Data sheet

6ES7516-3UN00-0AB0



SIMATIC S7-1500TF, CPU 1516TF-3 PN/DP, central processing unit with work memory 3 MB for program and 7.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1516TF-3 PN/DP
HW functional status	FS11
Firmware version	V3.1
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 375 μs (distributed) and 1 ms (central)
SysLog	Yes
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V15 (FW V2.5) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
Mains/voltage failure stored energy time	5 ms
Input current	
Current consumption (rated value)	1.2 A
Current consumption, max.	1.5 A
Inrush current, max.	1.9 A; Rated value
l²t	0.4 A²·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	30 W
Power loss	
Power loss, typ.	24 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

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		512 khyte: In total: available retentive memory for hit memories, timers
•••	. Storiuro data area (moi. timero, countero, nago), max.	
Extended retentive data area (incl. timers, counters, flags), max. 7.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF	Extended retentive data area (incl. timers, counters, flags), max.	7.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	Flag	

2.	4011
• 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	8 192; 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	64; 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	
integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
N 1 (100 1 II	inserted in total
Number of IO Controllers	
• integrated	2
Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
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	10 G, 1 yp.: 2 G
Number	16
Clock synchronization	
• supported	Yes
to DP, master	Yes
	Yes
• to DP, slave	
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	•
Number of PROFINET interfaces	2
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
 Number of ports 	
	2
integrated switch	Yes
• integrated switch Protocols	

Yes PROFINET IO Device • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted Web server Yes Media redundancy Yes **PROFINET IO Controller** Services - Isochronous mode Yes - Direct data exchange Yes; Requirement: IRT and isochronous mode (MRPD optional) - IRT PROFlenergy Yes; per user program - Prioritized startup Yes; Max. 32 PROFINET devices - Number of connectable IO Devices, max. 256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET - Of which IO devices with IRT, max. 64 256 - Number of connectable IO Devices for RT, max. - of which in line, max. - Number of IO Devices that can be simultaneously 8; in total across all interfaces activated/deactivated, max. - 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 - PROFINET Security Class 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 375 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 2 ms to 32 ms - for send cycle of 2 ms - for send cycle of 4 ms 4 ms to 64 ms - With IRT and parameterization of "odd" send cycles Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s ... 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 - Isochronous mode Nο - IRT Yes - PROFlenergy Yes; per user program - Shared device Yes - Number of IO Controllers with shared device, max. 4 - activation/deactivation of I-devices Yes; per user program - Asset management record Yes; per user program - PROFINET Security Class SNMP Configuration and DCP Read Only 2. Interface Interface types • RJ 45 (Ethernet) Yes; X2 Number of ports 1 • integrated switch No Protocols Yes; IPv4 IP protocol • PROFINET IO Controller Yes PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted Web server Yes Media redundancy No

PROFINET IO Controller	
Services	
— Isochronous mode	No
Direct data exchange	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
·	
Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
 Number of connectable IO Devices for RT, max. 	32
— of which in line, max.	32
 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
— PROFINET Security Class	1
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
·	
— Shared device	Yes
Number of IO Controllers with shared device, max.	4
 activation/deactivation of I-devices 	Yes; per user program
 Asset management record 	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
RS 485Number of ports	Yes; X3
Number of ports	
Number of ports Protocols	1
Number of portsProtocolsPROFIBUS DP master	1 Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave	1 Yes No
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication	1 Yes No
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master	1 Yes No Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet)	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autonegotiation	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autonegotiation Autocrossing	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections, max. Number of connections, max. Number of connections reserved for ES/HMI/web	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max. Services Equidistance Isochronous mode Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) Autocrossing Industrial Ethernet status LED RS 485 Transmission rate, max. Protocols PROFIsafe Number of connections Number of connections, max.	Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
— Media redundancy	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	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
· ·	Yes
Data record routing S7 communication, as conver.	Yes
S7 communication, as server	
S7 communication, as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	v
• TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
• web API	
Number of sessions, max.	200
 number of simultaneous HTTP calls, max. 	4
— HTTP request body, max.	131 072 byte
OPC UA	
Runtime license required	Yes; "Medium" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
 Number of connections, max. 	10
 Number of nodes of the client interfaces, recommended max. 	2 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 	300
max.	
	20
max. — Number of elements for one call of	20 100
max. — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. — Number of elements for one call of	
max. — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. — Number of elements for one call of OPC_UA_MethodGetHandleList, max. — Number of simultaneous calls of the client instructions for session management, per connection,	100
max. — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. — Number of elements for one call of OPC_UA_MethodGetHandleList, max. — Number of simultaneous calls of the client instructions for session management, per connection, max. — Number of simultaneous calls of the client	100

CIPC US Server	 Number of inputs/outputs when calling OPC UA MethodCall, max. 	20
- Application authentication - Security policies - Security policies - User authentication - CIDS support (confident management) - Number of sessions, max Number of sessions, max Number of sessions, max Number of sessions, max Number of subscriptions per session, max Publishing interval, min Number of sever methods, max Number of sever methods, max Number of sever methods, max Number of sever interfaces, max Of which status variables, max Of which proper interfaces, max Of which status variables, max Of which proper interfaces, max Of which proper interfaces, max Of which proper interfaces,		
- Security policies - User autherfication - User autherfication - GDS support (certificate management) - Number of sessions, max. - Soo - Number of se	— Application authentication	
- CDS support (certificate management) - Number of sessions, max Number of sessions, max Number of occessible variables, max Number of of subscriptions presession, max Number of subscriptions presession, max Sampling interval, min Publishing interval, min Number of service methods, max Number of monitoried berns, recommended max Number of monitoried berns, recommended max Number of monitoried berns, recommended max Number of service interfaces, max Number of service interfaces, max Number of program alarms - Number of layer alarms of vystem diagnostics - WOOBUS - WOOBUS - West MOOBUS - West	• •	available security policies: None, Basic128Rsa15, Basic256Rsa15,
Number of escessible variables, max Number of registerable nodes, max Number of registerable nodes, max Number of registerable nodes, max Sampling interval, min Sumpting interval, min Publishing interval, min Number of server methods, max Number of server methods, max Number of server interfaces, max Number of nortices titles, recommended max Number of nortices titles, recommended max Number of nortices titles, recommended max Number of oserver interfaces, max Number of program alarms Number of program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for system diagnostics Number of subscriptions, max Number of variables, max Number of variables, max Number of variables, max.	 User authentication 	"anonymous" or by user name & password
- Number of accessible variables, max. - Number of subscriptions per session, max. - Sampling interval, min. - Publishing interval, min. - Number of surver methods, max. - Number of number of surver methods, max. - Number of number of surver interfaces, max. - Number of number of surver interfaces, max. - Number of surver interfaces, max. - Number of onestored items, recommended max. - Number of nondiscopital per server method, max. - Number of surver interfaces, max. - Number of onestored items, meanmended max. - Number of onestored files, max. - Number of onestored items, meanmended max. - Number of onestored files server interfaces, max. - Number of onestored files server interfaces, max. - Number of simms for system diagnostics - Number of significations - Number of long stations for message functions, max. - Program diarms - Number of flagsdatributes for subscriptions, max. - Program diarms - Number of orindipurable program messages, max. - Program diarms - Number of alarms for system diagnostics - Number of longer malarms - Number of alarms for system diagnostics - Number of longer pipers in the pipers of the pi	 — GDS support (certificate management) 	Yes
Number of authority of subscriptions per session, 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 server methods, max Number of server interfaces, max Number of server interfaces, max Number of onders for user-defined server interfaces, max Number of nonders files, recommended max Number of nonders files, recommended max Number of nonders files, recommended max Number of nonders for user-defined server interfaces, max Number of nonders for user-defined server interfaces, max Number of program alarms Number of program alarms Number of program alarms Number of subscriptions, max Number of subscriptions, max Number of subscriptions, max Number of onders of user-defined server interfaces, max Number of subscriptions, max Symmetric for subscriptions, max Symmetric for subscriptions, max Symmetric for subscriptions, max Symmetric for subscriptions, max Number of fordinative program messages, max Number of fordinative program messages in RUN, max Number of fordinative program messages in RUN, max Number of fordinative program alarms Number of fordinative program alarms Number of loadable program messages in RUN, max Number of alarms for system diagnostics Number of alarms for system diagnostics Number of real program alarms Number of loadable program alarms Number of variables, max of which powerfall proof Number of configu	— Number of sessions, max.	48
- Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of imputsologists per server methods, max Number of imputsologists per server method, max Number of server interfaces, max Number of server interfaces, max Number of nondiscred items, recommended max Number of server interfaces, max Number of ondes for user-defined server interfaces, max Number of ondes for user-defined server interfaces, max Number of alarms for system diagnostics - Number of forgram alarms - Number of alarms for system diagnostics - Number of server interfaces of user-defined server interfaces, max Number of latins for system diagnostics - Number of subscriptions, max Number of of subscriptions, max Number of oligin stations for message functions, max Number of oligin stations for message functions, max Number of oligin stations for messages, max Number of oligin stations for messages, max 10000; Program messages are generated by the "Program_Alarm" block, Problag or GRAPH - Number of configurable program messages, max 10000; Program messages are generated by the "Program_Alarm" block, Problag or GRAPH - Number of oliginal stations of motion technology objects - Number of alarms for system diagnostics - Number of alarms for system diagnostics - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of variables, max of which status variables, max of which status variables, max of which ontrol variables, max of which ontrol variables, max of which proversial-proof - Forcing -	 Number of accessible variables, max. 	100 000
- Sampling interval, min Publishing interval, min Number of insputsoutputs per server method, max Number of insputsoutputs per server method, max Number of monitored litems, recommended max Number of monitored litems, recommended max Number of server interfaces, max Number of server interfaces, max Number of ordes for user-defined server interfaces, max Number of ordes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of program alarms - Number of subscriptions, max Number of subscriptions, max Number of subscriptions, max Number of ordigurable program messages in RUN, max Number of ordigurable program messages in RUN, max Number of loadable program messages in RUN, max Number of loadable program alarms - Number of variables, max Of which status variables, max Of which status variables, max Of which powerfall-p	 Number of registerable nodes, max. 	20 000
- Sampling interval, min Publishing interval, min Number of server methods, max Number of server methods, max Number of insubsculpts per server method, max Number of monitored litems, recommended max Number of server interfaces, max Number of orders of server interfaces, max Number of server interfaces, max Number of program alarms - Number of program alarms - Number of program interval diagnostics - More of subscriptions, max Number of local server interfaces in RUN, max Number of subscriptions, max Number of subscriptions, max Number of subscriptions, max Number of local server interfaces in RUN, max Number of local server interfaces, max Of which status variables, max Of which status variables, max Of which status variables, max Of which control variables, max Of which control variables, max Of which powerfall-groof - Forcing - Forc	-	50
- 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 server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of program alarms - Number of program alarms - Number of program alarms - Number of alarms for system diagnostics - Number of program alarms - Number of program alarms - Number of subscriptions, max Number of subscriptions, max Number of outputs be program message functions, max Number of configurable program messages in RUN, max Number of onfigurable program alarms - Number of oringurable program messages in RUN, max Number of simultaneously active program alarms - Number of alarms for system diagnostics - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of alarms for motion technology objects - Number of variables, max Of which status variables, max Of which status variables, max Of which control variables, max Of which powerfail proof - Forcing - Forcing - Forcing - Forcing - Forcing - Forcing - Yes, without fail-safe - proper all must of which powerfail proof - Number of oringurable Traces	·	
		100 ms
Number of inputs/outputs per server method, max Number of monitored tienns, recommended max Number of anomitored tienns, recommended max Number of nodes for user-defined server interfaces, max Number of program atoms Number of program atoms Number of program atoms Number of largory and largory	-	
- Number of monitored items, recommended max Number of anotes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of subscriptions, max Number of subscriptions, max Number of subscriptions, max Number of subscriptions, max Number of program messages in RUN, max Number of program alarms - Number of subscriptions technology objects - Number of alarms for notion technology objects - Number of alarms for notion technology objects - Number of of program alarms - Number of program alarms - Number of program alarms - Number of orderalarms - N		
- Number of server interfaces, max,		
Wighe "Reference namespace" and the server interfaces, and the server interfaces and the	•	· ·
Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics Further protocols • MODBUS Symassage functions Number of only instations for message functions, max. 1000 Number of only instations for message functions, max. 1000 Number of only instations for message functions, max. 10000 Program messages are generated by the "Program_Alarm" block, Profolag or GRAPH Number of configurable program messages, max. 10000 Number of instations for messages in RUN, max. Number of instations for motion alarms • Number of program alarms • Number of alarms for system diagnostics • Number of alarms for system diagnostics • Number of alarms for motion technology objects 1000 Number of alarms for motion technology objects 1000 No status block 1000 Yes; Parallel online access possible for up to 8 engineering systems Status block 1000 No Status block 1000 Status scontrol • Status/control variable • Variables • Variables • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. — of which powerfail-proof • Number of configurable Traces	— Number of Server interfaces, max.	
Alarms and Conditions Number of program alarms Number of program alarms Number of login stations for message functions, max. Number of subscriptions, max. Number of or subscriptions, max. Number of or subscriptions, max. Number of login stations for message functions, max. Number of or subscriptions, max. Number of or subscriptions, max. Number of configurable program messages, max. Program alarms Number of configurable program messages, max. Number of loadable program messages, max. Number of simultaneously active program alarms Number of pr	 Number of nodes for user-defined server interfaces, 	30 000
- Number of alarms for system diagnostics - Number of alarms for system diagnostics - MODBUS ST message functions Number of login stations for message functions, max. number of subscriptions, max. 1 500 number of subscriptions, max. 1 500 number of subscriptions, max. Number of onfigurable program messages, max. Number of onfigurable program messages, max. Number of login stations for messages in RUN, max. 1 0 000; Program messages are generated by the "Program_Alarm" block, Problag or GRAPH Number of loadable program messages in RUN, max. 1 0 000; Program messages are generated by the "Program_Alarm" block, Problag or GRAPH Number of simultaneously active program alarms • Number of simultaneously active program alarms • Number of alarms for system diagnostics • Number of breakpoints No Status block Single step No No Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which status variables, max. — of which control variables, max. — of which control variables, max. — of which other of variables, max. Prorting • Fororing, variables • Number of variables, max. — of which status variables, max. — of which powerfail—proof • Pressent • Number of configurable Traces 4	max.	
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— of which powerfail-proof 500 Traces ● Number of configurable Traces 4	•	
Traces • Number of configurable Traces 4		
Number of configurable Traces 4	— of which powerfail-proof	500
• Memory size per trace, max. 512 kbyte	-	
	Memory size per trace, max.	512 kbyte

nterrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC
	program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	6 400
 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
 Number of available Extended Motion Control resources for technology objects 	192
 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) 	55
 Number of positioning axes at motion control cycle of 8 ms (typical value) 	80
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
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
 Performance level according to ISO 13849-1 	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time	e of 100 hours)
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
 High demand/continuous mode: PFH in accordance with SIL3 	< 1.00E-09
mbient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	0 °C
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
 vertical installation, min. 	0 °C
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
onfiguration / header	
configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe

— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— CFC	Yes; either CFC or failsafe functionality
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
 Copy protection 	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Password for display 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	Yes
 Protection level: Complete protection 	Yes
User administration	Yes; device-wide
programming / cycle time monitoring / header	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

last modified: