6ES7513-1AM03-0AB0

Data sheet



SIMATIC S7-1500, CPU 1513-1 PN, central processing unit with work memory 600 KB for program and 2.5 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! ****

General information	
Product type designation	CPU 1513-1 PN
HW functional status	FS01
Firmware version	V3.0
Product function	
I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB $6x$ cycle of $500~\mu s$ (distributed) and $1~ms$ (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7513-1AL02-0AB0
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.	0.9 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 program)	600 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	2.5 Mbyte
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	or only to
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	110110
	4 000, Pleaks (OR ER EC DR) and URTs
Number of elements (total) DB	4 000; Blocks (OB, FB, FC, DB) and UDTs
Number range	1 60 999; subdivided into: number range that can be used by the
• Number range	user: 1 59 999, and number range of DBs created via SFC 86: 60 000
	60 999
Size, max.	2.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
 Number range 	0 65 535
• Size, max.	600 kbyte
FC	
Number range	0 65 535
• Size, max.	600 kbyte
OB	
• Size, max.	600 kbyte
 Number of free cycle OBs 	100
 Number of time alarm OBs 	20
 Number of delay alarm OBs 	20
 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	
— adjustable	Yes
S7 times	
• Number	2 048
Retentivity	V
— adjustable	Yes
IEC timer	Any (anh limited by the magic arrays)
Number Patantinita	Any (only limited by the main memory)
Retentivity	Voc
— 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,
Estandad natantis a data area (incl. 4)	counters, DBs, and technology data (axes): 216 KB
Extended retentive data area (incl. timers, counters, flags), max.	2.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
• Size, max.	16 kbyte
	,

Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	o, o disak memory sik, grouped into one clock memory syke
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	
• 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	32
Number of subprocess images, max. Hardware configuration.	02
Hardware configuration	20. A distributed I/O system is should be interested and an extract by the interest.
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	6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total
Rack	total
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	40
Number Clack synchronization	16
Clock synchronization	Yes
supportedin AS, master	Yes
• in AS, master • in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	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,	128
max.	129
— of which in line, max.	128 8: in total across all interfaces
 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	$250\;\mu\text{s}$ 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
— 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	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
	110
Number of connections may	128: via integrated interfaces of the CDL and connected CD. / CM
Number of connections, max. Number of connections reserved for ES/HMI/web.	128; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces.	10
Number of S7 routing paths	88
Number of S7 routing paths Pedundancy mode.	16
Redundancy mode	Von
H-Sync forwarding Madia radundanay	Yes
Media redundancy	only via 1at interfere (V4)
— 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) Yes See online help (S7 compunication) Yes See online help (S7 compunication) Yes Yes, Standard and user pages Yes, Small' license required Yes,	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 insultaneous 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 co	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: None, Basic128Rsa15, Basic256R		
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 Number of sessions, max. - Number of escions, max. - Number of escions, max. - Number of accessible variables, max.		
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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
• •	

— 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 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	100, 1 15 controller with integrated optimization for temperature
High-speed counter	Yes
	Tes
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
configuration / header	
configuration / programming / header	
Programming language	Vas
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
User program protection/password protectionCopy protection	Yes Yes
Copy protection	Yes
Copy protectionBlock protection	Yes
Copy protectionBlock protectionAccess protection	Yes Yes
 Copy protection Block protection Access protection protection of confidential configuration data 	Yes Yes
 Copy protection Block protection Access protection protection of confidential configuration data Password for display Protection level: Write protection 	Yes Yes Yes
Copy protection Block protection Access protection protection of confidential configuration data Password for display Protection level: Write protection Protection level: Read/write protection	Yes Yes Yes Yes Yes Yes
 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 for Failsafe 	Yes Yes Yes Yes Yes Yes Yes Yes
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 for Failsafe Protection level: Complete protection	Yes Yes Yes Yes Yes Yes Yes You Yes Yes Yes Yes Yes
 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 for Failsafe 	Yes
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: Write protection for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit	Yes Yes Yes Yes Yes Yes Yes Yes Yes Adjustable minimum cycle time
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: Write protection for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit	Yes
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions	Yes
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width	Yes
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height	Yes Yes Yes Yes Yes Yes Yes Yes No Yes adjustable minimum cycle time adjustable maximum cycle time 35 mm 147 mm
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height Depth	Yes
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height	Yes Yes Yes Yes Yes Yes Yes Yes No Yes adjustable minimum cycle time adjustable maximum cycle time 35 mm 147 mm
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 for Failsafe Protection level: Complete protection programming / cycle time monitoring / header lower limit upper limit Dimensions Width Height Depth	Yes Yes Yes Yes Yes Yes Yes Yes No Yes adjustable minimum cycle time adjustable maximum cycle time 35 mm 147 mm