Data sheet

6ES7511-1AL03-0AB0



SIMATIC S7-1500, CPU 1511-1 PN, central processing unit with work memory 300 KB for program and 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required **** approvals and certificate according to entry 109815653 at support.industry.siemens.com to be observed! ****

Product type designation	General information	
Firmware version Product function I&M data Yes; I&M to I&M3	Product type designation	CPU 1511-1 PN
Product function • I&M data • Isochronous mode Pegineering with • STEP 7 TIA Portal configurable/integrated from version **Configuration control** Via (FW V3.0); with older TIA Portal versions configurable as 6ES7511- 1AK02-0AB0 **Configuration control** Via dataset Pes Display Screen diagonal [cm] Control elements Number of keys 8 Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, u	HW functional status	FS01
Silk Mata Yes; Ik Mo to Is Ma	Firmware version	V3.0
• Isochronous mode Yes: Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central) Fingineering with • STEP 7 TIA Portal configurable/integrated from version V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7511-1AK02-0AB0 Configuration control via dataset Yes Display Screen diagonal [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 • Repeat rate, min. 1/s Input current Current consumption (rated value) 0.73 A Current consumption (rated value) 0.5 A*s Power Infeed power to the backplane bus (balanced) Power loss, typ. Memory Number of slots for SiMATIC memory card 1 SIMATIC memory card required Yes	Product function	
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• STEP 7 TIA Portal configurable/integrated from version V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7511- 1AK02-9AB0 Via dataset Ves Display Screen diagonal [cm] Surper of keys 8 Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Alians buffering • Mains voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Current consumption (rated value) Current, max. 1.15 A; Rated value Power Infleed power to the backplane bus (balanced) Power loss Power loss Power loss, typ. Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	• Isochronous mode	
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Screen diagonal [cm] 3.45 cm	via dataset	Yes
Control elements Number of keys 8 Mode buttons 2 Supply voltage 2 Rated value (DC) 24 V permissible range, lower limit (DC) 28.8 V Reverse polarity protection Yes Mains buffering 5 ms • Repeat rate, min. 1/s Input current Current consumption (rated value) Current consumption, max. 0.9 A Inrush current, max. 1.15 A; Rated value Pt 0.5 A²-s Power 10 W Power consumption from the backplane bus (balanced) 5.5 W Power loss Power loss, typ. Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Display	
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permissible range, upper limit (DC) Reverse polarity protection Mains buffering Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. Mains/voltage failure stored energy time 5 ms 5 ms 6 ms 7 ms 8 ms 6 ms 6 ms 7 ms 8 ms 8 ms 8 ms 8 ms 8 ms 8 ms 9 ms 10 W Power loss Power loss, typ. 3.4 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Rated value (DC)	24 V
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Mains/voltage failure stored energy time Repeat rate, min. 1/s Input current Current consumption (rated value) 0.73 A Current consumption, max. 0.9 A Inrush current, max. 1.15 A; Rated value I²t 0.5 A²-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. 3.4 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required 7 in/s 5 ms 5 ms 1/s 1/s 1/s 1/s 1/s 1/s 1/s 1/	Reverse polarity protection	Yes
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Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. Memory Number of slots for SIMATIC memory card SIMATIC memory card required O.73 A 0.9 A 1.15 A; Rated value 0.5 A²-s 10 W 5.5 W 9.5 W 10	Repeat rate, min.	1/s
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Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 3.4 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Inrush current, max.	1.15 A; Rated value
Infeed power to the backplane bus Power consumption from the backplane bus (balanced) 5.5 W Power loss Power loss, typ. Memory Number of slots for SIMATIC memory card SIMATIC memory card required 1 Yes	l²t	0.5 A²·s
Power consumption from the backplane bus (balanced) 5.5 W Power loss Power loss, typ. 3.4 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power	
Power loss Power loss, typ. 3.4 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Infeed power to the backplane bus	10 W
Power loss, typ. 3.4 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power consumption from the backplane bus (balanced)	5.5 W
Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Power loss	
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power loss, typ.	3.4 W
SIMATIC memory card required Yes	Memory	
	Number of slots for SIMATIC memory card	1
Work memory	SIMATIC memory card required	Yes
	Work memory	

• integrated (for program)	300 khyta
• integrated (for data)	300 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	00 Ob. 4-
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	N/
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1
0:	59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB . Number range	0. 05 505
Number range	0 65 535
• Size, max.	300 kbyte
FC	0.05.505
Number range	0 65 535
• Size, max.	300 kbyte
OB	
• Size, max.	300 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
 Number of delay alarm OBs 	20
 Number of cyclic interrupt OBs 	20; With minimum OB 3x cycle of 250 μs
 Number of process alarm OBs 	50
 Number of DPV1 alarm OBs 	3
 Number of isochronous mode OBs 	2
 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	(e) initiod by the main memory
·	Yes
— adjustable S7 times	100
Number	2 048
	2 070
Retentivity	Voc
— adjustable	Yes
IEC timer	Any (only limited by the mais manuar)
Number Petertinity	Any (only limited by the main memory)
Retentivity	V
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	
reterrive data area (moi. timero, ocumero, riago), max.	256 kbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 216 KB
Extended retentive data area (incl. timers, counters, flags), max.	

• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
 Retentivity adjustable 	Yes
Retentivity preset	No
Local data	
per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	2 040, max. number of modules / submodules
	22 khyta: All inputs are in the process image
• 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	
 Number of subprocess images, max. 	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	
 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	
• supported	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
	103
Interfaces	4
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
 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.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
 Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	128
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; in total across all interfaces
— Number of IO Devices per tool, max.	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
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 500 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 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 2 ms — for send cycle of 4 ms	4 ms to 64 ms
With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 μs: 375 μs, 625 μs 3
— With Irk I and parameterization of odd send cycles	875 µs)
Update time for RT	
— for send cycle of 250 μs	250 μs to 128 ms
 for send cycle of 500 μs 	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— 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
nterface types	
RJ 45 (Ethernet)	V
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	No
Number of connections	
 Number of connections, max. 	128; via integrated interfaces of the CPU and connected CPs / CMs
 Number of connections reserved for ES/HMI/web 	10
 Number of connections via integrated interfaces 	88
 Number of S7 routing paths 	16
Redundancy mode	
H-Sync forwarding	Yes
• H-Sylic lorwarding	

— 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 	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
• •	50
— Number of stations in the ring, max.	50
SIMATIC communication	Vacuation with TLC V4.2 are calcuted
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 routing	Yes
Data record routing	Yes
• S7 communication, as server	Yes
• S7 communication, as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	v.
• TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; max. 78 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Small" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
Number of connections, max.	4
Number of connections, max. Number of nodes of the client interfaces,	1 000
recommended max.	1 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 	300
max.	
 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 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 method calls of OPC_UA_MethodCall, max. 	100
 Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	20
OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
 Application authentication 	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
 User authentication 	"anonymous" or by user name & password
User authentication	"anonymous" or by user name & password

- GDS support (certificate management) - Number of acessions, max Number of acessions (with the same of the sam	000	N/
- Number of registrable nodes, max Number of registrable nodes, max Number of subscription per session, max Number of subscription per session, max Number of subscriptions per session, max Number of server interfaces, max Number of program alarms - Number of program subscriptions - Number of subscript		
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- Number of inpubliculpuls per server method, max Number of nontrolled items, recommended max Number of sever interfaces, max Number of nodes for user-defined server interfaces Number of program alarms - Number of program alarms - Number of program alarms - Number of search of alarms for system diagnostics - Nondous S Yes; MOBBUS TCP - ST massage functions - Number of login statons for message functions, max Program alarms - Number of logingraphe program messages, max Program alarms - Number of logingraphe program messages, max Program alarms - Number of loginations program messages in RUN, max Number of loginations program demas - Number of simulaneously active program alarms - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of program alarms - Number of alarms for motion technology objects - Number of program for motion technology objects - Number of rotal program for motion technology objects - Number of variables, max Of which status variables, max Of which control variables, max Of which powerfail-prof - Proceser - Number of configurable Traces - Number of avariable Number of configurable Traces - Number of avariable Number of	-	
- Number of nontrored items, accommended max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of program alarms - Number of alarms for system diagnostics - Number of lagrange functions - Number of original stations for message functions, max Yes - Rodge functions - Number of individual program messages, max Number of loging stations for message functions, max Yes - Rodge functions - Number of original program messages, max Number of original program messages, max Number of simultaneously active program alarms - Number of original program messages in RUN, max Number of alarms for route technology objects - Number of alarms for route technology objects - Number of alarms for route technology objects - Number of alarms for motion technology objects - Number of wariables, max of which statia variables, max of which control variables, max of which statia variables, max of which powerfail-proof - Forcing, variables - Number of variables, max of which powerfail-proof - Forcing, variables - Number of originable Traces - Number of origi	•	
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where reference namespace" - Number of nodes for user-defined server interfaces, max. - Alams and Conditions - Number of program alarms - Number of login stations for ressage functions, max. - Program alarms Number of login stations for message functions, max. - Program alarms Number of configurable program messages, max. - Double of program alarms - Number of simultaneously active program alarms - Number of alarms for system diagnostics - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of breakpoints - Salus block - Ves; Up to 8 simultaneously (in total across all ES clients) - Single step - Number of breakpoints - Salus block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Status block - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across all ES clients) - Ves; Up to 8 simultaneously (in total across al		
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- Number of program alarms 100	•	
- Number of alarms for system diagnostics • MODBUS • MODBUS **Tressage functions Number of login stations for message functions, max. Program alarms Number of loging stations for message functions, max. Program alarms Number of configurable program messages, max. Number of configurable program messages in RUN, max. Number of ladinations for system diagnostics • Number of program alarms • Number of alarms for motion technology objects 160 **Test commissioning functions Joint commission (Team Engineering) Joint commission (Team Engineering) Status block Yes; Up to 8 simultaneously (in total across all ES clients) Single step No Number of breakpoints 8 status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. — of which powerfal-proof • Proring • Forcing	Alarms and Conditions	Yes
Further protocols MODBUS MODBUS MODBUS MODBUS MODBUS MODBUS Modeus Mod	 Number of program alarms 	100
MODBUS **Tress-says functions** Number of login stations for message functions, max. **Program alarms** Number of configurable program messages, max. **Probleg or GRAPH** Number of loadable program messages in RUN, max. **Number of inadable program alarms** **Number of simultaneously active program alarms** **Number of program alarms** **Number of program alarms** **Number of program alarms** **Number of alarms for rowton technology objects** **Number of alarms for motion technology objects** **Number of alarms for motion technology objects** **Test commissioning functions** **Joint commissioning functions** **Joint commissioning functions** **Joint commission (Team Engineering)** **Yes; Up to 8 simultaneously (in total across all ES clients)** **Status block** **Yes; Up to 8 simultaneously (in total across all ES clients)** **Number of breakpoints** **Status/control** **Status/control** **Status/control** **Status/control** **Status/control** **Status/control** **Status/control** **Status/control** **Yes** **Number of variables, max. - of which control variables, max. - of which powerfail-proof **Tocing** **Forcing**	 Number of alarms for system diagnostics 	50
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Status block Yes; Up to 8 simultaneously (in total across all ES clients) Single step No Number of breakpoints 8 Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. — of which routrol variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. — of which control variables, max. — of which powerfall-groof • Forcing • Forcing • Forcing • Peripheral inputs/outputs • Number of variables, max. 200 Diagnostic buffer • present • present • Number of entries, max. — of which powerfall-proof Traces • Number of configurable Traces • RUN/STOP LED • RRIN/STOP LED • RROR LED • STOP ACTIVE LED • STOP ACTIVE LED • Connection display LINK TX/RX Yes Supported technology objects Motion Control • Number of available Motion Control resources for 1 120		
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- of which status variables, max of which control variables, max. 200; per job 200; per job Forcing Forcing Forci	 Variables 	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing Forcing Forcing Forcing Forcing, Yes Forcing, Variables Number of variables, max. Peripheral inputs/outputs Number of variables, max. Peripheral inputs/outputs Number of entries, max. Number of entries, max. Of which powerfail-proof Traces Number of configurable Traces Yes Number of configurable Traces Yes Number of configurable Traces Yes FORCING PRUN/STOP LED STOP ACTIVE LED Yes Connection display LINK TX/RX Yes Supported technology objects Motion Control Number of available Motion Control resources for 1 120	Number of variables, max.	
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Forcing Forcing, variables Forcing, variables Peripheral inputs/outputs 200 Diagnostic buffer Pesent Pesent Pesent Pesent Pesent Pumber of entries, max Pesent Pumber of configurable Traces Pesent Pes	Forcing	
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Number of variables, max. Diagnostic buffer present	-	
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MAINT LED Yes STOP ACTIVE LED Connection display LINK TX/RX Yes Supported technology objects Motion Control Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for 1 120		
STOP ACTIVE LED Yes Connection display LINK TX/RX Yes Supported technology objects Motion Control Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for 1 120		
 ◆ Connection display LINK TX/RX Supported technology objects Motion Control Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for 1 120 		100
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Motion Control Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for 1 120	MAINT LEDSTOP ACTIVE LED	
 Program; selection guide via the TIA Selection Tool Number of available Motion Control resources for 1 120 	MAINT LEDSTOP ACTIVE LEDConnection display LINK TX/RX	
Number of available Motion Control resources for 1 120	MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects	Yes
	MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects	Yes; Note: The number of technology objects affects the cycle time of the PLC
terminogy objects	MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool

- Deguined Meties Control recourses	
Required Motion Control resources	40
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
Positioning axis	
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	11
Number of positioning axes at motion control cycle	14
of 8 ms (typical value)	
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
PID_3Step	Yes; PID controller with integrated optimization for valves
PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
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
	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 display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
• 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
Installation altitude above sea level, max. configuration / header	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header configuration / programming / header	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes
configuration / header configuration / programming / header Programming language	
configuration / header configuration / programming / header Programming language — LAD	Yes
configuration / header configuration / programming / header Programming language — LAD — FBD	Yes Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	Yes Yes Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL	Yes Yes Yes Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	Yes Yes Yes Yes
configuration / header 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 Yes Yes
configuration / header 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 Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection	Yes Yes Yes Yes Yes Yes Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • protection of confidential configuration data	Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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: Complete protection programming / cycle time monitoring / header	Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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 / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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	Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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	Yes
configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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
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configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — 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