SIEMENS

Data sheet

6ES7212-1HF40-0XB0



SIMATIC S7-1200, CPU 1212FC, compact CPU, DC/DC/relay, onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 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/relay
Firmware version	
Engineering with	
 Programming package 	STEP 7 V17 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; CPU only
Current consumption, max.	1 200 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V
²t	0.8 A ² ·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	
• 24 V	L+ minus 4 V DC min.
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 hasing point arithmetic, typ. 2.3 µs; / instruction CPU-blocks Number of blocks (otal) DBs, FCS, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire vorking memory can be used OB - • Number, max. Limited only by RAM for code Data areas and their retentivity 14 kbyte Retentive data area (ind. timers, counters, flags), max. 14 kbyte; Size of bit memory address area • Size, 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 - Processi mage - • Inputs, adjustable 1 kbyte • Input subjer of day. 2 (somm, modules, 1 signal board, 2 signal modules Time of day Clock • Input subjer of technological functions 4 (HSC (Hig) Speed Counting) • Orp	for word operations, typ.	1.7 µs; / instruction
PDU blocks DBs. FCS. FBs. counters and times. The maximum number of addressable blocks ranges from 116 6553. There is no restriction, the entite working memory can be used OB • • Number of blocks (total) DBs. FCS. FBs. counters and times. The maximum number of addressable blocks ranges from 116 6553. There is no restriction, the entite working memory can be used OB • • Number data areas (ncl. times, counters, flags), max. 14 kbyte. FBg • • Starsas and their retentivity • • per priority class, max. 4 kbyte. Size of bit memory address area Lecal data • • per priority class, max. 16 kbyte. Priority class 1 (program cycle): 16 KB, priority class 2 to 26. 6 KB Address area • Produs, adjustable 1 kbyte • fordware cook (real-time) Yes • Backup time 40 h: Typical • Devision per day, max. 40 with flag peed Counting) Sourceshin kingut Yes Number of digital inpuds 6 integrated • of which inputs usable for technological functions 4. HSC (High Speed Counting) Sourceshin kingut Yes Number of aignutaneously controll		
Number of blocks (total) DBs. FCS. FEs. counters and times. The maximum number of addressable blocks range from 1 to ESSS. There is no residue, the entire working memory can be used • Number, max. Limited only by RAM for code Data areas and their retentivity Retentive data area (incl. times, counters, flegs), max. Flag		2.3 µs, / instruction
addressable blocks ranges from 1 to 6535. There is no restriction, the entre working memory can be used OB • Number, max. Limited only by RAM for code Data areas and their retentivity Itak byte. Retentive data area (incl. times, countiers, flags), max. Itak byte. • Size, max. Itak byte. • per priority class, max. Itak byte. • per priority class, max. Itak byte. • Propriority class, and max. To be and the retentive class of the memory address area • Propriority class area Itak byte. • Propriority class of the memory address area Itak byte. • Propriority class of the memory address area Itak byte. • Propriority class of the memory address area Itak byte. • Propriority class of the memory address area Itak byte. • Propriority class of the memory address area Itak byte. • Propriority class of the memory address of the memory address area Itak byte. • Propriority class, max. 30 comm. modules, 1 signal board, 2 sig		DBs ECs EBs counters and timers. The maximum number of
entire working memory can be used • Number, max. Limited only by RAM for code Data areas and their retentivity Relentive data heir retentivity Flag Execution of the retentivity • Size, max. 4 kbyte; Size of bit memory address area Local data • per priority class in acc. • per priority class, max. 4 kbyte; Size of bit memory address area Local data • per priority class in acc. • per priority class in acc. 1 kbyte Process image • Italyse • local data 1 kbyte • of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules • Number of modules per system, max. 480 h; Typical • Backup time 480 h; Typical • Backup time 490 simoth at 25 °C Digital inputs 9: Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Sourcesink input Yes Number of algital inputs 6; Integrated • or signal "1" 15 VDC at 2.5 mA Input voltage - por and cristopic retenhological functions • or sig	Number of blocks (total)	
• Number, max. Limited only by FAM for code Data areas and their retentivity FReptive data serie (incl. timers, counters, flags), max. 14 kbyte Flag - Frequents data serie (incl. timers, counters, flags), max. 16 kbyte; Stize of bit memory address area Local data - - - • par priority class, max. 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26 is KB Address area - - Process image - - • linputs, sdjustable 1 kbyte - • lonputs, sdjustable 1 kbyte - - Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Timo of day - - - Outputs, sdjustable 1 kbyte - - Hardware clock (real-time) Yes - • Backup time 480 h: Typical - • Deviation per day, max. 460 simonth at 25 °C - Digital inputs 60 simonth at 25 °C - Number of digital inputs 60 simonth at 25 °C - Number of digital inputs <t< td=""><td></td><td></td></t<>		
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• per priority class, max. 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB Address area Freess image Process image 1 kbyte • Outputs, adjustable 3 comm, modules, 1 signal board, 2 signal modules • Fardware coch (real-time) Yes • Backup time 480 h; Typical • Devide per day, max. 480 simoth at 25 °C Digital inputs 8 integrated • Ordich inputs usable for technological functions 4; HSC (High Speed Counting) Sources/ink input Yes • Iardw value (CC) 24 V • Or biginal 'O' 5 V OC at 1 mA • for signal 'O' 5 V OC at 1 mA • for signal 'O' 15 V DC at 2.5 mA Input delay (for rated value of input voltage) 16 rigo and 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at 'O' to 'T', 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 arow to 'T' max. 0.2 ms, 0.4 ms, 0.3 @ 30 wkHz & 3 @ 30 wHz & 3 @ 30 wHz & 3 @ 30 wHz	• Size, max.	4 kbyte; Size of bit memory address area
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Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Time of day Clock Clock Clock Clock Clock Signal board, 2 signal modules Signal board, 2 signal b	 Outputs, adjustable 	1 kbyte
Time of day Clock • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. 480 s/month at 25 °C Digital inputs 8; Integrated • of which inputs usable for technological functions 42; HSC (High Speed Counting) Source/sink input Yes Number of digital inputs 8 Input voltage 8 - up to 40 °C, max. 8 Input voltage 5 VDC at 1 mA • for signal °C 5 VDC at 1 mA • for signal °T 5 VD Cat 1 mA • for signal °C 5 VDC at 2.5 mA Input delay (for rated value of 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'n, min. 0.2 ms - at °C to °1'n, max. 12.8 ms for interrupt inputs - - parameterizable 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'n, max. 0.2 ms - at °C to °1'n, max. 12.8 ms for interrupt inputs - - parameterizable 0.3 m, 16 ms, 16 ms, 3.2 ms, 6.4	Hardware configuration	
Time of day Clock • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. 480 s/month at 25 °C Digital inputs 8; Integrated • of which inputs usable for technological functions 42; HSC (High Speed Counting) Source/sink input Yes Number of digital inputs 8 Input voltage 8 - up to 40 °C, max. 8 Input voltage 5 VDC at 1 mA • for signal °C 5 VDC at 1 mA • for signal °T 5 VD Cat 1 mA • for signal °C 5 VDC at 2.5 mA Input delay (for rated value of 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'n, min. 0.2 ms - at °C to °1'n, max. 12.8 ms for interrupt inputs - - parameterizable 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'n, max. 0.2 ms - at °C to °1'n, max. 12.8 ms for interrupt inputs - - parameterizable 0.3 m, 16 ms, 16 ms, 3.2 ms, 6.4	Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules
• Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. ±60 s/month at 25 °C Digital inputs 8; Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 4; HSC (High Speed Counting) all mounting positions	Time of day	
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• Backup time 480 h; Typical • Deviation per day, max. ±80 s/month at 25 °C Digital inputs 8; Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 8 Input voltage up to 40 °C, max. Bracket value (DC) 24 V • for signal °0° 5 V DC at 1 mA • for signal °0° 5 V DC at 2.5 mA Input delag (for rated value of input voltage) - for standard inputs 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. 0.2 ms at °0° to °1°, max. 12.8 ms for interrupt inputs - - parameterizable Yes for technological functions - - parameterizable Yes for technological functions - - parameterizable Yes for technological functions - - parameterizable Yes for technological functions: No 300 m; for technological functions: No Digital outputs -	 Hardware clock (real-time) 	Yes
• Deviation per day, max. ±60 s/month at 25 °C Digital inputs Number of digital inputs 8; Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 8 Infourting positions 8 up to 40 °C, max. 8 Input voltage 5 V DC at 1 mA • for signal °0° 5 V DC at 2.5 mA Input delay (for rated value of input voltage) 5 V DC at 2.5 mA for signal °1° 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 - parameterizable 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 Yes for technological functions 0.3 0 MHz • at °0° to °1°, max. 300 m, for technological functions: No Deparameterizable Yes for technological functions 300 m, for technological functions: No Digital outputs 6. Relays Switching capacity of the outputs 2 A		480 h; Typical
Digital inputs 8; Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 8 all mounting positions 8		
Number of digital inputs 8; Integrated • of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs all mounting positions		
• of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs all mounting positions up to 40 °C, max. 8 Input voltage 24 V • for signal °0" 5 V DC at 1 mA • for signal °1" 15 V DC at 2.5 mA Input delay (for rated value of input voltage)		8: Integrated
Source/sink input Yes Number of simultaneously controllable inputs all mounting positions — up to 40°C, max. 8 Input voltage 5 V DC at 1 mA • for signal "0" 5 V DC at 2.5 mA Input delay (for rated value of input voltage) 5 V DC at 2.5 mA for signal "1" 15 V DC at 2.5 mA Input delay (for rated value of input voltage) 6 or signal "0" for standard inputs 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", min. 0.2 ms — at "0" to "1", max. 12.8 ms for interrupt inputs - — parameterizable Yes for technological functions - — parameterizable 30 or signal phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length - • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 6, Relays Switching capacity of the outputs - • with resistive load, max. 2 A		-
Number of simultaneously controllable inputs all mounting positions up to 40 °C, max. Input voltage Rated value (DC) 6 for signal "0" 5 V DC at 1 mA for signal "1" 15 V DC at 2.5 mA Input delay (for rated value of input voltage) for standard inputs parameterizable at "0" to "1", min. at "0" to "1", max. at "0" to "1", max. at "0" to "1", max.	· · · ·	
all mounting positions 8		
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• for signal "0" 5 V DC at 1 mA • for signal "1" 15 V DC at 2.5 mA Input delay (for rated value of input voltage) for standard inputs 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", min. 0.2 ms - at "0" to "1", max. 12.8 ms for interrupt inputs - - parameterizable Yes for technological functions . - parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length . • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 6; Relays Switching capacity of the outputs . • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load . • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.		
• for signal "1" 15 V DC at 2.5 mA Input delay (for rated value of input voltage) for standard inputs - parameterizable 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", min. 0.2 ms - at "0" to "1", max. 12.8 ms for interrupt inputs ves - parameterizable Yes for technological functions ging le phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz b shielded, max. 500 m; 50 m for technological functions • unshielded, max. 500 m; for technological functions • unshielded, max. 6; Relays Switching capacity of the outputs 6; Relays Switching capacity of the outputs 30 W with DC, 200 W with AC Output delay with resistive load 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • 11" to "0", max. 10 ms; max.	Rated value (DC)	24 V
Input delay (for rated value of input voltage) for standard inputs parameterizable at "0" to "1", min. at "0" to "1", max. at "0" to "1", max. parameterizable at "0" to "1", max. parameterizable parameterizable parameterizable parameterizable Yes for interrupt inputs parameterizable parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 6; Relays Switching capacity of the outputs 6; Relays switching capacity of the outputs 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • 0" to "1", max. 10 ms; max.	• for signal "0"	5 V DC at 1 mA
for standard inputs	 for signal "1" 	15 V DC at 2.5 mA
parameterizable0.2 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 0.2 ms 0.2 ms 0.2 ms 0.2 ms 0.2 ms 0.2 ms 0.2 ms 0.2 ms 	Input delay (for rated value of input voltage)	
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- at "0" to "1", min.0.2 ms- at "0" to "1", max.12.8 msfor interrupt inputs12.8 ms- parameterizableYesfor technological functionsSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHzCable length500 m; 50 m for technological functions • unshielded, max.• shielded, max.500 m; 50 m for technological functions 300 m; for technological functions: NoDigital outputs6; RelaysSwitching capacity of the outputs6; Relays• with resistive load, max.2 A 30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max. 10 ms; max.• "1" to "0", max.10 ms; max.	— parameterizable	
at "0" to "1", max.12.8 msfor interrupt inputsYes parameterizableYesfor technological functionsSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz parameterizableSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHzCable lengthSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz• shielded, max.500 m; 50 m for technological functions 300 m; for technological functions: NoDigital outputs500 m; for technological functions: NoNumber of digital outputs6; RelaysSwitching capacity of the outputs2 A 30 W with DC, 200 W with ACOutput delay with resistive load30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.• "1" to "0", max.10 ms; max.• "1" to "0", max.10 ms; max.		
for interrupt inputs Yes — parameterizable Yes for technological functions Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz — parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length @ 30 kHz • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 6; Relays Switching capacity of the outputs 6; Relays • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.		
		12.8 ms
for technological functions — parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length		
— parameterizableSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHzCable length• shielded, max.500 m; 50 m for technological functions 300 m; for technological functions: NoDigital outputs300 m; for technological functions: NoNumber of digital outputs6; RelaysSwitching capacity of the outputs6; Relays• with resistive load, max.2 A 30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.• "0" to "1", max.10 ms; max.• "1" to "0", max.10 ms; max.		Yes
Cable length• shielded, max.500 m; 50 m for technological functions• unshielded, max.300 m; for technological functions: NoDigital outputs300 m; for technological functions: NoDigital outputs6; RelaysSwitching capacity of the outputs6; Relays• with resistive load, max.2 A• on lamp load, max.30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.• "0" to "1", max.10 ms; max.• "1" to "0", max.10 ms; max.	-	
• shielded, max.500 m; 50 m for technological functions• unshielded, max.300 m; for technological functions: NoDigital outputs6; RelaysNumber of digital outputs6; RelaysSwitching capacity of the outputs2 A• with resistive load, max.30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.• "0" to "1", max.10 ms; max.• "1" to "0", max.10 ms; max.		
• unshielded, max.300 m; for technological functions: NoDigital outputs6; RelaysNumber of digital outputs6; RelaysSwitching capacity of the outputs2 A• with resistive load, max.30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.• "0" to "1", max.10 ms; max.• "1" to "0", max.10 ms; max.		
Digital outputs 6; Relays Number of digital outputs 6; Relays Switching capacity of the outputs 9 • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.		-
Number of digital outputs 6; Relays Switching capacity of the outputs 2 A • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.		300 m; for technological functions: No
Switching capacity of the outputs • with resistive load, max. • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load • "0" to "1", max. • "0" to "1", max. 10 ms; max. 10 ms; max.	Digital outputs	
• with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.	Number of digital outputs	6; Relays
• on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.		
Output delay with resistive load 10 ms; max. • "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.	 with resistive load, max. 	2 A
• "0" to "1", max. 10 ms; max. • "1" to "0", max. 10 ms; max.	• on lamp load, max.	30 W with DC, 200 W with AC
• "1" to "0", max. 10 ms; max.		
		10 ms; max.
Relay outputs	• "1" to "0", max.	10 ms; max.
	Relay outputs	

- Number of volour outpute	0
Number of relay outputs	6
Number of operating cycles, max. Cable length	mechanically 10 million, at rated load voltage 100 000
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	150 11
	2
Number of analog inputs Input ranges	۷
Voltage	Yes
Input ranges (rated values), voltages	165
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	≥100k ohms
Cable length	
• 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.	10 bit
 Integration time, parameterizable 	Yes
Conversion time (per channel)	625 µs
Encoder	020 μ3
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
	DDOFINET
Interface type Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autorossing	Yes
Interface types	163
Number of ports	1
integrated switch	No
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
 SIMATIC communication 	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
 Media redundancy 	No
PROFINET IO Controller	
 Transmission rate, max. 	100 Mbit/s
Services	
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	No
— Prioritized startup	Yes
 — Number of IO devices with prioritized startup, 	16
max.	
— Number of connectable IO Devices, max.	16
 — Number of connectable IO Devices for RT, max 	16
max. — of which in line, max.	16
— Of which in line, max. — Activation/deactivation of IO Devices	Yes
— Activation/deactivation of IO Devices — 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.

Convision	
Services	Voci operation with TLC V/4.2 are colored
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, 	2
max.	
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	Yes
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
OPC UA	Yes; OPC UA Server
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Redundancy mode	
Media redundancy	
— MRP	No
— MRPD	No
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
OPC UA	
 Runtime license required 	Yes; "Basic" license required
OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required
 Application authentication 	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
 — Number of sessions, max. 	10
 Number of subscriptions per session, max. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
- Number of server methods, max.	20
 — Number of monitored items, max. 	1 000
 — Number of server interfaces, max. 	2
 — Number of nodes for user-defined server 	2 000
interfaces, max.	
Further protocols	
MODBUS	Yes
communication functions / header	
S7 communication	
supported	Yes
• as server	Yes
• as client	Yes
 User data per job, max. 	See online help (S7 communication, user data size)
Number of connections	
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections:

8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 64 max

	max
Test commissioning functions	
Status/control	
 Status/control variable 	Yes
Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe),
-	times, counters
Forcing	
Forcing	Yes; peripheral inputs/outputs (without fail-safe)
Diagnostic buffer	
present	Yes
Traces	
Number of configurable Traces	2
Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Integrated Functions	-
Counter	
Number of counters	6
 Counting frequency, max. 	100 kHz
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222
PID controller	Yes
Number of alarm inputs	4
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 	Relays
 between the channels 	No
 between the channels, in groups of 	2
EMC	
Interference immunity against discharge of static electricity	
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes
— Test voltage at air discharge	8 kV
— Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000-4-4 	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 IEC 61000-4-5 	Yes
Interference immunity against conducted variable disturbance	e induced by high-frequency fields
 Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 	Yes
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	103
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°0
• max.	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
 horizontal installation, min. 	0 °C
 horizontal installation, max. 	55 °C
 vertical installation, min. 	0 °C
 vertical installation, max. 	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Operation, min.	795 hPa
• Operation, max.	1 080 hPa
 Storage/transport, min. 	660 hPa
Storage/transport, max.	1 080 hPa
Altitude during operation relating to sea level	
 Installation altitude, min. 	-1 000 m
 Installation altitude, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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 / header	
configuration / programming / header	
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
Access protection	
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Complete protection 	Yes
programming / cycle time monitoring / header	
adjustable	Yes

Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	385 g
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