6ES7515-2AN03-0AB0

Data sheet



SIMATIC S7-1500, CPU 1515-2 PN, central processing unit with work memory 1 MB for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required *** approvals and certificates according to entry 109817466 at support.industry.siemens.com to be considered! ***

Product type designation CPU 1515-2 PN HW functional status FS01 Firmware version V3.0 Product function • I&M data Yes; I&MO to I&M3 * Isochronous mode Yes; I&MO to I&M3 * 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 * V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- * ZAM02-0AB0 * Ves Display Screen diagonal (cm) * Control elements * Whurber of keys * B Mode buttons * 2 * Supply voltage Rated value (DC) * permissible range, upper limit (DC) * One All All All All All All All All All Al	General information	
Firmware version V3.0 Product function • I&M data • Isochronous mode • STEP 7 TIA Portal configurable/integrated from version Configuration control via dataset Ves Display Screen diagonal [cm] Control elements Number of keys Rated value (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Reverse polarity protection Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption, max. Insub current, max. Prower consumption frated value Power consumption from the backplane bus (balanced) Power loss, typ. Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Ital Yes Ves Display Ves Ves Ves Ves Ves Ves Ves Ve	Product type designation	CPU 1515-2 PN
Product function • I&M data • Isochronous mode Engineering with • STEP 7 TIA Portal configurable/integrated from version and 1 ms (central) **Test Portal versions configurable as 6ES7515-2AM02-0AB0 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, uoper limit (DC) permissible range, uoper limit (DC) Reverse polarity protection Mains buffering • Mains voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Querent consumption (rated value) All Carrent consumption from the backplane bus (balanced) Power consumption from the backplane bus (balanced) Power loss, typ. Month of test of SIMATIC memory card required Ves SIMATIC memory card required Ves Ves Ves Ves Ves Ves Power loss typ. Month of test and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central) Ves; IškMot to liskM3 Ves; IškMot to liskM3 Ves; IškMot lot liskMa Ves; IškMot lot lisk Ma Ves; IškMot lot lisk Mit lot lisk lisk lisk lisk lisk lisk lisk Ves; IškMot lot lisk	HW functional status	FS01
• I8M data • 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 V18 (FWV 93.0); with older TIA Portal versions configurable as 6ES7515- 2AM02-OAB0 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) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Alains buffering • Mains/voltage failure stored energy time • Repeat rate, min. 1/s Input current Current consumption (rated value) Quarent consumption (rated value) Quarent consumption, max. 1.15 A; Rated value Prower onsumption from the backplane bus (balanced) Power consumption from the backplane bus (balanced) Power loss, typ. Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Vas (SIRFIN minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central); with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central); with nicentral, with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central); with nicentral; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515- ZAM02-OAB0 V18	Firmware version	V3.0
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• STEP 7 TIA Portal configurable/integrated from version 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, upper limit (DC) Reverse polarity protection Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Current consumption (rated value) Current consumption, max. Inrush current, max. Insub current, max. Insub current, max. Insub current, max. Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss, typ. Power of Sidn For SiMATIC memory card SIMATIC memory card required Ves	Isochronous mode	
Ves	Engineering with	
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) 0.83 A Current consumption (rated value) 0.83 A Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value Prower Infeed power to the backplane bus (balanced) 6.2 W Power loss Power loss Power loss typ. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required	STEP 7 TIA Portal configurable/integrated from version	
Screen diagonal [cm] 6.1 cm	Configuration control	
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 7 fs ms 1/s Repeat rate, min. 1/s Input current Current consumption (rated value) 0.83 A Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value Power Infeed power to the backplane bus (balanced) 6.2 W Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	via dataset	Yes
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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/voltage failure stored energy time 5 ms Repeat rate, min. 1/s Input current Current consumption (rated value) 0.83 A Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value Pt 0.6 A²-s Power Infeed power to the backplane bus 12 W Power consumption from the backplane bus (balanced) 6.2 W Power loss Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Control elements	
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/voltage failure stored energy time 5 ms • Repeat rate, min. 1/s Input current Current consumption (rated value) 0.83 A Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value IPt 0.6 A²-s Power Infeed power to the backplane bus 12 W Power consumption from the backplane bus (balanced) 6.2 W Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Number of keys	8
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) 0.83 A Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value If 0.6 A²-s Power Infeed power to the backplane bus (balanced) 6.2 W Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Mode buttons	2
permissible range, lower limit (DC) 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. Inush current, max. Inush current, max. Interest (D. 6 A²-s) Power Infeed power to the backplane bus 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 Yes	Supply voltage	
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Mains/voltage failure stored energy time Repeat rate, min. 1/s Input current Current consumption (rated value) Current consumption, max. 1.03 A Inrush current, max. 1.15 A; Rated value I²t 0.6 A²·s Power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required 5 ms 5 ms 1/s 1/s 1/s 1/s 1/s 1.03 A 1.03 A 1.15 A; Rated value 1.2 W Power 6.2 W 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Reverse polarity protection	Yes
• Repeat rate, min. Input current Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required 1/s 1./s 1./s 1./s 1./s 1./s 1.03 A 1.03 A 1.15 A; Rated value 1.15 A; Rated value 1.2 W Power 6.2 W Power 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Mains buffering	
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Inrush current, max. 1.15 A; Rated value 1²t 0.6 A²-s Power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Current consumption (rated value)	0.83 A
Power Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Current consumption, max.	1.03 A
Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Inrush current, max.	1.15 A; Rated value
Infeed power to the backplane bus Power consumption from the backplane bus (balanced) 6.2 W Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	l²t	0.6 A ² ·s
Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 7.9 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Power	
Power loss Power loss, typ. 7.9 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. 7.9 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power consumption from the backplane bus (balanced)	6.2 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.	7.9 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 program) integrated (for data)	4.5 Mbyte
Load memory	T.O HILLYCO
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	02 02,0
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 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.	4.5 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 	2
 Number of technology synchronous alarm OBs 	2
Number of startup OBs	100
 Number of asynchronous error OBs 	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	, (,
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	165
Number	Any (only limited by the main memory)
Retentivity	Any (only limited by the main memory)
— adjustable	Yes
·	160
Data areas and their retentivity	F12 khyto: In total: available retentive memory for hit managing firmers
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.	4.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
Flag	

• 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	o mayte, max. To the per block
Number of IO modules	9.100; may number of modules / submodules
	8 192; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of
	distributed I/O via PROFINET or PROFIBUS communication modules, but also
	by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
N 1 (10 0 1 iii	inserted in total
Number of IO Controllers	
• integrated	2
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
Dools	inserted in total
Rack	20. CDLL 24 modules
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	31013
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
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
1. Interface	
Interface types	V V
• 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	Yes
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 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 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 IRT	
— for send cycle of 250 μs	$250~\mu s$ 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 3 875 μ s)
Update time for RT	
— for send cycle of 250 μs	250 μs to 128 ms
— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— 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	Von: V2
RJ 45 (Ethernet) Number of parts	Yes; X2
Number of ports integrated switch	1 No
integrated switch Protocols	No
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Controller PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	INO
Services	
— PG/OP communication	Yes
—1 G/OT communication	165

 Isochronous mode 	No
Direct data exchange	No
— IRT	No
— PROFlenergy	
Prioritized startup	Yes; per user program No
Number of connectable IO Devices, max.	
— Number of connectable 10 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
— 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
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
 Autonegotiation 	Yes
 Autocrossing 	Yes
 Industrial Ethernet status LED 	Yes
Protocols	
PROFIsafe	No
Number of connections	
 Number of connections, max. 	256; via integrated interfaces of the CPU and connected CPs / CMs
 Number of connections reserved for ES/HMI/web 	10
 Number of connections via integrated interfaces 	128
Number of connections via integrated interfacesNumber of S7 routing paths	128 16
G	
Number of S7 routing paths Redundancy mode H-Sync forwarding	
Number of S7 routing paths Redundancy mode	16
Number of S7 routing paths Redundancy mode H-Sync forwarding	16
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy	16 Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP interconnection, supported	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ.	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max.	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max.	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing	only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing Data record routing	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing Data record routing S7 communication, as server	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing Data record routing S7 communication, as server S7 communication, as client	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication PG/OP communication S7 routing Data record routing S7 communication, as server S7 communication, as client User data per job, max.	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP MRP MRP Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing Data record routing S7 communication, as server S7 communication, as client User data per job, max. Open IE communication	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes Yes See online help (S7 communication, user data size)
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication PG/OP communication S7 routing Data record routing S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes Yes See online help (S7 communication, user data size)
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP MRP MRP Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication S7 routing Data record routing S7 communication, as server S7 communication, as client User data per job, max. Open IE communication	Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT 200 ms; For MRP, bumpless for MRPD 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes Yes See online help (S7 communication, user data size)

• 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. 118 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption Web server	Yes; Optional
Web server ◆ HTTP	Veg. Standard and user nages
• HTTPS	Yes; Standard and user pages Yes; Standard and user pages
OPC UA	res, Standard and user pages
Runtime license required	Yes; "Medium" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
 User authentication 	"anonymous" or by user name & password
— Number of connections, max.	10
 Number of nodes of the client interfaces, recommended max. 	2 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 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 Application authoritiestics	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes
Application authentication Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15,
occurry policies	Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
 User authentication 	"anonymous" or by user name & password
 — GDS support (certificate management) 	Yes
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. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	100 ms
 Number of server methods, max. 	50
 Number of inputs/outputs per server method, max. 	20
 Number of monitored items, recommended max. 	4 000; 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. 	30 000
Alarms and Conditions	Yes
Number of program alarms	200
Number of program alarms Number of alarms for system diagnostics	100
Further protocols	

• MODBUS	Yes; MODBUS TCP
S7 message functions	100, 1100 2000 101
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	
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	
	Yes
Status/control variable Variables	
Variables Number of variables, max.	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max. of which status variables, max.	200: per jeh
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	N.
• Forcing	Yes
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
Number of configurable Traces Interrupts/diagnostics/status information	4; Up to 512 KB of data per trace are possible
	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	4; Up to 512 KB of data per trace are possible Yes
Interrupts/diagnostics/status information Diagnostics indication LED	
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED	Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED	Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED	Yes Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED • STOP ACTIVE LED	Yes Yes Yes Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED • STOP ACTIVE LED • Connection display LINK TX/RX	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam per cam track	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam per cam track per probe Positioning axis Number of positioning axes at motion control cycle	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value)	Yes Yes Yes Yes Yes Yes Yes Yes Yes Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40 11
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value)	Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40 11
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per external encoder per output cam per cam track per probe Positioning axis Number of positioning axes at motion control cycle of 4 ms (typical value) Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact PID_Step	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact	Yes

High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-30 °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. 	-30 °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
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
 Copy protection 	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Password for display 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	No
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.	456 g

last modified:

8/8/2023