of registerable modes, max.       5000         - Number of inputs/outputs when calling OPC_UA_MethodCall, max.       5000         - OPC UA Server       Yes         - Application authentication       Yes         - Security policies       Available security policies: None, Basic128xs15, Basic256Rsa15, Basic256Rsa15, Basic256Shs256         - User authentication       Yes         - Security policies		
<ul> <li>Runtime license required</li> <li>Ves; "Small" license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>User authentication</li> <li>Security policies</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic2565Ra256</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>number of connections, max.</li> <li>number of elements for one call of</li> <li>OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> <li>Number of elements for one call of</li> <li>OPC_UA_NethodGetHandleList, max.</li> <li>Number of elements for one call of</li> <li>OPC_UA_MethodGetHandleList, max.</li> <li>number of simultaneous calls of the client instructions for session management, per connection, max.</li> <li>Number of registerable method calls of</li> <li>OPC_UA_MethodCall, max.</li> <li>OPC_UA_MethodCall, max.</li> <li>OPC_UA_MethodCall, max.</li> <li>Sccurity policies</li> <li>Ves; Data access (read, write, subscribe), method call, custom address space</li> <li>Application authentication</li> <li>Security policies</li> <li>Ves; Data access (read, write, subscribe), method call, custom address space</li> <li>Application authentication</li> <li>Security policies</li> <li>Ves; Data access (read, write, subscribe), method call, custom address space</li> <li>Application authentication</li> <li>Security policies</li> <li>Ves</li> <li>Number of sessions, max.</li> <li>Number of registerable nodes, max.</li> <li>Number of sessions, max.</li> <li>Number of sessions, max.</li> <li>Number of sessions, max.</li> <li>Number of sessions, max.</li> <li>Number of r</li></ul>		res, Standard and user pages
OPC UA Client     Application authentication     Security policies     Security policies     Autiable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256     User authentication     Number of nonections, max.     Aunuber of nodes of the client interfaces,     recommended max.     Number of elements for one call of     OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C     max.     — Number of elements for one call of     OPC_UA_NameSpaceGetIndexList, max.     — Number of elements for one call of     OPC_UA_NameSpaceGetIndexList, max.     — number of simultaneous calls of the client     instructions for data access, per connection, max.     — Number of registerable nodes, max.     — Number of registerable nethod calls of     OPC_UA_MethodCall, max.     — Number of inputs/outputs when calling     OPC_UA_MethodCall, max.     — Number of inputs/outputs when calling     OPC_UA_Server     — Application authentication     — Security policies     — Application authentication     — CDS support (certificate management)     — Number of registerable nodes, m		
- Application authenticationYes- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256- User authentication"anonymous" or by user name & password- Number of connections, max.4- number of nodes of the client interfaces, recommended max.1000- Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/ max.300- Number of elements for one call of OPC_UA_NodeGetHandleList, max.20- Number of elements for one call of OPC_UA_MethodGetHandleList, max.100- Number of elements for one call of OPC_UA_MethodGetHandleList, max.1- number of simultaneous calls of the client instructions for session management, per connection, max.1- number of simultaneous calls of the client instructions for data access, per connection, max.5- Number of registerable nodes, max.5- Number of rigisterable nodes, max.5- Number of pregisterable nodes, max.5- Number of pregisterable nodes, max.5- Number of not calling of OPC_UA_MethodCall, max.20- Number of pregisterable nodes, max.5- Number of rigisterable nodes, max.5- Number of of calls of the client instructions for data access, per connection, max.5- Number of rigisterable nodes, max.5- Number of rigisterable nodes, max.5- Number of rigisterable nodes, max.5- OPC UA ServerYes; Data access (read, write, subscribe), method call, custom address space- Application		
- Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256         - User authentication       "anonymous" or by user name & password         - Number of connections, max.       4         - number of nodes of the client interfaces, recommended max.       1000         - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.       300         - Number of elements for one call of OPC_UA_MethodGetHandleList, max.       20         - Number of elements for one call of OPC_UA_MethodGetHandleList, max.       100         - number of simultaneous calls of the client instructions for data access, per connection, max.       1         - Number of registerable nethod calls of OPC_UA_MethodCall, max.       5         - Number of input/solutputs when calling OPC_UA_MethodCall, max.       5         - Number of ringisterable nethod calls of OPC_UA_MethodCall, max.       5         - Number of negisterable nethod calls of OPC_UA_MethodCall, max.       5         - Number of origisterable nethod calls of OPC_UA_MethodCall, max.       5         - Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256 <td></td> <td></td>		
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/ max Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max Number of elements for one call of OPC_UA_MethodGetHandleList, max number of simultaneous calls of the client instructions for session management, per connection, max Number of registerable method calls of OPC_UA_MethodCall, max Application authentication		
Number of connections, max.       4         number of nodes of the client interfaces, recommended max.       1000         Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.       300         Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.       20         Number of elements for one call of OPC_UA_MethodGetHandleList, max.       100         Number of elements for one call of OPC_UA_MethodGetHandleList, max.       100         number of simultaneous calls of the client instructions for session management, per connection, max.       100         number of registerable nodes, max.       5 000         Number of registerable nodes, max.       5 000         Number of input/soutputs when calling OPC_UA_MethodCall, max.       20         Number of input/soutputs when calling OPC_UA_MethodCall, max.       5 000         Number of inputs/outputs when calling OPC_UA_MethodCall, max.       5 000         Application authentication       Yes         Security policies       Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256         User authentication       "anonymous" or by user name & password         GDS support (certificate management)       Yes         Number of acces	— Security policies	
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recommended max.ope: LuA_NodeGetHandleList/OPC_UA_ReadList/omax.300- Number of elements for one call of OPC_UA_NemeSpaceGetIndexList, max.20- Number of elements for one call of OPC_UA_MethodGetHandleList, max.100- Number of elements for one call of OPC_UA_MethodGetHandleList, max.100- Number of sements for one call of OPC_UA_MethodGetHandleList, max.1- number of simultaneous calls of the client instructions for session management, per connection, max.1- number of registerable nodes, max.5 000- Number of registerable nodes, max.5 000- Number of registerable nodes, max.5 000- Number of inputs/outputs when calling OPC_UA_MethodCall, max.20- Number of inputs/outputs when calling OPC_UA_MethodCall, max.20- Number of inputs/outputs when calling OPC_UA_MethodCall, max.5 000- Number of inputs/outputs when calling OPC_UA_MethodCall, max.20- Number of inputs/outputs when calling OPC_UA_MethodCall, max.Yes: Data access (read, write, subscribe), method call, custom address space- Application authentication - Security policiesYes: Data access (read, write, subscribe), method call, custom address space- User authentication - OES support (certificate management)Yes- Number of accessing, max.50 000- Number of r	<ul> <li>— Number of connections, max.</li> </ul>	4
Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/ max.300Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.20Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.100Number of elements for one call of OPC_UA_MethodGetHandleList, max.100- number of simultaneous calls of the client instructions for session management, per connection, max.1- number of simultaneous calls of the client instructions for data access, per connection, max.5- Number of registerable nodes, max.5- Number of registerable method calls of OPC_UA_MethodCall, max.100OPC_UA_MethodCall, max.5- Number of inputs/outputs when calling OPC_UA_MethodCall, max.20- Application authenticationYes: Data access (read, write, subscribe), method call, custom address space- Application authenticationYes: Data access (read, write, subscribe), method call, custom address space- User authentication"anonymous" or by user name & password- GDS support (certificate management)Yes- Number of accessing, max.50 000- Number of registerable nodes, max.50 000- Number of registerable nodes, max.10 000	<ul> <li>number of nodes of the client interfaces,</li> </ul>	1 000
OPC_UA_NodeGetHandleList/OPC_UA_ReadList/ max.20Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.20Number of elements for one call of OPC_UA_MethodGetHandleList, max.100Number of simultaneous calls of the client instructions for session management, per connection, max.1number of simultaneous calls of the client instructions for data access, per connection, max.5Number of registerable nodes, max.5 000Number of registerable method calls of OPC_UA_MethodCall, max.20Number of riputs/outputs when calling OPC_UA_MethodCall, max.20Number of riputs/outputs when calling OPC_UA_MethodCall, max.20Application authenticationYes; Data access (read, write, subscribe), method call, custom address spaceApplication authenticationYesSecurity policies"anonymous" or by user name & passwordSubser of sessions, max.32Number of registerable nodes, max.32Application authentication"anonymous" or by user name & passwordSecurity policies"anonymous" or by user name & passwordSubser of accessible variables, max.32Number of registerable nodes, max.32Number of registerable nodes, max.32Application authentication"anonymous" or by user name & passwordSubser of accessible variables, max.32Number of registerable nodes, max.10 000	recommended max.	
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Number of elements for one call of OPC_UA_MethodGetHandleList, max.100 number of simultaneous calls of the client instructions for session management, per connection, max.1 number of simultaneous calls of the client instructions for data access, per connection, max.5 Number of registerable nodes, max.5 Number of registerable method calls of OPC_UA_MethodCall, max.5 Number of inputs/outputs when calling OPC_UA_MethodCall, max.20 Number of inputs/outputs when calling OPC_UA_MethodCall, max.Yes; Data access (read, write, subscribe), method call, custom address space Application authentication Security policiesYes Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication GDS support (certificate management)Yes Number of sessions, max.32 Number of registerable nodes, max.32 Number of registerable nodes, max.50 000	- Number of elements for one call of	20
OPC_UA_MethodGetHandleList, max.1- number of simultaneous calls of the client instructions for session management, per connection, max.1- number of simultaneous calls of the client instructions for data access, per connection, max.5- number of registerable nodes, max.5 000- Number of registerable nodes, max.5 000- Number of registerable method calls of OPC_UA_MethodCall, max.100- Number of inputs/outputs when calling OPC_UA_MethodCall, max.20- Number of inputs/outputs when calling OPC_UA_MethodCall, max.Yes; Data access (read, write, subscribe), method call, custom address space- Application authentication - Security policiesYes- Security policies"anonymous" or by user name & password- GDS support (certificate management) - Number of sessions, max.Yes- Number of sessions, max.32- Number of sessions, max.50 000- Number of registerable nodes, max.10 000		400
instructions for session management, per connection, max	OPC_UA_MethodGetHandleList, max.	
number of simultaneous calls of the client instructions for data access, per connection, max.5 Number of registerable nodes, max.5 000 Number of registerable method calls of OPC_UA_MethodCall, max.100 Number of inputs/outputs when calling OPC_UA_MethodCall, max.20 Number of inputs/outputs when calling OPC_UA_MethodCall, max.Yes; Data access (read, write, subscribe), method call, custom address space Application authentication Security policiesYes User authentication GDS support (certificate management)Yes Number of sessions, max.32 Number of registerable variables, max.50 000 Number of registerable nodes, max.10 000	instructions for session management, per	1
<ul> <li>Number of registerable nodes, max.</li> <li>Number of registerable method calls of OPC_UA_MethodCall, max.</li> <li>Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> <li>OPC UA Server</li> <li>Application authentication</li> <li>Security policies</li> <li>Security policies</li> <li>Ves</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>GDS support (certificate management)</li> <li>Mumber of sessions, max.</li> <li>Number of accessible variables, max.</li> <li>Number of registerable nodes, max.</li> <li>Number of registerable nodes, max.</li> </ul>		5
<ul> <li>Number of registerable method calls of OPC_UA_MethodCall, max.</li> <li>Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> <li>OPC UA Server</li> <li>OPC UA Server</li> <li>Application authentication</li> <li>Security policies</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>GDS support (certificate management)</li> <li>Number of sessions, max.</li> <li>Number of accessible variables, max.</li> <li>Number of registerable nodes, max.</li> <li>100</li> <li>100</li> </ul>		5 000
<ul> <li>Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> <li>OPC UA Server</li> <li>Application authentication</li> <li>Security policies</li> <li>Ves</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>GDS support (certificate management)</li> <li>GDS support (certificate management)</li> <li>Number of sessions, max.</li> <li>Number of accessible variables, max.</li> <li>Number of registerable nodes, max.</li> <li>10 000</li> </ul>		100
<ul> <li>OPC UA Server</li> <li>Yes; Data access (read, write, subscribe), method call, custom address space</li> <li>Application authentication</li> <li>Security policies</li> <li>Ves</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>GDS support (certificate management)</li> <li>GDS support (certificate management)</li> <li>Yes</li> <li>Number of sessions, max.</li> <li>Number of accessible variables, max.</li> <li>Number of registerable nodes, max.</li> <li>10 000</li> </ul>	- Number of inputs/outputs when calling	20
- Security policiesAvailable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- User authentication"anonymous" or by user name & password- GDS support (certificate management)Yes- Number of sessions, max.32- Number of accessible variables, max.50 000- Number of registerable nodes, max.10 000		
- User authentication       "anonymous" or by user name & password         - GDS support (certificate management)       Yes         - Number of sessions, max.       32         - Number of accessible variables, max.       50 000         - Number of registerable nodes, max.       10 000	<ul> <li>Application authentication</li> </ul>	Yes
— GDS support (certificate management)Yes— Number of sessions, max.32— Number of accessible variables, max.50 000— Number of registerable nodes, max.10 000	— Security policies	
Number of sessions, max.       32         Number of accessible variables, max.       50 000         Number of registerable nodes, max.       10 000	<ul> <li>User authentication</li> </ul>	llene en un en
— Number of accessible variables, max.50 000— Number of registerable nodes, max.10 000		anonymous" or by user name & password
- Number of registerable nodes, max. 10 000	<ul> <li>— GDS support (certificate management)</li> </ul>	
<ul> <li>Number of registerable nodes, max.</li> <li>10 000</li> </ul>		Yes
	— Number of sessions, max.	Yes 32
	<ul> <li>— Number of sessions, max.</li> <li>— Number of accessible variables, max.</li> </ul>	Yes 32 50 000

— Sampling interval, min.	100 ms
<ul> <li>Publishing interval, min.</li> </ul>	500 ms
<ul> <li>— Number of server methods, max.</li> </ul>	20
<ul> <li>— Number of inputs/outputs per server method,</li> </ul>	20
max.	
<ul> <li>number of monitored items, recommended max.</li> </ul>	1 000; for 1 s sampling interval and 1 s send interval
- Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
<ul> <li>— Number of nodes for user-defined server interfaces, max.</li> </ul>	1 000
<ul> <li>Alarms and Conditions</li> </ul>	Yes
— Number of program alarms	100
<ul> <li>Number of alarms for system diagnostics</li> </ul>	50
Further protocols	
MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm"
Number of configurable program messages, max.	block, ProDiag or GRAPH
Number of loadable program manages in DUN, may	2 500
Number of loadable program messages in RUN, max.	2 300
Number of simultaneously active program alarms	
<ul> <li>Number of program alarms</li> </ul>	600
<ul> <li>Number of alarms for system diagnostics</li> </ul>	100
<ul> <li>Number of alarms for motion technology objects</li> </ul>	80
Test 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
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul> <li>Number of variables, max.</li> </ul>	
<ul> <li>— of which status variables, max.</li> </ul>	200; per job
<ul> <li>— of which control variables, max.</li> </ul>	200; per job
Forcing	
• Forcing	Yes
<ul> <li>Forcing, variables</li> </ul>	
	Perinheral inpute/outpute
• Number of verichles may	Peripheral inputs/outputs
Number of variables, max.	Peripheral inputs/outputs 200
Diagnostic buffer	200
Diagnostic buffer	200 Yes
Diagnostic buffer • present • Number of entries, max.	200 Yes 1 000
Diagnostic buffer	200 Yes
Diagnostic buffer • present • Number of entries, max.	200 Yes 1 000
Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof	200 Yes 1 000
Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof Traces • Number of configurable Traces	200 Yes 1 000 500
Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof Traces • Number of configurable Traces Interrupts/diagnostics/status information	200 Yes 1 000 500
Diagnostic buffer • present • Number of entries, max. — of which powerfail-proof Traces • Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible
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	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes
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	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes
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	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes
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	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes
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	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes
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 • Connection display LINK TX/RX Supported technology objects	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes
Diagnostic buffer • present • Number of entries, max. 	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes
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 • Connection display LINK TX/RX Supported technology objects	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes
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 • Connection display LINK TX/RX Supported technology objects Motion Control	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes
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 • RUN/STOP LED • ERROR LED • MAINT LED • Connection display LINK TX/RX Supported technology objects Motion Control • Number of available Motion Control resources for technology objects	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes
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 • RUN/STOP LED • ERROR LED • MAINT LED • Connection display LINK TX/RX Supported technology objects Motion Control • Number of available Motion Control resources for technology objects • Required Motion Control resources	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes Yes
Diagnostic buffer • present • Number of entries, max. 	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes Yes Yes Yes
Diagnostic buffer • present • Number of entries, max. 	200 Yes 1 000 500 4; Up to 512 KB of data per trace are possible Yes Yes Yes Yes Yes Yes Yes

— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
<ul> <li>Positioning axis</li> </ul>	
<ul> <li>— Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	5
<ul> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	10
Controller	
<ul> <li>PID_Compact</li> </ul>	Yes; Universal PID controller with integrated optimization
PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	0 °C
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the
	display is switched off
<ul> <li>vertical installation, min.</li> </ul>	0°0
<ul> <li>vertical installation, max.</li> </ul>	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
·	display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °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 / neader configuration / programming / header	
configuration / programming / header	Yes
configuration / programming / header Programming language	Yes Yes
configuration / programming / header Programming language — LAD	
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 — GRAPH	Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection	Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection	Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection	Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection	Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Block protection         • Block protection         Access protection	Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Block protection         • Block protection         • protection         • protection	Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • protection         • protection         • Password for display	Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Block protection         • protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Block protection         • protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Read/write protection	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Intervention         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Intervention	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Protection level: Complete protection	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Intervention         • Protection level: Complete protection         • Protection level: Complete protection         • Intervention         • Intervention	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Inwer limit         • upper limit	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Protection level: Complete protection         • Iower limit         • upper limit	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Diver limit         • upper limit	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Protection level: Complete protection         • Dimensions         Width         Height         Depth	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header         Programming language         — LAD         — FBD         — STL         — SCL         — GRAPH         Know-how protection         • User program protection/password protection         • Copy protection         • Block protection         • Protection of confidential configuration data         • Password for display         • Protection level: Write protection         • Protection level: Complete protection         • Programming / cycle time monitoring / header         • lower limit         • upper limit	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes

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