Data sheet

6ES7516-3AN02-0AB0



SIMATIC S7-1500, CPU 1516-3 PN/DP, central processing unit with 1 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 1516-3 PN/DP HW functional status FS01 Firmware version V2.9 Product function • I&M data Yes; I&M0 to I&M3 Yes; IBM0 to I&M0 to I&M0 Yes; IBM0 t	General information	
Firmware version V2.9 Product function • I&M data • Isochronous mode • IAM (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0 Configuration control Via dataset Ves Display Screen diagonal [cm] • 6.1 cm Control elements Number of keys 8 Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) 28.8 V Reverse polarity protection Mains buffering • Mainsvoltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) 0.85 A Current consumption (rated value) 0.85 A Current consumption (rated value) 1.1 A Insub current, max. 1.1 A Insub current, max. 2.4 A; Rated value Power Infeed power to the backplane bus 12 W Power consumption from the backplane bus (balanced) Power loss Power loss, typ. Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required	Product type designation	CPU 1516-3 PN/DP
Product function Name Nam	HW functional status	FS01
■ I8M 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 6ES7516-3AN01-0AB0 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 lim	Product function	
and 1 ms (central) Engineering with • STEP 7 TIA Portal configurable/integrated from version Configuration control via dataset Yes Display Screen diagonal [cm] Control elements Number of keys Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) Alians buffering • Mains buffering • Mains/voltage failure stored energy time • Mains/voltage failure stored energy time • Mains/voltage failure stored energy time • Mains buffering • Mains buff	● I&M data	Yes; I&M0 to I&M3
STEP 7 TIA Portal configurable/integrated from version configurable as 6ES7516-3AN01-0AE0 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 • Repeat rate, min. 1/s Input current Current consumption (rated value) 0.85 A Current consumption (rated value) 0.02 A²-s Power Infect of power to the backplane bus (balanced) 6.7 W Power loss Power loss Power loss, typ. 7 W Memory Number of Sids for SIMATIC memory card equired 1 SIMATIC memory card required Ves	Isochronous mode	
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Screen diagonal [cm] 6.1 cm	Configuration control	
Screen diagonal [cm] 6.1 cm	via dataset	Yes
Number of keys Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Reverse polarity protection • Mains/voltage failure stored energy time • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Current consumption (rated value) Current consumption, max. Inush current, max. Pt 0.02 A²-s Power Infeed power to the backplane bus (balanced) Power loss Power loss, typ. Yes Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Display	
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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 Pt 0.02 A²-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	Control elements	
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Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Pt Insubscript (1.1 A Rated value) Insubscript (2.4 A; Rated value) Power Infeed power to the backplane bus (balanced) Power loss Power loss Power loss, typ. Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Mode buttons	2
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permissible range, upper limit (DC) Reverse polarity protection Yes Mains buffering Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Irt Verent consumption, max. Inush current, max. Indeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss Power of slots for SIMATIC memory card SIMATIC memory card required Yes	Rated value (DC)	24 V
Reverse polarity protection Mains buffering Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Irt Inrush current, max. It Indeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. The deference of slots for SIMATIC memory card SIMATIC memory card required Yes	permissible range, lower limit (DC)	19.2 V
Mains buffering Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Irush current, max. If a consumption (and the value) If a consumption (and the value) If a consumption (and the value) In a consumpt	permissible range, upper limit (DC)	28.8 V
Mains/voltage failure stored energy time Repeat rate, min. 1/s Input current Current consumption (rated value) Current consumption, max. 1.1 A Inrush current, max. 2.4 A; Rated value I*t 0.02 A**s Power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required 5 ms 5 ms 1/s 5 ms 5 ms 5 ms 5 ms 5 ms 6 7 W 2.4 A; Rated value 1.1 A 1.1 A 1.1 A 1.2 4 A; Rated value 2.4 A; Rated value 3.6 7 W 4.7 W 4	Reverse polarity protection	Yes
• Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Interest power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. Power of slots for SIMATIC memory card SIMATIC memory card required 1/8 0.85 A 0.85 A 0.85 A 1.1 A Intu A	Mains buffering	
Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Interest power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss Power loss, typ. Memory Number of slots for SIMATIC memory card SIMATIC memory card required O.85 A 0.85 A 0.85 A 0.85 A 1.1	 Mains/voltage failure stored energy time 	5 ms
Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Infeed power to the backplane bus Infeed power to the backplane bus Infeed power consumption from the backplane bus (balanced) Power loss Power loss Power loss, typ. Number of slots for SIMATIC memory card SIMATIC memory card required O.85 A 1.1 A 1.1 A 1.2 W 0.02 A²·s Power 0.7 W 1.2 W 7 W 1.3 W 1.4 W 1.5 W	Repeat rate, min.	1/s
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Inrush current, max. 2.4 A; Rated value 2	Current consumption (rated value)	0.85 A
Power	Current consumption, max.	1.1 A
Infeed power to the backplane bus Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Inrush current, max.	2.4 A; Rated value
Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	l²t	0.02 A ² ·s
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 SIMATIC memory card required Yes	Power	
Power loss Power loss, typ. 7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Infeed power to the backplane bus	12 W
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 Mbyte
integrated (for data) integrated (for data)	5 Mbyte
Load memory	3 Mbyte
	22 Chyta
Plug-in (SIMATIC Memory Card), max. Packup	32 Gbyte
Backup	Voc
maintenance-free	Yes
CPU processing times	
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 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
a Siza may	-
• Size, max.	5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB a Number range	0 65 525
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
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
— aujustable IEC counter	, 50
Number	Any (only limited by the main memory)
	Any (only limited by the main memory)
Retentivity	Von
— adjustable	Yes
S7 times	0.040
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.	counters, DBs, and technology data (axes): 472 KB 5 Mbyte; When using PS 6 0W 24/48/60 V DC HF

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	o 102, main mambol of modulos / casmodulos
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
	32 kbyte, All outputs are in the process image
per integrated IO subsystem	O librato
— 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 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
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
 Deviation per day, max. 	10 s; Typ.: 2 s
Operating hours counter	
Number	16
Clock synchronization	
• supported	Yes
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	Yes
Interfaces	100
	2
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 Yes Media redundancy Yes **PROFINET IO Controller** Services - PG/OP communication Yes - Isochronous mode Yes - Direct data exchange Yes; Requirement: IRT and isochronous mode (MRPD optional) - IRT - 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 250 µs to 128 ms - for send cycle of 250 µs — 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. 4 - 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
— IRT	No
— PROFlenergy	Yes; per user program
Proritized 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	
 PROFIBUS DP master 	Yes
PROFIBUS DP slave	No
SIMATIC communication	Yes
PROFIBUS DP master	
Number of connections, max.	40 (11) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
•	48; for the integrated PROFIBUS DP interface
 Number of DP slaves, max. 	
Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Number of DP slaves, max. Services	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
Services	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Services — PG/OP communication — Equidistance	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes
Services — PG/OP communication	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet)	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET Yes Yes Yes Yes
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation	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
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation • Autocrossing	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
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation • Autocrossing • Industrial Ethernet status LED	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
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation • Autocrossing	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
Services — PG/OP communication — Equidistance — Isochronous mode — Activation/deactivation of DP slaves Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation • Autocrossing • Industrial Ethernet status LED	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
Services — PG/OP communication — 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.	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
Services — PG/OP communication — 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.	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
Services — PG/OP communication — 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	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
Services — PG/OP communication — 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	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
Services	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 S7 routing paths 	16
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
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 Yes
SNMP DCP	Yes
• LLDP	Yes
• Encryption	Yes; Optional
Web server	res, Optional
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Medium" license required
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
Liner authentication	
— User authentication— GDS support (certificate management)	"anonymous" or by user name & password Yes
	48
Number of sessions, max.	100 000
Number of accessible variables, max.	20 000
Number of subscriptions per session may	20 000
— Number of subscriptions per session, max.— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
Number of server methods, max.	50
Number of server methods, max. Number of inputs/outputs per server method, max.	20
Number of impuls/outputs per server metriou, max. Number of monitored items, recommended max.	
Number of morniored items, recommended max. Number of server interfaces, max.	2 000; for 1 s sampling interval and 1 s send interval 10 of each "Server interfaces" / "Companion specification" type and 20 of the
— Number of Server interfaces, max.	type "Reference namespace"
 Number of nodes for user-defined server interfaces, 	5 000
max.	
 Alarms and Conditions 	Yes
 Number of program alarms 	200
Number of alarms for system diagnostics	100
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,
Number of leadable program messages in PUIN may	ProDiag or GRAPH 5 000
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms	0 000
Number of program alarms Number of program alarms	1 000
• Number of program diams	1 000
· ·	200
Number of alarms for system diagnostics	200
Number of alarms for system diagnostics Number of alarms for motion technology objects	200 160
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions 	160
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team 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)
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step	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 alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max.	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. — of which status variables, max.	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max.	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. forcing Forcing	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables, max.	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing Forcing, variables, max. Number of variables, max. Number of variables, max.	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. Forcing Forcing, variables Number of variables, max. Diagnostic buffer present 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof Traces 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof Traces Number of configurable Traces 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information 	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500
 Number of alarms for system diagnostics Number of alarms for motion technology objects Test commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. — of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible Yes Yes
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. of which powerfail-proof Traces Number of configurable Traces Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED	Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job Yes Peripheral inputs/outputs 200 Yes 3 200 500 4; Up to 512 KB of data per trace are possible

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	2 400
technology objects	
Required Motion Control resources	40
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20 160
— per cam track	40
per probePositioning axis	40
Number of positioning axes at motion control cycle of 4 ms (typical value)	7
Number of positioning axes at motion control cycle of 8 ms (typical value)	14
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	, , , , , , , , , , , , , , , , , , ,
High-speed counter	Yes
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	
Autuae during operation relating to sea level	
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• • •	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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 Yes
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
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD	Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL	Yes Yes Yes
● Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL	Yes Yes Yes Yes
Installation altitude above sea level, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	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 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 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	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 • protection of confidential configuration data	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 • protection of confidential configuration data • Password for display	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 • protection of confidential configuration data • Password for display • Protection level: Write protection	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit • upper limit	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 • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection programming / cycle time monitoring / header • lower limit	Yes

Depth	129 mm
Weights	
Weight, approx.	845 g

last modified:

8/16/2023