SIEMENS

Data sheet

6ES7516-3FN02-0AB0



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

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 Yes; Ibinbuted and central; with minimum OB & cycle of 375 µs (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 Olisplay Screen diagonal (cm) Control demonts Number of keys 8 Mode buttons 2 Supply Voltage Rated value (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Pervise polarity protection Yes Mains buffering • Alansvoltage failure stored energy time • Repeat rate, min. Insule current Current consumption (rated value) O.02 A*s Power Infeed power to the backplane bus (balanced) Power consumption from the backplane for consumption from t	General information	
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Product function Namber of Reys Sale Value (DC) Sale Value	HW functional status	FS01
• I&M data • Isochronous mode •	Firmware version	V2.9
• Isochronous mode Yes: Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central) Engineering with • STEP 7 TIA Portal configurable/integrated from version configurable as 6ES7516-3FN01-0AB0 Configuration control via dataset Yes Display Screen diagonal [cm] Control elements Number of keys 8 Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) Alains buffering • Mains voltage failure stored energy time • Repeat rate, min. I/s Input current Current consumption (rated value) Current consumption, max. Inrush current, max. 2.4 A; Rated value Pewer consumption from the backplane bus (balanced) Power consumption from the backplane bus (balanced) Power loss, typ. Memory Number of slots for SIMATIC memory card I SIMATIC memory card required V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable of 375 µs (distributed) as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3FN01-0AB0 V17 (FW V2.9) / V18 (FW V2.9)	Product function	
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Screen diagonal [cm] 6.1 cm	via dataset	Yes
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Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Irush current, max. Indeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. Number of slots for SIMATIC memory card SIMATIC memory card required 5 ms 1/s 5 ms 1/s 5 ms 1/s 5 ms 1/s 1/s 1/s 1/s 1/s 1/s 1.1 A 1.1 A 1.1 A 1.2 4 A; Rated value 1.2 4 A; Rated value 1.2 W Power 6.7 W Power 7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Reverse polarity protection	Yes
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Power loss, typ. 7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power consumption from the backplane bus (balanced)	6.7 W
Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Power loss	
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power loss, typ.	7 W
SIMATIC memory card required Yes	Memory	
	Number of slots for SIMATIC memory card	1
Work memory	SIMATIC memory card required	Yes
	Work memory	

• integrated (for program)	1.5 Mbyte
integrated (for data)	1.5 Mbyte 5 Mbyte
integrated (for data) Load memory	5 Mbyte
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	32 Guyte
maintenance-free	Yes
CPU processing times	Tes
	10 mg
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	5 Mbyte, 1 of bbs with absolute addressing, the max. size is 64 Kb
Number range	0 65 535
Size, max.	1 Mbyte
FC	1 mbyto
Number range	0 65 535
-	
• Size, max.	1 Mbyte
	1 Mbyto
Size, max. Number of free evelo OPs	1 Mbyte 100
Number of free cycle OBs Number of time clare OBs	
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	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	rang (oray manaco by the monthly)
— adjustable	Yes
	100
Data areas and their retentivity	E40 khata la tatal available autotica according
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	, , , , , , , , , , , , , , , , , , , ,
1 109	

Size, max. Number of clock memories Petentivity adjustable Retentivity preset No Cocal data Per priority class, max. Address area Number of IO modules I/O address area Inputs Outputs Outputs Outputs Outputs Outputs (volume) Per CM/CP Inputs (volume) Outputs (volume) Number of subprocess images Number of subprocess images, max. Address area I/O addr	
Data blocks • Retentivity adjustable • Retentivity preset No	
Retentivity adjustable Retentivity preset No Retentivity preset No Retentivity preset No Retentivity preset No Address area Prepriority class, max. 84 kbyte; max. 16 KB per block Address area Number of IO modules Sa 192; max, number of modules / submodules Vo address area Inputs Outputs Sa kbyte; All inputs are in the process image Prince integrated IO subsystem Inputs (volume) Retentive (volume) Retentiv	
Retentivity preset Local data • per priority class, max. 64 kbyte; max. 16 KB per block Address area Number of IO modules 1/0 address area • Inputs • Outputs • Outputs • Outputs • Outputs • Outputs • Outputs (volume) • B kbyte — Outputs (volume) • B kbyte — Outputs (volume) • B kbyte Subprocess images • Number of subprocess images, max. 1 Inputs (volume) • 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 integratic distributed I/O via PROFINET or PROFIBUS communication modules by the connection of I/O via AS-i master modules or links (e.g. IE/PB-INUMBER of IO Controllers • Integrated • Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Number of Iones, max. • Number of PP CMs • Modules per rack, max. • Number of PP CMs • Number of Ines, max. 1 PIP CM • Number of PP CMs • Hardware clock	
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 1/O address area • Inputs • Outputs • Outputs • Outputs • Outputs (volume) — Skbyte • Number of subprocess images, max. 1ardware configuration Number of ID masters • Integrated • Via CM • Via CM • Via CM • Integrated • Via CM • Integrated • Via CM • Modules per rack, max. • Number of Iines, max. • Number of Pth CMs • Number of Pth CMs • Number of Pth CMs • Number of Iines, max. • Number of Iines, max. • Number of Pth CMs • Number of Iines, max. • Number of Pth CMs • Number of Pth CMs • Number of Iines, max. • Hardware connectable Pth CMs is only limited by the number of solots • Time of day Clock • Type Hardware clock	
Per priority class, max. Address area Number of IO modules Vo address area Inputs	
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Number of IO modules IVO address area Inputs Outputs Outputs Outputs Outputs Outputs Outputs Outputs (volume) Outputs (volu	
I/O address area Inputs Outputs Outputs 2 kbyte; All inputs are in the process image Per integrated IO subsystem Inputs (volume) Outputs (volume) B kbyte Per CM/CP Inputs (volume) B kbyte Outputs (volume) B kbyte Outputs (volume) B kbyte Outputs (volume) B kbyte Outputs (volume) B kbyte Subprocess images Number of subprocess images, max. Outputs (volume) Subprocess images Number of distributed I/O systems 64: A distributed I/O system is characterized not only by the integratic distributed I/O via PROFINET or PROFIBUS communication modules by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Number of DP masters Integrated Via CM Number of IO Controllers Integrated Number of IO Controllers Integrated Number of IO Controllers Number of IO Controllers Integrated Number of IO Controllers Integrated Number of IO Controllers Integrated Number of IO Controllers Number of IO	
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— Outputs (volume) Subprocess images Number of subprocess images, max. 32 Hardware configuration Number of distributed I/O systems 64; A distributed I/O system is characterized not only by the integratic distributed I/O via PROFINET or PROFIBUS communication modules by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Number of DP masters integrated integrated integrated integrated via CM Number of IO Controllers integrated via CM 3; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Rack Modules per rack, max. Number of lines, max. Number of lines, max. Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock	
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distributed I/O via PROFINET or PROFIBUS communication modules by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Number of DP masters • integrated • Via CM 1 **Number of IO Controllers • integrated • Via CM 2 • Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total **Rack • Modules per rack, max. • Modules per rack, max. • Number of lines, max. 1 **PtP CM • Number of PtP CMs **Time of day **Clock • Type Hardware clock	
 integrated Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Number of IO Controllers integrated Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Rack Modules per rack, max. Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock 	, but also
Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Number of IO Controllers integrated Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Rack Modules per rack, max. Number of lines, max. Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock	
Inserted in total Number of IO Controllers integrated Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) carrinserted in total Rack Modules per rack, max. Number of lines, max. Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock	
 integrated Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Rack Modules per rack, max. Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock 	be
Via CM 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) car inserted in total Rack Modules per rack, max. Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock	
Rack • Modules per rack, max. • Number of lines, max. 1 PtP CM • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock • Type Hardware clock	
Rack • Modules per rack, max. • Number of lines, max. 1 PtP CM • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock • Type Hardware clock	be
Modules per rack, max. Number of lines, max. Number of PtP CMs Number of PtP CMs Time of day Clock Type Hardware clock	
 Number of lines, max. PtP CM Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock 	
PtP CM • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock • Type Hardware clock	
 Number of PtP CMs the number of connectable PtP CMs is only limited by the number of slots Time of day Clock Type Hardware clock 	
Time of day Clock Type Hardware clock	71.11
Clock ◆ Type Hardware clock	vallable
Type Hardware clock	
27	
1 / /1 /	
• 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	
• 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	
Protocols	
IP protocol Yes; IPv4	
• PROFINET IO Controller Yes	

Yes PROFINET IO Device • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted Web server Media redundancy Yes; MRP Automanager according to IEC 62439-2 Edition 2.0 **PROFINET IO Controller** Services - PG/OP communication Yes - Isochronous mode Yes Yes; Requirement: IRT and isochronous mode (MRPD optional) - Direct data exchange - 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 - Number of connectable IO Devices for RT, max. 256 - of which in line max 256 - 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 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 - 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 cycles Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s ... 3 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 1 ms to 512 ms — for send cycle of 1 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, max. - activation/deactivation of I-devices Yes; per user program - Asset management record Yes; per user program 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	
— PG/OP communication	Yes
— 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
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
— ISOCITIONOUS MODE — 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
3. Interface	
Interface types	
• RS 485	Yes; X3
Number of ports	1
Protocols	
	Vee
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
SIMATIC communication	Yes
nterface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
	12 Mhit/o
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	
Number of connections Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
	256; via integrated interfaces of the CPU and connected CPs / CMs 10
Number of connections, max.Number of connections reserved for ES/HMI/web	
 Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces 	10
 Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths 	10 128
 Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode 	10 128 16
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding	10 128
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy	10 128 16 Yes
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding	10 128 16
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy	10 128 16 Yes Yes; only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP	10 128 16 Yes Yes; only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy — Media redundancy	10 128 16 Yes Yes; only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;

 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, 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	co, cpc c
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	. oo, otanaana ana aoo pagoo
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/OPC_I 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 connection, max.	1
 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

Dublishing interval min	200
— Publishing interval, min.	200 ms
Number of server methods, max.	50
Number of inputs/outputs per server method, max.	20
Number of monitored items, recommended max.	2 000; for 1 s sampling interval and 1 s send interval
Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
 Number of nodes for user-defined server interfaces, max. 	5 000
Further protocols	
• MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	64
Program alarms	Yes
Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	5 000
Number of simultaneously active program alarms	
Number of program alarms	1 000
Number of alarms for system diagnostics	200
Number of alarms for motion technology objects	160
Test commissioning functions	100
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
Status/control variable	Yes; without fail-safe
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	inputs/outputs, memory bits, bbs, distributed #05, timers, counters
of which status variables, max.	200; per job
of which control variables, max.	
— of which control variables, max.	200; per job
• Forcing	Yes; without fail-safe
Forcing, variables	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	
• present	Yes
Number of entries, max.	3 200
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
STOP ACTIVE LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	2 400
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
Positioning axis	
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	7
Number of positioning axes at motion control cycle	14
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 repair time	e of 100 hours)
 Low demand mode: PFDavg in accordance with 	< 2.00E-05
SIL3	
 High demand/continuous mode: PFH in 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
Tonzontal Installation, max.	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
Installation altitude above sea level, max. configuration / header	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Installation altitude above sea level, max. configuration / header configuration / programming / header	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language	
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD	Yes; incl. failsafe
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD	Yes; incl. failsafe Yes; incl. failsafe
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL	Yes; incl. failsafe Yes; incl. failsafe Yes
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL	Yes; incl. failsafe Yes; incl. failsafe Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	Yes; incl. failsafe Yes; incl. failsafe Yes
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection ● User program protection/password protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection ● User program protection/password protection ● Copy protection ● Block protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Read/write protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection ● User program protection/password protection ● Copy protection ● Block protection Access protection ● Password for display ● Protection level: Write protection ● Protection level: Read/write protection ● Protection level: Write protection for Failsafe	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Write protection for Failsafe • Protection level: Complete protection programming / cycle time monitoring / header	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Write protection for Failsafe • Protection level: Complete protection programming / cycle time monitoring / header • lower limit	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions Width Height Depth	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Write protection for Failsafe • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions Width Height	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection • Password for display • Protection level: Write protection • Protection level: Write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit Dimensions Width Height Depth	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Password for display Protection level: Write protection Protection level: Read/write protection Protection level: Write protection Protection level: Complete protection Programming / cycle time monitoring / header Iower limit upper limit Dimensions Width Height Depth Weights	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

