SIEMENS

Data sheet

6ES7512-1CK01-0AB0



SIMATIC S7-1500 Compact CPU CPU 1512C-1 PN, central processing unit with working memory 250 KB for program and 1 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high speed counters, 4 high speed outputs for PTO/PWM/frequency output 1. interface: PROFINET IRT with 2 port switch, 48 NS bit-performance, incl. front connector push-in, SIMATIC memory card necessary

Figure similar

General information	
Product type designation	CPU 1512C-1 PN
HW functional status	FS03
Firmware version	V2.9
Product function	
 I&M data 	Yes; I&M0 to I&M3
Isochronous mode	Yes; With minimum OB 6x cycle of 625 µs (distributed)
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 6ES7512-1CK00-0AB0
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; 20.4 V DC, for supplying the digital inputs/outputs
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
Mains/voltage failure stored energy time	5 ms; Refers to the power supply on the CPU section
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.8 A; Without load; 18.8 A: CPU + load
Current consumption, max.	1 A; Without load; 19 A: CPU + load
Inrush current, max.	1.9 A; Rated value
I²t	0.34 A²-s
Digital inputs	
from load voltage L+ (without load), max.	20 mA; per group
Digital outputs	
from load voltage L+, max.	30 mA; Per group, without load
output voltage / header	
Rated value (DC)	24 V
Encoder supply	
Number of outputs	2; One common 24 V encoder supply per 16 digital inputs
24 V encoder supply	=, one ostimon = 1 v one oder outprij per 10 digital inpute
Li v oliabadi dappiy	

• 24 V	Yes; L+ (-0.8 V)
Short-circuit protection	Yes
Output current, max.	1 A
Power	
Infeed power to the backplane bus	10 W
Power consumption from the backplane bus (balanced)	9 W
Power loss	
Power loss, typ.	15.2 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
integrated (for program)	250 kbyte
integrated (for data)	1 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 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 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
 Number range 	0 65 535
• Size, max.	250 kbyte
FC	
Number range	0 65 535
Size, max.	250 kbyte
ОВ	
• Size, max.	250 kbyte
 Number of free cycle OBs 	100
 Number of time alarm OBs 	20
Number of delay alarm OBs	20
 Number of cyclic interrupt OBs 	20; With minimum OB 3x cycle of 500 μs
 Number of process alarm OBs 	50
 Number of DPV1 alarm OBs 	3
 Number of isochronous mode OBs 	1
Number of technology synchronous alarm OBs	2
Number of startup OBs	100
Number of asynchronous error OBs	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24
Counters, timers and their retentivity	
S7 counter	2010
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)
Retentivity	7,00
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	128 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB
Extended retentive data area (incl. timers, counters, flags), max.	1 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
• Size, max.	16 kbyte
 Number of clock memories 	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
 per priority class, max. 	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	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/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	1
● Via CM	6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
Number of lines, max.	1
PtP CM • Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available
	slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	
• Number	16
Clock synchronization	
• supported	Yes
• in AS, master	Yes
in AS, masterin AS, device	Yes Yes
• in AS, master	Yes

	20
	32
S to leave the same of the sam	Yes
	P-reading
7 31	Yes
Digital input functions, parameterizable	/
·	Yes ,
	Yes ,
.,	Yes
Input voltage	22
	DC
	24 V
3 3 3 3	3 to +5V
	+11 to +30V
Input current	
3 7 31	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	/ 0.05 / 0.4 / 0.4 / 4.0 / 0.0 / 4.0 0.4 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 / 0.0 /
· ·	Yes; none / 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms
	4 µs; for parameterization "none"
	20 ms
	4 µs; for parameterization "none"
·	20 ms
for interrupt inputs	
	Yes; Same as for standard inputs
for technological functions	
	Yes; Same as for standard inputs
Cable length	4000 000 1 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1
	1 000 m; 600 m for technological functions; depending on input frequency, encoder and cable quality; max. 50 m at 100 kHz
	600 m; for technological functions: No
Digital outputs	
Type of digital output	Transistor
(50)	
	32
Current-sourcing \	Yes; Push-pull output
Current-sourcing Short-circuit protection	Yes; Push-pull output Yes; electronic/thermal
Current-sourcing Short-circuit protection Response threshold, typ.	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V)
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration 2	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max.	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output — Number, max. — Cycle duration, parameterizable	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output — Number, max. — Cycle duration, parameterizable — ON period, min.	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 %
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max. Cycle duration, parameterizable ON period, min. ON period, max.	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 %
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max. Cycle duration, parameterizable ON period, min. ON period, max. Resolution of the duty cycle	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 % 0.0036 %; For S7 analog format, min. 40 ns
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max. Cycle duration, parameterizable ON period, min. ON period, max. Resolution of the duty cycle Frequency output	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 %
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Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max. Cycle duration, parameterizable ON period, min. ON period, max. Resolution of the duty cycle Frequency output Switching capacity of the outputs with resistive load, max. on lamp load, max. Load resistance range lower limit	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 µs at high-speed output; see manual for details 2 µs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 % 0.0036 %; For S7 analog format, min. 40 ns Yes 0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed output; see manual for details 5 W; 1 W with high-speed output, i.e. when using a high-speed output; see
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Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output — Number, max. — Cycle duration, parameterizable — ON period, min. — ON period, max. — Resolution of the duty cycle Frequency output Switching capacity of the outputs with resistive load, max. on lamp load, max. Load resistance range lower limit	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 μs at high-speed output; see manual for details 2 μs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 % 0.0036 %; For S7 analog format, min. 40 ns Yes 0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed output; see manual for details 5 W; 1 W with high-speed output, i.e. when using a high-speed output; see manual for details
Current-sourcing Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Accuracy of pulse duration minimum pulse duration Digital output functions, parameterizable Switching tripped by comparison values PWM output Number, max. Cycle duration, parameterizable ON period, min. ON period, max. Resolution of the duty cycle Frequency output Switching capacity of the outputs with resistive load, max. on lamp load, max. Load resistance range lower limit upper limit Output voltage	Yes; Push-pull output Yes; electronic/thermal 1.6 A with standard output, 0.5 A with high-speed output; see manual for details Connector X11: -0.8 V; connector X12: L+ (-53 V) Yes Up to ±100 ppm ±2 μs at high-speed output; see manual for details 2 μs; With High Speed output Yes; As output signal of a high-speed counter Yes 4 Yes 0 % 100 % 0.0036 %; For S7 analog format, min. 40 ns Yes 0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed output; see manual for details 5 W; 1 W with high-speed output, i.e. when using a high-speed output; see manual for details

• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
for signal "1" rated value	0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed output,
for single HAII and socially and social	observe derating; see manual for details
• for signal "1" permissible range, min.	2 mA
• for signal "1" permissible range, max.	0.6 A; 0.12 A with high-speed output, i.e. when using a high-speed output, observe derating; see manual for details
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	200 µs
• "1" to "0", max.	500 μs; Load-dependent
for technological functions	
— "0" to "1", max.	5 µs; Depending on the output used, see additional description in manual
— "1" to "0", max.	5 µs; Depending on the output used, see additional description in manual
Parallel switching of two outputs	
• for logic links	Yes; for technological functions: No
• for uprating	No
for redundant control of a load	Yes; for technological functions: No
Switching frequency	
with resistive load, max.	100 kHz; For high-speed output, 100 Hz for standard output
with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
with inductive load, max. on lamp load, max.	10 Hz
	10 112
Total current of the outputs	0.5 At soo additional description in the manual
Current per channel, max. Current per group, max.	0.5 A; see additional description in the manual
Current per group, max.	8 A; see additional description in the manual
Current per power supply, max.	4 A; 2 power supplies for each group, current per power supply max. 4 A, see additional description in manual
for technological functions	
— Current per channel, max.	0.5 A; see additional description in the manual
Relay outputs	
Number of relay outputs	0
Cable length	
• shielded, max.	1 000 m; 600 m for technological functions; depending on output frequency, load, and cable quality; max. 50 m at 100 kHz
• unshielded, max.	600 m; for technological functions: No
Analog inputs	
Number of analog inputs	5; 4x for U/I, 1x for R/RTD
 For current measurement 	4; max.
 For voltage measurement 	·, · · · · · · ·
 For resistance/resistance thermometer measurement 	4; max.
■ 1 OF Tesistance/resistance thempothere measurement	
permissible input voltage for voltage input (destruction limit), max.	4; max.
permissible input voltage for voltage input (destruction limit),	4; max.
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit),	4; max. 1 28.8 V
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max.	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min.	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: ± 10 V
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: ± 10 V 100 kΩ
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; $^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$ Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; $^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$ Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V — Input resistance (-5 V to +5 V)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; $^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$ Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V — Input resistance (-5 V to +5 V) Input ranges (rated values), currents • 0 to 20 mA	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V — Input resistance (-5 V to +5 V) Input ranges (rated values), currents • 0 to 20 mA — Input resistance (0 to 20 mA)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 20 mA 50 Ω ; Plus approx. 55 ohm for overvoltage protection by PTC
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V — Input resistance (-5 V to +5 V) Input ranges (rated values), currents • 0 to 20 mA — Input resistance (0 to 20 mA) • -20 mA to +20 mA	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 20 mA 50 Ω ; Plus approx. 55 ohm for overvoltage protection by PTC Yes
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min. Technical unit for temperature measurement adjustable Input ranges (rated values), voltages • 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -5 V to +5 V — Input resistance (-5 V to +5 V) Input ranges (rated values), currents • 0 to 20 mA — Input resistance (0 to 20 mA)	4; max. 1 28.8 V 40 mA 1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Yes; °C/°F/K Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 10 V 100 k Ω Yes; Physical measuring range: \pm 20 mA 50 Ω ; Plus approx. 55 ohm for overvoltage protection by PTC

 Ni 100 — Input resistance (Ni 100) Pt 100 Pt 100 Input resistance (Pt 100) Input ranges (rated values), resistors 0 to 150 ohms Input resistance (0 to 150 ohms) 10 MΩ Input resistance (0 to 150 ohms) 10 MΩ Yes; Physical measuring range: 0 600 ohms Input resistance (0 to 300 ohms) Yes; Physical measuring range: 0 600 ohms Input resistance (0 to 600 ohms) Yes Input resistance (0 to 600 ohms) O MΩ Cable length shielded, max. 800 m; for U/I, 200 m for R/RTD Analog outputs integrated channels (AO) Yes Voltage output, short-circuit protection 	Input ranges (rated values), resistance thereesester		
- Input resistance (Ni 100) - Pi 100 - Pi 100 - Imput resistance (Pi 100) - Imput resistance (To 150 ohms) - Imput resistance (10 500 ohms) - Imput resistance (10 50	Input ranges (rated values), resistance thermometer	Vae: Standard/climate	
Pet 100 —Input resistance (Pt 100) Input renges (gread values), insistors ● 10 1 50 orns ■ Pet resistance (0 to 150 orns) ■ 10 MΩ ● 10 500 orns ■ Pet resistance (1 to 300 orns) ■ 10 MΩ ● 10 500 orns ■ Pet resistance (1 to 300 orns) ■ Pet resistance (1 to 100 or			
Import residence (PT 100) Input ranges (rated values), resistors - 10 to 150 dhms - Input resistance (0 to 150 dhms) - Input resistance (0 to 300 dhms) - Input resistance (0 to 600 dhms) - I			
Input ranges (rated values), resistors			
O to 150 chms		JO MIZ	
Input resistance (0 to 500 ohms) O to 300 ohms Input resistance (0 to 300 ohms) O to 600 ohms Input resistance (0 to 600 ohms) Input resistance (0 to 600 oh		Very District or a confirmation of a confirmatio	
■ 0 to 300 chms			
Injust cesistance (0 to 300 ohms)			
• 0 to 800 chms			
- Input resistance (0 to 600 ohms) Cable length shelded, max. 800 m; for U/I, 200 m for R/RTD Analog outputs integrated channels (AO) 2 Votage output, short-circuit protection Cycle time (all channels), min. 1 ms; Dependent on the parameterized interference frequency suppression; for details, see convertison procedure in manual Output ranges, voitage • 0 to 10 V • 1 Vto 5 V • 10 V to +10 V Output ranges, current • 0 to 20 mA • 20 m AA • 20 m AA to +20 mA • 20 m AA to +20 mA • 4 m A to 20 mA • with votage outputs, capacitive load, max. • with votage outputs, capacitive load, max. • with current outputs, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, min. • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Stip: Medium • Yes • Stip: M			
* shelded, max. * votage output, short-circuit protection * Ves * Votage output, short-circuit protection * Ves * Output ranges, votage * 0 to 10 V * 1 V to 5 V * 10 V to 14 V * 10 V to 14 V * 29 * - 10 V to 140 V * 20 mA Ves * - 20 mA to 20 mA * - 4 m kto 20 mA * - 3 m kto 20 mA * - 4 m kto 20 mA * - 3 m kto 20 mA * - 4 m kto 20 mA * - 20 m kto 20 mA * - 2			
Anslog outputs Integrated channels (AO) 2 Voltage output, short-circuit protection Cycle time (all channels), min. Output ranges, voltage • 0 to 10 V • 1 V to 5 V • 1 0 V to +10 V Output ranges, current • 0 to 20 mA • 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • with voltage outputs, appacitive load, max. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, max. • shelded, max. • answer owner over the inputs Integration and conversion frime/resolution per channel • Resolution with overrange (bit including sign), max. • integration and conversion for the outputs Integration and conversion interference frequency suppression for interference frequency filin ht z • parameterizable • Step: None • Step: None • Step: None • Step: None • Step: Index • Step: None • Step: Index • Connection of signal encoders • for resistance measurement with two-wire connection • for outputs measurement and a-wire transducer • for outputs measurement and a-wire transducer • for outputs measurement and a-wire transducer • for output measurement with two-wire connection		10 ΜΩ	
Analog outputs integrated channels (AO) Cycle time (all channels, min. Cycle time (all cycle time) Oto 10 V Yes -10 V to +10 V Yes -10 V to +10 V Yes -10 V to +10 V Yes -20 mA to +20 mA -20 mA to +20 mA -20 mA to +20 mA -4 m Ato 20 mA -4 m Ato 20 mA -4 m Ato 20 mA -4 with current outputs, min. -4 with current outputs, inductive load, max. -4 with current outputs, inductive load, max. -4 with current outputs, inductive load, max. -4 min current outputs, inductive load -5 consocial outputs -6 for resistive load -6 for inductive load -6 for inductive load -6 for corrent measurement outputs, with min	-		
integrated channels (AO) Votage output, short-crout protection Cycle time (all channels), min. Output ranges, voltage • 0 to 10 V • 10 to 10 V • 11 V to 5 V • 1-10 V to +10 V Ves • 1-10 V to +10 V • 20 mA • 20 mA to +20 mA • 20 mA to +20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • with outrent outputs, max. • with outrent outputs, max. • with current outputs, inductive load, max. • to 00 fo		800 m; for U/I, 200 m for R/RTD	
Voltage output, short-circuit protection Cycle time (all channels), min. details, see conversion procedure in manual Output ranges, voltage 0 to 10 1V 1	Analog outputs		
Cycle time (all channels), min. 1 ms. Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual Output ranges, voltage • 10 to 10 V • 1 V to 5 V • 10 V to +10 V Cuput ranges, current • 0 to 20 mA • 20 mA to +20 mA • 4 mA to 20 mA • 4 mA to 20 mA • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with output subject of the inputs Integration of conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration of measured values • parameterizable • parameterizable • parameterizable • Step: None • Step: None • Step: None • Step: Iwd • Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution • Step: Iwd • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Step: Iwd • For resistive load • For current measurement as 4-wire transducer • For output manuser • For output manuser • For output manuser • For output manuser • For output in manual • Fees output in manual • Fees output in manuser • For output in manuser •	integrated channels (AO)	2	
Output ranges, voltage • 0 to 10 V • 10 V to 5 V • 10 V to 10 V • 10 V to 10 V • 2 Ves • 10 V to 10 V Output ranges, current • 0 to 20 mA • 20 mA to +20 mA • 4 mA to 20 mA Load impedance (in reter range of output) • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, min. • with current outputs, min. • with voltage outputs, inductive load, max. • with current outputs, inductive load in interference frequency if in Hz Smoothing of measured values • parameterizable • Step: None • Step: None • Step: None • Step: None • Step: High • Yes • Step: High • Or resistive load • Pessolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Or or capacitive load • Or resistive load • Or or capacitive load • Or or ottoge measurement • Or or output measurement as 4-wire transducer • Or or output measurement as 4-wire transducer • Or or output measurement with two-wire connection • Or or capacitive load • Or or output measurement with two-wire connection	Voltage output, short-circuit protection	Yes	
Output ranges, voltage	Cycle time (all channels), min.	1 ms; Dependent on the parameterized interference frequency suppression; for	
• 0 to 10 V • 1 V to 5 V • 10 V to +10 V • 2 Ves • 10 V to +10 V • 10 to 20 mA • 20 mA to 20 mA • 20 mA to 10 x 0 mA • 4 mA to 20 mA • 5 man to 20 mA • 6		details, see conversion procedure in manual	
• 1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	· · · · · · · · · · · · · · · · · · ·		
10 V to +10 V Output ranges, current 0 to 20 mA 0 20 mA 20 mA Yes 4 mA to 20 mA 4 who 10 20 mA 6 with voltage outputs, min. 1 kΩ 6 with voltage outputs, capacitive load, max. 100 nF 6 with current outputs, max. 100 nF 6 with current outputs, inductive load, max. 100 nF 100 mB			
Output ranges, current • 10 to 20 mA • -20 mA to +20 mA • -4 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • with voltage outputs, min. • with voltage outputs, apacitive load, max. • with current outputs, inductive load, max. • on maximum maxi	• 1 V to 5 V	Yes	
O to 20 mA - 20 mA to +20 mA - 4 mA to 20 mA - 4 mA to 20 mA - with voltage outputs, min. - with voltage outputs, max. - with current outputs, max. - with current outputs, inductive load, max. - outputs, inductive load, inductive load, max. - outputs, inductive load - outputs, max. - outputs, max outputs,		Yes	
- 20 mA to +20 mA - 4 mA to 20 mA - 4 mA to 20 mA - 4 mA to 20 mA Load impedance (in rated range of output) - with voltage outputs, min with voltage outputs, capacitive load, max with current outputs, max with current outputs, inductive load, max with current outputs, inductive load, max with current outputs, inductive load, max. Cable length - shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max integration time, parameterizable - ves; 2.5 / 16.67 / 20 / 100 ms, acts on all channels - integration time, parameterizable - parameterizable - parameterizable - parameterizable - parameterizable - parameterizable - Step: None - Step: None - Step: None - Step: High - Yes - Step: High - Yes - Step: High - Yes Analog value generation for the outputs Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max. 16 bit Settling time - for resistive load - for inductive load - 2.5 ms - for capacitive load - for inductive load - for inductive load - for inductive load - for inductive load - for resistance measurement - for current measurement as 4-wire transducer - for resistance measurement with two-wire connection - Yes	Output ranges, current		
4 mA to 20 mA Load impedance (in rated range of output) with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, inductive load, max. 1 mH Cable length white current outputs, inductive load, max. 1 mH Cable length white current outputs, inductive load, max. 200 m Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. integration and conversion time/resolution per channel integration inte, parameterizable	• 0 to 20 mA	Yes	
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. 1 mH Cable length • shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values • parameterizable • Step: None • Step: None • Step: low • Step: Hedium • Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. Settling time • for resistive load • for capacitive load • for current measurement as 4-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection Yes	• -20 mA to +20 mA	Yes	
 with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, inductive load, max. 1 mH Cable length shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable interference voltage suppression for interference frequency 1f in Hz Smoothing of measured values Step: None Step: None Step: None Step: Medium Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for respistive load for capacitive load for or capacitive load for inductive load for inductive load for or current measurement for ourrent measurement for ourrent measurement as 4-wire transducer for current measurement as 4-wire transducer for current measurement as 4-wire transducer for current measurement with two-wire connection Yes	• 4 mA to 20 mA	Yes	
 with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, inductive load, max. 1 mH Cable length shielded, max. 200 m Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration generation for the inputs Smoothing of measured values parameterizable Step: None Step: None Step: Medium Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load for capacitive load 2.5 ms for inductive load 2.5 ms Encoder Connection of signal encoders for ournent measurement Yes for current measurement as 4-wire transducer Yes for our resistance measurement with two-wire connection Yes	Load impedance (in rated range of output)		
with current outputs, inductive load, max. with current outputs, inductive load, max. 1 mH Cable length shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltages suppression for interference frequency ff in Hz Smoothing of measured values parameterizable Step: None Step: None Step: None Step: Medium Step: Medium Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Setting time for resistive load for capacitive load for capacitive load for capacitive load for or capacitive load For voltage measurement For voltage measurement For voltage measurement as 4-wire transducer For resistance measurement with two-wire connection For resistance measurement with two-wire co	with voltage outputs, min.	1 kΩ	
with current outputs, inductive load, max. Cable length shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz. Smoothing of measured values Parameterizable Step: None Step: None Step: None Step: Medium Step: High Yes Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Yes Yes Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load for resistive load for ordactive load for ovoltage measurement for voltage measurement for ovoltage measurement for ovoltage measurement as 4-wire transducer for ovoresistance measurement with two-wire connection Yes	 with voltage outputs, capacitive load, max. 	100 nF	
Cable length • shielded, max. Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values • parameterizable • Step: None • Step: None • Step: Iow • Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. Settling time • for resistive load • for capacitive load • for or apacitive load • for voltage measurement • for voltage measurement • for voltage measurement as 4-wire transducer • for current measurement as 4-wire transducer • for cresistance measurement with two-wire connection Yes 16 bit 200 m Analog value generation for the inputs 16 bit 16 bit 17 ms 18 bit 19 ms 19 ms 10 ms 11 ms 12 ms 13 ms 14 bit 15 ms 16 bit 16 bit 17 ms 18 ms 19 ms 19 ms 19 ms 10 ms 10 ms 10 ms 10 ms 10 ms 11 ms 12 ms 13 ms 14 bit 15 ms 16 bit 16 bit 17 ms 18 ms 19 ms 19 ms 10	with current outputs, max.	500 Ω	
shielded, max. 200 m Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Parameterizable Yes Step: None Yes Step: None Yes Step: High Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load 1.5 ms for inductive load 2.5 ms Encoder Connection of signal encoders for voltage measurement as 4-wire transducer Yes for ourrent measurement as 4-wire transducer Yes for current measurement as 4-wire transducer Yes for resistance measurement with two-wire connection Yes		1 mH	
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values parameterizable Step: None Step: None Step: None Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for inductive load for inductive load for ovitage measurement for ovitage measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	Cable length		
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values parameterizable Step: None Step: None Step: None Step: High Yes Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for inductive load Settling time Connection of signal encoders for voltage measurement as 4-wire transducer frequency f1 in Hz Yes; 2.5 / 16.67 / 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 Yes; 2.5 / 16.67 / 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 Yes; 2.5 / 16.67 / 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 Yes Yes Yes Step: Medium Yes Step: Medium Yes Step: Medium Yes Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load Settling time for organization and conversion time/resolution per channel for organization and conversion time/resolution per channel for organization and conversion time/resolution per channel For resistative load Settling time for organization and conversion time/resolution per channel for resistation with overrange (bit including sign), max. For voltage measurement Yes for voltage measurement as 4-wire transducer Yes for current measurement with two-wire connection Yes	• shielded, max.	200 m	
Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Parameterizable Step: None Step: None Step: low Step: Medium Yes Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for capacitive load for inductive load For inductive load For ovoltage measurement For ovoltage measurement as 4-wire transducer For resistance measurement with two-wire connection Yes 16 bit Yes 400 / 60 / 50 / 10 Yes 400 / 60 / 50 / 10 Yes 400 / 60 / 50 / 10 The Set Set Set Set Set Set Set Set Set Se	Analog value generation for the inputs		
Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Parameterizable Step: None Step: None Step: None Step: High Yes Step: High Yes Step: High Yes The solution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for capacitive load for capacitive load for inductive load Connection of signal encoders for voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes 16 bit Yes 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 100 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 10 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 10 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 10 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 10 ms, acts on all channels 400 / 60 / 50 / 10 The set, 20 / 10 ms, 20 / 10 The set, 20 / 10 ms, 20 / 10 The set, 20 / 10 ms, 20 / 10 The set, 20 / 10 ms, 20 / 10 The set, 20 / 10 ms, 20 / 10 The set, 20 / 10 m	Integration and conversion time/resolution per channel		
Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion of the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max.		16 bit	
Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Interference voltage suppression for interference frequency f1 in Hz Smoothing of measured values Yes Step: None Yes Step: low Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time Integration and conversion time/resolution per channel Set			
frequency f1 in Hz Smoothing of measured values • parameterizable • Step: None • Step: None • Step: low • Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. Settling time • for resistive load • for capacitive load • for inductive load • for inductive load • for or diagnal encoders • for voltage measurement • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection Yes	-		
parameterizable Step: None Step: None Step: low Step: Medium Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load for capacitive load for inductive load for inductive load Encoder Connection of signal encoders for outputs for outputs for outputs Free Connection of signal encoders for voltage measurement for outputs transducer For resistance measurement with two-wire connection Yes	0 11		
Step: None Step: None Step: low Step: Medium Step: High Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for capacitive load for inductive load Sencoder Connection of signal encoders for voltage measurement for ourrent measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	Smoothing of measured values		
Step: low Step: Medium Step: High Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load for capacitive load for inductive load for inductive load Encoder Connection of signal encoders for overland over transducer for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	parameterizable	Yes	
Step: low Step: Medium Step: High Yes Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Settling time for resistive load for capacitive load for inductive load for inductive load Encoder Connection of signal encoders for overland over transducer for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	Step: None	Yes	
Step: High Step: High Yes Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for capacitive load for inductive load for inductive load Fincoder Connection of signal encoders for voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	·	Yes	
Step: High Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for capacitive load for inductive load Settling time for voltage measurement for voltage measurement as 4-wire transducer for current measurement with two-wire connection Yes	·	Yes	
Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time for resistive load for capacitive load for inductive load 2.5 ms for inductive load Connection of signal encoders for voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	•		
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Settling time of or resistive load for capacitive load for inductive load for inductive load Encoder Connection of signal encoders of or voltage measurement for current measurement as 4-wire transducer of or resistance measurement with two-wire connection Yes			
Resolution with overrange (bit including sign), max. Settling time of resistive load for capacitive load for inductive load for inductive load Encoder Connection of signal encoders of ro voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes of resistance measurement with two-wire connection 1.5 ms 2.5 ms Encoder Yes			
Settling time • for resistive load • for capacitive load • for inductive load • for inductive load 2.5 ms Encoder Connection of signal encoders • for voltage measurement • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection Yes		16 bit	
for resistive load for capacitive load for inductive load for inductive load for inductive load for inductive load for voltage measurement for voltage measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with two-wire connection		TO DIC	
for capacitive load of for inductive load of for current measurement of for current measurement as 4-wire transducer of for resistance measurement with two-wire connection of for resistance measurement with two-wire connection	·	1.5 ms	
for inductive load 2.5 ms Encoder Connection of signal encoders for voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes			
Encoder Connection of signal encoders • for voltage measurement Yes • for current measurement as 4-wire transducer Yes • for resistance measurement with two-wire connection Yes	•		
Connection of signal encoders • for voltage measurement • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection Yes		£.0 III0	
 for voltage measurement for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes Yes 			
 for current measurement as 4-wire transducer for resistance measurement with two-wire connection Yes	·		
• for resistance measurement with two-wire connection Yes	-		
	 for current measurement as 4-wire transducer 		
• for resistance measurement with three-wire connection Yes	• for resistance measurement with two-wire connection	Yes	
	• for resistance measurement with three-wire connection	Yes	
• for resistance measurement with four-wire connection Yes	for resistance measurement with four-wire connection	Yes	
Connectable encoders	Connectable encoders		

• 2-wire sensor	Yes		
permissible quiescent current (2-wire sensor), max.	1.5 mA		
Encoder signals, incremental encoder (asymmetrical)			
Input voltage	24 V		
Input frequency, max.	100 kHz		
Counting frequency, max.	400 kHz; with quadruple evaluation		
Signal filter, parameterizable	Yes		
 Incremental encoder with A/B tracks, 90° phase offset 	Yes		
 Incremental encoder with A/B tracks, 90° phase offset 	Yes		
and zero track			
• pulse encoder	Yes		
 pulse encoder with direction 	Yes		
pulse encoder with one impulse signal per count direction	Yes		
Errors/accuracies			
Linearity error (relative to input range), (+/-)	0.1 %		
Temperature error (relative to input range), (+/-)	0.005 %/K		
Crosstalk between the inputs, max.	-60 dB		
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %		
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %		
Linearity error (relative to output range), (+/-)	0.15 %		
Temperature error (relative to output range), (+/-)	0.005 %/K		
Crosstalk between the outputs, max.	-80 dB		
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %		
Operational error limit in overall temperature range			
Voltage, relative to input range, (+/-)	0.3 %		
• Current, relative to input range, (+/-)	0.3 %		
Resistance, relative to input range, (+/-)	0.3 %		
Resistance thermometer, relative to input range, (+/-)	Pt100 Standard: ±2 K, Pt100 Climate: ±1 K, Ni100 Standard: ±1.2 K, Ni100		
 Voltage, relative to output range, (+/-) 	Climate: ±1 K 0.3 %		
Current, relative to output range, (+/-)	0.3 %		
Basic error limit (operational limit at 25 °C)			
Voltage, relative to input range, (+/-)	0.2 %		
• Current, relative to input range, (+/-)	0.2 %		
Resistance, relative to input range, (+/-)	0.2 %		
• Resistance thermometer, relative to input range, (+/-)	Pt100 Standard: ±1 K, Pt100 Climate: ±0.5 K, Ni100 Standard: ±0.6 K, Ni100 Climate: ±0.5 K		
 Voltage, relative to output range, (+/-) 	0.2 %		
Current, relative to output range, (+/-)	0.2 %		
Interference voltage suppression for $f = n \times (f1 + /- 1 \%)$, $f1 = interference$			
Series mode interference (peak value of interference < rated value of input range), min.	30 dB		
Common mode voltage, max.	10 V		
Common mode interference, min.	60 dB; at 400 Hz: 50 dB		
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		
PROFINET IO Controller	Yes		
PROFINET IO Device	Yes		
SIMATIC communication	Yes		
Open IE communication	Yes; Optionally also encrypted		
Web server	Yes		
	Yes		
Media redundancy	165		
PROFINET IO Controller			

Convince		
Services	Von	
— 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 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	
 Of which IO devices with IRT, max. 	64	
 Number of connectable IO Devices for RT, max. 	128	
— of which in line, max.	128	
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; in total across all interfaces	
 Number of IO Devices per tool, max. 	8	
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data.	
Lindate time for IRT	configured user data	
Update time for IRT	250 up to 4 mg. Notes in the case of IDT with issue-	
— for send cycle of 250 μs	250 μs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 μs of the isochronous OB is decisive	
— for send cycle of 500 μs	$500~\mu s$ to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of $625~\mu s$ of the isochronous OB is decisive	
— 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 $\mu s:375~\mu s,625~\mu s~3~875~\mu s)$	
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	
— Isochronous mode	No	
— IRT	Yes	
— PROFlenergy	Yes; per user program	
— Shared device	Yes	
 Number of IO Controllers with shared device, max. 	4	
 activation/deactivation of I-devices 	Yes; per user program	
 Asset management record 	Yes; per user program	
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	
Autonegotiation	Yes	
Autorossing	Yes	
Industrial Ethernet status LED	Yes	
Protocols		
Number of connections		
Number of connections, max.	128: via integrated interfaces of the CDLL and connected CDs / CMs	
Number of connections, max. Number of connections reserved for ES/HMI/web	128; via integrated interfaces of the CPU and connected CPs / CMs 10	
	88	
Number of connections via integrated interfaces Number of S7 routing paths	16	
Number of S7 routing paths Pedundancy mode.	10	
Redundancy mode	Voc	
H-Sync forwarding	Yes	
Media redundancy	1 1 4 1 1 1 7 0 000	
— Media redundancy	only via 1st interface (X1)	
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	
 MRP interconnection, supported 	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	
— what interconnection, supported	1 65, 45 IVINT THIS HOUGE ACCORDING TO TEC 02455-2 EUTION 3.0	

— MRPD	Voc. Poquiroment: IDT	
···· -	Yes; Requirement: IRT	
— Switchover time on line break, typ.— Number of stations in the ring, max.	200 ms; For MRP, bumpless for MRPD 50	
SIMATIC communication	50	
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	
• S7 routing	Yes	
S7 routing S7 communication, as server	Yes	
S7 communication, as server S7 communication, as client	Yes	
User data per job, max.	See online help (S7 communication, user data size)	
Open IE communication	occ offiline help (or confinding alon, ascrada size)	
• 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		
• HTTP	Yes; Standard and user pages	
• HTTPS	Yes; Standard and user pages	
OPC UA		
 Runtime license required 	Yes; "Small" license required	
OPC UA Client	Yes	
 Application authentication 	Yes	
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256	
User authentication	"anonymous" or by user name & password	
 Number of connections, max. 	4	
 Number of nodes of the client interfaces, recommended max. 	1 000	
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I max. 	300	
 Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. 	20	
 Number of elements for one call of OPC_UA_MethodGetHandleList, max. 	100	
 Number of simultaneous calls of the client instructions for session management, per connection, max. 	1	
 Number of simultaneous calls of the client instructions for data access, per connection, max. 	5	
 Number of registerable nodes, max. 	5 000	
 Number of registerable method calls of OPC_UA_MethodCall, max. 	100	
— Number of inputs/outputs when calling OPC_UA_MethodCall, max.	20	
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	
Application authentication	Yes	
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256	
— User authentication	"anonymous" or by user name & password	
GDS support (certificate management)	Yes	
Number of sessions, max.	32	
 Number of accessible variables, max. 	50 000	
Number of registerable nodes, max.	10 000	
 Number of subscriptions per session, max. 	20	

Compling interval min	100 ms	
— Sampling interval, min.	500 ms	
— Publishing interval, min.		
Number of server methods, max.	20	
Number of inputs/outputs per server method, max.	20	
Number of monitored items, recommended max.	1 000; for 1 s sampling interval and 1 s send interval	
 Number of server interfaces, max. 	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"	
 Number of nodes for user-defined server interfaces, max. 	1 000	
 Alarms and Conditions 	Yes	
 Number of program alarms 	100	
 Number of alarms for system diagnostics 	50	
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	
	2 000	
Number of simultaneously active program alarms	600	
Number of program alarms Number of alarma for pustom diagnostics	600	
Number of alarms for system diagnostics	100	
Number of alarms for motion technology objects	80	
Test commissioning functions		
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		
Status/control variable	Yes	
 Variables 	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	
 Number of variables, max. 		
of which status variables, max.	200; per job	
— of which control variables, max.	200; per job	
Forcing		
• Forcing	Yes	
 Forcing, variables 	Peripheral inputs/outputs	
Number of variables, max.	200	
Diagnostic buffer		
• present	Yes	
 Number of entries, max. 	1 000	
— of which powerfail-proof	500	
Traces		
Number of configurable Traces	4; Up to 512 KB of data per trace are possible	
Interrupts/diagnostics/atatus information		
Interrupts/diagnostics/status information		
Alarms		
	Yes	
Alarms	Yes Yes	
Alarms • Diagnostic alarm		
Alarms • Diagnostic alarm • Hardware interrupt		
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses	Yes	
Alarms	Yes Yes; for analog inputs/outputs, see description in manual	
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses • Monitoring the supply voltage • Wire-break	Yes	
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • A/B transition error at incremental encoder	Yes Yes Yes; for analog inputs/outputs, see description in manual Yes; for analog outputs, see description in manual	
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • A/B transition error at incremental encoder Diagnostics indication LED	Yes Yes Yes; for analog inputs/outputs, see description in manual Yes; for analog outputs, see description in manual Yes	
Alarms Diagnostic alarm Hardware interrupt Diagnoses Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Diagnostics indication LED RUN/STOP LED	Yes Yes; for analog inputs/outputs, see description in manual Yes; for analog outputs, see description in manual Yes Yes	
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • A/B transition error at incremental encoder Diagnostics indication LED • RUN/STOP LED • ERROR LED	Yes Yes Yes; for analog inputs/outputs, see description in manual Yes; for analog outputs, see description in manual Yes Yes	
Alarms • Diagnostic alarm • Hardware interrupt Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • A/B transition error at incremental encoder Diagnostics indication LED • RUN/STOP LED	Yes Yes; for analog inputs/outputs, see description in manual Yes; for analog outputs, see description in manual Yes Yes	

 Monitoring of the supply voltage (PWR-LED) 	Yes
 Channel status display 	Yes
 for channel diagnostics 	Yes; For analog inputs/outputs
 Connection display LINK TX/RX 	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	800
 Required Motion Control resources 	
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
 Positioning axis 	
 Number of positioning axes at motion control cycle of 4 ms (typical value) 	5
 Number of positioning axes at motion control cycle of 8 ms (typical value) 	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
Integrated Functions	
Counter	
Number of counters	6
 Counting frequency, max. 	400 kHz; with quadruple evaluation
Counting functions	
Continuous counting	Yes
 Counter response parameterizable 	Yes
 Hardware gate via digital input 	Yes
Software gate	Yes
 Event-controlled stop 	Yes
 Synchronization via digital input 	Yes
 Counting range, parameterizable 	Yes
Comparator	
 Number of comparators 	2; per count channel; see manual for details
 Direction dependency 	Yes
 Can be changed from user program 	Yes
Position detection	
 Incremental acquisition 	Yes
 Suitable for S7-1500 Motion Control 	Yes
Measuring functions	
 Measuring time, parameterizable 	Yes
 Dynamic measurement period adjustment 	Yes
 Number of thresholds, parameterizable 	2
Measuring range	
— Frequency measurement, min.	0.04 Hz
 Frequency measurement, max. 	400 kHz; with quadruple evaluation
 Cycle duration measurement, min. 	2.5 μs
 Cycle duration measurement, max. 	25 s
Accuracy	
Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
 Velocity measurement 	100 ppm; depending on measuring interval and signal evaluation
— Velocity measurement Potential separation	100 ppm; depending on measuring interval and signal evaluation

 between the channels 		No		
between the channels, in groups of	16	16		
Potential separation digital outputs				
 between the channels 		No		
between the channels, in groups of	16	16		
Potential separation channels				
 between the channels and backplane bus 	Yes			
Between the channels and load voltage L+	No			
Isolation				
Isolation tested with	707 V DC (type test)			
Ambient conditions				
Ambient temperature during operation				
 horizontal installation, min. 	-25 °C; No condensation			
horizontal installation, max.	60 °C; note derating data for one operating temperature of typicall			
 vertical installation, min. 	-25 °C; No condensation			
vertical installation, max.	40 °C; note derating data for only operating temperature of typically			
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 installa	ition altitudes > 2 000 m,	see manual	
configuration / header				
configuration / programming / header				
Programming language				
— LAD	Yes			
— FBD	Yes			
— STL	Yes			
— SCL	Yes			
— GRAPH	Yes			
Know-how protection	165			
User program protection/password protection	Yes			
Copy protection	Yes			
Block protection	Yes			
·	Tes			
Access protection	V			
protection of confidential configuration data	Yes			
Password for display	Yes			
Protection level: Write protection		Yes		
Protection level: Read/write protection		Yes		
Protection level: Complete protection	Yes	Yes		
programming / cycle time monitoring / header				
• lower limit		adjustable minimum cycle time		
upper limit	adjustable maximum cycle time	adjustable maximum cycle time		
Dimensions				
Width	110 mm			
Height	147 mm			
Depth	129 mm	129 mm		
Weights				
Weight, approx.	1 360 g			
Classifications				
		Version	Classification	
	601	1.4	27 24 22 27	
	eClass	14	27-24-22-07	
	eClass eClass	14 12	27-24-22-07 27-24-22-07	
	eClass	12	27-24-22-07	
	eClass eClass eClass	12 9.1 9	27-24-22-07 27-24-22-07 27-24-22-07	
	eClass eClass eClass eClass	12 9.1 9 8	27-24-22-07 27-24-22-07 27-24-22-07 27-24-22-07	
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ETIM	9	EC000236
ETIM	8	EC000236
ETIM	7	EC000236
IDEA	4	3565
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval





Manufacturer Declara-tion

Miscellaneous



Miscellaneous

General Product Ap-

For use in hazardous locations





<u>FM</u>

CCC-Ex



Type Examination Cer**tificate**

For use in hazardous locations

Test Certificates

Marine / Shipping



IECEx

Miscellaneous

Type Test Certificates/Test Report







Marine / Shipping



NK / Nippon Kaiji Ky-okai





CCS (China Classification Society)



other

Industrial Communication

PROFINET

PROFINET

last modified:

12/8/2024

