SIEMENS

Data sheet

6ES7214-1AG40-0XB0



SIMATIC S7-1200, CPU 1214C, compact CPU, DC/DC/DC, onboard I/O: 14 DI 24 V DC; 10 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 1214C DC/DC/DC
Firmware version	V4.5
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
Reverse polarity protection	Yes
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)	500 mA; CPU only
Current consumption, max.	1 500 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V
l²t	0.5 A ² ·s
Output current	
for backplane bus (5 V DC), max.	1 600 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.	12 W
Memory	
Work memory	
 integrated 	100 kbyte
• expandable	No
Load memory	
 integrated 	4 Mbyte
 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
Backup	
present	Yes
maintenance-free	Yes
 without battery 	Yes

about the productions, typ. 0.08 pis / Instruction for word operations, typ. 17 pis / instruction for word operations, typ. 17 pis / instruction GPU biolocks 23 pis / instruction Number of biolos (rotal) DBs, FCs, FBs, counters and timers. The maximum number of addressable biolos ranges from 1 to 6535. There is no restriction, the entire working memory can be used OB • Number of biolos (rotal) • Number, max. Limited only by RAM for code Data areas and their referintity Petentive data area (not: Imres, counters, flags), max. • Par priority class, max. 8 kbyte, Size of bit memory address area Local data • per priority class, max. • Par priority class, max. 14 kbyte • Par priority class, max. 14 kbyte • Outputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Outputs, adjustable, nax. 3 comm. modules, 1 signal modules Time of day Cock Cock • • Hardware Clock (real-Ume) 4 signal modules • Jandware Clock (real-Ume) 4 signal modules • Datadato par day, max. 3 comm. modules, 1 signal boar	CPU processing times	
for word operations, typ. 17 / us/ instruction for fording point antimules, typ. 2.3 µs; / instruction GPU-blocks DBs, FCs, FBs, counters and timers. The maximum number of and the working method y usr be used GPU-blocks DBs, FCs, FBs, counters and timers. The maximum number of and the working method y usr be used GPU-blocks Limited only by RAM for code Out a ross and their retentivity Hand y and the used GPU-blocks Limited only by RAM for code Stat. max. B kbyte, Size of bit memory address area Local data esperificity class, max. Address area Percess integer Process integer 1 kbyte Backup time 480 h; Typical -Develop red day, max. 14 (Integrated -Original inputs 14, (Integrated -Original inputs 14, (Integrated -Original inputs 14, (Integrated -Original inputs 14,		0.08 µs; / instruction
For facting point arithmetic, typ. 2.3 µs; / instruction CRU-blocks DBs, FCs, FBs, counters and timers. The maximum number of antiges in the used OB • Number of blocks (total) Data areas and their retentivity Elimited only by RAM for code Pate areas and their retentivity Elimited only by RAM for code Pate areas and their retentivity 8 kbyte; Size of bit memory address area Local data • per priority class, max. • per priority class, max. 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB Address area • per priority class, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Drocess image • communications priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB • Clack • address area • Outputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Drocess image • per priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB • Outputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Drocess image • outputs		
CPUE-backs DBK_FCL_FEB_counters and times. The maximum number of addressable blocks ranges from 1 to e5535. There is no restriction, the entre working memory can be used OR Limited only by RAM for code Data areas and their retentivity 14 kbyte Fleig Size, max. B kbyte, Size of bit memory address area Local data Example Number of modules per priority class rank. Address area 14 kbyte Fleig Size, max. B kbyte, Size of bit memory address area Local data To kbyte, Priority class 1 (program cycle): 16 KB, priority class 2 to 26.6 KB Address area To kbyte, Priority class 1 (program cycle): 16 KB, priority class 2 to 26.6 KB Process image • hoputs, adjustable 1 kbyte • Dardware clock (mail:time) Yes Yes • Hardware clock (mail:time) Yes Yes • Backup line 480 h; Tyrical 480 h; Tyrical • Order prioritize organic modules 1 (hitiggraded 1 (hitiggraded • First divide (Cloc) 24 V Yes • Addresse old (fract-thenhological functions 14 Input delay (for rade value of (hoput voltage) For signal "0" <		
Number of blocks (total) DBs. FCs. FBs. counters and times. The maximum number of addressable block argos from 1 to 6555. There is no restriction, the entire working memory can be used OB - OB - Pate areas and their retentivity - Fleg - • Ster, max. B kbyte, Size of bit memory address area Local data - • per priority class, max. B kbyte, Size of bit memory address area Local data - • per priority class, max. 1 k kbyte • Process image - • Inputs, adjustable 1 kbyte • Data data - • Outputs, adjustable 1 kbyte • Data data - • Outputs, adjustable 1 kbyte • Data data - • Outputs, adjustable 1 kbyte • Data data - Clock - • Backup time 4 80 h; Typical • Backup time 4 80 h; Typical • Backup time - • Data inputs - Number of digital inputs		
Aumber, max. Linkled only by RAM for code Data areas and their rotentivity Eater areas and their rotentivity Reterive data area (incl. timers, counters, flags), max. Reterive data, suggest area Reterive data area (incl. times, counters, flags), max. Reterive data area (incl. times, counters, flags), max, flags, max, fl	Number of blocks (total)	addressable blocks ranges from 1 to 65535. There is no restriction, the
Data areas and their retentivity If keyse Refer 14 kbyte Flag 8 kbyte: Size of bit memory address area Local data 16 kbyte: Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB Address area 16 kbyte: Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB Address area 16 kbyte: Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB Address area 1 kbyte Process image 1 kbyte • Inputs, adjustable 1 kbyte 1 kbyte 1 kbyte Vardware cock (real-time) 480 h; Typical • Backup time 480 h; Typical • Backup time 480 h; Typical • Backup time 14 integrated • of which inputs usable for technological functions 6: HSC (High Speed Counting) Sourcelsink input Yes Number of adjatal inputs 14 • for signal '0' 5 V DC at 1 mA • for signal '0' 5 V DC at 1 mA • for signal '1'' 19 V DC at 2.5 mA Input desky (for rated value of input voltage) 0 zms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in		
Retentive data area (incl. timers, counters, flags), max. 14 kbyte Filig • Size, max. 8 kbyte; Size of bit memory address area Local data 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 28: 6 KB Address area Percess image • Inputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte • Cutputs, adjustable 1 kbyte • Cutputs, adjustable 1 kbyte • Cordputs, adjustable 1 kbyte • Cordputs, adjustable 1 kbyte • Cordputs, adjustable 1 kbyte • Clock • Hardware clock (real-time) • Backup time 480 h; Typical • Deviation per day, max. 14 (Integrated • Outputs, input Yes Number of digital inputs 14 (Integrated • Outputs, input Yes Number of simultaneously controllable inputs 14 (Integrated • For signal "0" 5 V DC at 1 mA • For signal "1" 15 V DC at 1 mA • For signal "1", min, 2, zms • a art 0" to "1", min, 2, zms • art 0" to "1", min, 2, zms • parameterizable Single phase: 3 (@ 100 kHz & 3 (@ 30 kHz, differential: 3 (@ 80 kHz & 3 (@ 30 kHz &		Limited only by RAM for code
Fing 8 kbyte; Size of bit memory address area Local data 8 kbyte; Size of bit memory address area Local data 16 kbyte; Pirority class 1 (program cycle); 16 KB, priority class 2 to 26; 6 KB Address area Process image Inputs, adjustable I kbyte Outputs, adjustable I kbyte Inputs, adjustable I kbyte Outputs, adjustable I kbyte Inme of day Clock Clock Backup time 480 h; Typical to day Clock Outputs, adjustable I (Hintegrated I I I I (Hintegrated I I I I (Hintegrated I I I I I (Hintegrated I I I I I I I (Hintegrated I I I I I I I I I I I I I I I I I I I	Data areas and their retentivity	
• Size max. 8 kbyte; Size of bit memory address area Local data • per priority class, max. • per priority class, max. 16 kbyte; Priority class 1 (program cycle); 16 KB, priority class 2 to 26: 6 KB Address area • Process image • Inputs, adjustable 1 kbyte • Cutoputs, adjustable 1 kbyte • Cutoputs, adjustable 1 kbyte • Number of modules per system, max. 3 comm. modules, 1 signal board, 8 signal modules Time of day • Hardware clock (real-time) • Kardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. ±60 s/month at 25 °C Digital inputs 14; Integrated • of which inputs usable for technological functions 14; Integrated • of which inputs usable for technological functions 14 Input were of simultaneously controllable inputs 14 Input veltage • explain 1°* • of which inputs 24 V • for signal 1°* 5 V DC at 1 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 - at 1°* for 1°*, min. 0.2 ms - at 1		14 kbyte
Local data 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26. 6 KB Address area 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26. 6 KB Process image 1 kbyte - Inputs, adjustable 2 kbyte - Inputs, adjustable 1 kbyte - Inputs, adjustable 1 kbyte - Backup time 480 h; Typical - Deviation per day, max. 2 k0 Kmonth at 25 °C Digital inputs 1 ki Integrated - of which inputs usable for technological functions 6; HSC (High Speed Counting) Sourcesrink input Yes Number of input soutable 14 Input odlage - up to 40 °C, max. - up to 40 °C, max. 14 Input odlagin form 5 V D	Flag	
• per priority class, max. 16 kbyte: Priority class 1 (program cycle): 16 KB, priority class 2 to 28: 6 KB Address area Process image • Inputs, adjustable 1 kbyte · Outputs, adjustable 1 kbyte · Inputs, adjustable 1 kbyte Hardware configuration Number of modules per system, max. 2 comm. modules, 1 signal board, 8 signal modules Time of day Clock · Hardware clock (real-time) Yes Backup time · Deviation per day, max. 260 s/month at 25 °C Digital inputs · Order of system · Order of system · Deviation per day, max. 260 s/month at 25 °C Digital inputs · Order of system · Order of system · Deviation per day, max. · Deviation per day, max. · Digital inputs · Order of system · Order of		8 kbyte; Size of bit memory address area
KB Address image Inputs, adjustable Inputs, adjustable Iskyte Outputs, adjustable Hardware configuration Number of modules per system, max. The of day Clock Elackup time • Backup time • Of which inputs usable for technological functions • Input voltage • Creat • Of which input suble controllable inputs all mounting positions		
Process image • Inputs, adjustable 1 kbyte • Outputs, adjustable 1 kbyte Hardware configuration 3 comm. modules, 1 signal board, 8 signal modules Time of day 3 comm. modules, 1 signal board, 8 signal modules Clock • • Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. ±60 s/month at 25 °C Digital inputs 14: Integrated • of which input usable for technological functions 6: HSC (High Speed Counting) Source/sink input Yes Number of signal 70° 5 V DC at 1 mA • for signal 70° 5 V DC at 1 mA • for signal 70° 5 V DC at 1 mA • for signal 71° 15 V DC 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 70° to 71°, min. 0.2 ms - parameterizable Yes for interrupt inputs - parameterizable - parameterizable Yes for interrupt inputs Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differentiat: 3 @ 80 kHz & 3 @ 30 m, for technological functions	 per priority class, max. 	
 Inputs, adjustable I kbyte Outputs, adjustable I kbyte Number of modules per system, max. 3 comm. modules, 1 signal board, 8 signal modules Time of day Clock Hardware colock (real-time) Sextup time Bevialion per day, max. Bevialion per day. Itigital inputs Itigital inputs<td></td><td></td>		
Outputs, adjustable Ikbyte Identify and the signal modules of signal modules Imme of digital inputs Imme of day Identify and the signal modules of signal modules Imme of digital inputs Imme of digital input setup: Imme of digital input setup: Imme of digital input setup: Imme of digital inputs Imme of digital outputs Imme of digital outputs Imme of digital outputs		
Hardware configuration Number of modules per system, max. 3 comm. modules, 1 signal board, 8 signal modules Time of day Clock 480 h; Typical Backup lime Bokup lime<td></td><td></td>		
Number of modules per system, max. 3 comm. modules, 1 signal board, 8 signal modules Time of day Clock Backup time Backup time Deviation per day, max. beviation per day, max. contexpiration per day, max. contexpiration per day, max. contexpiration per day day down per day, max. contexpiration per day, max. <licontexpiration day,="" li="" max.<="" per=""></licontexpiration>		
Time of day Clock Hardware clock (real-time) Backup time Backet time Backet time Bac		
Clock Hardware clock (real-time) Hardware clock (real-time)		3 comm. modules, 1 signal board, 8 signal modules
• Hardware clock (real-time) Yes • Backup time 480 h; Typical • Deviation per day, max. ±60 s/month at 25 °C Digital inputs 14; Integrated • of which inputs usable for technological functions 6; HSC (High Speed Counting) Sourcersink input Yes Number of simultaneously controllable inputs 14 all mounting positions	Time of day	
 Backup time 480 h; Typical 25 °C Digital inputs Number of digital inputs usable for technological functions 6; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs all mounting positions 	Clock	
Deviation per day, max. ±60 s/month at 25 °C Digital inputs Number of digital inputs of which inputs usable for technological functions Source/sink input Yes Number of simultaneously controllable inputs all mounting positions	 Hardware clock (real-time) 	
Digital inputs Number of digital inputs • of which inputs usable for technological functions Source/sink input Number of simultaneously controllable inputs all mounting positions	•	
Number of digital inputs 14; Integrated • of which inputs usable for technological functions 6; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs 14 all mounting positions		±60 s/month at 25 °C
• of which inputs usable for technological functions 6; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs all mounting positions -up to 40 °C, max. 14 Input voltage • • 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 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 °0" to °1", min. 0.2 ms - at °0" to °1", max. 12.8 ms for technological functions - - parameterizable Yes for technological functions - - parameterizable Yes for technological functions - - parameterizable Yes for technological functions - - parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 10 • of which high-speed o	Digital inputs	
Source/sink input Yes Number of simultaneously controllable inputs all mounting positions	Number of digital inputs	14; Integrated
Number of simultaneously controllable inputs all mounting positions — up to 40 °C, max. Input voltage • 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 delay (for rated value of input voltage)	 of which inputs usable for technological functions 	6; HSC (High Speed Counting)
all mounting positions 14 Input voltage 14 Input voltage 24 V • Rated value (DC) 5 V DC at 1 mA • for signal "1" 15 V DC 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 - 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	· · · · ·	Yes
Input voltage 24 V • 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 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 "0" to "1", min. 0.2 ms - at "0" to "1", max. 12.8 ms for interrupt inputs - - parameterizable Yes for technological functions 0.3 0 kHz - parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length shielded, max. • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A		
• 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 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 - - 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 • unshielded, max. 500 m; 50 m for technological functions • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A		14
• for signal "0"5 V DC at 1 mA• for signal "1"15 V DC at 2.5 mAInput delay (for rated value of input voltage)15 V DC at 2.5 mAfor standard inputs0.2 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 msfor interrupt inputs parameterizableYesfor technological functions 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 @ 30 kHz• unshielded, max.500 m; 50 m for technological functions @ 30 kHz• unshielded, max.500 m; 50 m for technological functions @ 30 m for technological functions @ 10 kHz & 3 @ 30 kHzNumber of digital outputs10• of which high-speed outputs4; 100 kHz Pulse Train OutputLimitation of inductive shutdown voltage toL+ (-48 V)Switching capacity of the outputs0.5 A	· · ·	
• 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 - - parameterizable Yes for technological functions - - 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. 300 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions • of which high-speed outputs 4; 100 kHz Pulse Train Output		
Input delay (for rated value of input voltage) for standard inputs	-	
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 parameterizable Yes for technological functions parameterizable parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length \$00 m; 50 m for technological functions • shielded, max. \$00 m; 50 m for technological functions • unshielded, max. \$00 m; for technological functions Number of digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A		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- at "0" to "1", min.0.2 ms- at "0" to "1", max.12.8 msfor interrupt inputs parameterizableYesfor technological functions 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 • unshielded, max.Digital outputs10Number of digital outputs10• of which high-speed outputs4; 100 kHz Pulse Train OutputLimitation of inductive shutdown voltage toL+ (-48 V)Switching capacity of the outputs0.5 A		
in groups of four - at "0" to "1", min. - 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. • unshielded, max. • 0.5 A	· ·	
at "0" to "1", max.12.8 msfor interrupt inputs parameterizableYesfor technological functions 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 00 m; for technological functions• unshielded, max.500 m; 50 m for technological functions 300 m; for technological functions 4; 100 kHz Pulse Train Output• of which high-speed outputs10 4; 100 kHz Pulse Train OutputLimitation of inductive shutdown voltage to Switching capacity of the outputsL+ (-48 V)• with resistive load, max.0.5 A		in groups of four
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 Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A		
— 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 length•• shielded, max.500 m; 50 m for technological functions 300 m; for technological functions: NoDigital outputs300 m; for technological functions: NoNumber of digital outputs10 4; 100 kHz Pulse Train OutputLimitation of inductive shutdown voltage toL+ (-48 V)Switching capacity of the outputs0.5 A		12.8 ms
for technological functions — parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length • shielded, max. • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A		
— parameterizableSingle phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHzCable length• shielded, max.• unshielded, max.• unshielded, max.300 m; 50 m for technological functions• unshielded, max.300 m; for technological functions: NoDigital outputsNumber of digital outputs• of which high-speed outputs4; 100 kHz Pulse Train OutputLimitation of inductive shutdown voltage toLimitation of the outputs• with resistive load, max.0.5 A		Yes
@ 30 kHz Cable length • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs 300 m; for technological functions: No Number of digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	-	
 shielded, max. unshielded, max. unshielded, max. 300 m; for technological functions: No Digital outputs Digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	— parameterizable	
• unshielded, max. 300 m; for technological functions: No Digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	Cable length	
Digital outputs 10 Number of digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	• shielded, max.	-
Number of digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	• unshielded, max.	300 m; for technological functions: No
• of which high-speed outputs 4; 100 kHz Pulse Train Output Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	Digital outputs	
Limitation of inductive shutdown voltage to L+ (-48 V) Switching capacity of the outputs 0.5 A	Number of digital outputs	10
Switching capacity of the outputs • with resistive load, max. 0.5 A	of which high-speed outputs	4; 100 kHz Pulse Train Output
• with resistive load, max. 0.5 A	Limitation of inductive shutdown voltage to	L+ (-48 V)
	Switching capacity of the outputs	
• on lamp load, max. 5 W	 with resistive load, max. 	0.5 A
	 on lamp load, max. 	5 W

Output voltage	
	0.1 V: with 10 kOhm load
• for signal "0", max.	0.1 V; with 10 kOhm load 20 V
• for signal "1", min.	20 V
Output current	0.5.4
for signal "1" rated value for signal "0" racidual ourrant, max	0.5 A
for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	1.02
• "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
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Input ranges	
Voltage	Yes
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	
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	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
	PROFINET
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autoregotiation	Yes
Autocrossing	Yes
Interface types	Voc
RJ 45 (Ethernet)	Yes
Number of ports	1
integrated switch	No
Protocols	Vec
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

Drightized startup	Vee
— Prioritized startup	Yes
 — Number of IO devices with prioritized startup, max. 	16
— 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; 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	No
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
SIMATIC communication	
S7 routing	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	No.
supported	Yes
User-defined websites	Yes
OPC UA	Ves: "Pasis" license required
 Runtime license required OPC UA Server 	Yes; "Basic" license required Yes; data access (read, write, subscribe), method call, runtime license
• OPC DA Server	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.	5
— 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	Ver
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
Test commissioning functions	
Status/control	
Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
Forcing	Yes
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
	165
Integrated Functions	
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs
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 	No
 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
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 to cable-borne interference Interference immunity on supply lines acc. to IEC 61000-4-4	Yes
 Interference immunity on signal cables acc. to IEC 	Yes
, , ,	

04000 4 4	
61000-4-4	
Interference immunity against voltage surge	
 Interference immunity on supply lines acc. to IEC 61000-4-5 	Yes
Interference immunity against conducted variable disturbance	a induced by high frequency fields
Interference immunity against conducted variable disturbance Interference immunity against high-frequency	Yes
radiation acc. to IEC 61000-4-6	165
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
Ambient conditions	
Free fall	0.3 m; five times, in product package
Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	-20 °C
• min.	
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C
	horizontal or 45 °C vertical
 horizontal installation, min. 	-20 °C
 horizontal installation, max. 	60 °C
 vertical installation, min. 	-20 °C
 vertical installation, max. 	50 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Operation, min.	795 hPa
	755 m a
 Operation, max. 	1 080 hPa
Operation, max.Storage/transport, min.	
Storage/transport, min.	1 080 hPa
	1 080 hPa 660 hPa
Storage/transport, min.Storage/transport, max.	1 080 hPa 660 hPa
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level 	1 080 hPa 660 hPa 1 080 hPa
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. 	1 080 hPa 660 hPa 1 080 hPa -1 000 m
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity 	1 080 hPa 660 hPa 1 080 hPa -1 000 m
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation
Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 Pollutant concentrations SO2 at RH < 60% without condensation 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 Pollutant concentrations SO2 at RH < 60% without condensation 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-7 Pollutant concentrations SO2 at RH < 60% without condensation configuration / programming / header Programming language 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-27 Pollutant concentrations SO2 at RH < 60% without condensation configuration / header Programming language LAD 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes
 Storage/transport, min. Storage/transport, max. Altitude during operation relating to sea level Installation altitude, min. Installation altitude, max. Relative humidity Operation, max. Vibrations Vibration resistance during operation acc. to IEC 60068-2-6 Operation, tested according to IEC 60068-2-6 Shock testing tested according to IEC 60068-2-7 Pollutant concentrations SO2 at RH < 60% without condensation configuration / programming / header Programming language 	1 080 hPa 660 hPa 1 080 hPa -1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual 95 %; no condensation 2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 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	110 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	415 g

last modified:

7/19/2022 🖸