SIEMENS

Data sheet

6ES7515-2AM01-0AB0



*** 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	FS03
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) / V13 (FW V1.5) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode selector switch	1
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
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	
• integrated (for program)	500 kbyte
• integrated (for data)	3 Mbyte

Load memory	
	22 Chuta
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	N/
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
• Size, max.	000 Myle
	500 khita
• 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	-
Nesting depth	
per priority class	24
	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	
Number	Any (only limited by the main memory)
	Any torny limited by the main memory)
Retentivity	Vec
— 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 3 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Extended retentive data area (incl. timers, counters, flags), max. Flag	
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Data blaska	
Data blocks	Vec
Retentivity adjustable	Yes No
Retentivity preset	NO
Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	8 192; max. number of modules / submodules
I/O address area	
Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	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 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	
• Туре	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
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols	
IP protocol	Yes; IPv4
IP protocol PROFINET IO Controller	Yes; IPv4 Yes
•	
PROFINET IO Controller	Yes
PROFINET IO Controller PROFINET IO Device	Yes Yes
PROFINET IO ControllerPROFINET IO DeviceSIMATIC communication	Yes Yes

Bit Market State St	PROFINET IO Controller	
- PGOP communication Yes - Isochronus mode Yes - Direct data exchange Yes, Requirement: IRT and isochronous mode (MRPD optional) - RT Yes - PROFilterity Yes, Yes, Mar. 20 PROFINED - Number of connectable ID Devices, max. 285, In that Job (NILT) Educes - Of which ID devices with IRT, max. 84 - Number of connectable ID Devices for RT, max. 84 - Number of connectable ID Devices for RT, max. 84 - Of which ID devices with IRT, max. 84 - Of which ID devices with IRT, max. 84 - Number of ID Devices for IRT 285 - Update time for IRT 280 (pi to 185 no - Or send cycle of 250 (pi to 50 (pi to		
- Isochronous model Yes - IRT Yes, Requirement: IRT and isochronous mode (MRPD optional) - IRT Yes, per user program - PROFIGHENERY Yes, per user program - Protocted startup Yes, per user program - Protocted startup Yes, per user program - Number of connectable ID Devices, max. Bit In tabil up to 1000 destributed ID devices can be connected Via AS-I, per UPADINET Content - Number of connectable ID Devices for RT, max. Bit In tabil up to 1000 destributed ID devices and ne communication the simulation of the up date time allo depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on optimum devices and the up date time allow depends on communication there allow depends on the up date time allow depends on communication there allow depends on the up date time allow depends on communication there allow depends on the up date time allow depends on the up d		Yes
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 PROF learency Ves: per user program Prioritized startup Number of connectable IO Devices, max. Prof Pio Devices Of which IO devices with IRT, max. Prof Pio Devices Number of connectable IO Devices for TT, max. Prof Pio Devices Prof Pio Devices Number of Devices per tool, max. Bet of the internet of too nectable IO Devices for TT, max. Prof Pio Devices Prof Pio Devices per tool, max. Update fine for IRT Update fine for IRT Prof Pio Devices per tool, max. In total across all interfaces In total across all interfaces In the part of Devices, and on the quantity of the update time also depends on communication than equantity of the update time for IRT In the part of Devices per tool, max. In the part of Devices of tool part of the part of Devices, and on the quantity of the update time for IRT In the of Start of Devices are tool, max. In the of Start of Devices are tool, part of the main mum value of the update time also depends on communication than equatity of the update time of Start of Devices, and on the quantity of the tool part of Devices are tool, part of the main mum value of the update time also depends on communication the quantity of the tool part of Devices are tool part of the device of Start of Devices are tool part of the tool part of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the tool part of tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Devices are tool part of the device of Start of Device	-	
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PROFINIST PROFINIST - O' which 10 devices with IRT, max. 26 - Number of connectable IO Devices for RT, max. 256 - Number of IO Devices that can be simultaneously explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication share explored by the state of the update time also depends on communication the state of the update time also depends on communication the state of the update time also depends on communication the state of the update time also depends on communication the state of the update time also depends on communication the state of the update time also depends on communication the state of the update tim		
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- for send cycle of 2 ms2 ms to 512 ms- for send cycle of 4 ms4 ms to 512 msPROFINET IO DeviceServices- PGOP communicationYes- IRTYes- PROFInergyYes; per user program- Shared deviceYes; per user program- Shared deviceYes; per user program- Asset management recordYes; per user program- Asset management recordYes; per user program- Asset management recordYes; per user program• Number of 10 Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program• Asset management recordYes; per user program• Number of ports1• Interface typesYes; Y2• Interface typesYes; N2• ProtocolYes; IPv4• ProtocolYes• PROFINET IO ControllerYes; Optionally also encrypted• PROFINET IO DeviceYes; Optionally also encrypted• SIMATIC communicationYes; Optionally also encrypted• Web serverYes; Optionally also encrypted• Media redundancyNoPROFINET IO ControllerYes; Optionally also encrypted• PCOPO communicationYes; Optionally also encrypted• PROFINET IO ControllerYes; Optionally also encrypted• Media redundancyNo• PCOPO communicationYes; Optionally also encrypted• PCOPO communicationYes• PCOPO communicationYes <td>— for send cycle of 500 μs</td> <td>500 µs to 256 ms</td>	— for send cycle of 500 μs	500 µs to 256 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 PROFInergy 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 Asset management record Yes; per user program Interface Interface types - RJ 45 (Ethernet) - RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • Integrated switch No Protocol Protocol • PROFINET IO Controller Yes; PV4 • PROFINET IO Controller Yes; Optionally also encrypted • Web server Yes <	— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device Services - PC/OP communication Yes - Isochronous mode No - Isochronous mode No - IRT Yes - PROFIenergy Yes; per user program - Shared device Yes - Number of IO Controllers with shared device, max. 4 - activation/deactivation of L-devices Yes; per user program - Asset management record Yes; per user program - Asset management record Yes; X2 Interface types 1 • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocol Yes; IPv4 • PROFINET IO Controller Yes • IP protocol Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller Yes • Media redundancy No PROFINET IO Controller Yes • SIMATIC communication Yes • Media redundancy No <t< td=""><td>— for send cycle of 2 ms</td><td>2 ms to 512 ms</td></t<>	— for send cycle of 2 ms	2 ms to 512 ms
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-IRTYes-PROFlenergyYes; per user program-Shared deviceYes-Shared device4-Author of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program2.InterfaceTerritoreInterface types1• RJ 45 (Ethernet)Yes; X2• Number of ports1• Interface switchYes• ProtocolsYesProtocolYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• SIMATIC communicationYes; Optionally also encrypted• Web serverYes• Media redundancyYesPROFINET IO ControllerYes; Optionally also encrypted• PROFINET IO ControllerYes; Optionally also encrypted• Media redundancyYes• NoTerritor• PROFORInterface• PROFORNo	— PG/OP communication	Yes
PROFlenergyYes- Shared deviceYes- Number of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program2. InterfaceYes; per user program2. Interface typesYes; X2Interface typesYes; X2• Number of ports1• Number of portsNo• IP protocolYes; IPV4• PROFINET IO ControllerYes• PROFINET IO ControllerYes• PROFINET IO DeviceYes; Optionally also encrypted• Media redundancyYes• Media redundancyNoPROFINET IO ControllerYes; Optionally also encrypted• Media redundancyNoPROFINET IO ControllerYes• PROFINET IO ControllerYes• ID OpticeYes• ID OpticeYes• ID OpticeYes• ID OpticeYes• ID OpticeYes <td>— Isochronous mode</td> <td>No</td>	— Isochronous mode	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 2. Interface Terface types Interface types Yes; X2 Number of ports 1 Integrated switch No Protocols Yes; IPv4 PROFINET IO Controller Yes INATIC communication Yes Open IE communication Yes; Optionally also encrypted Web server Yes Media redundancy Yes PROFINET IO Controller Yes PROFINET IO Controller Yes Open IE communication Yes Web server Yes Media redundancy No	— IRT	Yes
- Number of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program2. InterfaceInterface types• RJ 45 (Ethernet)Yes; X2• Number of ports1• Integrated switchNoProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNoPROFINET IO ControllerYes• PROFINET IO ControllerYes• Media redundancyNo• PROFINET IO ControllerYes• PROFINET IO ControllerYes• Media redundancyNo• PROFINET IO ControllerYes• In the protocolYes• Media redundancyNo• PROFINET IO ControllerYes• In the protocolYes• Media redundancyNo• DevicesNo• DevicesNo• DevicesNo• PROFINET IO ControllerYes• NoNo• PROFINET IO ControllerNo• PROFINET IO ControllerNo• PROFINET IO ControllerNo• DevicesNo• DevicesNo• DevicesNo• DevicesNo• DevicesNo• DevicesNo• DevicesNo•	— PROFlenergy	Yes; per user program
	— Shared device	Yes
Asset management record Yes; per user program 2. Interface Interface types RJ 45 (Ethernet) Yes; X2 Number of ports 1 integrated switch No Protocols IP protocol Yes; IPv4 PROFINET IO Controller Yes SIMATIC communication Yes; Optionally also encrypted Open IE communication Yes; Optionally also encrypted No PROFINET IO Controller Yes; Optionally also encrypted No PROFINET IO Controller Yes Open IE communication Yes; Optionally also encrypted No PROFINET IO Controller Yes Media redundancy No No PROFINET IO Controller Services PROFINET IO controller No 	 — Number of IO Controllers with shared device, max. 	4
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 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes; Optionally also encrypted • Open IE communication Yes; Optionally also encrypted • Media redundancy No PROFINET IO Controller Yes • Open IE communication Yes; Optionally also encrypted • Media redundancy No PROFINET IO Controller Yes • Media redundancy No		Yes; per user program
2. Interface Interface types • RJ 45 (Ethernet) • Number of ports • Number of ports • integrated switch Protocols • IP protocol • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Ves; Optionally also encrypted • Web server • Media redundancy PROFINET IO Controller • Services - PG/OP communication Yes • Media redundancy No		
Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocols Yes; IPv4 • IP protocol Yes; IPv4 • PROFINET IO Controller Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller Yes • Media redundancy No PROFINET IO controller Yes • Jeschronous mode No		
• RJ 45 (Ethernet)Yes; X2• Number of ports1• integrated switchNoProtocolsYes; IPv4• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNoPROFINET IO ControllerServices		
Number of ports1• integrated switchNoProtocolsProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNoPROFINET IO ControllerYes• PROFINET IO ControllerYes• Media redundancyNo• PROFINET IO ControllerYes• In the protocolYes• NoNo		Yes: X2
• integrated switchNoProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyYesVerorServices- PG/OP communicationYes- PG/OP communicationYes• NoNo		
Protocols Yes; IPv4 • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller Services		
• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNoServices- PG/OP communication- PG/OP communicationYes• NoNo		
PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNoPROFINET IO ControllerYesServicesYes- PG/OP communicationYes- Isochronous modeNo		Yes: IPv4
• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo• PROFINET IO ControllerYesServicesYes- PG/OP communicationYes- PG/OP communicationYes• NoNo		
• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo• PROFINET IO ControllerYes- PG/OP communicationYes- PG/OP communicationYes- Isochronous modeNo		
• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo• PROFINET IO ControllerYes- PG/OP communicationYes- PG/OP communicationYes- Isochronous modeNo		
• Web server Yes • Media redundancy No PROFINET IO Controller Services - PG/OP communication Yes - Isochronous mode No		
• Media redundancy No PROFINET IO Controller		
PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode No		
Services		No
— PG/OP communication Yes — Isochronous mode No		
— Isochronous mode No		
	— PG/OP communication	Yes
— Direct data exchange No	— Isochronous mode	No
	— Direct data exchange	No

	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
Autocrossing	Yes
 Industrial Ethernet status LED 	Yes
	165
Protocols	
	No
Protocols	
Protocols PROFIsafe	No
Protocols PROFIsafe Number of connections	
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web	No 192; via integrated interfaces of the CPU and connected CPs / CMs
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 Yes
Protocols PROFIsafe Number of connections Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — Media redundancy	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 Yes only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP — MRP interconnection, supported	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP — MRP interconnection, supported — MRPD	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — Media redundancy — MRP — MRP — MRPD — Switchover time on line break, typ.	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — Media redundancy — MRP — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — Number of stations in the ring, max.	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP — MRP — MRP — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - Media redundancy - MRP - MRP - MRPD - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - Media redundancy - MRP - MRP - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy — MRP — MRP — MRP — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max.	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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 See online help (S7 communication, user data size)
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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 See online help (S7 communication, user data size) Yes
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - MRPD - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. - several passive connections per port, supported	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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 See online help (S7 communication, user data size) Yes 64 kbyte
Protocols PROFIsafe Number of connections • Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. - several passive connections per port, supported • ISO-on-TCP (RFC1006)	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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 Yes See online help (S7 communication, user data size) Yes 64 kbyte Yes 94 kbyte Yes 95 kite
Protocols PROFIsafe Number of connections • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of S7 routing paths Redundancy mode • H-Sync forwarding Media redundancy - MRP - MRP - MRP - MRPD - Switchover time on line break, typ. - Number of stations in the ring, max. SIMATIC communication • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. - several passive connections per port, supported	No 192; via integrated interfaces of the CPU and connected CPs / CMs 10 108 16 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 See online help (S7 communication, user data size) Yes 64 kbyte Yes

— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
 Runtime license required 	Yes; "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
— 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	
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
est 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. — of which control variables, max. 	200; per job 200; per job
Forcing	
Forcing	Yes
 Forcing Forcing, variables 	Peripheral inputs/outputs
-	200
Number of variables, max.	200
Diagnostic buffer	Vee
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
nterrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	2 400
Required Motion Control resources	
- per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
Positioning axis	
 — Number of positioning axes at motion control cycle of 4 ms (typical value) 	7
 — Number of positioning axes at motion control cycle 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	
Counting and measuring • High-speed counter	Yes
	Yes

 horizontal installation, min. 	0 °C
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
 vertical installation, min. 	0°C
• 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
— 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	7/13/2024

last modified:

7/13/2024 🖸