6ES7512-1DK01-0AB0

Data sheet



SIMATIC DP, CPU 1512SP-1 PN for ET 200SP, Central processing unit with Work memory 200 KB for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 48 ns bit performance, SIMATIC Memory Card required, BusAdapter required for Port 1 and 2

General information	
Product type designation	CPU 1512SP-1 PN
HW functional status	FS05
Firmware version	V2.9
Product function	
I&M data	Yes; I&M0 to I&M3
 Module swapping during operation (hot swapping) 	Yes; Multi-hot swapping
Isochronous mode	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 μs
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
Configuration control	
via dataset	Yes
Control elements	
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
Input current	
Current consumption (rated value)	0.6 A
Current consumption, max.	0.9 A
Inrush current, max.	4.7 A; Rated value
l²t	0.14 A ² ·s
Power	
Infeed power to the backplane bus	8.75 W
Power loss	
Power loss, typ.	5.6 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	

maintenance-free	Yes
	160
CPU processing times	40 22
for bit operations, typ. for word operations, typ.	48 ns 58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
CPU-blocks	307 113
	4 000: Placks (OR ER EC DR) and URTs
Number of elements (total) DB	4 000; Blocks (OB, FB, FC, DB) and UDTs
Number range Size, max.	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 1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	200 kbyte
FC	0 05 505
Number range Size, may	0 65 535
• Size, max.	200 kbyte
• Size, max.	200 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 500 µs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
 Number of isochronous mode OBs 	1
 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	Any (anly limited by the main manager)
Number Petentivity	Any (only limited by the main memory)
Retentivity — adjustable	Yes
— adjustable S7 times	163
• Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	128 kbyte; Available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB
Flag	ovalitors, DDs, and technology data (axes). 00 ND
• 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	
• 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	O leby de
— Inputs (volume)— Outputs (volume)	8 kbyte 8 kbyte
Subprocess images	0 kbyte
Number of subprocess images, max.	32
Address space per module	
Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
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	1
Number of IO Controllers	
• integrated	1
• Via CM	0
Rack	
Modules per rack, max.	80; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules
Quantity of operable ET 200SP modules, max.	64
Quantity of operable ET 200AL modules, max.	16
Number of lines, max. PtP CM	1
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
• to DP, master	Yes; Via CM DP module
• to DP, slave	Yes; Via CM DP module
• in AS, master	Yes
in AS, slaveon Ethernet via NTP	Yes Yes
Interfaces	100
	1
Number of PROFINET interfaces Number of PROFIBUS interfaces	1: Via CM DP module
Optical interface	Yes; via BusAdapter
1. Interface	. 50, The Bub tarpets
Interface types RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
Number of ports	3; 1. integr. + 2. via BusAdapter
integrated switch	Yes
BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,
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; MRP Automanager according to IEC 62439-2 Edition 2.0
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
Undata tima for IDT	quantity of configured user data
Update time for IRT	250 us to 4 ms; Noto: In the case of IDT with inschrangua made, the
— for send cycle of 250 μs	250 μs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 μs of the isochronous OB is decisive
— for send cycle of 500 μs	500 μs to 8 ms; Note: In the case of IRT with isochronous mode, the 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
PG/OP communication Isochronous mode	No
— Isochronous mode — IRT	Yes
— PROFlenergy	Yes; per user program
— Profilerergy — 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
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
 Number of ports 	1
Protocols	
PROFIBUS DP master	Yes
 PROFIBUS DP slave 	Yes
SIMATIC communication	Yes
PROFIBUS DP master	
 Number of connections, max. 	48; Of which 4 each reserved for ES and HMI
 Number of DP slaves, max. 	125; In total, up to 512 distributed I/O devices can be connected via AS-
	i, PROFIBUS or PROFINET

Services	
— PG/OP communication	Yes
— Equidistance	No
— Isochronous mode	No
Activation/deactivation of DP slaves	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
 Autonegotiation 	Yes
 Autocrossing 	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
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 connections per CP/CM	32
Number of S7 routing paths	16
Redundancy mode	V
H-Sync forwarding Madia and an area	Yes
Media redundancy	Voc. only via Dua Adaptor
— Media redundancy	Yes; only via BusAdapter
— 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
 Number of stations in the ring, max. 	50
SIMATIC communication	
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	
• TCP/IP	Yes
Data length, max.	64 kbyte
— several passive connections per port,	Yes
supported	W
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
UDP Data langth, may	Yes 2 khyto: 1.472 hytos for LIDD broadcast
— Data length, max.— UDP multicast	2 kbyte; 1 472 bytes for UDP broadcast
	Yes; Max. 5 multicast circuits
DHCP DNS	Yes Yes
• SNMP	Yes
DCP	Yes
• LLDP	Yes
• Encryption	Yes; Optional
Web server	. 00, 0 patrici
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	,
Runtime license required	Yes; "Small" license required
Runtime license requiredOPC UA Client	Yes; "Small" license required Yes
OPC UA Client	·
	Yes
OPC UA Client— Application authentication	Yes Yes

- Number of concessories, max Number of nodes of the client interfaces, recommended max Number of elements for one call of OPC_UA_NodesCelridendeList, max Number of elements for one call of OPC_UA_NameSpaceCellindexList, max Number of elements for one call of OPC_UA_NameSpaceCellindexList, max Number of elements for one call of OPC_UA_NethodCelridendeList, max Number of simultaneous calls of the client instructions for season management, per over the client instructions for season management, per over the client instructions for season management, per over the client instructions for season max 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 method calls of OPC_UA_NethodCell, max Number of registerable modes, max Number of postport (certificate management) - GNS support (certificate management) - Number of seasons, max Number of subsporting per season max Number of subsporting per subsporting per season max Number of subsporting per subsporting per subsporting per subsportin		
recommended max. — Number of elements for one call of OPC_UA, Node-Gethandel.ist/OPC_UA ReadU.ist/C max. — Number of elements for one call of OPC_UA, Node-Gethandel.ist/OPC_UA, ReadU.ist/C max. — Number of elements for one call of OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.ist/OPC_UA, Node-Gethandel.int/OPC_UA, Node-Gethandel.int/OPC	Number of connections, max.	4
OPC_UA, NondespaceSetIndexList, max. — Number of elements for one call of OPC_UA, NamespaceSetIndexList, max. — Number of elements for one call of OPC_UA, MembogGetIndexList, max. — Number of elements for one call of OPC_UA, MembogGetIndexList, max. — Number of simultaneous calls of the client instructions for season management, per complete instructions for season management, per complete instructions for data access, per connection max. — Number of registerable method calls of OPC_UA, MembogGetIndex max. — Number of registerable method calls of OPC_UA, MembogGetIndex methods, max. — Application authentication — Security policies — User authentication — GDS support (certificate management) — Number of acessitions, max. — Number of registerable nodes, max. — Number of registerable nodes, max. — Number of sessions, max. — Number of sessions, max. — Number of sessions, max. — Number of server interfaces, max. — Number of program alarms — Number of program alarms — Number of program alarms — Number of acessions for message functions, max. — Number of of mentored items, recommended max. — Number of program alarms — Number of program alarms — Number of of mentored items, recommended max. — Number of program alarms — Number of program alarms — Number of program messages functions, max. — Program alarms — Number of program messages in RUN, max. 1 est commission from the sage functions, max. — Program alarms — Number of beakpoints 2 ves; MODBUS TCP 2 ves; MODBUS TCP 3 message functions 3 continued for program messages in RUN, max. 3 conditions and conditions and conditions, max. — Program alarms — Number of registerables, max. — Owhich status variables, max. — Owhich control variables, max. — O	· · · · · · · · · · · · · · · · · · ·	1 000
OPC_UA, Names pacacelethoduciat, max. - Number of elements for one call of OPC_UA, MethodicethandieList, max. - Number of simultaneous calls of the client instructions for session management, per connection, max. - Number of registerable nodes, max. - Number of registerable method calls of OPC_UA, Methodicall, max. - Number of registerable method calls of OPC_UA, Methodicall, max. - Number of registerable method calls of OPC_UA, Methodicall, max. - Number of registerable nodes, max. - Application authentication - Security policies - Application authentication - Security policies - Application authentication - Security policies - User authentication - So support (certificate management) - Number of sessions, max. - Number of accessible variables, max. - Number of subsciptions per session, max. - Number of subsciptions per session, max. - Number of unputsciptions per session, max. - Number of monitored items, recommended max. - Number of monitored items, recommended max. - Number of productions per session, max. - Numbe	OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C	300
OPC_UA_MethodGelHandtelst, max. — Number of simultaneous calls of the client instructions for session management, per connection, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — 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. — Security policies — Security policies — Application authentication — Security policies — Security policies — User authentication — GSS support (certificate management) — Number of sessions, max. — Number of sessions per session, max. — Publishing interval, min. — Publishing interval, min. — Publishing interval, min. — Number of program learns — Number of program slarms — Number of program messages in RUN, max. Fuch a security policies: None, Basic128Ras15, Basic256Ras15, Basic256Ras16, Basic256R		20
instructions for session management, per connection, max. — Number of simultaneous calls of the client instructions for data access, per connection, max. — Number of registerable modes, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of projects be method calls of OPC_UA_MethodCall, max. — OPC_UA_MethodCall, max. — OPC_UA_MethodCall, max. — OPC_UA_MethodCall, max. — Application authentication — Security policies — Application authentication — Security policies — User authentication — GSS support (certificate management) — Number of sessions, max. — Number of server methods, max. — Number of server methods, max. — Number of server interfaces, max. — Number of proptian alarms — Number of program alarms — Number of program alarms — Number of largest max. — Number of program alarms — Number of program messages in RUN, max. — Number of loadable program messages, max. Number of loadable program messages, max. Number of loadable program messages in RUN, max. — Status block Single step Number of reskpoints 8 Situs/Control variables, max. — of which scitals variables, max. — of which scitals, war. — of which scitals, max. — of which scitals, ma		100
instructions for data access, per connection, max. — Number of registerable nodes. max. — Number of registerable nodes. max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of pubt/soutputs when calling OPC_UA_MethodCall, max. • OPC UA Server — Application authentication — Security policies — Security policies — Available security policies: None, Basic128Rsa15, Basic256Rsa15,	instructions for session management, per	1
- Number of registerable method calls of OPC_UA_MethodCall, max Number of injuds/outputs when calling OPC_UA_MethodCall, max OPC UA_Server - Application authentication	instructions for data access, per connection, max.	
- Number of injust/soutputs 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 sessions without a session, max Number of sessions be variables, max Number of sessions without a session, max Number of sessions methods, max Number of server interfaces, max Number of injust/soutputs per server method, max Number of prodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max. - Number of ordes for user-defined server interfaces, max Number of loads for user-defined server interfaces, max Number of ordes for user-defined server interfaces interfaces, max Number of ordes for user-defined server interfaces and the program alarms - Number of ordes for user-defined server interfaces and the program alarms - Number of ordes for user-defined server interfaces and the program alarms - Number of ordinations - Number of ordinations for message functions, max Program alarms - Number of loadsible program messages, max South Program messages are generated by the "Program_Alarm" block, ProGlag or GRAPH - User, Up to 8 simultaneously (in total across all ES clients) - No Number of the program in the progr	 Number of registerable method calls of 	
OPC UA Server Application authentication Security policies Available security policies: None, Basic 128Rsa15, Basic 256Rsa15, Basic 256Sha256 User authentication GDS support (certificate management) Number of sessions, max Number of sessible variables, max Number of subscriptions per session, max. Number of inputs/outputs per server method, max. Number of inputs/outputs per server method, max. Number of nodes for user-defined server interfaces, max. Number of nodes for user-defined server interfaces, max. Number of loads for user-defined server interfaces, max. Number of loads for user-defined server interfaces, max. Number of loads for user-defined server interfaces, max. Number of loadsble program alarms Number of login stations for message functions, max. Program alarms Number of login stations for message functions, max. Program alarms Number of loadsble program messages, max. Number of loadsble program messages in RUN, max. 1est commission (Team Engineering) 3	 Number of inputs/outputs when calling 	20
Security policies - Security policies - User authentication - GDS support (certificate management) - Number of sessions, max. - Number of accessible variables, max. - Number of accessible variables, max. - Number of sessible variables, max. - Number of sessible variables, max. - Number of subscriptions per session, max. - Sampling interval, min. - Publishing interval, min. - Number of server methods, max. - Number of inputs/outputs per server method, max. - Number of inputs/outputs per server method, max. - Number of inputs/outputs per server method, max. - Number of onoitored items, recommended max. - Number of server interfaces, max. - Number of roses for user-defined server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Number of laims for system diagnostics - Number of laims for system diagnostics - Number of login stations for message functions, max. - Number of login stations for message functions, max. Program alarms Number of configurable program messages in RUN, max. - Yes; MODBUS TCP - S7 message functions Number of loadable program messages in RUN, max. - Yes; Porliag or GRAPH 2 500; Program messages are generated by the "Program_Alarm" block. Probling or GRAPH 2 500; Program messages are special control or to 5 engineering systems (res; Up to 8 simultaneously (in total across all ES clients) No Number of breakpoints - Status/control variable (Pas) - Variables - Number of variables, max. - of which satus variables, max. - of which control variables, max.		
- User authentication - GDS support (certificate management) - Number of sessions, max Number of sessions, max Number of sessible variables, max Number of registerable nodes, max Number of subscriptions per session, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of orgoram alarms - Number of olarms for system diagnostics - MODBUS - Ves: MODBUS TCP	 Application authentication 	Yes
- GDS support (certificate management) - Number of sessions, max Number of sessions, max Number of registerable nodes, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of ordes for user-defined server interfaces, max Number of program alarms - Number of program messages in sun, max Number of poligin stations for message functions, max Number of onlogin stations for message functions, max Number of configurable program messages, max Number of loopin stations for messages in RUN, max Tost commissioning functions - Status/control variable of the status variables, max of which status variables, max of which control variables, max Forcing - Ves - Sampling interval and 1 s send interval - 1000 - Sampling interval and 1 s send interval - 1000	— Security policies	Basic256Sha256
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- Number of accessible variables, max Number of registerable nodes, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of salarms for system diagnostics - Number of login stations for message functions, max Number of login stations for message functions, max Number of configurable program messages, max Number of configurable program messages in RUN, max Status/control variables - Ves; Up to 8 simultaneously (in total across all ES clients) - Number of variables, max of which status variables, max of which control variables, max of which status variables, max of which control variables, max of which control variables, max of which control variables, max Of which status variables, max Of which control variables, max Of which status variables, max.	 — GDS support (certificate management) 	Yes
- Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of server methods, max Number of monitored items, recommended max Number of monitored items, recommended max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max for the type "Reference namespace" - Number of program alarms - Number of program alarms - Number of alarms for system diagnostics - Number of alarms for system diagnostics - MODBUS - MODBUS - MODBUS - Wes; MODBUS TCP - Ves; MODBUS		32
- Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of ondes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of program alarms - Number of ladarms for system diagnostics - MODBUS - Number of login stations for message functions, max Yes; MODBUS TCP - Yes; MODBUS TCP		50 000
- Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of login stations for message functions, max. Program alarms Number of login stations for messages, max. Some of including functions Joint commission (Team Engineering) Status block Status block Status step Number of breakpoints Status/control - Status/control variable - Variables - Number of variables, max of which control variables, max Forcing - Forcing - Forcing - Forcing - Forcing - Forcing - Sampling interval and 1 s send interval - 1000 - 1000; program alarms and 1000; for 1 s sampling interval and 1 s send interval - 1000; max - 200; program interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s sampling interval and 1 s send interval - 1000; for 1 s	•	10 000
- Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of ondes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of ladarms for system diagnostics - MODBUS - Wes; MODBUS TCP - Model of the type "Reference namespace" - Number of login stations for message functions, max Yes; MODBUS TCP - Wessage functions - Number of login stations for message functions, max Yes - Number of login stations for messages, max Number of loadable program messages, max Sound program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH - Number of loadable program messages in RUN, max 2 500 - Yes; Parallel online access possible for up to 5 engineering systems - Yes; Up to 8 simultaneously (in total across all ES clients) - Number of breakpoints - Status/control - Status/control variable - Number of variables, max of which status variables, max of which control variables, max.		20
- Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of program alarms - Number of alarms for system diagnostics - MODBUS - MODBUS - Yes; MODBUS TCP - Yes - Number of login stations for message functions, max Program alarms - Number of configurable program messages, max Sound alarms - Number of login stations for messages in RUN, max 2 5000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH - Number of loadable program messages in RUN, max 2 500 - Yes; Parallel online access possible for up to 5 engineering systems - Yes; Up to 8 simultaneously (in total across all ES clients) - No - Number of breakpoints - Status/control variable - Variables - Number of variables, max of which status variables, max of which control variables, max Forcing - Forcing - Forcing - Forcing	· -	100 ms
Number of inputs/outputs per server method, max. Number of monitored items, recommended max. Number of server interfaces, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Number of program alarms Number of program alarms Number of program alarms Number of rolarms for system diagnostics Number of login stations for message functions, max. Program alarms Number of login stations for messages, max. Number of loadable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of variables Number of variables Status/control Status/control variables Number of variables, max. of which status variables, max. of which control variables, max.	<u> </u>	500 ms
max. — Number of monitored items, recommended max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. — Number of nodes for user-defined server interfaces, max. — Number of nodes for user-defined server interfaces, max. — Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics — Number of login stations for message functions, max. Program alarms Number of login stations for message functions, max. Program alarms Number of loadable program messages, max. Sourcest commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control • Status/control • Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which status variables, max. — of which control variables, max. —	 Number of server methods, max. 	20
- Number of monitored items, recommended max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of program alarms - Number of alarms for system diagnostics - MODBUS - MODBUS - Modbus - Mumber of login stations for message functions, max. Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control - Status/control variable - Variables - Number of variables, max of which control variables, max of which control variables, max of which control variables, max Forcing - Forcing - Forcing - Ves - Number of program was and interval and 1 s send interval max 1000 of the type "Reference namespace" - 1000 of the type "Reference namespace" - 1000 - 1		20
- Number of server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics Further protocols - MODBUS - MODBUS - Modbus -	 Number of monitored items, recommended 	1 000; for 1 s sampling interval and 1 s send interval
— Number of nodes for user-defined server interfaces, max. ● Alarms and Conditions — Number of program alarms — Number of program alarms — Number of alarms for system diagnostics ■ MODBUS Teuther protocols ■ MODBUS Yes; MODBUS TCP S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages, max. Number of loadable program messages in RUN, max. 1 south of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step No Number of breakpoints Status/control ■ Status/control ■ Status/control ■ Status/control variables, max. — of which status variables, max. — of which control variables, max. Porcing ■ Forcing 1 000 Yes MODBUS TCP Yes; MODBUS TCP Yes 1 000 3 2 Yes; MODBUS TCP Yes 1 000 Yes Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 2 000; Proplag or GRAPH 2 2 000; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No No No No Status/control variables, max. — of which control variables, max. 2 00; per job Forcing Forcing Yes		
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— Number of alarms for system diagnostics Further protocols ● MODBUS Yes; MODBUS TCP Tessage functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages, max. Foroing Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control ● Status/control ● Status/control ● Wariables ● Number of variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. — of which control variables, max. Forcing ● Forcing ▼es; MODBUS TCP Yes; MODBUS TCP Yes Yes Yes Yes Yes Yes Yes Toolog Yes Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No No No Status/control variable Pyes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters ● Number of variables, max. — of which control variables, max. — of which control variables, max. — of which control variables, max. Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Yes Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No No Status/control ● Status/control ● Status/control ● Status/control variable ● Number of variables, max. — of which control variables, max.	Alarms and Conditions	Yes
- Number of alarms for system diagnostics Further protocols ● MODBUS Yes; MODBUS TCP 77 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. 15 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. 15 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. 15 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 25 000 Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No Number of breakpoints 8 Status/control • Status/control variable • Variables • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. 200; per job Forcing • Forcing Yes	 Number of program alarms 	100
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Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control Status/control Status/control Status/control Status variables Number of variables, max. Of which status variables, max. Of which control variables, max. Forcing Forcing Forcing Yes 32 Yes 32 Yes Yes Forcing Yes Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Yes Stouck, ProDiag or GRAPH Yes Forcing Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No No No No Status/control variable Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Forcing Yes	Further protocols	
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. 1	MODBUS	Yes; MODBUS TCP
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. 1	S7 message functions	
Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variables Number of variables, max. Of which status variables, max. Of which control variables, max. Forcing Forcing Forcing Yes Status/control Yes Status/control Yes Status/control Yes Status/control Yes Status/control Yes Status/control Yes Status/control variables, max. Of which control variables, max. Yes Status/control Yes Status/control Yes Status/control variables, max. Of which control variables, max. Yes Status/control Yes	Number of login stations for message functions, max.	32
Number of configurable program messages, max. Number of loadable program messages in RUN, max. Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variables Number of variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. Forcing Forcing Status/control 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 2 500 Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No No Status/control Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job	5	
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Status block Single step No Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. Porcing Forcing Yes; Up to 8 simultaneously (in total across all ES clients) No Number of variables of less in puts/outputs, memory bits, DBs, distributed l/Os, timers, counters 200; per job Yes	Test commissioning functions	
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 — of which status variables, max. — of which control variables, max. Forcing Forcing Yes 	 Variables 	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
— of which control variables, max. 200; per job Forcing Forcing Yes	 Number of variables, max. 	
Forcing ◆ Forcing Yes	of which status variables, max.	200; per job
• Forcing Yes	— of which control variables, max.	200; per job
	Forcing	
• Forcing, variables Peripheral inputs/outputs	Forcing	Yes
	Forcing, variables	Peripheral inputs/outputs

 Number of variables, max. 	200
Diagnostic buffer	200
• 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
Monitoring of the supply voltage (PWR-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
 Number of available Motion Control resources for 	the PLC program; selection guide via the TIA Selection Tool 800
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) 	5
Number of positioning axes at motion control	10
cycle 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	Voc
High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	05 00 N
horizontal installation, min.	-25 °C; No condensation
horizontal installation, max.vertical installation, min.	60 °C -25 °C; No condensation
vertical installation, min. vertical installation, max.	50 °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	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection/password protection	Yes
Copy protection Please protection	Yes
Block protection	Yes
Access protection	Von
protection of confidential configuration dataProtection level: Write protection	Yes Yes
 Protection level: write protection Protection level: Read/write protection 	Yes
Protection level: Read/write protection Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
p. s gramming / cycle time monitoring / nedder	

lower limitupper limit	adjustable minimum cycle time adjustable maximum cycle time
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g
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