## **SIEMENS**

## **Data sheet**

6ES7513-1FL02-0AB0



SIMATIC S7-1500F, CPU 1513F-1 PN, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 450 KB FOR PROGRAM AND 1.5 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 2 PORT SWITCH, 40 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

Product type designation CPU 1513F-1 PN HW functional status FS00 Firmware version V2.9 Product function  • I&M data Yes; I&M0 to I&M3 Yes; Ibinbuted and central; with minimum OB & cycle of 500 µs (distributed) and 1 ms (central)  Engineering with  • STEP 7 TIA Portal configurable/integrated from version V17 (FW V2.9) /V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-QAB0  Configuration control via dataset Yes Oisplay Screen diagonal (cm) Control demonts Number of keys Alade value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Permissible range, upper limit (DC) Alade value (DC) Alade	General information	
Firmware version V2.9 Product function  • I&M data • Isochronous mode • IAM data • Intercept of the product of	Product type designation	CPU 1513F-1 PN
Product function  • I&M data • Isochronous mode  Engineering with • STEP 7 TIA Portal configurable/integrated from version configuration control  via dataset  Yes Display  Screen diagonal [cm] Control elements  Number of keys 8 Mode buttons 2 Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Reverse polarity protection Mains buffering • Mean'soltage failure stored energy time • Repeat rate, min.  Injust current Current consumption (rated value)  Or A Current consumption (rated value)  Power loss. Power foss (typ. Power loss, typ.  Power loss, typ.  Mombroy SIMATIC memory card required  Versible August (PC) Signary (versible of the Star (Versible))  Versible of the surface of the Star (Versible)  Versible of the Versible of the Star (Versible)  Versible of the	HW functional status	FS03
• I&M data • Isochronous mode •	Firmware version	V2.9
Secont one of the second of t	Product function	
and 1 ms (central)  Engineering with  STEP 7 TIA Portal configurable/integrated from version  Configuration control  via dataset  Yes  Display  Screen diagonal [cm]  Oontrol elements  Number of keys  Mode buttons  2  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, lower limit (DC)  Addisonal process  Wains buffering  Mains buffering  Mains voltage failure stored energy time  Repeat rate, min.  Proper current  Current consumption (rated value)  Current consumption, max.  In 9.9 K atted value  Pt  0.02 A²-s  Power  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  In 1 SIMATIC memory card required  V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0  V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0  V17 (FW V2.9) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0  V17 (FW V2.9) / V15 (F	● I&M data	Yes; I&M0 to I&M3
STEP 7 TIA Portal configurable/integrated from version configurable as 6ES7513-1FL01-0AB0  Configuration control via dataset Yes  Display  Screen diagonal [cm] 3.45 cm  Control elements  Number of keys 8 Mode buttons 2  Supply voltage  Rated value (DC) 24 V  permissible range, lower limit (DC) 19.2 V  permissible range, upper limit (DC) 28.8 V  Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time • Repeat rate, min. 1/s  Input current  Current consumption (rated value) 0.7 A  Current consumption (rated value) 0.95 A  Inrush current, max. 1.9 A; Rated value  Power  Infeed power to the backplane bus (balanced) 5.5 W  Power loss  Power loss  Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card equired  Ves  Ves  Ves  Ves  Ves  Ves  Va.7 (FW V2.9) /V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0  Ves  Ves  Ves  0.45 (FW V2.9) /V15 (FW V2.9) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0  Ves  8  Ves  Ves  Ves  Ves  Ves  Ves	Isochronous mode	
configuration control  via dataset  Display  Screen diagonal [cm]  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Mains buffering  Mains buffering  Mains voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  1.9 A, Rated value  Power  Infeed power to the backplane bus  Power loss  Power loss  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  1 SIMATIC memory card required  Vas A separation control and seeds of the seeds	Engineering with	
via dataset Yes  Display  Screen diagonal [cm] 3.45 cm  Control elements  Number of keys 8 Mode buttons 2  Supply voltage  Rated value (DC) 24 V permissible range, lower limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time 5 ms • Repeat rate, min. 1/s  Input current  Current consumption (rated value) 0.7 A  Current consumption, max. 0.95 A  Inrush current, max. 1.9 A; Rated value  I't 0.02 A²-s  Power  Infeed power to the backplane bus (balanced) 5.5 W  Power loss  Power loss  Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required	STEP 7 TIA Portal configurable/integrated from version	
Screen diagonal [cm]   3.45 cm	Configuration control	
Screen diagonal [cm]   3.45 cm	via dataset	Yes
Number of keys  Mode buttons  2  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Mains/voltage failure stored energy time  • Mains/voltage failure stored energy time  • Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption (rated value)  Current consumption, max.  1.9 A; Rated value  Pt  Infeed power to the backplane bus  Power loss  Power loss  Power loss  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes	Display	
Number of keys  Mode buttons  2  Supply voltage  Rated value (DC) 24 V  permissible range, lower limit (DC) 19,2 V  permissible range, upper limit (DC) 28.8 V  Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time 5 ms • Repeat rate, min. 1/s  Input current  Current consumption (rated value) 0.7 A  Current consumption, max. 0.95 A  Inrush current, max. 1.9 A; Rated value  Infed power to the backplane bus 0.5 W  Power loss  Power loss  Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes	Screen diagonal [cm]	3.45 cm
Mode buttons  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  • Mains buffering  • Mains/voltage failure stored energy time  • Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Insubscurrent, max.  In 9 A; Rated value  Ift  0.02 A²-s  Power  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss  Power loss, typ.  SIMATIC memory card  SIMATIC memory card required  Yes	Control elements	
Rated value (DC) 24 V permissible range, lower limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time 5 ms • Repeat rate, min. 1/s  Input current  Current consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value  Ift 0.02 A²-s  Power  Infeed power to the backplane bus 10 W Power consumption from the backplane bus (balanced) 5.5 W  Power loss  Power loss  Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Number of keys	8
Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  28.8 V  Reverse polarity protection  Yes  Mains buffering  • Mains/voltage failure stored energy time • Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Insub current, max.  In 9 A; Rated value  I*t  0.02 A*s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  SiMATIC memory card required  Yes	Mode buttons	2
permissible range, lower limit (DC) permissible range, upper limit (DC) 28.8 V  Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time • Repeat rate, min.  Input current  Current consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value  Pt 0.02 A²s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss Power loss, typ.  5.7 W  Memory  Number of slots for SIMATIC memory card SIMATIC memory card required Yes	Supply voltage	
permissible range, upper limit (DC) Reverse polarity protection  Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inush current, max.  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  Memory  Number of slots for SIMATIC memory card SIMATIC memory card required  Yes	Rated value (DC)	24 V
Reverse polarity protection  Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inush current, max.  Inush current, max.  Infeed power to the backplane bus  Infeed power to the backplane bus (balanced)  Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  S.7 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes	permissible range, lower limit (DC)	19.2 V
Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inush current, max.  Ift 0.02 A²-s  Power  Infeed power to the backplane bus Power loss Power loss Power loss, typ.  S.7 W  Memory  Number of slots for SIMATIC memory card SIMATIC memory card required  5 ms 5 ms 5 ms 6	permissible range, upper limit (DC)	28.8 V
Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inrush current, max.  Insumption (rated value)  I*  O.02 A**s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  S.7 W  Memory  Number of slots for SIMATIC memory card SIMATIC memory card required  5 ms 1/s  1/s  1/s  1/s  1/s  1/s  1/s  1.9 A; Rated value 1.0 A; Rated valu	Reverse polarity protection	Yes
● Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inush current, max.  Interest of the backplane bus  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  Simple of slots for SIMATIC memory card  SIMATIC memory card required  1/8  1.7  1.7  1.7  1.7  1.7  1.7  1.7  1.	Mains buffering	
Input current Current consumption (rated value)  Current consumption, max.  0.95 A  Inrush current, max.  1.9 A; Rated value  I²t  0.02 A²-s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss  Power loss  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  10.7 A  0.95 A  1.9 A; Rated value  1.1 A; Bimatic value  1.1 A; Bimatic value  1.1 A; Bimatic value  1.2 A; Bimatic value  1.3 A; Bimatic value  1.4 A; Bimatic value  1.5 A; Bimatic va	<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Interest of the backplane bus  Infeed power to the backplane bus  Infeed power consumption from the backplane bus (balanced)  Power loss  Power loss  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  O.7 A  0.95 A  0.95 A  1.9 A; Rated value  1.0 W  1.0 W  5.5 W  Power loss  Fower loss of the backplane bus (balanced)  S.7 W  Memory  Number of slots for SIMATIC memory card  Yes	Repeat rate, min.	1/s
Current consumption, max.  Inrush current, max.  1.9 A; Rated value  12t  0.02 A²-s  Power  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  5.7 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  1 Yes	Input current	
Inrush current, max.  Inrush current, max.  Infeed power to the backplane bus Infeed power to the backplane bus (balanced)  Power consumption from the backplane bus (balanced)  Fower loss  Power loss, typ.  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.5 W  Infeed power to the backplane bus (balanced)  S.7 W  Infeed power to the backplane bus (balanced)  Infeed power to the backplane bus (balanced)  S.7 W  Infeed power to the backplane bus (balanced)  Infeed power to the backplane bus (balanced)  S.7 W  Infeed power to the backplane bus (balanced)  Infeed powe	Current consumption (rated value)	0.7 A
Power  Infeed power to the backplane bus Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  Sometimes of slots for SIMATIC memory card SIMATIC memory card required  O.02 A²-s  10 W  5.5 W  Fower loss	Current consumption, max.	0.95 A
Power Infeed power to the backplane bus 10 W Power consumption from the backplane bus (balanced) 5.5 W  Power loss Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Inrush current, max.	1.9 A; Rated value
Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  5.5 W  Power loss  Power loss, typ.  5.7 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes	l²t	0.02 A²-s
Power consumption from the backplane bus (balanced)  5.5 W  Power loss  Power loss, typ.  5.7 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes	Power	
Power loss Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes	Infeed power to the backplane bus	10 W
Power loss, typ. 5.7 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes	Power consumption from the backplane bus (balanced)	5.5 W
Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes	Power loss	
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes	Power loss, typ.	5.7 W
SIMATIC memory card required Yes	Memory	
	Number of slots for SIMATIC memory card	1
Work memory	SIMATIC memory card required	Yes
	Work memory	

a integrated (for program)	450 khyta
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	00.01.4
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	N/
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
CPU-blocks	
Number of elements (total)	4 000; 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
0:	59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB Number and a	0. 05 505
Number range	0 65 535
• Size, max.	450 kbyte
FC	
Number range	0 65 535
• Size, max.	450 kbyte
OB	
• Size, max.	450 kbyte
Number of free cycle OBs	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 500 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	100
Number	Any (only limited by the main memory)
	Any (only limited by the main memory)
Retentivity	Von
— adjustable	Yes
S7 times	2.040
Number  Petertisits	2 048
Retentivity	V
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— adjustable	
	Yes
Data areas and their retentivity	Yes
Data areas and their retentivity  Retentive data area (incl. timers, counters, flags), max.	Yes  128 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB
	128 kbyte; In total; available retentive memory for bit memories, timers,

• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
<ul> <li>Retentivity adjustable</li> </ul>	Yes
Retentivity preset	No
Local data	
<ul> <li>per priority class, max.</li> </ul>	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	2010, 1101011001010110010010010001000
• Inputs	32 kbyte; All inputs are in the process image
•	32 kbyte; All outputs are in the process image
Outputs  Outputs	32 kbyte, All outputs are in the process image
per integrated IO subsystem	Ollhoda
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	32
Hardware configuration	
Number of distributed IO systems	32; 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	6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
Number of lines, max.	1
PtP CM	·
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	10 0, 196 20
Number	16
Clock synchronization	Voc
• supported	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X1
Number of ports	2
• integrated switch	Yes
Protocols	
IP protocol	Yes; IPv4
	1 Co, 11 V4
	Voc
PROFINET IO Controller	Yes
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li></ul>	Yes
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li><li>SIMATIC communication</li></ul>	Yes Yes
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li></ul>	Yes

Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	100, In a rational agos according to 120 of 100 f Edition 2.0
Services	
— PG/OP communication	Yes
Isochronous mode	Yes
Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
Prioritized startup	Yes; Max. 32 PROFINET devices
Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i,
— Number of connectable to Devices, max.	PROFIBUS or PROFINET
<ul> <li>Of which IO devices with IRT, max.</li> </ul>	64
<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</li> </ul>	8; in total across all interfaces
activated/deactivated, max.	
<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
Update time for IRT	
— for send cycle of 250 μs	$250~\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 $\mu s$ of the isochronous OB is decisive
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
— With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 $\mu$ s: 375 $\mu$ s, 625 $\mu$ s 3
Update time for RT	875 μs)
— 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	
<ul><li>— PG/OP communication</li></ul>	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
<ul> <li>activation/deactivation of I-devices</li> </ul>	Yes; per user program
Asset management record	Yes; per user program
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	
Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web	10
Number of connections via integrated interfaces	88
Number of S7 routing paths	16
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
— Media redundancy	Yes; only via 1st interface (X1)
<b>,</b>	, , ,

— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
<ul> <li>MRP interconnection, supported</li> </ul>	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms; For MRP, bumpless for MRPD
<ul> <li>Number of stations in the ring, max.</li> </ul>	50
SIMATIC communication	
<ul> <li>PG/OP communication</li> </ul>	Yes; encryption with TLS V1.3 pre-selected
<ul> <li>S7 routing</li> </ul>	Yes
<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
several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• Encryption	Yes; Optional
Web server	res, Optional
HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	res, standard and user pages
Runtime license required	Yes
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.	4
<ul> <li>Number of nodes of the client interfaces, recommended max.</li> </ul>	1 000
— Number of elements for one call of	300
OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_	
max.  — Number of elements for one call of	20
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of	
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection,	20
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client	20 100
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.	<ul><li>20</li><li>100</li><li>1</li><li>5</li></ul>
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.	20 100 1 5 5 000
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.	<ul><li>20</li><li>100</li><li>1</li><li>5</li></ul>
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of	20 100 1 5 5 000 100
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling	20 100 1 5 5 000 100
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling OPC_UA_MethodCall, max.	20 100 1 5 5 000 100 20
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling OPC_UA_MethodCall, max.  • OPC UA Server	20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling OPC_UA_MethodCall, max.  • OPC UA Server  — Application authentication	20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15,
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling OPC_UA_MethodCall, max.  • OPC UA Server  — Application authentication  — Security policies	20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
max.  — Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.  — Number of elements for one call of OPC_UA_MethodGetHandleList, max.  — Number of simultaneous calls of the client instructions for session management, per connection, max.  — Number of simultaneous calls of the client instructions for data access, per connection, max.  — Number of registerable nodes, max.  — Number of registerable method calls of OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling OPC_UA_MethodCall, max.  • OPC UA Server  — Application authentication  — Security policies  — User authentication	20  100  1  5  5 000 100  20  Yes; Data access (read, write, subscribe), method call, custom address space Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password

<ul> <li>Number of registerable nodes, max.</li> </ul>	10 000
<ul> <li>Number of subscriptions per session, max.</li> </ul>	20
<ul><li>— Sampling interval, min.</li></ul>	100 ms
<ul><li>— Publishing interval, min.</li></ul>	500 ms
<ul> <li>Number of server methods, max.</li> </ul>	20
<ul> <li>Number of inputs/outputs per server method, max.</li> </ul>	20
<ul> <li>Number of monitored items, recommended max.</li> </ul>	1 000; for 1 s sampling interval and 1 s send interval
<ul> <li>Number of server interfaces, max.</li> </ul>	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
<ul> <li>Number of nodes for user-defined server interfaces, max.</li> </ul>	1 000
Alarms and Conditions	Yes
Further protocols	
• MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	2 500
Number of simultaneously active program alarms	
Number of program alarms	600
Number of program alarms     Number of alarms for system diagnostics	100
Number of alarms for system diagnostics     Number of alarms for motion technology objects	80
Test commissioning functions	
	Voc. Parallal anline access possible for up to 5 angingering quetoms
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 5 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
<ul><li>Status/control variable</li><li>Variables</li></ul>	Yes; without fail-safe inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times,
• Variables	
<ul><li> Variables</li><li> Number of variables, max.</li></ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
<ul> <li>Variables</li> <li>Number of variables, max.</li> <li>— of which status variables, max.</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job
<ul><li>Variables</li><li>Number of variables, max.</li></ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
<ul> <li>Variables</li> <li>Number of variables, max.</li> <li>— of which status variables, max.</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job
<ul> <li>Variables</li> <li>Number of variables, max.</li> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe
<ul> <li>Variables</li> <li>Number of variables, max. <ul> <li>of which status variables, max.</li> <li>of which control variables, max.</li> </ul> </li> <li>Forcing <ul> <li>Forcing, variables</li> </ul> </li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job
<ul> <li>Variables</li> <li>Number of variables, max.</li> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> <li>Forcing</li> <li>Forcing</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe
<ul> <li>Variables</li> <li>Number of variables, max. <ul> <li>of which status variables, max.</li> <li>of which control variables, max.</li> </ul> </li> <li>Forcing <ul> <li>Forcing, variables</li> </ul> </li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)
<ul> <li>Variables</li> <li>Number of variables, max.</li> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul> Forcing <ul> <li>Forcing</li> <li>Forcing, variables</li> <li>Number of variables, max.</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)
<ul> <li>Variables</li> <li>Number of variables, max.         <ul> <li>of which status variables, max.</li> <li>of which control variables, max.</li> </ul> </li> <li>Forcing         <ul> <li>Forcing, variables</li> <li>Number of variables, max.</li> </ul> </li> <li>Diagnostic buffer</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200
<ul> <li>Variables</li> <li>Number of variables, max.         <ul> <li>of which status variables, max.</li> <li>of which control variables, max.</li> </ul> </li> <li>Forcing         <ul> <li>Forcing, variables</li> <li>Number of variables, max.</li> </ul> </li> <li>Diagnostic buffer         <ul> <li>present</li> </ul> </li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes
<ul> <li>Variables</li> <li>Number of variables, max.  — of which status variables, max.  — of which control variables, max.</li> <li>Forcing <ul> <li>Forcing</li> <li>Forcing, variables</li> <li>Number of variables, max.</li> </ul> </li> <li>Diagnostic buffer <ul> <li>present</li> <li>Number of entries, max.</li> </ul> </li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000
<ul> <li>Variables</li> <li>Number of variables, max.  — of which status variables, max.  — of which control variables, max.</li> <li>Forcing  • Forcing  • Forcing, variables  • Number of variables, max.</li> <li>Diagnostic buffer  • present  • Number of entries, max.  — of which powerfail-proof</li> </ul>	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000
Variables      Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     Forcing     Forcing, variables     Number of variables, max.  Diagnostic buffer     present     Number of entries, max.     — of which powerfail-proof  Traces	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes  1 000  500
Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     Forcing     Forcing, variables     Number of variables, max.  Diagnostic buffer     present     Number of entries, max.     — of which powerfail-proof  Traces     Number of configurable Traces	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes  1 000  500
Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     Forcing     Forcing, variables     Number of variables, max.  Diagnostic buffer     present     Number of entries, max.     — of which powerfail-proof  Traces     Number of configurable Traces  Interrupts/diagnostics/status information	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes  1 000  500
Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     • Forcing     • Forcing, variables     • Number of variables, max.  Diagnostic buffer     • present     • Number of entries, max.     — of which powerfail-proof  Traces     • Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible
Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     Forcing     Forcing, variables     Number of variables, max.  Diagnostic buffer     present     Number of entries, max.     — of which powerfail-proof  Traces     Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED     RUN/STOP LED	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible
Number of variables, max.     — of which status variables, max.     — of which control variables, max.  Forcing     Forcing     Forcing, variables     Number of variables, max.  Diagnostic buffer     present     Number of entries, max.     — of which powerfail-proof  Traces     Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED     RUN/STOP LED     ERROR LED     MAINT LED	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes
Number of variables, max. — of which status variables, max. — of which control variables, max.  Forcing  Forcing  Forcing, variables Number of variables, max.  Diagnostic buffer  present Number of entries, max. — of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes
Number of variables, max. — of which status variables, max. — of which control variables, max.  Forcing  Forcing  Forcing, variables Number of variables, max.  Diagnostic buffer  present Number of entries, max. — of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job  200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe)  200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes
Number of variables, max.  of which status variables, max.  of which control variables, max.  Forcing  Forcing  Forcing, variables  Number of variables, max.  Diagnostic buffer  present  Number of entries, max.  of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX  Supported technology objects	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe) 200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes Yes Yes
Number of variables, max. — of which status variables, max. — of which control variables, max.  Forcing  Forcing  Forcing, variables Number of variables, max.  Diagnostic buffer  present Number of entries, max. — of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe) 200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes Yes Yes Yes Yes Y
Number of variables, max.  of which status variables, max.  of which control variables, max.  Forcing  Forcing  Forcing, variables  Number of variables, max.  Diagnostic buffer  present  Number of entries, max.  of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX  Supported technology objects	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe) 200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes Yes Yes
Number of variables, max.  of which status variables, max.  of which control variables, max.  Forcing  Forcing  Forcing, variables  Number of variables, max.  Diagnostic buffer  present  Number of entries, max.  of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  RRROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX  Supported technology objects  Motion Control  Number of available Motion Control resources for	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe) 200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes Yes Yes Yes Yes Y
Variables  Number of variables, max.  of which status variables, max.  of which control variables, max.  Forcing  Forcing  Forcing, variables  Number of variables, max.  Diagnostic buffer  present  Number of entries, max.  of which powerfail-proof  Traces  Number of configurable Traces  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  STOP ACTIVE LED  Connection display LINK TX/RX  Supported technology objects  Motion Control  Number of available Motion Control resources for technology objects	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters  200; per job 200; per job  Yes; without fail-safe peripheral inputs/outputs (without fail-safe) 200  Yes 1 000 500  4; Up to 512 KB of data per trace are possible  Yes Yes Yes Yes Yes Yes Yes Yes Yes Y

	••
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— 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>	5
<ul> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	10
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	
Performance level according to ISO 13849-1	Plo
Performance level according to ISO 13849-1     SIL acc. to IEC 61508	PLe SIL 3
Probability of failure (for service life of 20 years and repair time	
Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
<ul> <li>horizontal installation, min.</li> </ul>	-25 °C; No condensation
<ul> <li>horizontal installation, max.</li> </ul>	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
<ul> <li>vertical installation, min.</li> </ul>	-25 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
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; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— SCL — GRAPH	
	Yes
Know-how protection	Von
User program protection/password protection	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
Password for display	Yes
Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Write protection for Failsafe</li> </ul>	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	35 mm

Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	405 g

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