SIEMENS

Data sheet

6ES7511-1TL03-0AB0



SIMATIC S7-1500T, CPU 1511T-1 PN, central processing unit with work memory 450 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 certificates according to entry 109816881 at support.industry.siemens.com to be observed! ****

Figure similar

General information	
Product type designation	CPU 1511T-1 PN
HW functional status	FS01
Firmware version	V3.0
FW update possible	Yes
Product function	
● I&M data	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.73 A
Current consumption, max.	0.94 A
Inrush current, max.	1.15 A; Rated value
l²t	0.5 A ² ·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.	7.5 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

integrated (for data)	1.5 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	,\-
maintenance-free	Yes
CPU processing times	
	25 ns
for bit operations, typ. for word operations, typ.	32 ns
	42 ns
for fixed point arithmetic, typ.	170 ns
for floating point arithmetic, typ.	170 lis
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.	1.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	450 kbyte
FC	
Number range	0 65 535
• Size, max.	450 kbyte
OB	
• Size, max.	450 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 startup ODS Number of asynchronous error OBs	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	•
per priority class	24
	24
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
• Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	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),	1.5 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

Data blocks	
Retentivity adjustable	Yes
Retentivity adjustable 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	
• 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 Packup time	Hardware clock
Backup time Deviction par day, may	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max. Operating hours counter.	10 s; Typ.: 2 s
Operating hours counter • Number	16
Clock synchronization	10
• supported	Yes
• in AS, master	Yes
• 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
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
— Opualing limes	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
— for send cycle of 500 μs	minimum update time of 500 µs of the isochronous OB is decisive 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 4 ms	4 ms to 64 ms
 With IRT and parameterization of "odd" send 	Update time = set "odd" send clock (any multiple of 125 μs: 375 μs, 625
cycles	μs 3 875 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, 	4
max. — activation/deactivation of I-devices	Veet nor user program
	Yes; per user program
Asset management record	Yes; per user program
Interface types	
RJ 45 (Ethernet)	
• 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, max. Number of connections reserved for ES/HMI/web	10
	88
Number of C7 routing paths	
Number of S7 routing paths Deduction of S7 routing paths	16
Redundancy mode	V
H-Sync forwarding	Yes
Media redundancy	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Media redundancy	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client

Switchover fine on line break, typ Number of stations in the ring, max. FGUP communication FGY routing FGY communication as server FGY c	 MRP interconnection, supported 	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
Number of stations in the ring, max. PGOP communication Yes Yes Post record routing Yes	— MRPD	Yes; Requirement: IRT
Number of stations in the ring, max. PGOP communication Yes Yes Post record routing Yes	 Switchover time on line break, typ. 	200 ms; For MRP, bumpless for MRPD
PROOP communication STrouting Page Bala record routing Page STroommunication, as elever STroommunication Page Stroommunication Page Stroommunication, as elever STroommunication, as elever STroommunication Stroommunication Stroommunication Stroommunication Stroommunication, user data size) Page Stroommunication Stroommunication, user data size) Page Stroommunication, user data size) Page Stroommunication Stroommunication Page Stro		
Solution For communication, as server For communication, as server For communication, as server For communication, as server For communication For communic	SIMATIC communication	
Palar accord routing S communication, as server S 7 communication, as client Ses on the server Server of the server of th	PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
Solvent data per job, max. User data per job, max. See online help (S7 communication, user data size) Open it communication TCP/IP Data length, max. See online help (S7 communication, user data size) Open it communication See online help (S7 communication, user data size) Open it communication See online help (S7 communication, user data size) Open it communication See online help (S7 communication, user data size) Open it communication See online help (S7 communication, user data size) Open it communication See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication, user data size) Open it communication Yes See online help (S7 communication user data size) Yes See online help (S7 communication user data size) Yes See online help (S7 communication user data size) Yes See online help (S7 communication user data size) Yes See online help (S7 communication user data size) Yes See online help (S7 communication user data size) Yes Yes See online help (S7 compunication user data size) Yes Yes See online help (S7 compunication user data size) Yes See online help (S7 routing	Yes
See online help (\$7 communication, user data size) Open IE communication **CPCHP** Data length, max. - several passive connections per port, supported IsOs-on-TCP (RFC1006) - Data length, max. - UDP Data length, max. - UDP Data length, max. - UDP multicast **ONICP** **NIMP** **DOCP** **ONIS** **SNMP** **DOCP** **ITTP** **ITTP** **ITTP** **DOCP** **ITTP** **ITTP** **Pes: Standard and user pages **ITTP** **Pes: Standard and user pages **ITTP** **Pes: Standard and user pages **P	 Data record routing 	Yes
● User data per job, max. ○ PCPIP - Data length, max several passive connections per port, supported - (SCO-nT-ICP (RFC1006)) - Data length, max UDP multicast - UDP multicast - (UDP multicast circuits - (Ves max. 78 mu	 S7 communication, as server 	Yes
Open LE communication • TCPIP — Data length, max. — several passive connections per port, supported • ISC-on-TCP (RFC1008) — Data length, max. — UDP — Data length, max. — UDP multicast — Ves • SNMP • DCP • INDS • SNMP • DCP • INDP • Encryption Web server • HTTP • HTTP • HTTP • HTTP • HTTP • Yes; Standard and user pages Ye	 S7 communication, as client 	Yes
TCP/IP Data length, max. — several passive connections per port, supported SCO-n-TCP (RFC1008) — Data length, max. — UDP Data length, max. — UDP multicast OHCP — Data length, max. — UDP multicast OHCP — Data length, max. — UDP multicast OHCP — Yes SMMP — Yes SMMP — Yes SMMP — Yes - COPC — Yes - LLIDP — Percent of the connection of the client instructions for session management, per connection, max. — Number of simultaneous calls of the client instructions for session management, per connection, max. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client instructions for session management, per connection, from x. — Number of simultaneous calls of the client	 User data per job, max. 	See online help (S7 communication, user data size)
Data length, max several passive connections per port, supported ISC-on-TCP (RFC1006) Data length, max UDP Data length, max UDP multicast Ves SNMP Ves SNMP Ves SNMP Ves SNMP DCP Encryption Ves Encryption Ves Encryption Ves Encryption Ves	Open IE communication	
	• TCP/IP	Yes
supported ISO-On-TOP (RRC1006) Data length, max. UDP Data length, max. Defended and the length of the length	— Data length, max.	64 kbyte
ISO-on-TCP (RRC106) Data length, max. UDP Data length, max. UDP multicast Purp mult	 several passive connections per port, 	Yes
- Data length, max UDP - Data length, max UDP multicast - Ves; max. 78 multicast circuits - Ves - SMMP - Ves - SMMP - Ves - SMMP - DCP - ULDP - Ves - Encryption - Ves; Optional - Ves; Standard and user pages - Ves; Ves; Data Access (rejettered Read/Write), Method Call Ves; Data Access (Read, Write, Subscribe), Method Call Ves; Data Access	supported	
- UDP - Data length, max UDP multicast - Ves; max. 78 multicast circuits - Ves - DNS - SMMP - DCP - Ves - Encryption - Ves - Encryption - Ves - Encryption - Ves - ULDP - Ves - Encryption - Ves - ULDP - Ves - Ves; Optional - Ves; Standard and user pages - Ves; Data Access (registered Read/Write), Method Call - Ves; Data Access (registered Read/Write), Method Call - Ves - Ves, Data Access (registered Read/Write), Method Call - Ves - Number of elements for one call of - OPC_UA_Node/GetHandleList/OPC_UA_ReadList/C max Number of simultaneous calls of the client - Instructions for session management, per - Connection, max Number of simultaneous calls of the client - Instructions for data access, per connection, max Number of simultaneous calls of the client - Instructions for data access, per connection, max Number of simultaneous calls of the client - Instructions for data access, per connection, max Number of instructions for data access, per connection, max Number of instructions for data access, per connection, max Number of instructions for data access, per connection, max Number of instructions for data access, per connection, max Number of simultaneous ca	ISO-on-TCP (RFC1006)	Yes
- Data length, max UDP multicast - DPCP - DNS - SNMP - DCP - Encryption Web server - HTTP - HTTP - HTTP - HTTP - Required - OPC UA Client - Application authentication - Number of elements for one call of OPC, UA, NameSpaceSetIndeut ist, max Number of simultaneous calls of the client instructions for data access, per connection, max Number of simultaneous calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Calls, max Number of registerable method calls of OPC, UA, Method Calls, max Number of registerable method calls of OPC, UA, Method Calls, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of registerable method calls of OPC, UA, Method Call, max Number of secsible veriables, m	Data length, max.	64 kbyte
□ UPP multicast ○ DHCP ○ DNS ○ SNMP ○ SNMP ○ DCP ○ LLDP ○ LLDP ○ Encryption Web server ○ HTTP ○ PC UA ○ Runtime license required ○ OPC UA Client ○ Application authentication ○ Security policies ○ Number of elements for one call of OPC UA, Node Self-Handle List/OPC_UA, ReadList/O max. ○ Number of elements for one call of OPC_UA, Node Self-Handle List/OPC_UA, ReadList/O max. ○ Number of elements for one call of OPC_UA, Node Self-Handle List, max. ○ Number of simultaneous calls of the client instructions for session management, per connection, max. ○ Number of eligible read and calls of OPC_UA, Method-Call, max. ○ Number of eligible read and calls of OPC_UA, Method-Call, max. ○ Number of eligible read and calls of OPC_UA, Method-Call, max. ○ Number of eligible read and calls of OPC_UA, Method-Call, max. ○ Number of eligible read and calls of OPC_UA, Method-Call, max. ○ OPC UA Server ○ Application authentication ○ Security policies ○ Security policies ○ Application authentication ○ Security policies ○ Security policies ○ Application authentication ○ GDS support (certificate management) ○ Number of sessions, max. ○ OPC UA Server ○ Application authentication ○ GDS support (certificate management) ○ Number of sessions, max. ○ OPC UA Server ○ OPC UA S		
DHCP DNS NNMP NNMP DCP LLDP Encryption Web server HTTTP HTTP HTTP HTTP TYes: Standard and user pages HTTP PCUA Client Runtime license required OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of nodes of the client interfaces, recommended max. — Number of elements for one call of OPC_UA, NameSpaceGetIndexList, max. — Number of simultaneous calls of the client instructions for data access, per connection, max. — Number of simultaneous calls of the client instructions for data access, per connection, max. — Number of registerable motiod calls of OPC_UA, MethodGetHandleList, max. — Number of elements for one call of OPC_UA, MethodGetHandleList, max. — Number of simultaneous calls of the client instructions for data access, per connection, max. — Number of registerable method calls of OPC_UA, MethodGetJanduptus when calling OPC_UA, MethodGetJanduptus	— Data length, max.	
NS SNMP SNMP DCP Ves DCP LLDP Encryption Web server HTTP Yes; Standard and user pages HTTPS Yes; Standard and user pages Percent of the standard and user pages PHTTPS Yes; Standard and user pages PEC UA Runtime license required OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of connections, max. — Number of lements for one call of OPC_UA, Node-Get-HandleList/OPC_UA_ReadList/C max. — Number of elements for one call of OPC_UA, MemodeGetHandleList, max. — Number of elements for one call of OPC_UA, MemodeGetHandleList, max. — Number of simultaneous calls of the client instructions for seasion management, per connection, max. — Number of registerable method calls of OPC_UA, MethodCall, max. — Number of registerable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of pregisterable method calls of OPC_UA, MethodCall, max. — Number of sessions, max. — Security policies — User authentication — GDS support (certificate management) — Number of sessions, max. — Security policies on nea, max of the client instructions of the client instructi		
SNMP DCP LLDP Encryption Web server HTTP HTTP HTTP OPC UA Runtime license required OPC UA Client — Application authentication — Number of feejsterable method calls of OPC_UA_MethodCall, max. — Number of feejsterable method calls of OPC_UA_MethodCall, max. — Number of feejsterable mades, max. — Number of registerable nodes, max. — Number of elements for one call of OPC_UA_MethodCall+six max. — Number of registerable nodes, max. — Number of elements for one call of OPC_UA_MethodCall-six max. — Number of elements for one call of OPC_UA_MethodCall-six max. — Number of elements for one call of OPC_UA_MethodCall-six max. — Number of registerable nodes, max. — Number of simultaneous calls of the client instructions for session management, per connection, max. — Number of fegisterable method calls of OPC_UA_MethodCall, max. — Number of fegisterable method calls of OPC_UA_MethodCall, max. OPC UA Server — Application authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — User authentication — Security policies — Ves; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes; Data Access (Read, Write,	• DHCP	
DCP LLDP Encryption Yes Forcyption Yes; Optional Web server HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages PCUA Runtime license required OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of elements for one call of OPC_UA, NodeGetHandleList/OPC_UA_ReadList/Cmax. Number of elements for one call of OPC_UA, NodeGetHandleList/OPC_UA_ReadList/Cmax. Number of elements for one call of OPC_UA, MendeGetHandleList/OPC_UA_ReadList/Cmax. Number of elements for one call of OPC_UA, MendeGetHandleList, max. Number of elements for one call of OPC_UA, MendeGetHandleList, max. Number of elements for one call of OPC_UA, MendeGetHandleList/Opc_UA, MendeGetHandleList/Opc_U	• DNS	Yes
Encryption Yes: Standard and user pages Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call,	• SNMP	Yes
Encryption Web server HTTP HTTP HTTP HTTP HTTP HTTP HTTP HT		Yes
HTTP HTTPS HTTPS Yes; Standard and user pages POP UA Runtime license required OPC UA Client — Application authentication — Security policies — Security policies — User authentication — Number of connections, max. — Number of connections, max. — Number of of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. — Number of elements for one call of OPC_UA_NetfandleList, max. — Number of elements for one call of OPC_UA_NetfandleList, max. — Number of elements for one call of OPC_UA_NetfandleList, max. — Number of registerable nodes, finax. — Number of fimultaneous calls of the client instructions for session management, per connection, max. — Number of fregisterable nodes, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of inputs/outputs when calling OPC_UA_MethodCall, max. — Application authentication — Security policies — User authentication — Security policies — User authentication — GDS support (certificate management) — Number of sessions, max. — Auther of sessions max. — Auther of sessions max. — Application authentication — Security policies — User authentication — GDS support (certificate management) — Number of sessions, max.	• LLDP	Yes
● HTTP ● HTTPS ● HTTPS OPC UA ● Runtime license required ● OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max. — Number of lements for one call of OPC_UA_NededetHandleList/OPC_UA_ReadList/C 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 method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of inputs/outputs when calling OPC_UA_MethodCall, max. — Application authentication — Security policies — User authentication — GDS support (certificate management) — Number of sessions, max. — Number of sessions, max. — Number of sessions, max. — Sumber of sessions, max. — User authentication — Security policies — User authentication — Runtber of sessions, max. — Number of accessible variables, max. — Sumber of accessible variables, max. — Standard and user pages sum and user pages were required — Yes; Sata Access (registered Read/Write), Method Call — Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space — Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space — Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space — Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space — Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space — Ye	Encryption	Yes; Optional
HTTPS Pautitime license required OPC UA Client Application authentication Security policies Security policies Security policies Security policies Security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 Security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Basic256Sha256, Basic256Sha256, Basic256SRsa15, Basic256Sha256, Basic256Sha256, Basic256Sha256, Basic256SRsa15, Basic256Sha256, Basic256Sha256Rsa0aep, Aes256Sha256RsaPss anonymous" or by user name & password Yes: Data Access (registered Read/Write), Method Call Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes: Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom A		
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 Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. OPC UA Server Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Application authentication Security policies User authentication GDS support (certificate management) Number of sessions, max. Number of accessible variables, max. 5 000 100 <li< td=""><td>— Number of simultaneous calls of the client</td><td>5</td></li<>	— Number of simultaneous calls of the client	5
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 — Number of inputs/outputs when calling OPC_UA_MethodCall, max. ◆ OPC UA Server ✓ Application authentication — Security policies — User authentication — GDS support (certificate management) — Number of sessions, max. — Number of accessible variables, max. 20 Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss — "anonymous" or by user name & password Yes So 000 	 Number of registerable method calls of 	
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 Application authentication Security policies available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss User authentication GDS support (certificate management) Number of sessions, max. Number of accessible variables, max. 50 000 		
 — Security policies — available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss — User authentication — GDS support (certificate management) — Number of sessions, max. — Number of accessible variables, max. 50 000 	 Application authentication 	
 — GDS support (certificate management) — Number of sessions, max. — Number of accessible variables, max. 50 000 	• •	
 Number of sessions, max. Number of accessible variables, max. 50 000 	 User authentication 	·
 Number of sessions, max. Number of accessible variables, max. 50 000 	 GDS support (certificate management) 	
Number of accessible variables, max.50 000		32
— Number of registerable nodes, max. 10 000		50 000
	 Number of registerable nodes, max. 	10 000

 Number of subscriptions per session, max. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
 Number of server methods, max. 	20
 Number of inputs/outputs per server method, max. 	20
 Number of monitored items, recommended max. 	4 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
 Number of nodes for user-defined server interfaces, max. 	15 000
 Alarms and Conditions 	Yes
 Number of program alarms 	100
 Number of alarms for system diagnostics 	50
Further protocols	
• MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm"
	block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	2 500
Number of simultaneously active program alarms	
 Number of program alarms 	600
 Number of alarms for system diagnostics 	100
 Number of alarms for motion technology objects 	160
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	
Status/control variable	Yes
 Variables 	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
 Number of variables, max. 	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing	Yes
Forcing, variables	Peripheral inputs/outputs
 Number of variables, max. 	200
Diagnostic buffer	
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
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
WOUGH CONTO	the PLC program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for 	1 120
technology objects	
Required Motion Control resources	
per speed-controlled axis	40
per positioning axis	80
— per synchronous axis	160
• •	

nor external encoder	80
— per external encoder	20
— per output cam	160
— per cam track	
— per probe	40
 Number of available Extended Motion Control resources for technology objects 	90
 Required Extended Motion Control resources 	
per cam (1 000 points and 50 segments)	2
 per cam (10 000 points and 50 segments) 	20
 for each set of kinematics 	30
 Per leading axis proxy 	3
 Positioning axis 	
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	11
 Number of positioning axes at motion control cycle of 8 ms (typical value) 	14
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
• Vertical installation, max.	display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
	70 °C
• max.	70 C
Altitude during operation relating to sea level	
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
Altitude during operation relating to sea level	
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header	
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language LAD —FBD	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes
Altitude during operation relating to sea level ● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes
Altitude during operation relating to sea level ● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection ● User program protection/password protection	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Altitude during operation relating to sea level Installation altitude above sea level, max. 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	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection Access protection protection of confidential configuration data Password for display Protection level: Write protection Protection level: Write protection Protection level: Write protection Protection level: Write protection	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection Access protection protection of confidential configuration data Password for display Protection level: Write protection Protection level: Read/write protection Protection level: Write protection for Failsafe Protection level: Complete protection	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection oprotection of confidential configuration data password for display Protection level: Write protection Protection level: Write protection Protection level: Write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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: Write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection oprotection of confidential configuration data password for display Protection level: Write protection protection level: Write protection Protection level: Write protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. 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: Write protection Protection level: Write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection copy protection protection of confidential configuration data Password for display Protection level: Write protection Protection level: Write protection Protection level: Write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Block protection oprotection of confidential configuration data password for display Protection level: Write protection Protection level: Write protection Protection level: Write protection Protection level: Complete protection Programming / cycle time monitoring / header I lower limit upper limit Dimensions Width Height Depth Weights	Yes
Altitude during operation relating to sea level Installation altitude above sea level, max. Configuration / header 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: Write protection Protection level: Write protection Protection level: Write protection Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height Depth	Yes