SIEMENS

Data sheet

6ES7212-1AF40-0XB0

SIMATIC S7-1200F, CPU 1212 FC, compact CPU, DC/DC/DC, onboard I/O: 8 DI 24 V DC; 6 DO 24 V DC; 2 AI 0-10 V DC, Power supply: DC 20.4-28.8V DC, Program/data memory 100 KB



General information	
Product type designation	CPU 1212FC DC/DC/DC
Firmware version	V4.2
Engineering with	
 Programming package 	STEP 7 V14 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
Rated value (DC)	24 V
 permissible range, lower limit (DC) 	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	400 mA; Typical
Inrush current, max.	12 A; at 28.8 V DC
l²t	0.5 A²·s

Output current	
for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Encoder supply 24 V encoder supply	
	Permissible range: 20.4V to 28.8V
• 24 V	Fermissible range. 20.4 V to 20.0 V
Power loss	
Power loss, typ.	9 W
Memory	
Work memory	
 integrated 	100 kbyte
• expandable	No
Load memory	
• integrated	2 Mbyte
 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
Backup	
● present	Yes
maintenance-free	Yes
 without battery 	Yes
CPU processing times for bit operations, typ.	0.08 μs; / instruction
for word operations, typ.	1.7 μ s; / instruction
for floating point arithmetic, typ.	$2.5 \ \mu s; / instruction$
	2.0 µ0, / monuolon
CPU-blocks	
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no
	restriction, the entire working memory can be used
OB	
• Number, max.	Limited only by RAM for code
Data areas and their retentivity	40 l.h.t.
Retentive data area (incl. timers, counters, flags), max.	10 kbyte
Flag	
• Number, max.	4 kbyte; Size of bit memory address area
Local data	
 per priority class, max. 	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
	to 26: 6 KB
Address area I/O address area	
Inputs	1 024 byte
• Outputs	1 024 byte
Salpato	

 Inputs, adjustable Ikbyte Outputs, adjustable Ikbyte Outputs, adjustable Ikbyte Indexed configuration Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Inne of day Clock Hardware clock (real-time) Backup time Operation per day, max. 80 stronth at 25 °C Digital inputs Number of digital inputs 8; Integrated of which inputs usable for technological functions - up to 40 °C, max. 8 Input voltage Rated value (DC) 24 V For signal °C* for signal °C* for signal °C* - parameterizable selectable in groups of four - parameterizable single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz. Cable length shielded, max. Soure, 500 m; 50 m for technological functions - parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz. Cable length shielded, max. Soure, 500 m; 50 m for technological functions - parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz. Cable length shielded, max. Soure, 500 m; 50 m for technological functions - parameterizable shielded, max. Soure, 500 m; 50 m for technological functions - parameterizable Ves Tor technological functions - parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz. 	Process image	
Hardware configuration Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Time of day Clock • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. 60 smooth at 25 °C Ogital inputs 8; Integrated • of which inputs usable for technological functions 6; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 8 all mounting positions - up to 40 °C, max. • for signal °C* 5 V DC at 1 mA • for signal °1* 15 V DC at 2.5 mA Input voltage 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four • at °C* to *1*, max. 1.2 ms for interrupt inputs - parameterizable • parameterizable Yes for interrupt inputs - parameterizable • parameterizable Yes for interrupt inputs - parameterizable • parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 30 kHz & 1 @ 30 kHz Clable length . Stole tochological functions • unshielded, max. 300 m; for technological functions • unshielded, max. 300 m; for technological functions	 Inputs, adjustable 	1 kbyte
Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Time of day Clock • • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. 60 s/month at 25 °C Optical inputs 8: Integrated • of which inputs usable for technological functions 8: Integrated • of which inputs Yes Number of simultaneously controllable inputs 8 all mounting positions – - up to 40 °C, max. 8 Input voltage 9 • Rated value (DC) 24 V • for signal °0° 5 V DC at 1 mA • for signal °1° 15 V DC at 2.5 mA Input voltage - • for signal °1° 1 mA Input delay (for rated value of input voltage) for signal °1°, min. • for signal °1°, min. 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at °0° to °1°, max. 12.8 ms for interrupt inputs – - parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz • or	Outputs, adjustable	1 kbyte
Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Time of day Clock • • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. 60 s/month at 25 °C Optical inputs 8: Integrated • of which inputs usable for technological functions 8: Integrated • of which inputs Yes Number of simultaneously controllable inputs 8 all mounting positions – - up to 40 °C, max. 8 Input voltage 9 • Rated value (DC) 24 V • for signal °0° 5 V DC at 1 mA • for signal °1° 15 V DC at 2.5 mA Input voltage - • for signal °1° 1 mA Input delay (for rated value of input voltage) for signal °1°, min. • for signal °1°, min. 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at °0° to °1°, max. 12.8 ms for interrupt inputs – - parameterizable Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz • or	llenduren er formelien	
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for standard inputs	● for signal "1", typ.	1 mA
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• unshielded, max. 300 m; for technological functions: No Digital outputs Number of digital outputs 6	Cable length	
Digital outputs 6	• shielded, max.	500 m; 50 m for technological functions
Number of digital outputs 6	• unshielded, max.	300 m; for technological functions: No
	Digital outputs	
of which high-speed outputs 4; 100 kHz Pulse Train Output	Number of digital outputs	6
	 of which high-speed outputs 	4; 100 kHz Pulse Train Output

Linitation of inductive shuldown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A • with resistive load, max. 5 W Output voltage 0.1 V; with 10 kOhm load • for signal "0", max. 20 V Output voltage 0.5 A • for signal "1" rated value 0.5 A • for the pulse outputs. with resistive load, max. 100 KHz Relay outputs 0 • outputs outputs 0 • outputs 2 • outputs 2 • loup to felso outputs 2	Short-circuit protection	No; to be provided externally
• with resistive load, max.0.5 Å• on lamp load, max.5 WOutput voitage0.1 V, with 10 kOhm load• for signal "1", min.20 VOutput current0.5 Å• for signal "1" rated value0.5 Å• for signal "1" rated value0.1 mÅOutput delay with resistive load0.1 mÅ• Output delay with resistive load1 µS• "0" to "1", max.1 µS• "1" to "0", max.1 µS• of the pulse outputs, with resistive load, max.100 kHzRelay outputs0Cable length500 m• unshielded, max.500 m• of to +10 VYes• of to +10 VYes• of to +10 V2 100k ohmsCable length100 m; twisted and shielded• hielded, max.100 m; twisted and shieldedAnalog outputs0Cable length10 bit• shielded, max.625 µs	Limitation of inductive shutdown voltage to	L+ (-48 V)
on lang load, max. 5 W Output voitage 0.1 V; with 10 kOhm load o for signal "0", max. 0.1 V; with 10 kOhm load o for signal "1", max. 0.1 VA o for signal "1" rated value 0.5 A o for signal "0" residual current, max. 0.1 mA Output delay with resistive load 1 µS o "0 for "1", max. 5 µS Switching frequency 0 load kHz o "1 of "1", max. 5 µS Switching frequency 0 o the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 Cable length 100 kHz o the pulse outputs 500 m o number of relay outputs 500 m o thankog inputs 2 o thankog inputs	Switching capacity of the outputs	
Output voltage 0.1 V; with 10 kOhm load • for signal "0", max. 20 V Output current 20 V • for signal "1" rated value 0.5 A • for signal "1" rated value 0.5 A • for signal "1" rated value 0.1 mA Output delay with resistive load 1 µs • "1" to "0", max. 1 µs • "1" to "0", max. 1 µs • "1" to "0", max. 1 00 kHz Relay outputs 0 • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • shielded, max. 500 m • unshielded, max. 150 m Voltage Ves • olo to 10 V Yes • linput resistance (0 to 10 V) Yes • olo to +10 V Yes • olo to +10 V Yes • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of a	• with resistive load, max.	0.5 A
• for signal "0", max. 0.1 V; with 10 kOhm load • for signal "1", min. 20 V Output current 0.5 A • for signal "0" residual current, max. 0.1 mA Output delay with resistive load 0.1 mA Output delay with resistive load 1 μs • "0" to "1", max. 1 μs • "1" to "0", max. 1 μs • "1" to "0", max. 100 kHz • Relay outputs 100 kHz • Khelded, max. 500 m • shelded, max. 500 m • unshielded, max. 500 m • unshielded, max. 500 m • unshielded, max. 500 m • Uotage Ves Input ranges - • Voltage Ves • Input resistance (0 to 10 V) Yes • sheleided, max. 100 m; twisted and shielded • Shielded, max. 100 m; twisted and shielded • Notage Ves • O to +10 V Yes • Input resistance (0 to 10 V) Yes • Shielded, max. 100 m; twisted and shielded	• on lamp load, max.	5 W
• for signal *1", min. 20 V Output current 0.5 A • for signal *0" residual current, max. 0.5 A Output delay with resistive load 0 • "0" to "1", max. 1 µs • "0" to "1", max. 1 µs • "1" to "0", max. 5 µs Switching frequency 0 • for the pulse outputs, with resistive load, max. 100 kHz • Rumber of relay outputs 0 Cable length 0 • shielided, max. 500 m • unshielded, max. 150 m • unshielded, max. 150 m • unshielded, max. 2 • for to fage Yes • logt ranges - • logt ranges - • logt called, max. 100 khms Cable length - • logt called, max. 100 kms Cable length - • logt to to V Yes - logt to tesistone (0 to 10 V) Yes - shielided, max. 100 m; twisted and shielded Analog outputs 0	Output voltage	
Output current 0.5 A • for signal *0" residual current, max. 0.1 mA Output delay with resistive load 5 μs • *0" to "1", max. 5 μs Switching frequency 5 μs • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 Cable length 0 • shielded, max. 500 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 Input ranges 100 kms - Input resistance (0 to 10 V) 2100k ohms Cable length 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog outputs 10 bit · esolution with overrange (bit including sign), max. 10	● for signal "0", max.	0.1 V; with 10 kOhm load
• for signal "1" rated value 0.5 Å • for signal "0" residual current, max. 0.1 mÅ Output delay with resistive load 1 μs • "0" to "1", max. 1 μs • "1" to "0", max. 5 μs Switching frequency 0 • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • Number of relay outputs 0 • Shielded, max. 500 m • shielded, max. 150 m Analog inputs 2 • Voltage Yes • Ot + 10 V Yes • 0 to + 10 V 2100k ohms Cable length 2100k ohms Input ranges (rated values), voltages 2100k ohms • O to + 10 V Yes • 10 to + 10 V 2100k ohms Cable length 2100k ohms Cable length 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Cable length 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog outputs 10 bit • shielded, max. 10 bit • heregration fine	● for signal "1", min.	20 V
i-for signal "0" residual current, max. 0.1 mA Output delay with resistive load 1 μs • "0" to "1", max. 5 μs Switching frequency 00 kHz • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • Number of relay outputs 0 • Shielded, max. 500 m • unshielded, max. 150 m Number of analog inputs 2 • oto 10 v Yes - Input resistance (0 to 10 V) Yes - lnput resistance (0 to 10 V) 2100k ohms Cable length - • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of	Output current	
Instant of the source for th	 for signal "1" rated value 	0.5 A
• "0" to "1", max. 1 μs • "1" to "0", max. 5 μs Switching frequency 100 kHz • of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • Number of relay outputs 0 Cable length 500 m • unshielded, max. 500 m • unshielded, max. 500 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 • Voltage Yes Input ranges (rated values), voltages - • 0 to +10 V Yes - Input resistance (0 to 10 V) Yes - Input resistance (0 to 10 V) Yes • shielded, max. 100 m; twisted and shielded Analog outputs 0 Cable length - • shielded, max. 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog outputs 0 Integration and conversion time/resolution per channel - • Resolution with overrange (bit including sign), max. 10 bit	 for signal "0" residual current, max. 	0.1 mA
• "1" to "0", max.5 μsSwitching frequency100 kHz• of the pulse outputs, with resistive load, max.100 kHzRelay outputs0Cable length500 m• shielded, max.500 m• unshielded, max.150 mAnalog inputs2• number of nalog inputs2• VoltageYes• VoltageYes• O to +10 VYes• nupt resistance (0 to 10 V)100 knmsCable length0• shielded, max.100 m; twisted and shielded• Shielded, max.100 m; twisted and shieldedInput ranges100 m• Shielded, max.100 m; twisted and shielded• Shielded, max.10 bit• Shielded, max.10 bit• Shielded, max.10 bit• Integration and conversion time/resolution per channel• Resolution with overrange (bit including sign), max.10 bit• Integration mite (per channel)625 μs• EncoderEncoderConnectable encoders10 bit	Output delay with resistive load	
Switching frequency 100 kHz e of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 Cable length 0 • Shielded, max. 500 m • unshielded, max. 500 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 • Voltage Yes Input ranges Yes • Oto +10 V Yes - Input resistance (0 to 10 V) 2100k ohms Cable length 2 • Shielded, max. 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit max. Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 10 bit • Conversion time (per channel) Yes • Conversion time (per channel) 625 µs	• "0" to "1", max.	1 µs
• of the pulse outputs, with resistive load, max. 100 kHz Relay outputs 0 • Number of relay outputs 0 Cable length 500 m • unshielded, max. 500 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 Input ranges Yes • Voltage Yes Input resistance (0 to 10 V) 2100k ohms Cable length 2 • Shielded, max. 100 m; twisted and shielded • Oto +10 V Yes - Input resistance (0 to 10 V) 2100k ohms Cable length 0 • shielded, max. 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog value generation for the inputs Integration and conversion time/resolution per channel Yes • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) Yes • Conversin time (per channel) Yes	• "1" to "0", max.	5 µs
Relay outputs 0 • Number of relay outputs 0 Cable length 500 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 Input ranges Yes • Voltage Yes Input ranges (rated values), voltages >100 m; twisted and shielded • 0 to +10 V Yes — Input resistance (0 to 10 V) >100 m; twisted and shielded Cable length 100 m; twisted and shielded • shielded, max. 0 Analog outputs 0 Analog outputs 0 Analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel Yes • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	Switching frequency	
• Number of relay outputs 0 Cable length 500 m • shielded, max. 150 m • unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 Input ranges Yes • Voltage Yes Input ranges (rated values), voltages • 2100k ohms • 0 to +10 V Yes - Input resistance (0 to 10 V) 2100k ohms Cable length • 2100k ohms • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit max. 10 bit • Integration and conversion time/resolution per channel Yes • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Encoder	• of the pulse outputs, with resistive load, max.	100 kHz
Cable length 500 m • shielded, max. 500 m • unshielded, max. 150 m Number of analog inputs 2 Input ranges 2 • Voltage Yes Input ranges (rated values), voltages 9 • 0 to +10 V Yes — Input resistance (0 to 10 V) 2100k ohms Cable length 100 m; twisted and shielded • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel 10 bit • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	Relay outputs	
• shielded, max.500 m• unshielded, max.150 mAnalog inputs2Number of analog inputs2Input rangesYes• VoltageYesInput ranges (rated values), voltagesYes• 0 to +10 VYes— Input resistance (0 to 10 V)2100k ohmsCable length100 m; twisted and shielded• shielded, max.100 m; twisted and shieldedAnalog outputs0Number of analog outputs0Integration and conversion time/resolution per channel10 bit• Resolution with overrange (bit including sign), max.10 bit• Integration time, parameterizableYes• Conversion time (per channel)625 µsEncoderEncoderConnectable encodersIntegration time (per channel)	 Number of relay outputs 	0
• unshielded, max. 150 m Analog inputs 2 Number of analog inputs 2 Input ranges Yes • Voltage Yes Input ranges (rated values), voltages 2 • 0 to +10 V Yes — Input resistance (0 to 10 V) 2100k ohms Cable length 100 m; twisted and shielded • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel Yes • Conversion time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	Cable length	
Analog inputs 2 Number of analog inputs 2 Input ranges Yes • Voltage Yes Input ranges (rated values), voltages 2 • 0 to +10 V Yes — Input resistance (0 to 10 V) 2100k ohms Cable length 2 • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel Yes • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs	• shielded, max.	500 m
Number of analog inputs 2 Input ranges Voltage • Voltage (rated values), voltages Yes • 0 to +10 V Yes — Input resistance (0 to 10 V) ≥100k ohms Cable length • • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	• unshielded, max.	150 m
Number of analog inputs 2 Input ranges Voltage • Voltage (rated values), voltages Yes • 0 to +10 V Yes — Input resistance (0 to 10 V) ≥100k ohms Cable length • • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	Analog inputs	
• Voltage Yes Input ranges (rated values), voltages Yes • 0 to +10 V Yes Input resistance (0 to 10 V) ≥100k ohms Cable length 2100k ohms • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 μs		2
Input ranges (rated values), voltages ● 0 to +10 V Yes — Input resistance (0 to 10 V) ≥100k ohms Cable length • shielded, max. 100 m; twisted and shielded Analog outputs 0 Analog outputs 0 Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders	Input ranges	
• 0 to +10 V Yes — Input resistance (0 to 10 V) ≥100k ohms Cable length 200 m; twisted and shielded • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 100 m; twisted and shielded Integration and conversion time/resolution per channel 10 bit • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 μs Encoder 500 metable encoders	Voltage	Yes
− Input resistance (0 to 10 V) ≥100k ohms Cable length 100 m; twisted and shielded • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 10 bit Integration and conversion time/resolution per channel 10 bit • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 μs	Input ranges (rated values), voltages	
Cable length 100 m; twisted and shielded • shielded, max. 100 m; twisted and shielded Analog outputs 0 Number of analog outputs 0 Analog value generation for the inputs 0 Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs	• 0 to +10 V	Yes
 shielded, max. 100 m; twisted and shielded Analog outputs Number of analog outputs 0 Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Conversion time (per channel) Encoder Connectable encoders 	— Input resistance (0 to 10 V)	≥100k ohms
Analog outputs 0 Analog value generation for the inputs 0 Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs	Cable length	
Number of analog outputs 0 Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs	• shielded, max.	100 m; twisted and shielded
Number of analog outputs 0 Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs		
Analog value generation for the inputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Conversion time (per channel) Encoder Connectable encoders		0
Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 10 bit • Integration time, parameterizable Yes • Conversion time (per channel) 625 μs Encoder Connectable encoders		•
 Resolution with overrange (bit including sign), max. Integration time, parameterizable Conversion time (per channel) Kes Kes<td>Analog value generation for the inputs</td><td></td>	Analog value generation for the inputs	
max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs Encoder Connectable encoders		
• Conversion time (per channel) 625 µs Encoder Connectable encoders		10 bit
Encoder Connectable encoders	 Integration time, parameterizable 	Yes
Connectable encoders	 Conversion time (per channel) 	625 µs
Connectable encoders	Encoder	
• 2-wire sensor Yes		
	• 2-wire sensor	Yes

1. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes
Number of ports	1
 integrated switch 	Yes
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
 SIMATIC communication 	Yes
Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	No
— Prioritized startup	Yes
— Number of IO devices with prioritized	16
startup, max.	
— Number of connectable IO Devices, max.	16
 — Number of connectable IO Devices for RT, 	16
max.	
— of which in line, max.	16
- Activation/deactivation of IO Devices	Yes
— Number of IO Devices that can be	8
simultaneously activated/deactivated, max.	
— Updating time	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.
PROFINET IO Device	
Services	
— PG/OP communication	Yes

— S7 routing	Yes
— Isochronous mode	No
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	2

Protocols			
Supports protocol for PROFINET IO	Yes		
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required		
AS-Interface	Yes; CM 1243-2 required		
Protocols (Ethernet)			
• TCP/IP	Yes		
• DHCP	No		
• SNMP	Yes		
• DCP	Yes		
• LLDP	Yes		
Open IE communication			
• TCP/IP	Yes		
— Data length, max.	8 kbyte		
 ISO-on-TCP (RFC1006) 	Yes		
— Data length, max.	8 kbyte		
• UDP	Yes		
— Data length, max.	1 472 byte		
Web server			
 supported 	Yes		
 User-defined websites 	Yes		
Further protocols			
• MODBUS	Yes		
Communication functions	Communication functions		
S7 communication			
 supported 	Yes		
• as server	Yes		
• as client	Yes		
• User data per job, max.	See online help (S7 communication, user data size)		
Test commissioning functions			
Status/control			
Status/control variable	Yes		

Diagnostic buffer	Yes
Diagnostic buffer	
	Yes
• present	Yes
procent	
Traces	
 Number of configurable Traces 	2
 Memory size per trace, max. 	512 kbyte
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	100 kHz
Frequency measurement	Yes
	Yes
	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	100 kHz
Potential separation	
Potential separation digital inputs	
 Potential separation digital inputs 	500V AC for 1 minute
• between the channels, in groups of	1
Potential separation digital outputs	
 Potential separation digital outputs 	Yes
• between the channels	No
• between the channels, in groups of	1
Permissible potential difference	
	500 V DC between 24 V DC and 5 V DC
EMC	
Interference immunity against discharge of static electricit	ly .
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes
	8 kV
	6 kV
Interference immunity to cable-borne interference	
	Yes
• Interference immunity on signal cables acc. to IEC 61000-4-4	Yes

Interference immunity against voltage surge	
Interference immunity on supply lines acc. to	Yes
IEC 61000-4-5	
Interference immunity against conducted variable distur	bance induced by high-frequency fields
 Interference immunity against high-frequency 	Yes
radiation acc. to IEC 61000-4-6	
Emission of radio interference acc. to EN 55 011	
 Limit class A, for use in industrial areas 	Yes; Group 1
 Limit class B, for use in residential areas 	Yes; When appropriate measures are used to ensure compliance
	with the limits for Class B according to EN 55011
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Highest safety class achievable in safety mode	
Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Free fall	
 Fall height, max. 	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
 horizontal installation, min. 	0°0
 horizontal installation, max. 	55 °C
 vertical installation, min. 	0°0
 vertical installation, max. 	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Storage/transport, min.	660 hPa
 Storage/transport, max. 	1 139 hPa
Altitude during operation relating to sea level	
 Installation altitude, min. 	-1 000 m
 Installation altitude, max. 	2 000 m

Relative humidity	
• Operation, max.	95 %; no condensation
Vibrations	
 Vibration resistance during operation acc. to IEC 60068-2-6 	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
 Operation, tested according to IEC 60068-2-6 	Yes
Shock testing	
• tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Pollutant concentrations	
 SO2 at RH < 60% without condensation 	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration	
Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— SCL	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Cycle time monitoring	
• adjustable	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g
last modified:	10/13/2020

