SIEMENS

Data sheet

6ES7515-2AM02-0AB0



*** spare part *** SIMATIC S7-1500, CPU 1515-2 PN, central processing unit with work memory 500 KB for program and 3 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 30 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1515-2 PN
HW functional status	FS01
Firmware version	V2.9
Product function	
• I&M data	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 500 μs (distributed) and 1 ms (central)
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7515-2AM01-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.8 A
Current consumption, max.	1.1 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.2 W
Power loss	
Power loss, typ.	6.3 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

e integrated (for program)	
integrated (for program) integrated (for data)	500 kbyte
integrated (for data) Load memory	3 Mbyte
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Plug-In (SilviAnd Memory Card), max. Backup	<u> </u>
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	30 ns
for word operations, typ.	36 ns
for fixed point arithmetic, typ.	48 ns
for floating point arithmetic, typ.	192 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.	3 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	500 kbyte
FC	
Number range	0 65 535
• Size, max.	500 kbyte
OB	
• Size, max.	500 kbyte
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 500 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	24
per priority class	24
Counters, timers and their retentivity	
S7 counter	2.049
Number Petentivity	2 048
Retentivity	Ves
— adjustable IEC counter	Yes
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— 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.	3 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	

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 16 • Number 16 Clock synchronization Yes • in AS, master Yes • in AS, device Yes • on Ethernet via NTP Yes		
Data books enclose of the second	• Size, max.	16 kbyte
Releventing adjustatio Yes Releventing adjustatio Number of product otals, max. Per priority class, max. Bekapie, max. 16 KB per book. Authorss area Includes of products of submodules Under of the modules of submodules Bitz, max. number of modules of submodules Per product of the modules Submode of the modules of submodules Per product of the modules of submodules Submode of submodules Per product of the modules of submodules Submode of submodes Per product of the modules of submodules Submode of subproces image. Per product of the modules of submodules or finites (e.g. IE-PP Link) Submode of subproces image. Per product of distributed for ovelens Submode of subproces image. Number of subproces image. 2 Number of distributed for ovelens Submode of subproces image. Number of distributed for ovelens 2 Number of distr distribut	Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
• NoNoLocal idea• per priority class, max.64 kbyte: max. 16 KB per blockAddress area• Inputs8 192, max, number of modules / submodules• Inputs32 kbyte, All inputs are in the process image• Inputs32 kbyte, All inputs are in the process image• Inputs (volume)8 kbyte• Ordprick (volume)8 kbyte• Number of Disprocess insiges9• Via CdA8. A maximum of & CMs/CPs (PROFIBUS, PROFINET, Elternet) can be insinger and in kball• Number of Disprick2• Via CdA8. A maximum of & CMs/CPs (PROFIBUS, PROFINET, Elternet) can be insinger and in kball• Via CdA8. A maximum of & CMs/CPs (PROFIBUS, PROFINET, Elternet) can be insinger and in kball• Via CdA8. A maximum of & CMs/CPs (PROFIBUS, PROFINET, Elternet) can be insinger and in kball• Via CdA9• Number of PIP CMs9• Number of PIP CMs <t< td=""><td>Data blocks</td><td></td></t<>	Data blocks	
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• exp profily class, max. 94 kbyte; max. 16 KB per block Address area • Number of O noclules 8 log; max. number of modules / submodules • Inputs 32 kbyte; All inputs are in the process image • Inputs • Inputs 32 kbyte; All inputs are in the process image • Inputs • Inputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Outputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Outputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Outputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Outputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Outputs (volume) 8 kbyte • Inputs (volume) • Inputs (volume) • Number of subprocess images, max. 32 • Inputs (volume) • Inputs (volume) • Number of the Uprocess image • A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inscrited in kball • Inputs (volume) • Via CM 8. A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inscrited in kball • Inputs (volume) • Via CM 8. A maximum of 8 CMs/CPs (P	Retentivity preset	No
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• integrated2• Via CM8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in totalRack2; CPU + 31 modulesRack3; CPU + 31 modules• Number of lines, max.1PIP CM1• Number of PIP CMsslotsTime of day5Clock4• Number of PIP CMs6 wk; At 40 °C ambient temperature, typically• Deviation per day, max.10 s; Typ: 2 s• Operating hours counter5• Number of PAP6 wk; At 40 °C ambient temperature, typically• Deviation per day, max.10 s; Typ: 2 s• Operating hours counter9• Number10 s; Typ: 2 s• Operating hours counter9• Number of PROFINET interfaces9• Number of PROFINET interfaces9• Number of PROFINET interfaces9• Number of PROFINET interfaces2• Number of PROFINET interfaces2• Number of PROFINET interfaces2• RJ 45 (Ethernet)9• RJ 45 (Ethernet)2• Number of ports2• Interface types9• PROFINET ID Controller9• PROFINET ID Controller9• PROFINET ID Device9• PROFINET ID Device9• SIMATIC communicationYes	• Via CM	
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• Modules per rack, max.32; CPU + 31 modules• Number of lines, max.1PIP CMInternational Connectable PIP CMs is only limited by the number of available slots• Number of PIP CMsthe number of connectable PIP CMs is only limited by the number of available slots• Time of day•Clock•• TypeHardware clock 6 wk; At 40 °C ambient temperature, typically 0 beviation per day, max.• Deviation per day, max.10 s; Typ. 2 sOperating hours counter16• Number16Clock synchronizationYes• In AS, device • on Ethernet via NTPYes• Number of PROFINET interfaces2Interfaces1Interface types1• RJ 45 (Ethernet) • Number of ports • lineface typesYes; X1 • S• RJ 45 (Ethernet) • Number of ports • linefacet switchYes; Y1 • S• PROFINET IO Controller • PROFINET IO ControllerYes; IPV4 	• Via CM	
• Number of lines, max. 1 PIP CM the number of connectable PIP CMs is only limited by the number of available solds Time of day Clock • Number of PIP CMs Hardware clock • Backup time 6 wk; At 40 °C ambient temperature, typically • Deviation per day, max. 10 s; Typ: 2 s Operating hours counter 16 • Number 16 Clock synchronization Yes • in AS, master Yes • in AS, device Yes • on Ethernet via NTP Yes Number of POROFINET interfaces 2 Number of POROFINET interfaces 2 • Interface types Yes; X1 • Number of ports 2 • Number of ports 2 • Interfacet switch Yes; IPV4 • Interfacet switch Yes • IP protocol Yes; IPV4 • IP protocol IP of controller Yes • IP protocol IP of ports Yes • IP protocol IP of police Yes	Rack	
PIP CM • Number of PIP CMs the number of connectable PIP 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. 0 beviation seconter • Number 16 Clock synchronization • Number 16 Clock synchronization Yes • in AS, master Yes • in AS, master Yes • on Ethernet via NTP Yes Interfaces 2 Interface types 2 • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • Interface switch Yes • Protocols Yes • PROFINET IO Controller Yes • PROFINET IO Device Yes • PROFINET IO Device Yes	 Modules per rack, max. 	32; CPU + 31 modules
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 • in AS, master Yes • in AS, device Yes • number of PROFINET interfaces 2 Interface Yes • number of PROFINET interfaces 2 • RJ 45 (Ethernet) Yes; X1 • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • Protocol Yes • Interface types Yes • RJ 45 (Ethernet) Yes; X1 • RD FINET IO Controller Yes • PROFINET IO Controller Yes • ROFINET IO Device Yes	 Number of lines, max. 	1
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 in AS, master in AS, device ion Ethernet via NTP Yes Number of PROFINET interfaces 2 RJ 45 (Ethernet) Number of ports	PtP CM	
Clock • Type Hardware clock • Backup time 6 wk; At 40 °C ambient temperature, typically • Deviation per day, max. 10 s; Typ.: 2 s Operating hours counter 10 • Number 16 Clock synchronization ************************************	Number of PtP CMs	
• TypeHardware clock• Backup time6 wk; At 40 °C ambient temperature, typically• Deviation per day, max.10 s; Typ.: 2 sOperating hours counter16• Number16Clock synchronizationYes• in AS, masterYes• in AS, deviceYes• on Ethernet via NTPYesNumber of PROFINET interfaces2InterfaceYes; X1• Interface typesYes; X1• interface typesYes• ProtocolYes; Y1• ProtocolYes; IPV4• PROFINET IO ControllerYes; IPV4• PROFINET IO DeviceYes; IPV4• RSUADINET IO DeviceYes• SIMATIC communicationYes	Time of day	
• Backup time6 wk; At 40 °C ambient temperature, typically• Deviation per day, max.10 s; Typ.: 2 sOperating hours counter16• Number16Clock synchronizationYes• in AS, masterYes• in AS, deviceYes• on Ethernet via NTPYesNumber of PROFINET interfaces2Interface types2• Interface typesYes; X1• Interface typesYes• Interface typesYes• Interface switchYes; X1• Number of ports2• Interface typesYes; Y1• Interface typesYes; Y1• ProtocolYes; IPv4• PROFINET IO ControllerYes; IPv4• PROFINET IO ControllerYes; IPv4• PROFINET IO DeviceYes; IPv4• SIMATIC communicationYes	Clock	
• Deviation per day, max.10 s; Typ: 2 sOperating hours counter16• Number16Clock synchronizationYes• supportedYes• supportedYes• in AS, masterYes• in AS, deviceYes• on Ethernet via NTPYesNumber of PROFINET interfaces2Interface typesYes; X1• Interface typesYes; X1• Number of ports2• integrated switchYes; X1• ProtocolYes; IPV4• PROFINET IO ControllerYes; IPV4• PROFINET IO ControllerYes; IPV4• PROFINET IO DeviceYes; Name, Yes• SIMATIC communicationYes	• Туре	Hardware clock
Operating hours counter Instrume • Number 16 Clock synchronization * • supported Yes • in AS, master Yes • in AS, device Yes • on Ethernet via NTP Yes Interfaces * Number of PROFINET interfaces 2 1. Interface types * • Number of ports 2 • integrated switch Yes; X1 Protocols Yes; IPv4 • PROFINET IO Controller Yes; IPv4 • PROFINET IO Device Yes; SIMATIC communication	Backup time	6 wk; At 40 °C ambient temperature, typically
• Number16Clock synchronization• supportedYes• in AS, masterYes• in AS, deviceYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces21. Interface typesYes; X1• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYesProtocolsYes; IPv4• PROFINET IO ControllerYes; IPv4• PROFINET IO DeviceYes• SIMATIC communicationYes	Deviation per day, max.	10 s; Typ.: 2 s
Clock synchronization• supportedYes• in AS, masterYes• in AS, deviceYes• on Ethernet via NTPYesInterfaces2Interfaces2Interface types• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYesProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	Operating hours counter	
• supportedYes• in AS, masterYes• in AS, deviceYes• on Ethemet via NTPYesInterfacesZInterface2• Interface typesYes• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYes• ProtocolsYes• IP protocolYes; IPV4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	Number	16
in AS, masterYesin AS, deviceYesin AS, deviceYesin Chernet via NTPYesInterfacesInterfacesInterface types• RJ 45 (Ethernet)Yes; X1• RJ 45 (Ethernet)2• Interface typesYes• ProtocolsYes• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	Clock synchronization	
• in AS, deviceYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces21. InterfaceYes; X1• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYesProtocolsYes; IPv4• PROFINET IO ControllerYes; IPv4• PROFINET IO DeviceYes• SIMATIC communicationYes	supported	Yes
• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces21.InterfaceYes; X1Interface types2• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYesProtocolsYes; IPv4• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	• in AS, master	Yes
• on Ethernet via NTPYesInterfacesNumber of PROFINET interfaces21. InterfaceInterface types• RJ 45 (Ethernet)Yes; X1• Number of ports2• integrated switchYesProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	• in AS, device	Yes
Number of PROFINET interfaces 2 Interface 1 Interface types - Interface types 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		Yes
Number of PROFINET interfaces 2 Interface 1 Interface types - Interface types 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	Interfaces	
1. Interface Interface types • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols Yes; IPv4 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes		2
Interface types • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols Yes; IPv4 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes		
• RJ 45 (Ethernet)Yes; X1• Number of ports2• Integrated switchYesProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes		
• Number of ports2• integrated switchYesProtocolsYes; IPv4• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes		Yes: X1
• integrated switch Yes Protocols • IP protocol Yes, IPv4 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes		
Protocols Yes; IPv4 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes		
• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes	· · · · · · · · · · · · · · · · · · ·	
• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes		VegilDu4
PROFINET IO Device Yes SIMATIC communication Yes		
SIMATIC communication Yes		
Open IE communication Yes; Optionally also encrypted		
	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. of which in line, max 	256 256
 — of which in line, max. — Number of IO Devices that can be simultaneously 	8: in total across all interfaces
activated/deactivated, max.	
 Number of IO Devices per tool, max. 	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
— for send cycle of 250 µs	250 μs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 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
. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
Number of ports	1
integrated switch	No
Protocols	
IP protocol	Yes; IPv4
	Yes
PROFINET IO Controller	
PROFINET IO Device	Yes
PROFINET IO Device SIMATIC communication	Yes
PROFINET IO DeviceSIMATIC communicationOpen IE communication	Yes Yes; Optionally also encrypted
 PROFINET IO Device SIMATIC communication Open IE communication Web server 	Yes Yes; Optionally also encrypted Yes
 PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy 	Yes Yes; Optionally also encrypted
 PROFINET IO Device SIMATIC communication Open IE communication Web server 	Yes Yes; Optionally also encrypted Yes
 PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy 	Yes Yes; Optionally also encrypted 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
— 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
Autoregoliation Autoregoliation	Yes
Industrial Ethernet status LED	Yes
	Tes
Protocols	Al-
PROFIsafe	No
Number of connections	
Number of connections, max.	192; 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	108
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 MRP interconnection, supported 	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
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
 MRP MRP interconnection, supported 	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
 MRP MRP interconnection, supported MRPD 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication 	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
 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 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication \$7 routing \$7 communication, as server 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication \$7 routing \$7 communication, as server \$7 communication, as client 	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
 MRP MRP interconnection, supported MRPD Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication \$7 routing \$7 communication, as server \$7 communication, as client User data per job, max. 	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
 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 S7 communication, as server S7 communication, as client User data per job, max. Open IE communication	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 See online help (S7 communication, user data size)
 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 S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP 	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 See online help (S7 communication, user data size)
 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 S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. 	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 See online help (S7 communication, user data size) Yes 64 kbyte

— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server HTTP	Vac: Standard and user pages
• 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
- 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_L max. 	300
 — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. 	20
 — Number of elements for one call of OPC_UA_MethodGetHandleList, max. 	100
 — Number of simultaneous calls of the client instructions for session management, per connection, max. 	1
 — Number of simultaneous calls of the client instructions for data access, per connection, max. 	5
 Number of registerable nodes, max. 	5 000
 — Number of registerable method calls of OPC_UA_MethodCall, max. 	100
 — Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	20
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
 — 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. 	20
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
- Number of server methods, max.	50
 — Number of inputs/outputs per server method, max. 	20
- Number of monitored items, recommended max.	2 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
 — Number of nodes for user-defined server interfaces, max. 	5 000
Alarms and Conditions	Yes
— Number of program alarms	200
 — Number of alarms for system diagnostics 	100
Further protocols	
MODBUS	Yes; MODBUS TCP
Isochronous mode	

Fauidistance	Vac
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	64
Program alarms	Yes
Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	5 000
Number of simultaneously active program alarms	
 Number of program alarms 	800
 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	
Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
 Number of variables, max. 	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
• 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
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Vac
	tes
	Yes
• ERROR LED	Yes
• ERROR LED • MAINT LED	Yes Yes
 ERROR LED MAINT LED STOP ACTIVE LED 	Yes Yes Yes
 ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX 	Yes Yes
ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects	Yes Yes Yes
 ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX 	Yes Yes Yes Yes Yes
ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects	Yes Yes Yes
ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control	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
ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for	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
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 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
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 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
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 Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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; 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
 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
 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 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 Yes
 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 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 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 Yes Yes
 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 probe Positioning axis Number of positioning axes at motion control cycle of 4 ms (typical value) Controller 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
 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 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) PID_Compact 	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 40 80 160 80 20 160 40 7 Yes; Universal PID controller with integrated optimization

High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-25 °C; No condensation
 horizontal installation, max. 	60 $^\circ\text{C};$ Display: 50 $^\circ\text{C},$ at an operating temperature of typically 50 $^\circ\text{C},$ the display is switched off
 vertical installation, min. 	-25 °C; No condensation
• vertical installation, max.	40 $^\circ\text{C};$ Display: 40 $^\circ\text{C},$ at an operating temperature of typically 40 $^\circ\text{C},$ 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
— 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: 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.	830 g
last modified	12/2/2024

last modified:

12/8/2024 🖸