SIEMENS

Data sheet



SIMATIC S7-1500F, CPU 1516F-3 PN/DP, central processing unit with 1.5 MB work memory for program and 5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 10 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1516F-3 PN/DP
HW functional status	FS01
Firmware version	V2.9
Product function	
I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 375 μ s (distributed) and 1 ms (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 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)	0.85 A
Current consumption, max.	1.1 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.7 W
Power loss	
Power loss, typ.	7 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

integrated (for program)	1.5 Mbyte
integrated (for data) integrated (for data)	5 Mbyte
Load memory	3 IVIDY LE
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	oz obyte
maintenance-free	Yes
	163
CPU processing times	10
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
CPU-blocks	
Number of elements (total)	8 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
 Size, max. 	5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	1 Mbyte
FC	
Number range	0 65 535
• Size, max.	1 Mbyte
OB	
• Size, max.	1 Mbyte
 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 	3
 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; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	2 040
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	, any (stary analogous of the month of the stary)
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	, , , ,
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB
Extended retentive data area (incl. timers, counters, flags), max.	5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	4011
Size, max.	16 kbyte

Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	o, o clock memory bit, grouped into one clock memory byte
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)— Outputs (volume)	8 kbyte 8 kbyte
per CM/CP	o kbyte
— 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	(4.9)
integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can
	be inserted in total
Number of IO Controllers	
integratedVia CM	2 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can
• Via Civi	be inserted in total
Rack	
 Modules per rack, max. 	32; CPU + 31 modules
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	available slots
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
• in AS, master	Yes Yes
in AS, slaveon 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
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 PROFINITION Controlled PROFINI	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.	256; In total, up to 1 000 distributed I/O devices can be connected via
— Of which IO devices with IRT, max.	AS-i, PROFIBUS or PROFINET 64
Number of connectable IO Devices for RT,	256
max.	
— of which in line, max.	256
 Number of IO Devices that can be 	8; in total across all interfaces
simultaneously 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
Update time for IRT	
— for send cycle of 250 μs	250 μs to 4 ms; Note: In the case of IRT with isochronous mode, the
•	minimum update time of 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
— 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 Update time for RT	μs 3 875 μs)
— for send cycle of 250 µs	250 μs to 128 ms
— for send cycle of 200 μs — for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 300 μs — 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.	Voci per user program
activation/deactivation of I-devices Asset management record.	Yes; per user program
Asset management record Interface	Yes; per user program
2. Interface	
Interface types	Voc. V2
RJ 45 (Ethernet)Number of ports	Yes; X2
integrated switch	No
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	No
PROFINET IO Controller	
Services	
— PG/OP communication	Yes

la a alexan a un manda	No
— 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 	8; in total across all interfaces
simultaneously 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
Update time for RT	, ,
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
Isochronous mode	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
Shared device	Yes
Number of IO Controllers with shared device,	4
max.	4
activation/deactivation of I-devices	Yes; per user program
Asset management record	Yes; per user program
3. Interface	Too, por door program
Interface types	V V0
• RS 485	Yes; X3
Number of ports	1
Protocols	V.
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
SIMATIC communication	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	Yes; V2.4 / V2.6
Number of connections	,
Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections, max. Number of connections reserved for ES/HMI/web	10
Number of connections reserved for ESH Mill Web Number of connections via integrated interfaces	128
Number of S7 routing paths	16
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	. 00
Media redundancy	Yes; 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. 	
— Switchover time on line break, typ.— Number of stations in the ring, max.	200 ms; For MRP, bumpless for MRPD
Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication	200 ms; For MRP, bumpless for MRPD

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. Open IF communication.	See online help (S7 communication, user data size)
Open IE communication • TCP/IP	Yes
— Data length, max.	64 kbyte
— Bata length, max. — several passive connections per port,	Yes
supported	165
• 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
OPC UA	
 Runtime license required 	Yes
OPC UA Client	Yes
 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/C max. 	300
Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.	20
Number of elements for one call of OPC_UA_MethodGetHandleList, max.	100
Number of simultaneous calls of the client instructions for session management, per	1
connection, max.	
Number of simultaneous calls of the client instructions for data access, per connection, max.	5
Number of registerable nodes, max.	5 000
 Number of registerable method calls of OPC_UA_MethodCall, max. 	100
Number of inputs/outputs when calling OPC_UA_MethodCall, max.	20
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
 Application authentication 	Yes
Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15,
	Basic256Sha256
User authentication	"anonymous" or by user name & password
Number of sessions, max.	48
 Number of accessible variables, max. 	100 000
 Number of registerable nodes, max. 	20 000
 Number of subscriptions per session, max. 	20
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
Number of server methods, max.	50
 Number of inputs/outputs per server method, max. 	20
max.	

max — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. Further profects	 Number of monitored items, recommended 	2 000; for 1 s sampling interval and 1 s send interval
- Number of nodes for user-defined server interfaces, max. Further profeccies - MODBUS - MODBUS - Wes MODBUS TCP Bookmanus mode		2 000, for 1 5 sampling interval and 1 5 send interval
interfaces, max. Further protocols • MODBUS • MODBUS Forman and the program message functions, max. Program alarms Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of configurable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms • Number of alarms for system dispositios • Number of alarms for system dispositios • Number of alarms for system technology objects Test commissioning functions Joint commission fream Engineering) Status block Yes: Parallel online access possible for up to 8 engineering systems Yes: Up to 8 simultaneously (in total across all ES clients) No Number of breakpoints 8 Status block Yes: Without fail-safe • Variables • Number of variables, max. — of which control variables, max. — of which powerfail-groof Forcing • Forcing • Forcing variables • Number of oringurable Traces • Number of configurable Traces • Perspect Connection display LINK TX/RX • Yes • Cennection display LINK TX/RX • Perspiration on the control resources for 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 affects the cycle time of the PLC program, selection guide via the TIA Selection Tool • Per option axis • per prother on a 20 • Per option axis • per prother on a 20 • Positioning axis • Number of positioning axis • Per prother on a 20 • Positioning axis • Number of positioning axis • Number of positioning axis at motion control • Tacks • Number of positioning axis and the program messages are generated by the "Program _Alarm" block. Proc State Beneral and t	 Number of server interfaces, max. 	
MODBUS Yes; MODBUS Yes; MODBUS TCP		5 000
Sociation Symbol		
Equidistance Sy message functions Number of login stations for message functions, max. Program alarms Number of login stations for messages, max. Number of oringfurable program messages in RUN, max. Number of configurable program messages in RUN, max. Number of simultaneously active program alarms Number of salarms for system diagnostics Number of alarms for motion technology objects Test.commissioning functions Joint commission (Team Engineering) Ves: Parallel online access possible for up to 8 engineering systems Status block Yes: Versive program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 1000 Number of slarms for system diagnostics Ves: Parallel online access possible for up to 8 engineering systems Ves: Up to 8 simultaneously (in total across all ES clients) No Number of breakpoints 8 Statuscontrol Ves: Versive program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH 1000 Test.commission of salar for trouble access possible for up to 8 engineering systems Ves: Up to 8 simultaneously (in total across all ES clients) No Ves: Parallel online access possible for up to 8 engineering systems Ves: Up to 8 simultaneously (in total across all ES clients) No No Number of breakpoints 8 Statuscontrol Ves: Parallel online access possible for up to 8 engineering systems Ves: Up to 8 simultaneously (in total across all ES clients) No Ves: Parallel online access possible for up to 8 engineering systems Ves: Up to 8 simultaneously (in total across all ES clients) No Ves: Parallel online access possible for up to 8 engineering systems Ves: Without fail-safe Ve	MODBUS	Yes; MODBUS TCP
Number of login status for message functions, max. Program alarms Number of loginations for messages, max. Number of loadable program messages in RUN, max. Number of loadable program messages in RUN, max. Number of loadable program alarms • Number of alarms for system diagnostics 200 • Number of alarms for system diagnostics 500 • Number of alarms for system diagnostics 500 • Number of loadables for motion technology objects 500 Status block 7	Isochronous mode	
Number of login status for message functions, max. Program alarms Number of loginations for messages, max. Number of loadable program messages in RUN, max. Number of loadable program messages in RUN, max. Number of loadable program alarms • Number of alarms for system diagnostics 200 • Number of alarms for system diagnostics 500 • Number of alarms for system diagnostics 500 • Number of loadables for motion technology objects 500 Status block 7	Equidistance	Yes
Number of login stations for message functions, max. Program alarms Whither of configurable program messages, max. Number of configurable program messages in RUN, max. Number of isimultaneously active program alarms Number of alarms for motion technology objects Number of alarms for motion technology objects Status block Number of alarms for motion technology objects Test commission (Team Engineering) Ves; Parallel online access possible for up to 8 engineering systems Status Stock Yes; Up to 8 simultaneously (in total across all ES clients) No Number of breakpoints 8 Status/control variable Variables Number of variables, max. — of which control variables, max. — of which program messages are generated by the "Program_Alarm" block, FroBlog or GRAPH Ves; Variables Ves; Variables Ves; Variables Ves; Ves; without fail-safe Inputs/outputs, memory bits, D8s, distributed li/Os, timers, counters Program messages are generated by the "Program_Alarm" block, FroBlog or GRAPH Ves; Variables Ves; Ves; without fail-safe Inputs/outputs, memory bits, D8s, distributed li/Os, timers, counters Program Ves; without fail-safe Perpiberal inputs/outputs Program Ves; without fail-safe Perpiberal inputs/outputs Program Ves; without fail-safe Perpiberal inputs/outputs Number of variables, max. — of which powerfail-proof Program Ves; without fail-safe Perpiberal inputs/outputs Program Ves; without fail-safe Program Ves; without fail-safe Perpiberal inputs/outputs Progra	•	
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Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program starms • Number of program starms • Number of alarms for motion technology objects 1 000 Number of alarms for motion technology objects 1 000 **Number of alarms for motion technology objects **Status block Single step • Status block Single step • Status/control variable • Variables • Number of variables, max. — of which patients was allowed and the program states was allowed and the program starts was allowed and the program alarms 1 000 **Vest Up to 8 simultaneously (in total across all ES clients) **Ves; Up to 8 simultaneously (in total across all ES clients) **Number of breakpoints 8 **Status/control variable • Variables • Variables • Number of variables, max. — of which control variables, max. — of which program messages are generated by the "Program Alarms" blooms and the program starts was allowed and the program alarms 1 000 **Yes; Ves; Up to 8 simultaneously (in total across all ES clients) **Number of variables, max. — of which program starts was allowed and the program and the program allowed and the program allowed and the program and the program allowed and the program and the program allowed and the program and the pr		
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Number of alarms for system diagnostics Number of alarms for motion technology objects Fost commissioning functions Joint commission (Team Engineering) Status block Single step No Number of breakpoints 8 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 status variables, max. — of which status variables, max. — of which other of variables, max. — of which control variables, max. — of which control variables, max. — of which other of variables, max. Diagnostic buffer • present • Number of variables, max. — of which powerfail-proof • Porcing • Porcing, variables • Number of configurable Traces • Number of particles, max • Status information Diagnostics indication LED • RUNNSTOP LED • RONNSTOP LED • RONNSTOP LED • RONNSTOP LED • STOP ACTIVE LED • Per speed-controlled axis — per positioning axis — per synchronous axis — per synchronous axis — per synchronous axis — per synchronous axis — per synchronous axis — per positioning axis — per cam track — per positioning axis — number of cam track — per positioning axis — Number of positioning axes at motion control • Positioning axis — Number of positioning axes at motion control • Positioning axis — Number of positioning axes at motion control • Positioning axis — Number of positioning axes at motion control • Positioning axis — Number of positioning axes at motion control • Positioning axis — Number of positioning axes at motion control	Number of loadable program messages in RUN, max.	
Number of alarms for system diagnostics Number of alarms for motion technology objects Fost commissioning functions Joint commission (Team Engineering) Joint commission (Team Engineering) Status block Single step No Number of breakpoints Status Stock Sistus/Control Status/Control variable Variables Number of variables, max. — of which status variables, max. — of which ontrol variables, max. — of variables, max. — of variables, max. — of which powerfall-proof Forcing • Forcing • Forc	Number of simultaneously active program alarms	
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Joint Commission (Team Engineering) Joint Commission (Team Engineering) Status block Single step No Number of breakpoints 8 Status/control variable • Variables • Number of variables, max. — of which control variables, max. — of which powerfall-proof • Forcing •	 Number of alarms for system diagnostics 	200
Joint commission (Team Engineering) Status block Yes; Up to 8 simultaneously (in total across all ES clients) Single step No Number of breakpoints 8 Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which status variables, max. — of which control variables • Forcing • Forcing • Forcing, variables • Number of variables, max. — of which control variables, max. — of which status variables, max. — of which control variables, max. Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters * Ves; without fail-safe Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters * Ves; without fail-safe Peripheral inputs/outputs Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bi	 Number of alarms for motion technology objects 	160
Joint commission (Team Engineering) Status block Yes; Up to 8 simultaneously (in total across all ES clients) Single step No Number of breakpoints 8 Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which status variables, max. — of which control variables • Forcing • Forcing • Forcing, variables • Number of variables, max. — of which control variables, max. — of which status variables, max. — of which control variables, max. Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters * Ves; without fail-safe Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters * Ves; without fail-safe Peripheral inputs/outputs Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters Peripheral inputs/outputs, memory bi	Test commissioning functions	
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. — of which status variables, max. — of which control variables, max. — of which protection with the variables, max. — of which powerfail-proof Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of position LED New NSTOP LED New NSTOP LED New NSTOP LED New NSTOP ACTIVE LED New North New		Yes: Parallel online access possible for up to 8 engineering systems
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 — per cam track — per probe Positioning axis — Number of positioning axes at motion control 7 	— per external encoder	80
 — per probe Positioning axis — Number of positioning axes at motion control 7 	— per output cam	20
 Positioning axis — Number of positioning axes at motion control 7 	— per cam track	160
Number of positioning axes at motion control7	— per probe	40
	 Positioning axis 	
		7
	cycle of 4 ms (typical value)	

Number of positioning axes at motion control	14
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	
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 repai	· · · · · · · · · · · · · · · · · · ·
Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
High demand/continuous mode: PFH in	< 1.00E-09
accordance with SIL3	1.00E-09
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-25 °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. 	-25 °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	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection • User program protection/password protection	Yes
Copy protection	Yes
Block protection	Yes
Access protection	100
Password for display	Yes
Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
Protection level: Read/write protection	Yes
Protection level: Write protection for Failsafe	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	845 g
G / three	•
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