## **SIEMENS**

## Data sheet

## 6ES7517-3FP00-0AB0

SIMATIC S7-1500F, CPU 1517F-3 PN/DP, Central processing unit with Work memory 3 MB for Program and 8 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required



General information	
Product type designation	CPU 1517F-3PN/DP
HW functional status	FS04
Firmware version	V2.5
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V15 (FW V2.5) / V13 Update 3 (FW V1.6) 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	
Type of supply voltage	24 V DC
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)	1.55 A
Inrush current, max.	2.4 A; Rated value
<sup>2</sup> t	0.02 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus	30 W
(balanced)	
Dower loop	
Power loss Power loss, typ.	24 W
	2 - 11
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
<ul> <li>integrated (for program)</li> </ul>	3 Mbyte
<ul> <li>integrated (for data)</li> </ul>	8 Mbyte
Load memory	
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte
Backup	
maintenance-free	Yes
CPUL processing times	
CPU processing times for bit operations, typ.	2 ns
for word operations, typ.	3 ns
for fixed point arithmetic, typ.	3 ns
for floating point arithmetic, typ.	12 ns
	12.10
CPU-blocks	
Number of elements (total)	10 000; 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.	8 Mbyte; For non-optimized block accesses, the max. size of the DB 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
<ul> <li>Number of free cycle OBs</li> </ul>	100
<ul> <li>Number of time alarm OBs</li> </ul>	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 100 µs
<ul> <li>Number of process alarm OBs</li> </ul>	50
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	2
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of startup OBs</li> </ul>	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
<ul> <li>Number of diagnostic alarm OBs</li> </ul>	1
Nesting depth	
● per priority class	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
• Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags),	768 kbyte; Available retentive memory for bit memories, timers,
max.	counters, DBs, and technology data (axes): 700 KB
Extended retentive data area (incl. timers, counters,	8 Mbyte; When using PS 60W 24/48/60V DC HF
flags), max. Flag	
• Number, max.	16 kbyte

Data blocksYes• Retentivity adjustableYes• Retentivity presetNoLocal data64 kbyte; max• per priority class, max.64 kbyte; maxAddress area64 kbyte; maxNumber of IO modules16 384; max.I/O address area16 384; max.• Inputs32 kbyte; All in• Outputs32 kbyte; All in• Inputs (volume)16 kbyte; 16 k- Outputs (volume)16 kbyte; 16 k- Outputs (volume)16 kbyte; 16 k	nory bit, grouped into one clock memory byte . 16 KB per block number of modules / submodules nputs are in the process image
<ul> <li>Retentivity preset</li> <li>Retentivity preset</li> <li>No</li> <li>Local data         <ul> <li>per priority class, max.</li> <li>64 kbyte; max</li> </ul> </li> <li>Address area         <ul> <li>I/O address area</li> <li>Inputs</li> <li>Outputs</li> <li>S2 kbyte; All in the integration of the integ</li></ul></li></ul>	number of modules / submodules nputs are in the process image
<ul> <li>Retentivity preset</li> <li>No</li> <li>Local data         <ul> <li>per priority class, max.</li> </ul> </li> <li>Address area</li> <li>Number of IO modules</li> <li>16 384; max.</li> <li>I/O address area</li> <li>Inputs</li> <li>Outputs</li> <li>Outputs</li> <li>Inputs (volume)</li> <li>Kbyte; 16 K via the integrated IO subsystem</li> <li>Outputs (volume)</li> <li>Kbyte; 16 K via the integrated IO subsystem</li> <li>Outputs (volume)</li> </ul>	number of modules / submodules nputs are in the process image
Local data• per priority class, max.64 kbyte; maxAddress area64 kbyte; maxNumber of IO modules16 384; max.I/O address area16 384; max.• Inputs32 kbyte; All in 32 kbyte; All in 9 coutputs• Outputs32 kbyte; All in 9 coutputs— Inputs (volume)16 kbyte; 16 k via the integra— Outputs (volume)16 kbyte; 16 k via the integra	number of modules / submodules nputs are in the process image
<ul> <li>per priority class, max.</li> <li>64 kbyte; max</li> <li>Address area</li> <li>I/O address area</li> <li>Inputs</li> <li>Outputs</li> <li>Outputs</li> <li>16 kbyte; All or</li> <li>per integrated IO subsystem</li> <li>Inputs (volume)</li> <li>Mathematical and the integration of the</li></ul>	number of modules / submodules nputs are in the process image
Address area         Number of IO modules       16 384; max.         I/O address area       32 kbyte; All in         • Inputs       32 kbyte; All in         • Outputs       32 kbyte; All of         per integrated IO subsystem       16 kbyte; 16 k         — Inputs (volume)       16 kbyte; 16 k         via the integrated ion (volume)       16 kbyte; 16 k         With the integrated ion (volume)       16 kbyte; 16 k         Via the integrated ion (volume)       16 kbyte; 16 k         With the integrated ion (volume)       16 kbyte; 16 k	number of modules / submodules nputs are in the process image
Number of IO modules       16 384; max.         I/O address area       32 kbyte; All in         • Inputs       32 kbyte; All in         • Outputs       32 kbyte; All in         • Inputs       32 kbyte; All in         • Outputs       32 kbyte; All in         • Inputs (volume)       16 kbyte; 16 k         - Outputs (volume)       16 kbyte; 16 k         via the integrated in the integr	nputs are in the process image
I/O address area       32 kbyte; All in         • Inputs       32 kbyte; All in         • Outputs       32 kbyte; All in         per integrated IO subsystem       32 kbyte; All in         — Inputs (volume)       16 kbyte; 16 k         — Outputs (volume)       16 kbyte; 16 k         — Outputs (volume)       16 kbyte; 16 k         via the integrate       16 kbyte; 16 k	nputs are in the process image
<ul> <li>Inputs</li> <li>Outputs</li> <li>Outputs</li> <li>2 kbyte; All in 32 kbyte; All in 32 kbyte; All of 22 kbyte; All of 32 kbyte; All of</li></ul>	
Outputs 32 kbyte; All of per integrated IO subsystem     — Inputs (volume) 16 kbyte; 16 k     via the integra     — Outputs (volume) 16 kbyte; 16 k     via the integra	
per integrated IO subsystem     16 kbyte; 16 k       Inputs (volume)     16 kbyte; 16 k       Outputs (volume)     16 kbyte; 16 k       via the integrated inte	
<ul> <li>Inputs (volume)</li> <li>16 kbyte; 16 k</li> <li>via the integra</li> <li>Outputs (volume)</li> <li>16 kbyte; 16 k</li> <li>via the integra</li> </ul>	outputs are in the process image
<ul> <li>Outputs (volume)</li> <li>Via the integra</li> <li>16 kbyte; 16 k</li> <li>via the integra</li> </ul>	
— Outputs (volume) 16 kbyte; 16 k via the integra	B via the integrated PROFINET IO interface, 8 KB
via the integra	ted DP interface
per CM/CP	KB via the integrated PROFINET IO interface, 8 KB ted DP interface
— Inputs (volume) 8 kbyte	
— Outputs (volume) 8 kbyte	
Subprocess images	
• Number of subprocess images, max. 32	
Hardware configuration	
integration of communication	ed I/O system is characterized not only by the distributed I/O via PROFINET or PROFIBUS n modules, but also by the connection of I/O via AS- iles or links (e.g. IE/PB-Link)
Number of DP masters	
• integrated 1	
• Via CM 8; A maximum can be inserted	n of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) ed in total
Number of IO Controllers	
• integrated 2	
• Via CM 8; A maximum can be inserted	n of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) ed in total
Rack	
• Modules per rack, max. 32; CPU + 31	modules
Number of lines, max.	
PtP CM	
Number of PtP CMs     the number of of available sl	
Time of day	connectable PtP CMs is only limited by the number ots

Clock

• Backup time6 wk; At 40 °C ambient temperature, typically• Deviation per day, max.10 s; Typ.: 2 sOperating hours counter16• Number16Clock synchronizationYes• to DP, masterYes• in AS, masterYes• in AS, slaveYes• on Ethernet via NTPYesInterfacesNumber of PROFINET interfaces2Number of PROFIBUS interfaces1		
• Deviation per day, max.10 s. Typ. 2 sOperating hours counter• Number16Clock synchronizationYes• to DP, masterYes• to DP, masterYes• n AS, masterYes• n AS, shaveYes• n AS, shaveYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces2Number of PROFINET interfaces2• Number of profs2• Number of ports2• Number of ports2• RJ 45 (Ethernet)Yes• PROFINET IO ControllerYes• IP protocolYes• PROFINET IO ControllerYes• ServicesYes• ServicesYes• ServicesYes• ServicesYes• PROFINET IO ControllerYes• ServicesYes• ServicesYes• PROFINET IO ControllerYes• ServicesYes• Marce of profsYes• MARD communicationYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• Number of profsYes• MERPYes• Number of profsYes• ServicesYes• ServicesYes• ServicesYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• ServicesY	• Туре	Hardware clock
Operating hour sconter         16           Clock synchronization         16           Clock synchronization         Yes           • supported         Yes           • in AS, master         Yes           • in AS, slave         Yes           • on Ethernet via NTP         Yes           Interfaces         2           Number of PROFINET interfaces         2           Number of PROFINET interfaces         1           Interface         2           Number of PROFINET interfaces         2           Number of PROFINET interfaces         2           Number of PROFINET interfaces         2           Interface         1           Profecode         Yes           • RJ 45 (Ethernet)         Yes; X1           Protocol         Yes           • PROFINET IO Contoller         Yes           • PROFINET IO Device         Yes           • SIMATIC communication         Yes           • Web server         Yes           • Media redundancy         Yes; MRP Automanager according to IEC 62439-2 Edition 2.0           PROFINET IO Controller         Yes           • PROFINET IO Controller         Yes           • PROFINET IO Controller         Yes <td>Backup time</td> <td></td>	Backup time	
• Number         16           Clock synchronization         Yes           • to DP, master         Yes           • to DP, master         Yes           • in AS, master         Yes           • in AS, slave         Yes           • on Ethernet via NTP         Yes           Interfaces         2           Number of PROFINET Interfaces         2           Number of PROFISUS interfaces         1           Interface         1           Interface         1           Interface         Yes           • Number of PROFISUS interfaces         2           • Number of ports         2           • Interface types         2           • Number of ports         2           • Integrated switch         Yes; X1           Protocol         Yes; NP4           • PROFINET IO Controller         Yes; NP4           • PROFINET IO Controller         Yes           • ROFINET IO Device         Yes; MRP Automanager according to IEC 62439-2 Edition 2.0           PROFINET IO Controller         Yes           • PROFOP communication         Yes           • PROFOP communication         Yes           • Services         Yes           • PROFOP c		10 s; Тур.: 2 s
Clock synchronization           • supported         Yes           • supported         Yes           • in AS, master         Yes           • in AS, slave         Yes           • on Ethernet via NTP         Yes           Interfaces         2           Number of PROFINET interfaces         2           Number of PROFIBUS interfaces         1           Interface         2           Interface         1           Interface types         2           • Number of PROFIBUS interfaces         2           • Number of ports         2           • Interface types         2           • Number of ports         2           • Interface types         2           • Number of ports         2           • Interface types         Yes, X1           • Protocol         Yes           • PROFINET IO Controller         Yes           • PROFINET IO Device         Yes	Operating hours counter	
• supportedYes• to DP, masterYes• in AS, masterYes• in AS, slaveYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces2Number of PROFIBUS interfaces11InterfaceInterfaceYes• Number of ports2• Number of ports2• Rundle of ports2• Rundle of ports4• Rof Isegrated switchYes• RJ 45 (Ethemet)Yes: X1ProtocolYes: IPV4• PROFINET IO ControllerYes• PROFINET IO ControllerYes• SIMATIC communicationYes• Open IE communicationYes• Open IE communicationYes• PROFINET IO ControllerYes• ServicesYes- PGOP communicationYes• Services PGOP communicationYes- Ischronous modeYes- Open IE communicationYes- NRPYes: As MRP redundancy manager and/or MRP client; max. number of devices in the ring. 50- NRPDYes: Raz user in the ring. 50- NRPDYes: Max. 32 PROFINET idevices- PROFIenergyYes- Profitized startupYes: Max. 32 PROFINET devices- Number of connectable IO Devices, max.512. In total, up to 1000 distributed I/O devices can be connected	Number	16
to DP, masterYesin AS, masterYesin AS, masterYeson Ethernet via NTPYesInterfaces2Number of PROFINET interfaces2Number of PROFIBUS interfaces1Interface1Interface types2• Interface types2• Interface types2• Interface types2• Interface types2• RJ 45 (Ethernet)Yes; X1ProtocolsYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes• Media redundancyYesPROFINET IO ControllerYes• SiMATIC communicationYes• Open IE communicationYes• Open IE communicationYes• PROFINET IO ControllerYes• Media redundancyYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• Merice to ControllerYes• PROFINET IO ControllerYes• PROFINET IO ControllerYes• Number of PROFINET IO ControllerYes• Number of PROFINET IO ControllerYes• PR	Clock synchronization	
In AS, materYesIn AS, materYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces2Number of PROFIBUS interfaces111Interface types2• Number of ports2• Number of ports2• Number of ports2• Rid 45 (Ethernet)Yes; X1ProtocolsYes• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes• PG/OP communicationYes• PG/OP communicationYes• DevicesYes• PG/OP communicationYes• SimationYes• Open IE communicationYes• PROFINET IO ControllerYes• Simatic SimationYes• Open IE communicationYes• PG/OP communication <td< td=""><td><ul> <li>supported</li> </ul></td><td>Yes</td></td<>	<ul> <li>supported</li> </ul>	Yes
In AS, slaveYes• on Ethernet via NTPYesInterfaces2Number of PROFINET interfaces2Number of PROFIBUS interfaces1Interface2Interface types2• Number of ports2• Number of ports2• RJ 45 (Ethernet)Yes; X1ProtocolYes; X1ProtocolYes• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Web serverYes• Media redundancyYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerYes• PROFINET IO ControllerYes• SIMATIC communicationYes• Veb serverYes• Media redundancyYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerYes• PROFINET IO Controll	● to DP, master	Yes
Number of PROFINET interfaces         Yes           Number of PROFINET interfaces         2           Number of PROFIBUS interfaces         1           Interface         1           Interface types         2           Interface         Yes           Interface         Yes           Interface         Yes           Interface         Yes           Intotinine <td>● in AS, master</td> <td>Yes</td>	● in AS, master	Yes
Interfaces           Number of PROFINET interfaces         2           Number of PROFIBUS interfaces         1           Interface         1           Interface types         2           • Number of ports         2           • Number of ports         2           • Interface types         2           • Number of ports         2           • Integrated switch         Yes;           • RJ 45 (Ethernet)         Yes; X1           Protocols         -           • IP protocol         Yes; IPv4           • PROFINET IO Controller         Yes           • SIMATIC communication         Yes           • Open IE communication         Yes           • Open IE communication         Yes           • Web server         Yes           • Media redundancy         Yes; MRP Automanager according to IEC 62439-2 Edition 2.0           PROFINET IO Controller         -           Services         -           - PG/OP communication         Yes           - S7 routing         Yes           - Open IE communication         Yes           - Open IE communication         Yes           - IRT         Yes           - MRP         Yes; As MRP redundancy manager and/or MRP client;	• in AS, slave	Yes
Number of PROFINET interfaces       2         Number of PROFIBUS interfaces       1         1       Interface         Interface types       2         • Number of ports       2         • Integrated switch       Yes         • RU 45 (Ethernet)       Yes; X1         Protocols       -         • IP protocol       Yes; IPv4         • PROFINET IO Controller       Yes         • PROFINET IO Controller       Yes         • SIMATIC communication       Yes         • Open IE communication       Yes         • Web server       Yes         • Media redundancy       Yes; MRP Automanager according to IEC 62439-2 Edition 2.0         PROFINET IO Controller       Services         Services       -         - PG/OP communication       Yes         - ST routing       Yes         - IRT       Yes         - Open IE communication       Yes         - IRT       Yes         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; Max. 32 PROFINET devices         - PROFINErgy	<ul> <li>on Ethernet via NTP</li> </ul>	Yes
Number of PROFIBUS interfaces       1         Interface types       Interface types         • Number of ports       2         • integrated switch       Yes         • RJ 45 (Ethernet)       Yes; X1         Protocols       Image: Stress of Str	Interfaces	
1 Interface lypes         Interface lypes         Number of ports       2         integrated switch       Yes         RJ 45 (Ethernet)       Yes; X1         Protocol         IP protocol       Yes; IPv4         PROFINET IO Controller       Yes         PROFINET IO Device       Yes         SIMATIC communication       Yes         Open IE communication       Yes         Web server       Yes         Media redundancy       Yes; MRP Automanager according to IEC 62439-2 Edition 2.0         PROFINET IO Controller       Yes         Services       -         - PG/OP communication       Yes         - S7 routing       Yes         - Isochronous mode       Yes         - Open IE communication       Yes         - IRT       Yes         - Open IE communication       Yes         - IRT       Yes         - Open IE communication       Yes         - IRT       Yes         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; Requirement: IRT         - PROFIenergy       Yes         - Prointized startup       Yes; Ma		
Interface types       2         • Number of ports       2         • integrated switch       Yes         • RJ 45 (Ethernet)       Yes; X1         Protocols          • IP protocol       Yes; IPv4         • PROFINET IO Controller       Yes         • PROFINET IO Device       Yes         • SIMATIC communication       Yes         • Open IE communication       Yes         • Web server       Yes         • Media redundancy       Yes; MRP Automanager according to IEC 62439-2 Edition 2.0         PROFINET IO Controller       Yes         Services       -         - PG/OP communication       Yes         - Softronous mode       Yes         - Softronous mode       Yes         - Open IE communication       Yes         - Open IE communication       Yes         - Softronous mode       Yes         - IRT       Yes         - Open IE communication       Yes         - Open IE communication       Yes         - RPD       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD <t< td=""><td>Number of PROFIBUS interfaces</td><td>1</td></t<>	Number of PROFIBUS interfaces	1
• Number of ports       2         • integrated switch       Yes         • RJ 45 (Ethernet)       Yes; X1         Protocols       ************************************	1. Interface	
integrated switchYesintegrated switchYes; X1ProtecolsYes; IPv4IP protocolYes; IPv4PROFINET IO ControllerYesPROFINET IO DeviceYesSIMATIC communicationYesOpen IE communicationYesWeb serverYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerYesNedia redundancyYesServicesYesImage: Simple communicationYesServicesYesImage: Simple communicationYesServicesYesImage: Simple communicationYesServicesYesImage: Simple communicationYesServicesYesImage: Simple communicationYesImage: Simple communicationYesIm		
• RJ 45 (Ethernet)       Yes; X1         Protocols          • IP protocol       Yes; IPv4         • PROFINET IO Controller       Yes         • PROFINET IO Device       Yes         • SIMATIC communication       Yes         • Open IE communication       Yes         • Web server       Yes         • Media redundancy       Yes; MRP Automanager according to IEC 62439-2 Edition 2.0         PROFINET IO Controller       Yes         Services          - PG/OP communication       Yes         - PG/OP communication       Yes         - PG/OP communication       Yes         - S7 routing       Yes         - S7 routing       Yes         - Open IE communication       Yes         - IRT       Yes         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; Requirement: IRT         - PROFIENERY       Yes; Max. 32 PROFINET devices         - Prioritized startup       Yes; Max. 32 PROFINET devices         - Number of connectable IO Devices, max.       512; In total, up to 1000 distributed I/O devices can be connected		
Protocols       Yes; IPv4 <ul> <li>PROFINET IO Controller</li> <li>Yes</li> <li>PROFINET IO Device</li> <li>Yes</li> <li>SIMATIC communication</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> <li>PROFINET IO Controller</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Softward</li> <li>Yes</li> <li>Softward</li> <li>Yes</li> <li>Yes</li> <li>Netai a redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> <li>PROFINET IO Controller</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>Softward</li> <li>Yes, As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>Softward</li> <li>Yes; Requirement: IRT</li> <li>PROFIenergy</li> <li>Yes; Max. 32 PROFINET devices</li> <li>Prioritized startup</li> <li>Yes; Max. 32 PROFINET devices</li> <li>Softward</li> <li>Yes; In total, up to 1000 distributed I/O devices can be connected</li> <li>Softward</li> <li>Softward</li> <li>Softward</li> <li>Softward</li> <li>Softward</li> <li>Softward</li> <li>Sof</li></ul>	-	
• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes• Web serverYes• Media redundancyYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerServices- PG/OP communicationYes- PG/OP communicationYes- S7 routingYes- S7 routingYes- Open IE communicationYes- IRTYes- IRTYes- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFIenergyYes; Max. 32 PROFINET devices- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1000 distributed I/O devices can be connected	· · ·	Yes; X1
<ul> <li>PROFINET IO Controller</li> <li>Yes</li> <li>SIMATIC communication</li> <li>SIMATIC communication</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>Yes</li> <li>Web server</li> <li>Yes</li>     &lt;</ul>		
Index not obviousingYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes• Web serverYes• Media redundancyYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerServices- PG/OP communicationYes- PG/OP communicationYes- S7 routingYes- S7 routingYes- Isochronous modeYes- Open IE communicationYes- IRTYes- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFIlenergyYes; Max. 32 PROFINET devices- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	IP protocol	
<ul> <li>SIMATIC communication</li> <li>SIMATIC communication</li> <li>Open IE communication</li> <li>Web server</li> <li>Web server</li> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> <li>PROFINET IO Controller</li> </ul> PROFINET IO Controller Services <ul> <li>PG/OP communication</li> <li>Yes</li> <li>S7 routing</li> <li>S7 routing</li> <li>Soften in the server</li> <li>Soften in the server</li> <li>Soften in the server</li> <li>Soften in the server</li> <li>Services</li> </ul> PROFINET IO Controller Services <ul> <li>Yes</li> <li>Services</li> <li>Services</li> </ul> Services <ul> <li>Yes</li> <li>Services</li> <li>Services<td>PROFINET IO Controller</td><td>Yes</td></li></ul>	PROFINET IO Controller	Yes
<ul> <li>Open IE communication</li> <li>Yes</li> <li>Web server</li> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> <li>PROFINET IO Controller</li> <li>Services</li> <li>PG/OP communication</li> <li>S7 routing</li> <li>S7 routing</li> <li>S6 Yes</li> <li>S7 routing</li> <li>Services</li> <li>S</li></ul>	PROFINET IO Device	Yes
• Web serverYes• Media redundancyYes; MRP Automanager according to IEC 62439-2 Edition 2.0PROFINET IO ControllerServices- PG/OP communicationYes- S7 routingYes- Isochronous modeYes- Isochronous modeYes- Open IE communicationYes- IRTYes- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFIenergyYes- PROFIenergyYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	<ul> <li>SIMATIC communication</li> </ul>	Yes
Media redundancy     Yes; MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services      - PG/OP communication     - S7 routing     - S7 routing     - Isochronous mode     - Isochronous mode     - Open IE communication     - Ves     - Open IE communication     - Yes     - NRP     - MRP     Yes; As MRP redundancy manager and/or MRP client; max.     number of devices in the ring: 50      - MRPD     Yes; Requirement: IRT     Yes     - PROFIenergy     Yes; Max. 32 PROFINET devices     - Number of connectable IO Devices, max.     S12; In total, up to 1000 distributed I/O devices can be connected	<ul> <li>Open IE communication</li> </ul>	Yes
PROFINET IO Controller         Services         - PG/OP communication       Yes         - S7 routing       Yes         - Isochronous mode       Yes         - Open IE communication       Yes         - IRT       Yes         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; Requirement: IRT         - PROFlenergy       Yes         - Prioritized startup       Yes; Max. 32 PROFINET devices         - Number of connectable IO Devices, max.       512; In total, up to 1 000 distributed I/O devices can be connected	Web server	Yes
Services         - PG/OP communication       Yes         - S7 routing       Yes         - Isochronous mode       Yes         - Open IE communication       Yes         - IRT       Yes         - MRP       Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50         - MRPD       Yes; Requirement: IRT         - PROFIenergy       Yes         - Prioritized startup       Yes; Max. 32 PROFINET devices         - Number of connectable IO Devices, max.       512; In total, up to 1 000 distributed I/O devices can be connected	Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PG/OP communicationYes S7 routingYes Isochronous modeYes Open IE communicationYes IRTYes MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 MRPDYes; Requirement: IRT PROFIenergyYes Prioritized startupYes; Max. 32 PROFINET devices Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	PROFINET IO Controller	
S7 routingYes Isochronous modeYes Open IE communicationYes IRTYes IRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 MRPDYes; Requirement: IRT PROFIenergyYes Prioritized startupYes; Max. 32 PROFINET devices Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	Services	
<ul> <li>Isochronous mode</li> <li>Yes</li> <li>Open IE communication</li> <li>IRT</li> <li>MRP</li> <li>MRP</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>MRPD</li> <li>PROFIenergy</li> <li>Yes; Requirement: IRT</li> <li>PROFIenergy</li> <li>Yes; Max. 32 PROFINET devices</li> <li>Number of connectable IO Devices, max.</li> <li>512; In total, up to 1 000 distributed I/O devices can be connected</li> </ul>	— PG/OP communication	Yes
- Open IE communicationYes- IRTYes- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFlenergyYes- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	— S7 routing	Yes
- IRTYes- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFlenergyYes- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	— Isochronous mode	Yes
- MRPYes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50- MRPDYes; Requirement: IRT- PROFlenergyYes- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	— Open IE communication	Yes
number of devices in the ring: 50MRPDYes; Requirement: IRTPROFlenergyYesPrioritized startupYes; Max. 32 PROFINET devicesNumber of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	— IRT	Yes
- PROFlenergyYes- Prioritized startupYes; Max. 32 PROFINET devices- Number of connectable IO Devices, max.512; In total, up to 1 000 distributed I/O devices can be connected	— MRP	
— Prioritized startup       Yes; Max. 32 PROFINET devices         — Number of connectable IO Devices, max.       512; In total, up to 1 000 distributed I/O devices can be connected	— MRPD	Yes; Requirement: IRT
— Prioritized startup       Yes; Max. 32 PROFINET devices         — Number of connectable IO Devices, max.       512; In total, up to 1 000 distributed I/O devices can be connected	— PROFlenergy	Yes
- Number of connectable IO Devices, max. 512; In total, up to 1 000 distributed I/O devices can be connected		Yes; Max. 32 PROFINET devices
	·	

— Of which IO devices with IRT, max.	64
— Number of connectable IO Devices for RT,	512
max.	
— of which in line, max.	512
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	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 µs to 4 ms
— 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
<ul> <li>With IRT and parameterization of "odd" send cycles</li> </ul>	Update time = set "odd" send clock (any multiple of 125 $\mu s$ : 375 $\mu s$ , 625 $\mu s$ 3 875 $\mu s$ )
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
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	Yes
— MRP	Yes
— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes
— Shared device	Yes
- Number of IO Controllers with shared	4
device, max.	
— Asset management record	Yes; Per user program
2. Interface	
Interface types	
Number of ports	1
<ul> <li>integrated switch</li> </ul>	No

• RJ 45 (Ethernet)	Yes; X2
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
<ul> <li>SIMATIC communication</li> </ul>	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	No
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Prioritized startup	No
— Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul> <li>— Number of connectable IO Devices for RT, max.</li> </ul>	128
— of which in line, max.	128
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	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
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	No
— MRPD	No

	Yes
— PROFlenergy	
— Prioritized startup	No
— Shared device	Yes
— Number of IO Controllers with shared	4
device, max.	Voc: Der uper program
— Asset management record	Yes; Per user program
3. Interface	
Interface types	
Number of ports	1
• RS 485	Yes; X3
Protocols	
<ul> <li>PROFIBUS DP master</li> </ul>	Yes
<ul> <li>PROFIBUS DP slave</li> </ul>	No
SIMATIC communication	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
Ducto colo	
Protocols Number of connections	
Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs /
	CMs
<ul> <li>Number of connections reserved for</li> </ul>	10
ES/HMI/web	
<ul> <li>Number of connections via integrated</li> </ul>	160
interfaces	
<ul> <li>Number of S7 routing paths</li> </ul>	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	Yes
— Open IE communication	Yes
— IRT	Yes
— PROFlenergy	Yes
Drievitized starture	
<ul> <li>Prioritized startup</li> </ul>	Yes; Max. 32 PROFINET devices

<ul> <li>— Number of connectable IO Devices, max.</li> </ul>	128; In total, up to 512 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,	128
max.	128
— of which in line, max.	8; in total across all interfaces
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	
<ul> <li>— Number of IO Devices per tool, max.</li> </ul>	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
Redundancy mode	
• MRP	Yes; As MRP redundancy manager and/or MRP client; max.
	number of devices in the ring: 50
• MRPD	Yes; Requirement: IRT
SIMATIC communication	
<ul> <li>S7 communication, as server</li> </ul>	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
• User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
<ul> <li>— several passive connections per port, supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
PROFIBUS DP master	
Number of connections, max.	48; for the integrated PROFIBUS DP interface
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Data record routing	Yes

— Isochronous mode	Yes
— Equidistance	Yes
— Number of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes
OPC UA	
OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
<ul> <li>Application authentication</li> </ul>	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of sessions, max.	64
— Number of accessible variables, max.	200 000
— Number of registerable nodes, max.	50 000
<ul> <li>— Number of subscriptions per session, max.</li> </ul>	20
— Sampling time, min.	10 ms
— Send time, min.	10 ms
— Number of server methods, max.	100
<ul> <li>— Number of inputs/outputs per server method, max.</li> </ul>	20
<ul> <li>— Number of monitored items, max.</li> </ul>	10 000; For 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10
<ul> <li>— Number of nodes for user-defined server</li> </ul>	30 000
interfaces, max.	
Further protocols	
MODBUS	Yes; MODBUS TCP
Media redundancy	
• Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
<ul> <li>Number of stations in the ring, max.</li> </ul>	50
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 250 µs
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	10 000
Number of simultaneously active program alarms	
<ul> <li>Number of program alarms</li> </ul>	1 000
<ul> <li>Number of alarms for system diagnostics</li> </ul>	200

• Number of alarms for motion technology objects

objects	
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 10 engineering
	systems
Status block	Yes; Up to 16 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	20
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul> <li>Number of variables, max.</li> </ul>	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing, variables	Peripheral inputs/outputs
• Number of variables, max.	200
Diagnostic buffer	
• present	Yes
<ul> <li>Number of entries, max.</li> </ul>	3 200
— of which powerfail-proof	1 000
Traces	
Number of configurable Traces	8; 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 axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
<ul> <li>Number of available Motion Control resources</li> </ul>	10 240
for technology objects (except cam disks)	
Required Motion Control resources	
— per speed-controlled axis	40
— per positioning axis	80
	160
— per synchronous axis	80
— per external encoder	
— per output cam	20

— per cam track	160
— per probe	40
<ul> <li>Positioning axis</li> </ul>	
<ul> <li>— Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	70; At 40% CPU load due to Motion Control
<ul> <li>— Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	128; At 40% CPU load due to Motion Control
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
<ul> <li>Performance level according to ISO 13849-1</li> </ul>	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and	
<ul> <li>Low demand mode: PFDavg in accordance with SIL3</li> </ul>	< 2.00E-05
— High demand/continuous mode: PFH in	< 1.00E-09
accordance with SIL3	
Ambient conditions	
Ambient conditions Ambient temperature during operation	
Ambient conditions	0 °C
Ambient conditions Ambient temperature during operation	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
Ambient conditions Ambient temperature during operation • horizontal installation, min.	60 °C; Display: 50 °C, at an operating temperature of typically 50
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation	<ul> <li>60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off</li> <li>0 °C</li> <li>40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off</li> </ul>
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation         • min.         • max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation         • min.         • max.         Configuration         Programming	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation         • min.         • max.         Configuration         Programming         Programming language	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation         • min.         • max.         Configuration         Programming         Programming language         — LAD	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C Yes; incl. failsafe
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.         • moment temperature during storage/transportation         • min.         • max.         Configuration         Programming         Programming language         - LAD         - FBD	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C Yes; incl. failsafe Yes; incl. failsafe
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, min.         • vertical installation, max.         Ambient temperature during storage/transportation         • min.         • max.         Configuration         Programming         Programming language         — LAD	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C Yes; incl. failsafe Yes; incl. failsafe Yes; incl. failsafe
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.         • moment temperature during storage/transportation         • min.         • max.         Configuration         Programming         Programming language         - LAD         - FBD	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C Yes; incl. failsafe Yes; incl. failsafe Yes Yes
Ambient conditions         Ambient temperature during operation         • horizontal installation, min.         • horizontal installation, max.         • vertical installation, min.         • vertical installation, max.         Configuration         • max.         Configuration         Programming         Programming language         - LAD         - FBD         - STL	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off -40 °C 70 °C Yes; incl. failsafe Yes; incl. failsafe Yes; incl. failsafe

<ul> <li>User program protection/password protection</li> </ul>	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
<ul> <li>Password for display</li> </ul>	Yes
<ul> <li>Protection level: Write protection</li> </ul>	Yes; Specific write protection both for Standard and for Failsafe
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
Cycle time monitoring	
lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 978 g
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