



| 200V

System description 200V

Structure and Concept

200V is a highly compact and modular expandable system.

The system is designed for centralized and decentralized automation tasks.

With a central extension of a maximum of 32 modules directly to the CPU and up to 126 fieldbus slave modules with a further maximum of 32 modules per fieldbus slave module, 200V is highly flexible. The module size allows use in almost any automation environment.

The assembly is extremely simple. The bus connector for communication between the modules and the CPU can be easily inserted into a 35 mm standard rail, and then 200V modules are snapped on – finished.

Included with the supply of the signal and function modules are front connectors and labeling strips.



Performance and Application

200V is designed for centralized and decentralized automation tasks in the manufacturing and process industry up to medium power range.

Programming

200V is programmed with VIPA WinPLC7 or with Siemens STEP7 in LAD, FBD and STL.

Memory

The CPUs in 200V have the work and load memory already integrated. Depending on the CPU version, users can choose from 48 kByte to 128 kByte work memory. In addition, MMC cards for storing program and data are supported.

Functions

For the connection of sensors and actuators, a variety of signaling modules are available for acquiring digital and analog signals in and out of the process.

For positioning tasks and path measurement various SSI, servo and stepper modules can be chosen.

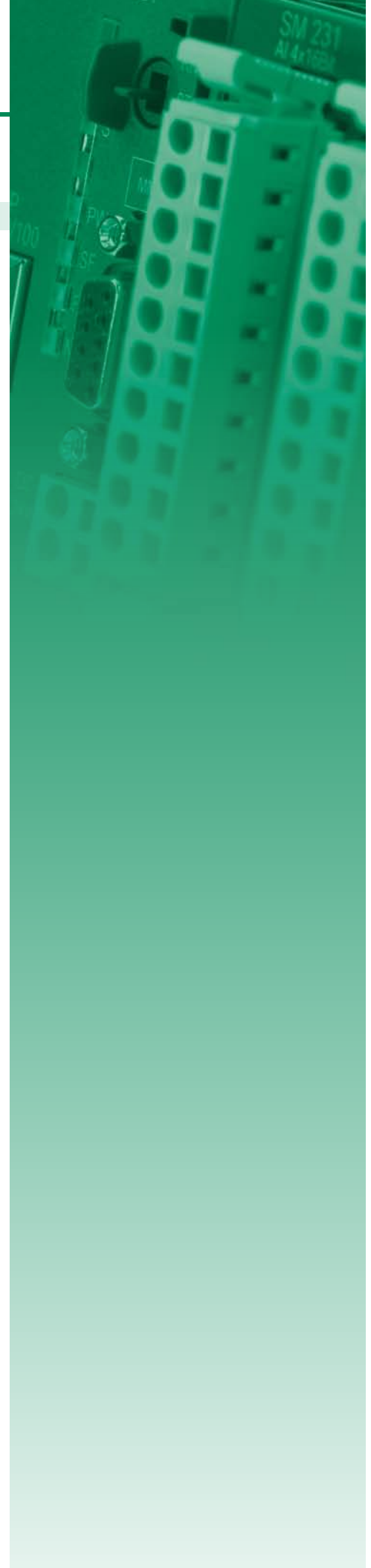
The counter modules in 200V also support complex and fast counting tasks in the manufacturing and process industry to calculate the comparative features and the connection of sensors, such as photoelectric barriers.

Communication

For the connection of serial devices, e.g. scanner or printer, and for the integration of systems from other manufacturers, the system offers a full complement of serial communication processors.

Ethernet communication processors incorporates 200V horizontally and vertically into the existing network structures, and thus make all relevant data connected to the MES and ERP systems available.

200V possesses fieldbus master and slave modules with various fieldbus protocols and can therefore function, manufacturer-independent, as master control as well as subordinate fieldbus slave unit.



CPUs



CPUs-Central Modules

Central Processing Units (CPU) control and regulate processes in plant and machinery. The CPUs are selected according to application with the appropriate performance and work memory and can be extended with signal and function modules, as well as communication processors.

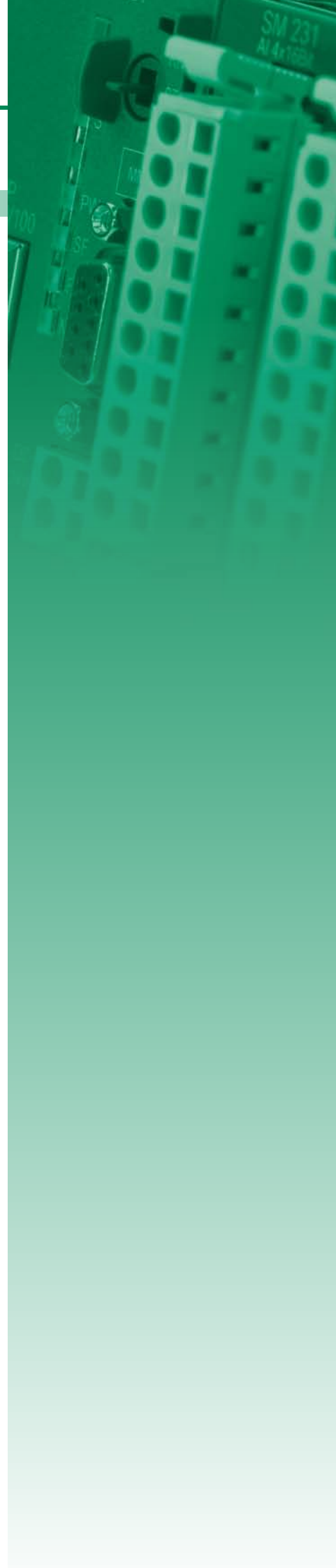
The system 200V CPUs are designed for small and medium-sized applications and represent as universal automation systems an ideal solution for applications in centralized and decentralized structures.

For the construction of the control a wide CPU-range in various performance classes are available. The various CPUs differ in work memory, address range, number of connections and processing time.

The CPUs of the system 200V are particularly suitable for industrial use and for general control and automation tasks in the medium performance range.

Characteristics

- Programmable with VIPA WinPLC7 or Siemens STEP7
- Integrated work memory, operation without additional memory card possible
- Integrated flash ROM memory for continuous saving of program and data
- Integrated accumulator-backed RAM memory
- Support of standard MMC cards for saving of program and data
- Suitable for centralized and decentralized applications
- Modular expandable, up to 32 modules can be used
- Integrated real time clock as well as MPI interface on board
- Front integrated status LEDs
- Assembly with 35 mm profile rail
- 24 months warranty

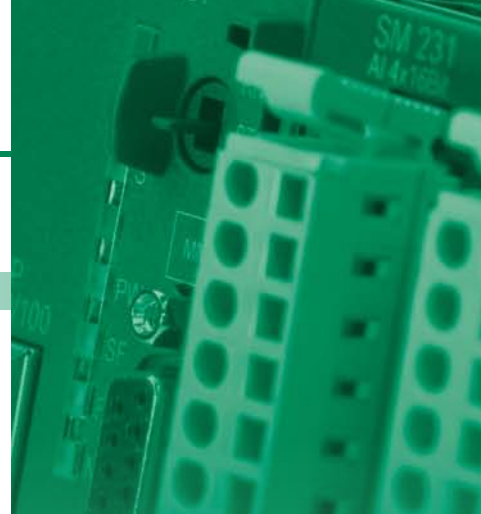


Overview

Order no.	Name/Description	Page
CPUs STEP7 programmable, standard		
214-1BA03	CPU 214 - PLC CPU ‣ 96 kB work memory ‣ 144 kB load memory	249
214-1BA06	CPU 214 - PLC CPU ‣ 96 kB work memory ‣ 144 kB load memory ‣ Also configurable via TIA-Portal	249
214-1BC03	CPU 214C - PLC CPU ‣ 48 kB work memory ‣ 80 kB load memory	249
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215-1BA03	CPU 215 - PLC CPU ‣ 128 kB work memory ‣ 192 kB load memory	254
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CPUs STEP7 programmable, NET-CPUs		
214-2BE03	CPU 214PG - PLC CPU ‣ Twisted pair Ethernet via RJ45 ‣ 96 kB work memory ‣ 144 kB load memory	259
214-2BT13	CPU 214NET - PLC CPU ‣ Ethernet CP 243 ‣ Twisted pair Ethernet via RJ45 ‣ 96 kB work memory ‣ 144 kB load memory	259
215-2BE03	CPU 215PG - PLC CPU ‣ Twisted pair Ethernet via RJ45 ‣ 128 kB work memory ‣ 192 kB load memory	259
215-2BT13	CPU 215NET - PLC CPU ‣ Ethernet CP 243 ‣ Twisted pair Ethernet via RJ45 ‣ 128 kB work memory ‣ 192 kB load memory	259
CPUs STEP7 programmable, PiP		
214-2BS03	CPU 214SER - PLC CPU ‣ Serial communication via 2x RS232 ‣ 96 kB work memory ‣ 144 kB load memory	265
214-2BS13	CPU 214SER - PLC CPU ‣ Serial communication via RS232 ‣ 96 kB work memory ‣ 144 kB load memory	265
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215-2BS03	CPU 215SER - PLC CPU ‣ Serial communication via 2x RS232 ‣ 128 kB work memory ‣ 192 kB load memory	265
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Overview

Order no.	Name/Description	Page
CPUs STEP7 programmable, DP master		
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214-2BM06	CPU 214DPM - PLC CPU ▶ PROFIBUS-DP master ▶ 96 kB work memory ▶ 144 kB load memory ▶ Also configurable via TIA-Portal	277
215-2BM03	CPU 215DPM - PLC CPU ▶ PROFIBUS-DP master ▶ 128 kB work memory ▶ 192 kB load memory	277
CPUs STEP7 programmable, DP slave		
214-2BP03	CPU 214DP - PLC CPU ▶ PROFIBUS-DP slave ▶ 96 kB work memory ▶ 144 kB load memory	283
215-2BP03	CPU 215DP - PLC CPU ▶ PROFIBUS-DP slave ▶ 128 kB work memory ▶ 192 kB load memory	283
CPUs STEP7 programmable, CAN master		
214-2CM03	CPU 214CAN - PLC CPU ▶ CANopen master ▶ 96 kB work memory ▶ 144 kB load memory	288
215-2CM03	CPU 215CAN - PLC CPU ▶ CANopen master ▶ 128 kB work memory ▶ 192 kB load memory	288



CPUs STEP7 programmable, standard

CPUs | CPUs STEP7 programmable, standard

214-1BA03
214-1BA06
214-1BC03
214-1BC06

215-1BA03
215-1BA06

Order number	214-1BA03	214-1BA06	214-1BC03	214-1BC06
Figure				
Type	CPU 214	CPU 214	CPU 214C	CPU 214C
General information				
Note	-	-	-	-
Features	▸ 96 kB work memory ▸ 144 kB load memory	▸ 96 kB work memory ▸ 144 kB load memory ▸ Also configurable via TIA-Portal	▸ 48 kB work memory ▸ 80 kB load memory	▸ 48 kB work memory ▸ 80 kB load memory ▸ Also configurable via TIA-Portal
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	50 mA	50 mA	50 mA	50 mA
Current consumption (rated value)	1.5 A	1.5 A	1.5 A	1.5 A
Inrush current	65 A	65 A	65 A	65 A
I _{Δt}	0.75 A²s	0.75 A²s	0.75 A²s	0.75 A²s
Max. current drain at backplane bus	3 A	3 A	3 A	3 A
Power loss	3.5 W	3.5 W	3.5 W	3.5 W
Load and working memory				
Load memory, integrated	144 KB	144 KB	80 KB	80 KB
Load memory, maximum	144 KB	144 KB	80 KB	80 KB
Work memory, integrated	96 KB	96 KB	48 KB	48 KB
Work memory, maximal	96 KB	96 KB	48 KB	48 KB
Memory divided in 50% program / 50% data	-	-	-	-
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB
Hardware configuration				
Racks, max.	4	4	4	4
Modules per rack, max.	total max. 32	total max. 32	total max. 32	total max. 32
Number of integrated DP master	-	-	-	-
Number of DP master via CP	8	8	8	8
Operable function modules	32	32	32	32
Operable communication modules PtP	32	32	32	32
Operable communication modules LAN	-	-	-	-
Command processing times				
Bit instructions, min.	0.18 μs	0.18 μs	0.18 μs	0.18 μs
Word instruction, min.	0.78 μs	0.78 μs	0.78 μs	0.78 μs
Double integer arithmetic, min.	1.8 μs	1.8 μs	1.8 μs	1.8 μs
Floating-point arithmetic, min.	40 μs	40 μs	40 μs	40 μs

CPUs CPUs STEP7 programmable, standard						
214-1BA03 214-1BA06 214-1BC03 214-1BC06	215-1BA03 215-1BA06					

Order number	214-1BA03	214-1BA06	214-1BC03	214-1BC06
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256	256	256
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64
S7 counter remanence adjustable	C0 .. C7	C0 .. C7	C0 .. C7	C0 .. C7
Number of S7 times	256	256	256	256
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128
S7 times remanence adjustable	not retentive	not retentive	not retentive	not retentive
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit	8192 Bit	8192 Bit
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15
Number of data blocks	2047	2047	2047	2047
Max. data blocks size	16 KB	16 KB	16 KB	16 KB
Number range DBs	1 ... 2047	1 ... 2047	1 ... 2047	1 ... 2047
Max. local data size per execution level	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Max. local data size per block	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Blocks				
Number of OBs	14	14	14	14
Maximum OB size	16 KB	16 KB	16 KB	16 KB
Total number DBs, FBs, FCs	-	-	-	-
Number of FBs	1024	1024	1024	1024
Maximum FB size	16 KB	16 KB	16 KB	16 KB
Number range FBs	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Number of FCs	1024	1024	1024	1024
Maximum FC size	16 KB	16 KB	16 KB	16 KB
Number range FC2	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Maximum nesting depth per priority class	8	8	8	8
Maximum nesting depth additional within an error OB	1	1	1	1
Time				
Real-time clock buffered	✓	✓	✓	✓
Clock buffered period (min.)	30 d	30 d	30 d	30 d
Type of buffering	-	-	-	-
Load time for 50% buffering period	20 h	20 h	20 h	20 h
Load time for 100% buffering period	48 h	48 h	48 h	48 h
Accuracy (max. deviation per day)	10 s	10 s	10 s	10 s
Number of operating hours counter	8	8	8	8
Clock synchronization	-	-	-	-
Synchronization via MPI	-	-	-	-
Synchronization via Ethernet (NTP)	-	-	-	-

CPUs | CPUs STEP7 programmable, standard

214-1BA03
214-1BA06
214-1BC03
214-1BC06

215-1BA03
215-1BA06

Order number	214-1BA03	214-1BA06	214-1BC03	214-1BC06
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Output I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Process image adjustable	-	-	-	-
Input process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Output process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Input process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Output process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Digital inputs	8192	8192	8192	8192
Digital outputs	8192	8192	8192	8192
Digital inputs central	512	512	512	512
Digital outputs central	512	512	512	512
Integrated digital inputs	-	-	-	-
Integrated digital outputs	-	-	-	-
Analog inputs	512	512	512	512
Analog outputs	512	512	512	512
Analog inputs, central	128	128	128	128
Analog outputs, central	128	128	128	128
Integrated analog inputs	-	-	-	-
Integrated analog outputs	-	-	-	-
Communication functions				
PG/OP channel	✓	✓	✓	✓
Global data communication	✓	✓	✓	✓
Number of GD circuits, max.	4	4	4	4
Size of GD packets, max.	22 Byte	22 Byte	22 Byte	22 Byte
S7 basic communication	✓	✓	✓	✓
S7 basic communication, user data per job	76 Byte	76 Byte	76 Byte	76 Byte
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
S7 communication, user data per job	160 Byte	160 Byte	160 Byte	160 Byte
Number of connections, max.	16	16	16	16
Functionality Sub-D interfaces				
Type	MP2I	MP2I	MP2I	MP2I
Type of interface	RS485	RS485	RS485	RS485
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female
Electrically isolated	-	-	-	-
MPI	✓	✓	✓	✓
MP2I (MPI/RS232)	✓	✓	✓	✓
Point-to-point interface	-	-	-	-

CPUs | CPUs STEP7 programmable, standard

214-1BA03 214-1BA06 214-1BC03 214-1BC06	215-1BA03 215-1BA06					
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Order number	214-1BA03	214-1BA06	214-1BC03	214-1BC06
Functionality MPI				
Number of connections, max.	16	16	16	16
PG/OP channel	✓	✓	✓	✓
Routing	-	-	-	-
Global data communication	✓	✓	✓	✓
S7 basic communication	✓	✓	✓	✓
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s
Datasizes				
Input bytes	0	0	0	0
Output bytes	0	0	0	0
Parameter bytes	3	3	3	3
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm
Weight	100 g	100 g	100 g	100 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	in preparation	yes	in preparation

Connections, Interfaces

CPU CPU STEP7 programmable, standard						
214-1BA03	215-1BA03					
214-1BA06	215-1BA06					
214-1BC03						
214-1BC06						

214-1BA03



MP1

- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ M5V
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

- + ① + DC 24 V
- ② 0 V

214-1BA06



MP1

- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ M5V
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

- + ① + DC 24 V
- ② 0 V

214-1BC03



MP1

- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ M5V
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

- + ① + DC 24 V
- ② 0 V

214-1BC06



MP1

- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ M5V
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

- + ① + DC 24 V
- ② 0 V

CPUs STEP7 programmable, standard

CPUs CPUs STEP7 programmable, standard						
214-1BA03	215-1BA03					
214-1BA06	215-1BA06					
214-1BC03						
214-1BC06						

Order number	215-1BA03	215-1BA06		
Figure				
Type	CPU 215	CPU 215		
General information				
Note	-	-		
Features	▸ 128 kB work memory ▸ 192 kB load memory	▸ 128 kB work memory ▸ 192 kB load memory ▸ Also configurable via TIA-Portal		
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V		
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V		
Reverse polarity protection	✓	✓		
Current consumption (no-load operation)	50 mA	50 mA		
Current consumption (rated value)	1.5 A	1.5 A		
Inrush current	65 A	65 A		
I _{Δt}	0.75 A²s	0.75 A²s		
Max. current drain at backplane bus	3 A	3 A		
Power loss	3.5 W	3.5 W		
Load and working memory				
Load memory, integrated	192 KB	192 KB		
Load memory, maximum	192 KB	192 KB		
Work memory, integrated	128 KB	128 KB		
Work memory, maximal	128 KB	128 KB		
Memory divided in 50% program / 50% data	-	-		
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB		
Hardware configuration				
Racks, max.	4	4		
Modules per rack, max.	total max. 32	total max. 32		
Number of integrated DP master	-	-		
Number of DP master via CP	8	8		
Operable function modules	32	32		
Operable communication modules PtP	32	32		
Operable communication modules LAN	-	-		
Command processing times				
Bit instructions, min.	0.18 μs	0.18 μs		
Word instruction, min.	0.78 μs	0.78 μs		
Double integer arithmetic, min.	1.8 μs	1.8 μs		
Floating-point arithmetic, min.	40 μs	40 μs		

CPUs | CPUs STEP7 programmable, standard

214-1BA03
214-1BA06
214-1BC03
214-1BC06

215-1BA03
215-1BA06

Order number	215-1BA03	215-1BA06			
Timers/Counters and their retentive characteristics					
Number of S7 counters	256	256			
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64			
S7 counter remanence adjustable	C0 .. C7	C0 .. C7			
Number of S7 times	256	256			
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128			
S7 times remanence adjustable	not retentive	not retentive			
Data range and retentive characteristic					
Number of flags	8192 Bit	8192 Bit			
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256			
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15			
Number of data blocks	2047	2047			
Max. data blocks size	16 KB	16 KB			
Number range DBs	1 ... 2047	1 ... 2047			
Max. local data size per execution level	1024 Byte	1024 Byte			
Max. local data size per block	1024 Byte	1024 Byte			
Blocks					
Number of OBs	14	14			
Maximum OB size	16 KB	16 KB			
Total number DBs, FBs, FCs	-	-			
Number of FBs	1024	1024			
Maximum FB size	16 KB	16 KB			
Number range FBs	0 ... 1023	0 ... 1023			
Number of FCs	1024	1024			
Maximum FC size	16 KB	16 KB			
Number range FC2	0 ... 1023	0 ... 1023			
Maximum nesting depth per priority class	8	8			
Maximum nesting depth additional within an error OB	1	1			
Time					
Real-time clock buffered	✓	✓			
Clock buffered period (min.)	30 d	30 d			
Type of buffering	-	-			
Load time for 50% buffering period	20 h	20 h			
Load time for 100% buffering period	48 h	48 h			
Accuracy (max. deviation per day)	10 s	10 s			
Number of operating hours counter	8	8			
Clock synchronization	-	-			
Synchronization via MPI	-	-			
Synchronization via Ethernet (NTP)	-	-			

CPUs | CPUs STEP7 programmable, standard

214-1BA03
214-1BA06
214-1BC03
214-1BC06

215-1BA03
215-1BA06

Order number	215-1BA03	215-1BA06				
Address areas (I/O)						
Input I/O address area	1024 Byte	1024 Byte				
Output I/O address area	1024 Byte	1024 Byte				
Process image adjustable	-	-				
Input process image preset	128 Byte	128 Byte				
Output process image preset	128 Byte	128 Byte				
Input process image maximal	128 Byte	128 Byte				
Output process image maximal	128 Byte	128 Byte				
Digital inputs	8192	8192				
Digital outputs	8192	8192				
Digital inputs central	512	512				
Digital outputs central	512	512				
Integrated digital inputs	-	-				
Integrated digital outputs	-	-				
Analog inputs	512	512				
Analog outputs	512	512				
Analog inputs, central	128	128				
Analog outputs, central	128	128				
Integrated analog inputs	-	-				
Integrated analog outputs	-	-				
Communication functions						
PG/OP channel	✓	✓				
Global data communication	✓	✓				
Number of GD circuits, max.	4	4				
Size of GD packets, max.	22 Byte	22 Byte				
S7 basic communication	✓	✓				
S7 basic communication, user data per job	76 Byte	76 Byte				
S7 communication	✓	✓				
S7 communication as server	✓	✓				
S7 communication as client	-	-				
S7 communication, user data per job	160 Byte	160 Byte				
Number of connections, max.	16	16				
Functionality Sub-D interfaces						
Type	MP2I	MP2I				
Type of interface	RS485	RS485				
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female				
Electrically isolated	-	-				
MPI	✓	✓				
MP2I (MPI/RS232)	✓	✓				
Point-to-point interface	-	-				

CPUs | CPUs STEP7 programmable, standard

214-1BA03 214-1BA06 214-1BC03 214-1BC06	215-1BA03 215-1BA06					
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Order number	215-1BA03	215-1BA06		
Functionality MPI				
Number of connections, max.	16	16		
PG/OP channel	✓	✓		
Routing	-	-		
Global data communication	✓	✓		
S7 basic communication	✓	✓		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s		
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s		
Datasizes				
Input bytes	0	0		
Output bytes	0	0		
Parameter bytes	3	3		
Diagnostic bytes	0	0		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm		
Weight	100 g	100 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	in preparation		

215-1BA06



MP²I



① reserved

② M24V

③ Rx/D/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ Rx/D/TxD-N (line A)

⑨ n.c.

X1



① + DC 24 V

② 0 V

CPUs STEP7 programmable, NET-CPUs

CPUs | CPUs STEP7 programmable, NET-CPUs

214-2BE03
214-2BT13
215-2BE03
215-2BT13

Order number	214-2BE03	214-2BT13	215-2BE03	215-2BT13
Figure				
Type	CPU 214NET	CPU 214NET	CPU 215NET	CPU 215NET
General information				
Note	-	-	-	-
Features	▸ Twisted pair Ethernet via RJ45 ▸ 96 kB work memory ▸ 144 kB load memory	▸ Ethernet CP 243 ▸ Twisted pair Ethernet via RJ45 ▸ 96 kB work memory ▸ 144 kB load memory	▸ Twisted pair Ethernet via RJ45 ▸ 128 kB work memory ▸ 192 kB load memory	▸ Ethernet CP 243 ▸ Twisted pair Ethernet via RJ45 ▸ 128 kB work memory ▸ 192 kB load memory
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	140 mA	140 mA	140 mA	140 mA
Current consumption (rated value)	1.5 A	1.5 A	1.5 A	1.5 A
Inrush current	65 A	65 A	65 A	65 A
I²t	0.75 A²s	0.75 A²s	0.75 A²s	0.75 A²s
Max. current drain at backplane bus	3 A	3 A	3 A	3 A
Power loss	6 W	6 W	6 W	6 W
Load and working memory				
Load memory, integrated	144 KB	144 KB	192 KB	192 KB
Load memory, maximum	144 KB	144 KB	192 KB	192 KB
Work memory, integrated	96 KB	96 KB	128 KB	128 KB
Work memory, maximal	96 KB	96 KB	128 KB	128 KB
Memory divided in 50% program / 50% data	-	-	-	-
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB
Hardware configuration				
Racks, max.	4	4	4	4
Modules per rack, max.	total max. 32	total max. 32	total max. 32	total max. 32
Number of integrated DP master	-	-	-	-
Number of DP master via CP	8	8	8	8
Operable function modules	32	32	32	32
Operable communication modules PtP	32	32	32	32
Operable communication modules LAN	-	-	-	-

CPUs CPUs STEP7 programmable, NET-CPUs						
214-2BE03						
214-2BT13						
215-2BE03						
215-2BT13						

Order number	214-2BE03	214-2BT13	215-2BE03	215-2BT13
Command processing times				
Bit instructions, min.	0.18 µs	0.18 µs	0.18 µs	0.18 µs
Word instruction, min.	0.78 µs	0.78 µs	0.78 µs	0.78 µs
Double integer arithmetic, min.	1.8 µs	1.8 µs	1.8 µs	1.8 µs
Floating-point arithmetic, min.	40 µs	40 µs	40 µs	40 µs
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256	256	256
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64
S7 counter remanence adjustable	C0 .. C7	C0 .. C7	C0 .. C7	C0 .. C7
Number of S7 times	256	256	256	256
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128
S7 times remanence adjustable	not retentive	not retentive	not retentive	not retentive
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit	8192 Bit	8192 Bit
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15
Number of data blocks	2047	2047	2047	2047
Max. data blocks size	16 KB	16 KB	16 KB	16 KB
Number range DBs	1 ... 2047	1 ... 2047	1 ... 2047	1 ... 2047
Max. local data size per execution level	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Max. local data size per block	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Blocks				
Number of OBs	14	14	14	14
Maximum OB size	16 KB	16 KB	16 KB	16 KB
Total number DBs, FBs, FCs	-	-	-	-
Number of FBs	1024	1024	1024	1024
Maximum FB size	16 KB	16 KB	16 KB	16 KB
Number range FBs	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Number of FCs	1024	1024	1024	1024
Maximum FC size	16 KB	16 KB	16 KB	16 KB
Number range FC2	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Maximum nesting depth per priority class	8	8	8	8
Maximum nesting depth additional within an error OB	1	1	1	1
Time				
Real-time clock buffered	✓	✓	✓	✓
Clock buffered period (min.)	30 d	30 d	30 d	30 d
Type of buffering	-	-	-	-
Load time for 50% buffering period	20 h	20 h	20 h	20 h
Load time for 100% buffering period	48 h	48 h	48 h	48 h

CPUs | CPUs STEP7 programmable, NET-CPUs

214-2BE03
214-2BT13
215-2BE03
215-2BT13

Order number	214-2BE03	214-2BT13	215-2BE03	215-2BT13
Accuracy (max. deviation per day)	10 s	10 s	10 s	10 s
Number of operating hours counter	8	8	8	8
Clock synchronization	-	-	-	-
Synchronization via MPI	-	-	-	-
Synchronization via Ethernet (NTP)	-	-	-	-
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Output I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Process image adjustable	-	-	-	-
Input process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Output process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Input process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Output process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Digital inputs	8192	8192	8192	8192
Digital outputs	8192	8192	8192	8192
Digital inputs central	512	512	512	512
Digital outputs central	512	512	512	512
Integrated digital inputs	-	-	-	-
Integrated digital outputs	-	-	-	-
Analog inputs	512	512	512	512
Analog outputs	512	512	512	512
Analog inputs, central	128	128	128	128
Analog outputs, central	128	128	128	128
Integrated analog inputs	-	-	-	-
Integrated analog outputs	-	-	-	-
Communication functions				
PG/OP channel	✓	✓	✓	✓
Global data communication	✓	✓	✓	✓
Number of GD circuits, max.	4	4	4	4
Size of GD packets, max.	22 Byte	22 Byte	22 Byte	22 Byte
S7 basic communication	✓	✓	✓	✓
S7 basic communication, user data per job	76 Byte	76 Byte	76 Byte	76 Byte
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
S7 communication, user data per job	160 Byte	160 Byte	160 Byte	160 Byte
Number of connections, max.	16	16	16	16
Functionality Sub-D interfaces				
Type	MP2I	MP2I	MP2I	MP2I
Type of interface	RS485	RS485	RS485	RS485
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female
Electrically isolated	-	-	-	-
MPI	✓	✓	✓	✓
MP2I (MPI/RS232)	✓	✓	✓	✓
Point-to-point interface	-	-	-	-

CPU CPUs STEP7 programmable, NET-CPU						
214-2BE03						
214-2BT13						
215-2BE03						
215-2BT13						

Order number	214-2BE03	214-2BT13	215-2BE03	215-2BT13
Functionality MPI				
Number of connections, max.	16	16	16	16
PG/OP channel	✓	✓	✓	✓
Routing	-	-	-	-
Global data communication	✓	✓	✓	✓
S7 basic communication	✓	✓	✓	✓
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s
Functionality RJ45 interfaces				
Type	TP	TP	TP	TP
Type of interface	Ethernet 10/100 MBit	Ethernet 10/100 MBit	Ethernet 10/100 MBit	Ethernet 10/100 MBit
Connector	RJ45	RJ45	RJ45	RJ45
Electrically isolated	✓	✓	✓	✓
PG/OP channel	✓	✓	✓	✓
Number of connections, max.	8	8	8	8
Productive connections	✓	✓	✓	✓
Ethernet communication CP				
Number of productive connections, max.	16	16	16	16
Number of productive connections by Siemens NetPro, max.	16	16	16	16
S7 connections	-	-	-	-
User data per S7 connection, max.	-	-	-	-
TCP-connections	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling
User data per TCP connection, max.	64 KB	64 KB	64 KB	64 KB
ISO-connections	-	SEND and RECEIVE	-	SEND and RECEIVE
User data per ISO connection, max.	-	8 KB	-	8 KB
ISO on TCP connections (RFC 1006)	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling
User data per ISO on TCP connection, max.	32 KB	32 KB	32 KB	32 KB
UDP-connections	-	SEND and RECEIVE	-	SEND and RECEIVE
User data per UDP connection, max.	-	2 KB	-	2 KB
UDP-multicast-connections	-	SEND and RECEIVE (max. 16 Multicast groups)	-	SEND and RECEIVE (max. 16 Multicast groups)
UDP-broadcast-connections	-	SEND	-	SEND

CPUs | CPUs STEP7 programmable, NET-CPUs

214-2BE03
214-2BT13
215-2BE03
215-2BT13

Order number	214-2BE03	214-2BT13	215-2BE03	215-2BT13
Datasizes				
Input bytes	0	0	0	0
Output bytes	0	0	0	0
Parameter bytes	3	3	3	3
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm
Weight	150 g	150 g	150 g	150 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

CPU s CPU s STEP7 programmable, NET-CPU s					
214-2BE03					
214-2BT13					
215-2BE03					
215-2BT13					

214-2BE03



MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n.c.

X1

+ ① + DC 24 V

- ② 0 V

RJ45

① Transmit +

② Transmit -

③ Receive +

④ -

⑤ -

⑥ Receive -

⑦ -

⑧ -

214-2BT13



MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n.c.

X1

+ ① + DC 24 V

- ② 0 V

RJ45

① Transmit +

② Transmit -

③ Receive +

④ -

⑤ -

⑥ Receive -

⑦ -

⑧ -

215-2BE03



MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n.c.

X1

+ ① + DC 24 V

- ② 0 V

RJ45

① Transmit +

② Transmit -

③ Receive +

④ -

⑤ -

⑥ Receive -

⑦ -

⑧ -

215-2BT13



MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n.c.

X1

+ ① + DC 24 V

- ② 0 V

RJ45

① Transmit +

② Transmit -

③ Receive +

④ -

⑤ -

⑥ Receive -

⑦ -

⑧ -

CPUs STEP7 programmable, PtP

CPUs | CPUs STEP7 programmable, PtP

214-2BS03
214-2BS13
214-2BS33
215-2BS03

215-2BS13
215-2BS33

Order number	214-2BS03	214-2BS13	214-2BS33	215-2BS03
Figure				
Type	CPU 214SER	CPU 214SER	CPU 214SER	CPU 215SER
General information				
Note	-	-	-	-
Features	- Serial communication via 2x RS232 96 kB work memory 144 kB load memory	- Serial communication via RS232 96 kB work memory 144 kB load memory	- Serial communication via RS485 96 kB work memory 144 kB load memory	- Serial communication via 2x RS232 128 kB work memory 192 kB load memory
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	90 mA	90 mA	80 mA	90 mA
Current consumption (rated value)	1.5 A	1.5 A	1.5 A	1.5 A
Inrush current	65 A	65 A	65 A	65 A
I _q	0.75 A²s	0.75 A²s	0.75 A²s	0.75 A²s
Max. current drain at backplane bus	3 A	3 A	3 A	3 A
Power loss	5 W	5 W	5 W	5 W
Load and working memory				
Load memory, integrated	144 KB	144 KB	144 KB	192 KB
Load memory, maximum	144 KB	144 KB	144 KB	192 KB
Work memory, integrated	96 KB	96 KB	96 KB	128 KB
Work memory, maximal	96 KB	96 KB	96 KB	128 KB
Memory divided in 50% program / 50% data	-	-	-	-
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB
Hardware configuration				
Racks, max.	4	4	4	4
Modules per rack, max.	total max. 32	total max. 32	total max. 32	total max. 32
Number of integrated DP master	-	-	-	-
Number of DP master via CP	8	8	8	8
Operable function modules	32	32	32	32
Operable communication modules PtP	32	32	32	32
Operable communication modules LAN	-	-	-	-
Command processing times				
Bit instructions, min.	0.18 µs	0.18 µs	0.18 µs	0.18 µs
Word instruction, min.	0.78 µs	0.78 µs	0.78 µs	0.78 µs
Double integer arithmetic, min.	1.8 µs	1.8 µs	1.8 µs	1.8 µs
Floating-point arithmetic, min.	40 µs	40 µs	40 µs	40 µs

CPUs | CPUs STEP7 programmable, PtP

214-2BS03	215-2BS13					
214-2BS13	215-2BS33					
214-2BS33						
215-2BS03						

Order number	214-2BS03	214-2BS13	214-2BS33	215-2BS03
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256	256	256
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64
S7 counter remanence adjustable	C0 .. C7	C0 .. C7	C0 .. C7	C0 .. C7
Number of S7 times	256	256	256	256
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128
S7 times remanence adjustable	not retentive	not retentive	not retentive	not retentive
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit	8192 Bit	8192 Bit
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15
Number of data blocks	2047	2047	2047	2047
Max. data blocks size	16 KB	16 KB	16 KB	16 KB
Number range DBs	1 ... 2047	1 ... 2047	1 ... 2047	1 ... 2047
Max. local data size per execution level	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Max. local data size per block	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Blocks				
Number of OBs	14	14	14	14
Maximum OB size	16 KB	16 KB	16 KB	16 KB
Total number DBs, FBs, FCs	-	-	-	-
Number of FBs	1024	1024	1024	1024
Maximum FB size	16 KB	16 KB	16 KB	16 KB
Number range FBs	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Number of FCs	1024	1024	1024	1024
Maximum FC size	16 KB	16 KB	16 KB	16 KB
Number range FC2	0 ... 1023	0 ... 1023	0 ... 1023	0 ... 1023
Maximum nesting depth per priority class	8	8	8	8
Maximum nesting depth additional within an error OB	1	1	1	1
Time				
Real-time clock buffered	✓	✓	✓	✓
Clock buffered period (min.)	30 d	30 d	30 d	30 d
Type of buffering	-	-	-	-
Load time for 50% buffering period	20 h	20 h	20 h	20 h
Load time for 100% buffering period	48 h	48 h	48 h	48 h
Accuracy (max. deviation per day)	10 s	10 s	10 s	10 s
Number of operating hours counter	8	8	8	8
Clock synchronization	-	-	-	-
Synchronization via MPI	-	-	-	-
Synchronization via Ethernet (NTP)	-	-	-	-

CPUs | CPUs STEP7 programmable, PtP

214-2BS03
214-2BS13
214-2BS33
215-2BS03

215-2BS13
215-2BS33

Order number	214-2BS03	214-2BS13	214-2BS33	215-2BS03
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Output I/O address area	1024 Byte	1024 Byte	1024 Byte	1024 Byte
Process image adjustable	-	-	-	-
Input process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Output process image preset	128 Byte	128 Byte	128 Byte	128 Byte
Input process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Output process image maximal	128 Byte	128 Byte	128 Byte	128 Byte
Digital inputs	8192	8192	8192	8192
Digital outputs	8192	8192	8192	8192
Digital inputs central	512	512	512	512
Digital outputs central	512	512	512	512
Integrated digital inputs	-	-	-	-
Integrated digital outputs	-	-	-	-
Analog inputs	512	512	512	512
Analog outputs	512	512	512	512
Analog inputs, central	128	128	128	128
Analog outputs, central	128	128	128	128
Integrated analog inputs	-	-	-	-
Integrated analog outputs	-	-	-	-
Communication functions				
PG/OP channel	✓	✓	✓	✓
Global data communication	✓	✓	✓	✓
Number of GD circuits, max.	4	4	4	4
Size of GD packets, max.	22 Byte	22 Byte	22 Byte	22 Byte
S7 basic communication	✓	✓	✓	✓
S7 basic communication, user data per job	76 Byte	76 Byte	76 Byte	76 Byte
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
S7 communication, user data per job	160 Byte	160 Byte	160 Byte	160 Byte
Number of connections, max.	16	16	16	16
Functionality Sub-D interfaces				
Type	MP2I	MP2I	MP2I	MP2I
Type of interface	RS485	RS485	RS485	RS485
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female
Electrically isolated	-	-	-	-
MPI	✓	✓	✓	✓
MP2I (MPI/RS232)	✓	✓	✓	✓
Point-to-point interface	-	-	-	-

CPU s CPU s STEP7 programmable, PtP						
214-2BS03 214-2BS13 214-2BS33 215-2BS03	215-2BS13 215-2BS33					

Order number	214-2BS03	214-2BS13	214-2BS33	215-2BS03
Type	COM1	COM	COM	COM1
Type of interface	RS232	RS232	RS485	RS232
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, male	Sub-D, 9-pin, female	Sub-D, 9-pin, male
Electrically isolated	-	-	✓	-
MPI	-	-	-	-
MP ² _I (MPI/RS232)	-	-	-	-
Point-to-point interface	✓	✓	✓	✓
Type	COM2	-	-	COM2
Type of interface	RS232	-	-	RS232
Connector	Sub-D, 9-pin, male	-	-	Sub-D, 9-pin, male
Electrically isolated	-	-	-	-
MPI	-	-	-	-
MP ² _I (MPI/RS232)	-	-	-	-
Point-to-point interface	✓	-	-	✓
Functionality MPI				
Number of connections, max.	16	16	16	16
PG/OP channel	✓	✓	✓	✓
Routing	-	-	-	-
Global data communication	✓	✓	✓	✓
S7 basic communication	✓	✓	✓	✓
S7 communication	✓	✓	✓	✓
S7 communication as server	✓	✓	✓	✓
S7 communication as client	-	-	-	-
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s
Point-to-point communication				
PtP communication	✓	✓	✓	✓
Interface isolated	-	-	✓	-
RS232 interface	✓	✓	-	✓
RS422 interface	-	-	-	-
RS485 interface	-	-	✓	-
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, male	Sub-D, 9-pin, female	Sub-D, 9-pin, male
Transmission speed, min.	150 bit/s	150 bit/s	150 bit/s	150 bit/s
Transmission speed, max.	115.2 kbit/s	115.2 kbit/s	115.2 kbit/s	115.2 kbit/s
Cable length, max.	15 m	15 m	500 m	15 m
Point-to-point protocol				
ASCII protocol	✓	✓	✓	✓
STX/ETX protocol	✓	✓	✓	✓
3964(R) protocol	✓	✓	✓	✓
RK512 protocol	✓	-	-	✓
USS master protocol	-	✓	✓	-
Modbus master protocol	-	✓	✓	-
Modbus slave protocol	-	✓	✓	-
Special protocols	-	-	-	-

CPUs | CPUs STEP7 programmable, PtP

214-2BS03	215-2BS13					
214-2BS13	215-2BS33					
214-2BS33						
215-2BS03						

Order number	214-2BS03	214-2BS13	214-2BS33	215-2BS03
Datasizes				
Input bytes	0	0	0	0
Output bytes	0	0	0	0
Parameter bytes	3	3	3	3
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm
Weight	150 g	150 g	150 g	150 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

CPU CPU STEP7 programmable, PtP						
214-2BS03	215-2BS13					
214-2BS13	215-2BS33					
214-2BS33						
215-2BS03						

214-2BS03



COM1 RS232

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1

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COM2 RS232

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MP1

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X1

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214-2BS13



COM RS232

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2

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1

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MP2

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X1

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214-2BS33



COM RS485

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MP2

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4

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6

7

8

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3

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X1

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215-2BS03



COM1 RS232

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COM2 RS232

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MP1

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X1

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CPUs STEP7 programmable, PtP

CPUs | CPUs STEP7 programmable, PtP

214-2BS03 214-2BS13 214-2BS33 215-2BS03	215-2BS13 215-2BS33					
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Order number	215-2BS13	215-2BS33		
Figure				
Type	CPU 215SER	CPU 215SER		
General information				
Note	-	-		
Features	- Serial communication via RS232 128 kB work memory 192 kB load memory	- Serial communication via RS485 128 kB work memory 192 kB load memory		
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V		
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V		
Reverse polarity protection	✓	✓		
Current consumption (no-load operation)	90 mA	80 mA		
Current consumption (rated value)	1.5 A	1.5 A		
Inrush current	65 A	65 A		
I _{Δt}	0.75 A²s	0.75 A²s		
Max. current drain at backplane bus	3 A	3 A		
Power loss	5 W	5 W		
Load and working memory				
Load memory, integrated	192 KB	192 KB		
Load memory, maximum	192 KB	192 KB		
Work memory, integrated	128 KB	128 KB		
Work memory, maximal	128 KB	128 KB		
Memory divided in 50% program / 50% data	-	-		
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB		
Hardware configuration				
Racks, max.	4	4		
Modules per rack, max.	total max. 32	total max. 32		
Number of integrated DP master	-	-		
Number of DP master via CP	8	8		
Operable function modules	32	32		
Operable communication modules PtP	32	32		
Operable communication modules LAN	-	-		
Command processing times				
Bit instructions, min.	0.18 µs	0.18 µs		
Word instruction, min.	0.78 µs	0.78 µs		
Double integer arithmetic, min.	1.8 µs	1.8 µs		
Floating-point arithmetic, min.	40 µs	40 µs		

CPU CPU STEP7 programmable, PtP						
214-2BS03	215-2BS13					
214-2BS13	215-2BS33					
214-2BS33						
215-2BS03						

Order number	215-2BS13	215-2BS33		
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256		
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64		
S7 counter remanence adjustable	C0 .. C7	C0 .. C7		
Number of S7 times	256	256		
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128		
S7 times remanence adjustable	not retentive	not retentive		
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit		
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256		
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15		
Number of data blocks	2047	2047		
Max. data blocks size	16 KB	16 KB		
Number range DBs	1 ... 2047	1 ... 2047		
Max. local data size per execution level	1024 Byte	1024 Byte		
Max. local data size per block	1024 Byte	1024 Byte		
Blocks				
Number of OBs	14	14		
Maximum OB size	16 KB	16 KB		
Totalnumber DBs, FBs, FCs	-	-		
Number of FBs	1024	1024		
Maximum FB size	16 KB	16 KB		
Number range FBs	0 ... 1023	0 ... 1023		
Number of FCs	1024	1024		
Maximum FC size	16 KB	16 KB		
Number range FC2	0 ... 1023	0 ... 1023		
Maximum nesting depth per priority class	8	8		
Maximum nesting depth additional within an error OB	1	1		
Time				
Real-time clock buffered	✓	✓		
Clock buffered period (min.)	30 d	30 d		
Type of buffering	-	-		
Load time for 50% buffering period	20 h	20 h		
Load time for 100% buffering period	48 h	48 h		
Accuracy (max. deviation per day)	10 s	10 s		
Number of operating hours counter	8	8		
Clock synchronization	-	-		
Synchronization via MPI	-	-		
Synchronization via Ethernet (NTP)	-	-		

CPUs | CPUs STEP7 programmable, PtP

214-2BS03 214-2BS13 214-2BS33 215-2BS03	215-2BS13 215-2BS33					
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Order number	215-2BS13	215-2BS33		
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte		
Output I/O address area	1024 Byte	1024 Byte		
Process image adjustable	-	-		
Input process image preset	128 Byte	128 Byte		
Output process image preset	128 Byte	128 Byte		
Input process image maximal	128 Byte	128 Byte		
Output process image maximal	128 Byte	128 Byte		
Digital inputs	8192	8192		
Digital outputs	8192	8192		
Digital inputs central	512	512		
Digital outputs central	512	512		
Integrated digital inputs	-	-		
Integrated digital outputs	-	-		
Analog inputs	512	512		
Analog outputs	512	512		
Analog inputs, central	128	128		
Analog outputs, central	128	128		
Integrated analog inputs	-	-		
Integrated analog outputs	-	-		
Communication functions				
PG/OP channel	✓	✓		
Global data communication	✓	✓		
Number of GD circuits, max.	4	4		
Size of GD packets, max.	22 Byte	22 Byte		
S7 basic communication	✓	✓		
S7 basic communication, user data per job	76 Byte	76 Byte		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
S7 communication, user data per job	160 Byte	160 Byte		
Number of connections, max.	16	16		
Functionality Sub-D interfaces				
Type	MP2I	MP2I		
Type of interface	RS485	RS485		
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female		
Electrically isolated	-	-		
MPI	✓	✓		
MP2I (MPI/RS232)	✓	✓		
Point-to-point interface	-	-		

CPU s CPU s STEP7 programmable, PtP						
214-2BS03 214-2BS13 214-2BS33 215-2BS03	215-2BS13 215-2BS33					

Order number	215-2BS13	215-2BS33		
Type	COM	COM		
Type of interface	RS232	RS485		
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, female		
Electrically isolated	-	✓		
MPI	-	-		
MP ² I (MPI/RS232)	-	-		
Point-to-point interface	✓	✓		
Type	-	-		
Type of interface	-	-		
Connector	-	-		
Electrically isolated	-	-		
MPI	-	-		
MP ² I (MPI/RS232)	-	-		
Point-to-point interface	-	-		
Functionality MPI				
Number of connections, max.	16	16		
PG/OP channel	✓	✓		
Routing	-	-		
Global data communication	✓	✓		
S7 basic communication	✓	✓		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s		
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s		
Point-to-point communication				
PtP communication	✓	✓		
Interface isolated	-	✓		
RS232 interface	✓	-		
RS422 interface	-	-		
RS485 interface	-	✓		
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, female		
Transmission speed, min.	150 bit/s	150 bit/s		
Transmission speed, max.	115.2 kbit/s	115.2 kbit/s		
Cable length, max.	15 m	500 m		
Point-to-point protocol				
ASCII protocol	✓	✓		
STX/ETX protocol	✓	✓		
3964(R) protocol	✓	✓		
RK512 protocol	-	-		
USS master protocol	✓	✓		
Modbus master protocol	✓	✓		
Modbus slave protocol	✓	✓		
Special protocols	-	-		

CPU's CPU's STEP7 programmable, PtP						
214-2BS03 214-2BS13 214-2BS33 215-2BS03	215-2BS13 215-2BS33					

Order number	215-2BS13	215-2BS33		
Datasizes				
Input bytes	0	0		
Output bytes	0	0		
Parameter bytes	3	3		
Diagnostic bytes	0	0		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm		
Weight	150 g	150 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

CPU CPU STEP7 programmable, PtP					
214-2BS03	215-2BS13				
214-2BS13	215-2BS33				
214-2BS33					
215-2BS03					

215-2BS13



COM
RS232C

1

2

3

4

5

1

 CD-

2

 RxD

3

 TxD

4

 DTR-

5

 GND

6

 DSR-

7

 RTS-

8

 CTS-

9

 RI-

MP²¹

1

2

3

4

5

6

7

8

9

1

 reserved

2

 M24V

3

 RxD/TxD-P (line B)

4

 RTS

5

 M5V

6

 P5V

7

 P24V

8

 RxD/TxD-N (line A)

9

 n.c.

X1

1

2

+

 DC 24 V

-

 0 V

215-2BS33



COM
RS485

1

2

3

4

5

1

 n. c.

2

 n. c.

3

 RxD/TxD-P (line B)

4

 RTS

5

 M5V

6

 P5V

7

 n. c.

8

 RxD/TxD-N (line A)

9

 n.c.

MP²¹

1

2

3

4

5

6

7

8

9

1

 reserved

2

 M24V

3

 RxD/TxD-P (line B)

4

 RTS

5

 M5V

6

 P5V

7

 P24V

8

 RxD/TxD-N (line A)

9

 n.c.

X1

1

2

+

 DC 24 V

-

 0 V

CPUs STEP7 programmable, DP master

CPUs | CPUs STEP7 programmable, DP master

214-2BM03
214-2BM06
215-2BM03

Order number	214-2BM03	214-2BM06	215-2BM03	
Figure				
Type	CPU 214DPM	CPU 214DPM	CPU 215DPM	
General information				
Note	-	-	-	
Features	▸ PROFIBUS-DP master ▸ 96 kB work memory ▸ 144 kB load memory	▸ PROFIBUS-DP master ▸ 96 kB work memory ▸ 144 kB load memory ▸ Also configurable via TIA-Portal	▸ PROFIBUS-DP master ▸ 128 kB work memory ▸ 192 kB load memory	
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	
Reverse polarity protection	✓	✓	✓	
Current consumption (no-load operation)	130 mA	130 mA	130 mA	
Current consumption (rated value)	1.5 A	1.5 A	1.5 A	
Inrush current	65 A	65 A	65 A	
I²t	0.75 A²s	0.75 A²s	0.75 A²s	
Max. current drain at backplane bus	3 A	3 A	3 A	
Power loss	5 W	5 W	5 W	
Load and working memory				
Load memory, integrated	144 KB	144 KB	192 KB	
Load memory, maximum	144 KB	144 KB	192 KB	
Work memory, integrated	96 KB	96 KB	128 KB	
Work memory, maximal	96 KB	96 KB	128 KB	
Memory divided in 50% program / 50% data	-	-	-	
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB	
Hardware configuration				
Racks, max.	4	4	4	
Modules per rack, max.	total max. 32	total max. 32	total max. 32	
Number of integrated DP master	1	1	1	
Number of DP master via CP	8	8	8	
Operable function modules	32	32	32	
Operable communication modules PtP	32	32	32	
Operable communication modules LAN	-	-	-	
Command processing times				
Bit instructions, min.	0.18 µs	0.18 µs	0.18 µs	
Word instruction, min.	0.78 µs	0.78 µs	0.78 µs	
Double integer arithmetic, min.	1.8 µs	1.8 µs	1.8 µs	
Floating-point arithmetic, min.	40 µs	40 µs	40 µs	

CPUs | CPUs STEP7 programmable, DP master

214-2BM03 214-2BM06 215-2BM03						
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Order number	214-2BM03	214-2BM06	215-2BM03	
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256	256	
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64	adjustable 0 up to 64	
S7 counter remanence adjustable	C0 .. C7	C0 .. C7	C0 .. C7	
Number of S7 times	256	256	256	
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128	adjustable 0 up to 128	
S7 times remanence adjustable	not retentive	not retentive	not retentive	
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit	8192 Bit	
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256	adjustable 0 up to 256	
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15	
Number of data blocks	2047	2047	2047	
Max. data blocks size	16 KB	16 KB	16 KB	
Number range DBs	1 ... 2047	1 ... 2047	1 ... 2047	
Max. local data size per execution level	1024 Byte	1024 Byte	1024 Byte	
Max. local data size per block	1024 Byte	1024 Byte	1024 Byte	
Blocks				
Number of OBs	14	14	14	
Maximum OB size	16 KB	16 KB	16 KB	
Total number DBs, FBs, FCs	-	-	-	
Number of FBs	1024	1024	1024	
Maximum FB size	16 KB	16 KB	16 KB	
Number range FBs	0 ... 1023	0 ... 1023	0 ... 1023	
Number of FCs	1024	1024	1024	
Maximum FC size	16 KB	16 KB	16 KB	
Number range FC2	0 ... 1023	0 ... 1023	0 ... 1023	
Maximum nesting depth per priority class	8	8	8	
Maximum nesting depth additional within an error OB	1	1	1	
Time				
Real-time clock buffered	✓	✓	✓	
Clock buffered period (min.)	30 d	30 d	30 d	
Type of buffering	-	-	-	
Load time for 50% buffering period	20 h	20 h	20 h	
Load time for 100% buffering period	48 h	48 h	48 h	
Accuracy (max. deviation per day)	10 s	10 s	10 s	
Number of operating hours counter	8	8	8	
Clock synchronization	-	-	-	
Synchronization via MPI	-	-	-	
Synchronization via Ethernet (NTP)	-	-	-	

CPUs | CPUs STEP7 programmable, DP master

214-2BM03
214-2BM06
215-2BM03

Order number	214-2BM03	214-2BM06	215-2BM03	
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte	1024 Byte	
Output I/O address area	1024 Byte	1024 Byte	1024 Byte	
Process image adjustable	-	-	-	
Input process image preset	128 Byte	128 Byte	128 Byte	
Output process image preset	128 Byte	128 Byte	128 Byte	
Input process image maximal	128 Byte	128 Byte	128 Byte	
Output process image maximal	128 Byte	128 Byte	128 Byte	
Digital inputs	8192	8192	8192	
Digital outputs	8192	8192	8192	
Digital inputs central	512	512	512	
Digital outputs central	512	512	512	
Integrated digital inputs	-	-	-	
Integrated digital outputs	-	-	-	
Analog inputs	512	512	512	
Analog outputs	512	512	512	
Analog inputs, central	128	128	128	
Analog outputs, central	128	128	128	
Integrated analog inputs	-	-	-	
Integrated analog outputs	-	-	-	
Communication functions				
PG/OP channel	✓	✓	✓	
Global data communication	✓	✓	✓	
Number of GD circuits, max.	4	4	4	
Size of GD packets, max.	22 Byte	22 Byte	22 Byte	
S7 basic communication	✓	✓	✓	
S7 basic communication, user data per job	76 Byte	76 Byte	76 Byte	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
S7 communication, user data per job	160 Byte	160 Byte	160 Byte	
Number of connections, max.	16	16	16	
Functionality Sub-D interfaces				
Type	MP2I	MP2I	MP2I	
Type of interface	RS485	RS485	RS485	
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	
Electrically isolated	-	-	-	
MPI	✓	✓	✓	
MP2I (MPI/RS232)	✓	✓	✓	
DP master	-	-	-	
DP slave	-	-	-	
Point-to-point interface	-	-	-	

CPU | CPU STEP7 programmable, DP master

214-2BM03						
214-2BM06						
215-2BM03						

Order number	214-2BM03	214-2BM06	215-2BM03	
Type	DP	DP	DP	
Type of interface	RS485	RS485	RS485	
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	
Electrically isolated	✓	✓	✓	
MPI	-	-	-	
MP ² I (MPI/RS232)	-	-	-	
DP master	yes	yes	yes	
DP slave	-	-	-	
Point-to-point interface	-	-	-	
Functionality MPI				
Number of connections, max.	16	16	16	
PG/OP channel	✓	✓	✓	
Routing	-	-	-	
Global data communication	✓	✓	✓	
S7 basic communication	✓	✓	✓	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s	
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s	187.5 kbit/s	
Functionality PROFIBUS master				
PG/OP channel	✓	✓	✓	
Routing	-	-	-	
S7 basic communication	-	-	-	
S7 communication	-	-	-	
S7 communication as server	-	-	-	
S7 communication as client	-	-	-	
Activation/deactivation of DP slaves	✓	✓	✓	
Direct data exchange (slave-to-slave communication)	-	-	-	
DPV1	-	-	-	
Transmission speed, min.	9.6 kbit/s	9.6 kbit/s	9.6 kbit/s	
Transmission speed, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	
Number of DP slaves, max.	64	64	64	
Address range inputs, max.	1 KB	1 KB	1 KB	
Address range outputs, max.	1 KB	1 KB	1 KB	
User data inputs per slave, max.	244 Byte	244 Byte	244 Byte	
User data outputs per slave, max.	244 Byte	244 Byte	244 Byte	

CPUs | CPUs STEP7 programmable, DP master

214-2BM03
214-2BM06
215-2BM03

Order number	214-2BM03	214-2BM06	215-2BM03	
Datasizes				
Input bytes	0	0	0	
Output bytes	0	0	0	
Parameter bytes	4	4	4	
Diagnostic bytes	0	0	0	
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm	
Weight	150 g	150 g	150 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	in preparation	yes	

Connections, Interfaces

CPU CPU STEP7 programmable, DP master					
214-2BM03					
214-2BM06					
215-2BM03					

214-2BM03



DP master

① shield

② n. c.

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ n. c.

⑧ RxD/TxD-N (line A)

⑨ n. c.

MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n. c.

X1

① + DC 24 V

② 0 V

214-2BM06



DP master

① shield

② n. c.

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ n. c.

⑧ RxD/TxD-N (line A)

⑨ n. c.

MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n. c.

X1

① + DC 24 V

② 0 V

215-2BM03



DP master

① shield

② n. c.

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ n. c.

⑧ RxD/TxD-N (line A)

⑨ n. c.

MP²1

① reserved

② M24V

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ P24V

⑧ RxD/TxD-N (line A)

⑨ n. c.

X1

① + DC 24 V

② 0 V

CPUs STEP7 programmable, DP slave

CPUs | CPUs STEP7 programmable, DP slave

214-2BP03
215-2BP03

Order number	214-2BP03	215-2BP03			
Figure					
Type	CPU 214DP	CPU 215DP			
General information					
Note	-	-			
Features	▸ PROFIBUS-DP slave ▸ 96 kB work memory ▸ 144 kB load memory	▸ PROFIBUS-DP slave ▸ 128 kB work memory ▸ 192 kB load memory			
Technical data power supply					
Power supply (rated value)	DC 24 V	DC 24 V			
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V			
Reverse polarity protection	✓	✓			
Current consumption (no-load operation)	100 mA	100 mA			
Current consumption (rated value)	1.5 A	1.5 A			
Inrush current	65 A	65 A			
I _{Δt}	0.75 A ² s	0.75 A ² s			
Max. current drain at backplane bus	3 A	3 A			
Power loss	5 W	5 W			
Load and working memory					
Load memory, integrated	144 KB	192 KB			
Load memory, maximum	144 KB	192 KB			
Work memory, integrated	96 KB	128 KB			
Work memory, maximal	96 KB	128 KB			
Memory divided in 50% program / 50% data	-	-			
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB			
Hardware configuration					
Racks, max.	4	4			
Modules per rack, max.	total max. 32	total max. 32			
Number of integrated DP master	-	-			
Number of DP master via CP	8	8			
Operable function modules	32	32			
Operable communication modules PtP	32	32			
Operable communication modules LAN	-	-			
Command processing times					
Bit instructions, min.	0.18 μs	0.18 μs			
Word instruction, min.	0.78 μs	0.78 μs			
Double integer arithmetic, min.	1.8 μs	1.8 μs			
Floating-point arithmetic, min.	40 μs	40 μs			

CPUs | CPUs STEP7 programmable, DP slave

214-2BP03
215-2BP03

Order number	214-2BP03	215-2BP03		
Timers/Counters and their retentive characteristics				
Number of S7 counters	256	256		
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64		
S7 counter remanence adjustable	C0 .. C7	8		
Number of S7 times	256	256		
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128		
S7 times remanence adjustable	not retentive	not retentive		
Data range and retentive characteristic				
Number of flags	8192 Bit	8192 Bit		
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256		
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15		
Number of data blocks	2047	2047		
Max. data blocks size	16 KB	16 KB		
Number range DBs	1 ... 2047	1 ... 2047		
Max. local data size per execution level	1024 Byte	1024 Byte		
Max. local data size per block	1024 Byte	1024 Byte		
Blocks				
Number of OBs	14	14		
Maximum OB size	16 KB	16 KB		
Totalnumber DBs, FBs, FCs	-	-		
Number of FBs	1024	1024		
Maximum FB size	16 KB	16 KB		
Number range FBs	0 ... 1023	0 ... 1023		
Number of FCs	1024	1024		
Maximum FC size	16 KB	16 KB		
Number range FC2	0 ... 1023	0 ... 1023		
Maximum nesting depth per priority class	8	8		
Maximum nesting depth additional within an error OB	1	1		
Time				
Real-time clock buffered	✓	✓		
Clock buffered period (min.)	30 d	30 d		
Type of buffering	-	-		
Load time for 50% buffering period	20 h	20 h		
Load time for 100% buffering period	48 h	48 h		
Accuracy (max. deviation per day)	10 s	10 s		
Number of operating hours counter	8	8		
Clock synchronization	-	-		
Synchronization via MPI	-	-		
Synchronization via Ethernet (NTP)	-	-		
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte		
Output I/O address area	1024 Byte	1024 Byte		
Process image adjustable	-	-		
Input process image preset	128 Byte	128 Byte		

CPUs | CPUs STEP7 programmable, DP slave

214-2BP03
215-2BP03

Order number	214-2BP03	215-2BP03		
Output process image preset	128 Byte	128 Byte		
Input process image maximal	128 Byte	128 Byte		
Output process image maximal	128 Byte	128 Byte		
Digital inputs	8192	8192		
Digital outputs	8192	8192		
Digital inputs central	512	512		
Digital outputs central	512	512		
Integrated digital inputs	-	-		
Integrated digital outputs	-	-		
Analog inputs	512	512		
Analog outputs	512	512		
Analog inputs, central	128	128		
Analog outputs, central	128	128		
Integrated analog inputs	-	-		
Integrated analog outputs	-	-		
Communication functions				
PG/OP channel	✓	✓		
Global data communication	✓	✓		
Number of GD circuits, max.	4	4		
Size of GD packets, max.	22 Byte	22 Byte		
S7 basic communication	✓	✓		
S7 basic communication, user data per job	76 Byte	76 Byte		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
S7 communication, user data per job	160 Byte	160 Byte		
Number of connections, max.	16	16		
Functionality Sub-D interfaces				
Type	MP2I	MP2I		
Type of interface	RS485	RS485		
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female		
Electrically isolated	-	-		
MPI	✓	✓		
MP2I (MPI/RS232)	✓	✓		
DP master	-	-		
DP slave	-	-		
Point-to-point interface	-	-		
Type	DP	DP		
Type of interface	RS485	RS485		
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female		
Electrically isolated	✓	✓		
MPI	-	-		
MP2I (MPI/RS232)	-	-		
DP master	-	-		
DP slave	yes	yes		
Point-to-point interface	-	-		

CPU CPU STEP7 programmable, DP slave						
214-2BP03 215-2BP03						

Order number	214-2BP03	215-2BP03		
Functionality MPI				
Number of connections, max.	16	16		
PG/OP channel	✓	✓		
Routing	-	-		
Global data communication	✓	✓		
S7 basic communication	✓	✓		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s		
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s		
Functionality PROFIBUS slave				
PG/OP channel	-	-		
Routing	-	-		
S7 communication	-	-		
S7 communication as server	-	-		
S7 communication as client	-	-		
Direct data exchange (slave-to-slave communication)	-	-		
DPV1	-	-		
Transmission speed, min.	9.6 kbit/s	9.6 kbit/s		
Transmission speed, max.	12 Mbit/s	12 Mbit/s		
Automatic detection of transmission speed	-	-		
Transfer memory inputs, max.	64 Byte	64 Byte		
Transfer memory outputs, max.	64 Byte	64 Byte		
Address areas, max.	1	1		
User data per address area, max.	64 Byte	64 Byte		
Datasizes				
Input bytes	0	0		
Output bytes	0	0		
Parameter bytes	16	16		
Diagnostic bytes	0	0		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm		
Weight	150 g	150 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

CPU CPU STEP7 programmable, DP slave					
214-2BP03					
215-2BP03					

214-2BP03

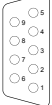


DP slave



- ① shield
- ② n. c.
- ③ Rx/D/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ n. c.
- ⑧ Rx/D/TxD-N (line A)
- ⑨ n. c.

MP²1



- ① reserved
- ② M24V
- ③ Rx/D/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ P24V
- ⑧ Rx/D/TxD-N (line A)
- ⑨ n. c.

X1



- + ① + DC 24 V
- ② 0 V

215-2BP03

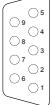


DP slave



- ① shield
- ② n. c.
- ③ Rx/D/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ n. c.
- ⑧ Rx/D/TxD-N (line A)
- ⑨ n. c.

MP²1



- ① reserved
- ② M24V
- ③ Rx/D/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ P24V
- ⑧ Rx/D/TxD-N (line A)
- ⑨ n. c.

X1



- + ① + DC 24 V
- ② 0 V

CPUs STEP7 programmable, CAN master

CPUs CPUs STEP7 programmable, CAN master					
214-2CM03 215-2CM03					

Order number	214-2CM03	215-2CM03		
Figure				
Type	CPU 214CAN	CPU 215CAN		
General information				
Note	-	-		
Features	▸ CANopen master ▸ 96 kB work memory ▸ 144 kB load memory	▸ CANopen master ▸ 128 kB work memory ▸ 192 kB load memory		
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V		
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V		
Reverse polarity protection	✓	✓		
Current consumption (no-load operation)	110 mA	110 mA		
Current consumption (rated value)	1.5 A	1.5 A		
Inrush current	65 A	65 A		
I _{Δt}	0.75 A²s	0.75 A²s		
Max. current drain at backplane bus	3 A	3 A		
Power loss	5 W	5 W		
Load and working memory				
Load memory, integrated	144 KB	192 KB		
Load memory, maximum	144 KB	192 KB		
Work memory, integrated	96 KB	128 KB		
Work memory, maximal	96 KB	128 KB		
Memory divided in 50% program / 50% data	-	-		
Memory card slot	MMC-Card with max. 512 MB	MMC-Card with max. 512 MB		
Hardware configuration				
Racks, max.	4	4		
Modules per rack, max.	total max. 32	total max. 32		
Number of integrated DP master	-	-		
Number of DP master via CP	8	8		
Operable function modules	32	32		
Operable communication modules PtP	32	32		
Operable communication modules LAN	-	-		
Command processing times				
Bit instructions, min.	0.18 μs	0.18 μs		
Word instruction, min.	0.78 μs	0.78 μs		
Double integer arithmetic, min.	1.8 μs	1.8 μs		
Floating-point arithmetic, min.	40 μs	40 μs		

CPUs | CPUs STEP7 programmable, CAN master

214-2CM03
215-2CM03

Order number	214-2CM03	215-2CM03			
Timers/Counters and their retentive characteristics					
Number of S7 counters	256	256			
S7 counter remanence	adjustable 0 up to 64	adjustable 0 up to 64			
S7 counter remanence adjustable	C0 .. C7	C0 .. C7			
Number of S7 times	256	256			
S7 times remanence	adjustable 0 up to 128	adjustable 0 up to 128			
S7 times remanence adjustable	not retentive	not retentive			
Data range and retentive characteristic					
Number of flags	8192 Bit	8192 Bit			
Bit memories retentive characteristic adjustable	adjustable 0 up to 256	adjustable 0 up to 256			
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15			
Number of data blocks	2047	2047			
Max. data blocks size	16 KB	16 KB			
Number range DBs	1 ... 2047	1 ... 2047			
Max. local data size per execution level	1024 Byte	1024 Byte			
Max. local data size per block	1024 Byte	1024 Byte			
Blocks					
Number of OBs	14	14			
Maximum OB size	16 KB	16 KB			
Total number DBs, FBs, FCs	-	-			
Number of FBs	1024	1024			
Maximum FB size	16 KB	16 KB			
Number range FBs	0 ... 1023	0 ... 1023			
Number of FCs	1024	1024			
Maximum FC size	16 KB	16 KB			
Number range FC2	0 ... 1023	0 ... 1023			
Maximum nesting depth per priority class	8	8			
Maximum nesting depth additional within an error OB	1	1			
Time					
Real-time clock buffered	✓	✓			
Clock buffered period (min.)	30 d	30 d			
Type of buffering	-	-			
Load time for 50% buffering period	20 h	20 h			
Load time for 100% buffering period	48 h	48 h			
Accuracy (max. deviation per day)	10 s	10 s			
Number of operating hours counter	8	8			
Clock synchronization	-	-			
Synchronization via MPI	-	-			
Synchronization via Ethernet (NTP)	-	-			

CPUs | CPUs STEP7 programmable, CAN master

214-2CM03
215-2CM03

Order number	214-2CM03	215-2CM03		
Address areas (I/O)				
Input I/O address area	1024 Byte	1024 Byte		
Output I/O address area	1024 Byte	1024 Byte		
Process image adjustable	-	-		
Input process image preset	128 Byte	128 Byte		
Output process image preset	128 Byte	128 Byte		
Input process image maximal	128 Byte	128 Byte		
Output process image maximal	128 Byte	128 Byte		
Digital inputs	8192	8192		
Digital outputs	8192	8192		
Digital inputs central	512	512		
Digital outputs central	512	512		
Integrated digital inputs	-	-		
Integrated digital outputs	-	-		
Analog inputs	512	512		
Analog outputs	512	512		
Analog inputs, central	128	128		
Analog outputs, central	128	128		
Integrated analog inputs	-	-		
Integrated analog outputs	-	-		
Communication functions				
PG/OP channel	✓	✓		
Global data communication	✓	✓		
Number of GD circuits, max.	4	4		
Size of GD packets, max.	22 Byte	22 Byte		
S7 basic communication	✓	✓		
S7 basic communication, user data per job	76 Byte	76 Byte		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
S7 communication, user data per job	160 Byte	160 Byte		
Number of connections, max.	16	16		
Functionality Sub-D interfaces				
Type	MP2I	MP2I		
Type of interface	RS485	RS485		
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female		
Electrically isolated	-	-		
MPI	✓	✓		
MP2I (MPI/RS232)	✓	✓		
DP master	-	-		
DP slave	-	-		
Point-to-point interface	-	-		

CPUs | CPUs STEP7 programmable, CAN master

214-2CM03
215-2CM03

Order number	214-2CM03	215-2CM03		
Type	CAN	CAN		
Type of interface	CAN	CAN		
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, male		
Electrically isolated	✓	✓		
MPI	-	-		
MP ² I (MPI/RS232)	-	-		
DP master	-	-		
DP slave	-	-		
Point-to-point interface	-	-		
Functionality MPI				
Number of connections, max.	16	16		
PG/OP channel	✓	✓		
Routing	-	-		
Global data communication	✓	✓		
S7 basic communication	✓	✓		
S7 communication	✓	✓		
S7 communication as server	✓	✓		
S7 communication as client	-	-		
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s		
Transmission speed, max.	187.5 kbit/s	187.5 kbit/s		
Datasizes				
Input bytes	0	0		
Output bytes	0	0		
Parameter bytes	3	3		
Diagnostic bytes	0	0		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 80 mm	50.8 mm x 76 mm x 80 mm		
Weight	150 g	150 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

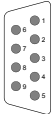
Connections, Interfaces

CPU s CPU s STEP7 programmable, CAN master					
214-2CM03 215-2CM03					

214-2CM03

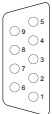


CAN



- ① n. c.
- ② CAN low
- ③ CAN Ground
- ④ n. c.
- ⑤ shield
- ⑥ Ground
- ⑦ CAN high
- ⑧ n. c.
- ⑨ n. c.

MP²¹



- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

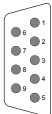


- + ① + DC 24 V
- ② 0 V

215-2CM03

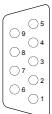


CAN



- ① n. c.
- ② CAN low
- ③ CAN Ground
- ④ n. c.
- ⑤ shield
- ⑥ Ground
- ⑦ CAN high
- ⑧ n. c.
- ⑨ n. c.

MP²¹



- ① reserved
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1



- + ① + DC 24 V
- ② 0 V

Clamp modules



Structure and Function

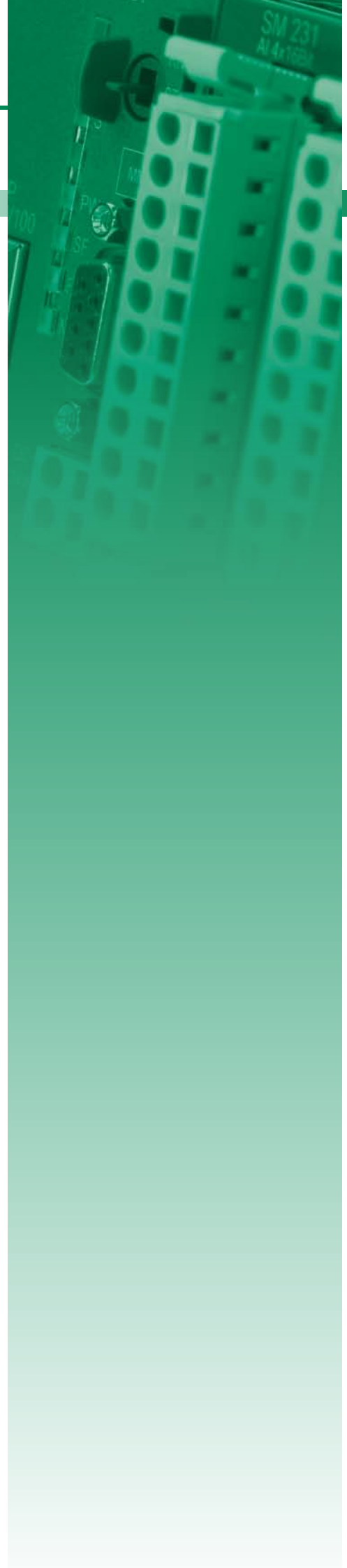
Clamp modules are passive modules for 2- or 3-wire installations, the contacts are electrically connected internally vertically. They offer various connectivity options for signals, mass and plus potentials.

By the use of clamp modules distributors for a power supply can be realized in a simple way and thus offer the possibility for connection of active supplied sensors such as proximity switches. Wiring is carried out by means of time saving and secure cage clamp technology.

Passive terminal modules have no connection to the backplane bus. Therefore during the assembly of the terminal modules the signal passage to post-positioned assemblies via backplane bus connectors must be ensured. The terminal modules are attached to the mounting surface using a 35 mm profile rail.

Characteristics

- › Maintenance-free cage clamp technology
- › Color-coded terminals
- › Maximum terminal current 10 A
- › Compact design
- › Assembly with 35 mm profile rail
- › 24 months warranty



Overview

Order no.	Name/Description	Page
Clamp modules		
201-1AA00	CM 201 - Double clamps module › Dual terminals › 2x11 clamps, gray/gray › Passive	296
201-1AA10	CM 201 - Double clamps module › Dual terminals › 2x11 clamps, green-yellow/gray › Passive	296
201-1AA20	CM 201 - Double clamps module › Dual terminals › 2x11 clamps, red/blue › Passive	296
201-1AA40	CM 201 - 4-tier clamps module › Quad terminals › 2x5 clamps gray/gray › 2x6 clamps red/blue › Passive	296

Clamp modules

Clamp modules | Clamp modules

201-1AA00
201-1AA10
201-1AA20
201-1AA40

Order number	201-1AA00	201-1AA10	201-1AA20	201-1AA40
Figure				
Type	CM 201	CM 201	CM 201	CM 201
General information				
Note	-	-	-	-
Features	▸ Dual terminals ▸ 2x11 clamps, gray/gray ▸ Passive	▸ Dual terminals ▸ 2x11 clamps, green-yellow/gray ▸ Passive	▸ Dual terminals ▸ 2x11 clamps, red/blue ▸ Passive	▸ Quad terminals ▸ 2x5 clamps gray/gray ▸ 2x6 clamps red/blue ▸ Passive
Clamp parameter				
Terminal voltage max.	DC 60 V	DC 60 V	DC 60 V	DC 60 V
Terminal current max.	10 A	10 A	10 A	10 A
Isolated group				
Number of clamps	11-11	11-11	11-11	5-5-6-6
Color of clamps	grey-grey	green/yellow-grey	red-blue	grey-grey-red-blue
Binding of potential	unbound-unbound	unbound-unbound	unbound-unbound	unbound-unbound-unbound-unbound
Potential group current, max.	10 A-10 A	10 A-10 A	10 A-10 A	10 A-10 A-10 A-10 A
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm	25.4 mm x 76 mm x 80 mm
Weight	90 g	90 g	90 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

Clamp modules Clamp modules						
201-1AA00						
201-1AA10						
201-1AA20						
201-1AA40						

201-1AA00



X1	X2
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11

201-1AA10



X1	X2
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11

201-1AA20



X1	X2
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11

201-1AA40



X1	X2
1	1
2	2
3	3
4	4
5	5
X3	X4
6	6
7	7
8	8
9	9
10	10
11	11

Power supply



Structure and Function

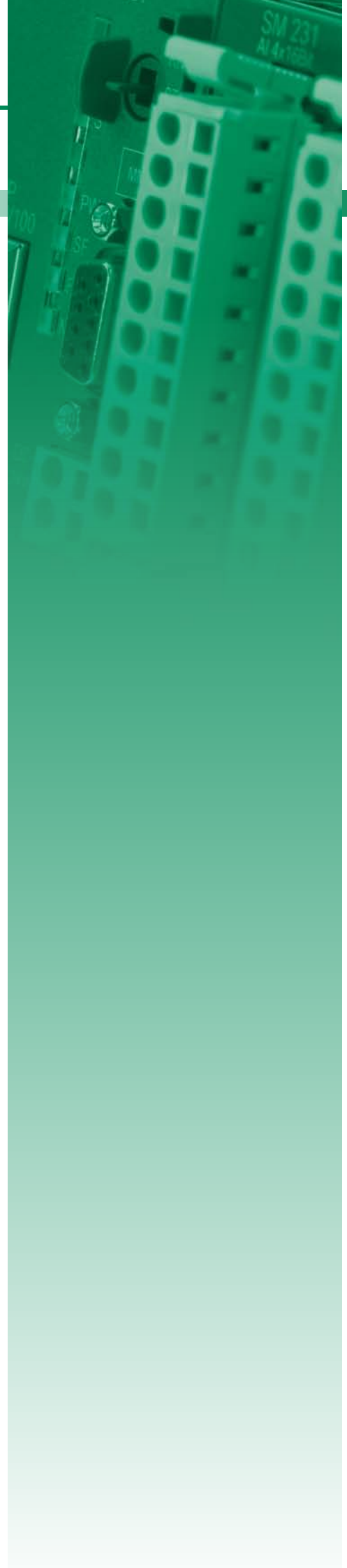
Power supply modules are used to supply the system as well as the sensors and actuators with direct current. They convert the mains AC voltage into a DC voltage of 24 V.

Power supply modules can be fixed on a 35 mm profile rail either combined with system 200V components or as "stand-alone" modules.

The power supply has no connection to the backplane bus.

Characteristics

- › Automatic wide range input detection (AC 100 V - 240 V)
- › Connection to single phase AC mains
- › Output current 2 A
- › Nominal output voltage DC 24 V
- › Front integrated status LEDs for fault diagnosis
- › Protection against short circuit, overload and open circuit
- › IP 20 protection
- › Compact design
- › Assembly with 35 mm profile rail
- › 24 month warranty



Overview

Order no.	Name/Description	Page
Power supply		
207-1BA00	PS 207 - Power supply ‣ AC 100...240 V w/o manual intervention ‣ Output voltage DC 24 V	300
207-2BA20	PS 207 - Power supply ‣ AC 100...240 V w/o manual intervention ‣ Output voltage DC 24 V ‣ Terminal module with 2x11 clamps	300

Power supply

Power supply | Power supply

207-1BA00
207-2BA20

Order number

Figure

Type

General information

Note

Features

Technical data power supply

Input voltage (rated value)

Input voltage (permitted range)

Mains frequency (rated value)

Mains frequency (permitted range)

Input current (at 120 V)

Input current (at 230 V)

Inrush current (at 25 °C)

Power consumption typ.

Output voltage (rated value)

Output current (rated value)

Power supply parallel switchable

Protect type

Ripple of output voltage (max.), BW=20 MHz

Efficiency typ.

Power loss typ.

Clamp parameter

Terminal voltage max.

Terminal current max.

Status information, alarms, diagnostics

Status display

Interrupts

Process alarm

Diagnostic interrupt

Diagnostic functions

Diagnostics information read-out

Supply voltage display

Group error display

Channel error display

207-1BA00



PS 207

-

- AC 100...240 V w/o manual intervention
- Output voltage DC 24 V

AC 100...240 V

AC 100...240 V

50...60 Hz

47...63 Hz

0.53 A

0.24 A

30 A

53 W

24 V

2 A

✓

Short circuit, overload, over temperature

100 mV

90 %

5 W

-

-

yes

no

no

no

no

none

none

none

none

207-2BA20



PS 207

-

- AC 100...240 V w/o manual intervention
- Output voltage DC 24 V
- Terminal module with 2x11 clamps

AC 100...240 V

AC 100...240 V

50...60 Hz

47...63 Hz

0.53 A

0.24 A

30 A

53 W

24 V

2 A

✓

Short circuit, overload, over temperature

100 mV

90 %

5 W

DC 60 V

10 A

yes

no

no

no

no

none

none

none

none

Power supply | Power supply

207-1BA00 207-2BA20						
------------------------	--	--	--	--	--	--

Order number	207-1BA00	207-2BA20		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	50.8 mm x 76 mm x 78 mm		
Weight	150 g	210 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	-	-		

Connections, Interfaces

Power supply Power supply						
207-1BA00 207-2BA20						

207-1BA00



X1
100-240V AC
550-230mA
50-60Hz

L	①	AC 100 ... 240 V
N	②	AC 100 ... 240 V
P	③	PE
E		

X2
OUT DC 24V / 32A
4A (peak)

1	①	+ DC 24 V
2	②	M
3	③	+ DC 24 V
4	④	M

207-2BA20



X1
100-240V AC
550-230mA
50-60Hz

L	①	AC 100 ... 240 V
N	②	AC 100 ... 240 V
P	③	PE
E		

X2
OUT DC 24V / 32A
4A (peak)

1	①	+ DC 24 V
2	②	M
3	③	+ DC 24 V
4	④	M

X3

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

X4

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

Signal modules digital

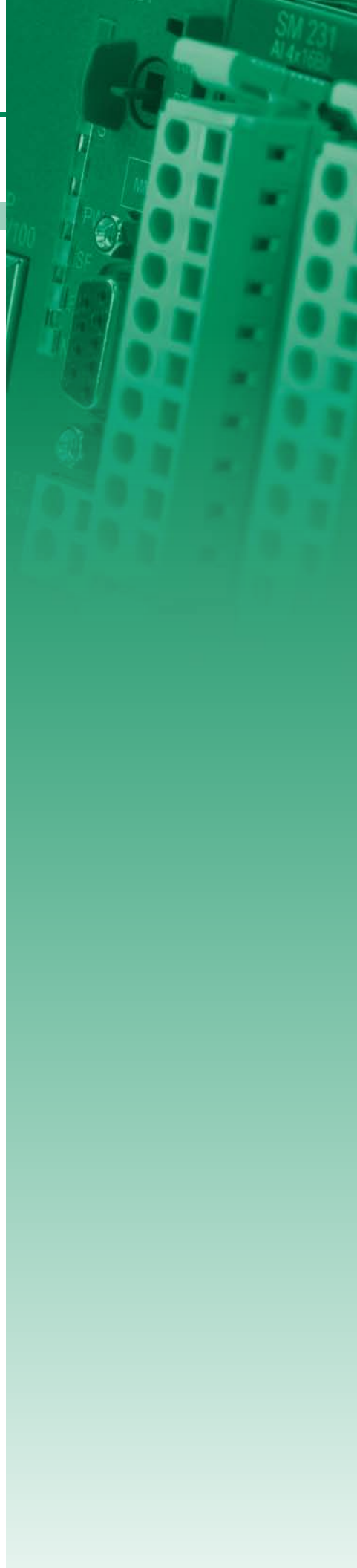


Structure and Function

Digital modules for connection of sensors and actuators are the interface of the PLC to the process. Digital input modules acquire the binary control signals from the process level and transform them into interpretable signals for the control. Digital output modules convert the internal binary control signals into signals suitable for the process level. There are digital modules with 4 to 32 channels available.

Characteristics

- Large selection, modules are available for all popular applications
- Compact design
- LED status indicator
- Electrically isolated to the backplane bus
- Maintenance-free cage-clamp technology
- Label cards included
- Front connector included
- Assembly with 35 mm profile rail
- 24 month warranty

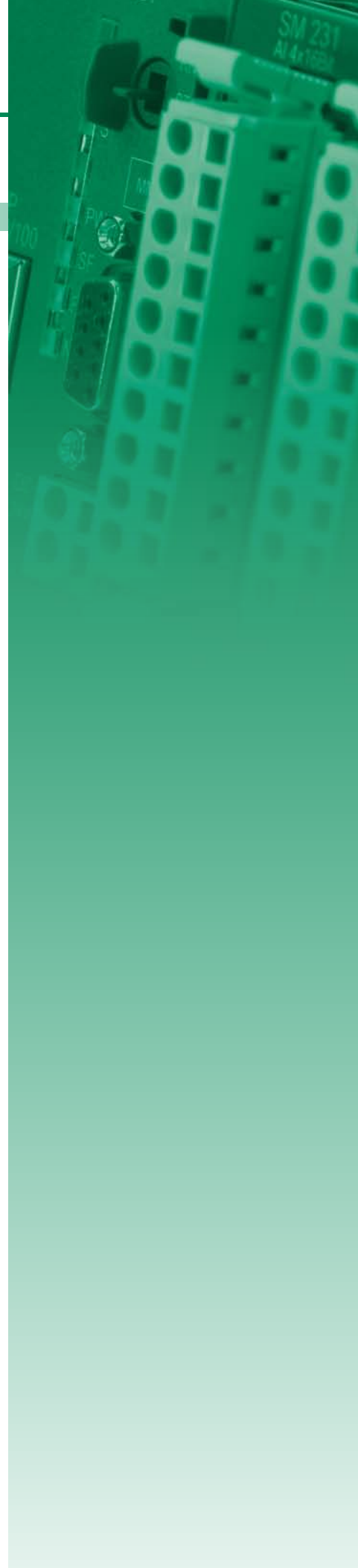


Overview

Order no.	Name/Description	Page
Digital input modules		
221-1BF00	SM 221 - Digital input ‣ 8 inputs	307
221-1BF10	SM 221 - Digital input ‣ 8 inputs, ‣ Delay time 0.2 ms	307
221-1BF21	SM 221 - Digital input ‣ 8 alarm inputs ‣ Delay time 0.2 ms	307
221-1BF30	SM 221 - Digital input ECO ‣ 8 inputs	307
221-1BF50	SM 221 - Digital input ‣ 8 inputs ‣ Active low input	310
221-1BH00	SM 221 - Digital input ‣ 16 inputs ‣ LED status display on the conversion module UB4x	310
221-1BH10	SM 221 - Digital input ‣ 16 inputs	310
221-1BH30	SM 221 - Digital input ECO ‣ 16 inputs	310
221-1BH50	SM 221 - Digital input ‣ 16 inputs ‣ Active low input ‣ LED status display on conversion module UB4x	313
221-1BH51	SM 221 - Digital input ‣ 16 inputs ‣ Active low input	313
221-1FD00	SM 221 - Digital input ‣ 4 inputs ‣ AC/DC 90...230 V ‣ Isolation per channel	313
221-1FF20	SM 221 - Digital input ‣ 8 inputs ‣ AC/DC 60...230 V	313
221-1FF30	SM 221 - Digital input ‣ 8 inputs ‣ AC/DC 24...48 V	316
221-1FF50	SM 221 - Digital input ‣ 8 inputs ‣ AC 180...265 V	316
221-2BL10	SM 221 - Digital input ‣ 32 inputs	316
KSD221-1BH00	SM 221 Set - Digital input ‣ 16 inputs ‣ LED status display on conversion module UB48D	316
KS221-1BH00	SM 221 Set - Digital input ‣ 16 inputs ‣ LED status display on conversion module UB48	319
Digital input with counter		
221-1BH20	SM 221 - Digital input ‣ 16 inputs ‣ 2 inputs are configurable as counter ‣ LED status display	322
Digital output modules		
222-1BF00	SM 222 - Digital output ‣ 8 outputs ‣ Output current 1 A	325
222-1BF10	SM 222 - Digital output ‣ 8 outputs ‣ Output current 2 A	325
222-1BF20	SM 222 - Digital output ‣ 8 outputs ‣ Isolation in 4 groups per 2 outputs ‣ Output current 2 A	325
222-1BF30	SM 222 - Digital output ECO ‣ 8 outputs ‣ Output current 0.5 A	325

Overview

Order no.	Name/Description	Page
222-1BF50	SM 222 - Digital output ‣ 8 Low-Side outputs ‣ Output current 0.5 A	328
222-1BH00	SM 222 - Digital output ‣ 16 outputs ‣ Output current 0.5 A ‣ LED status display on conversion module UB4x	328
222-1BH10	SM 222 - Digital output ‣ 16 outputs ‣ Output current 1 A	328
222-1BH20	SM 222 - Digital output ‣ 16 outputs ‣ Output current 2 A	328
222-1BH30	SM 222 - Digital output ECO ‣ 16 outputs ‣ Output current 0.5 A	331
222-1BH50	SM 222 - Digital output ‣ 16 Low-Side outputs ‣ Output current 0.5 A	331
222-1BH51	SM 222 - Digital output ‣ 16 Low-Side outputs ‣ Output current 0.5A	331
222-1DB00	SM 222 - Digital output ‣ 2 outputs ‣ AC 100...240 V ‣ Output current 2 A ‣ Software dimmer for resistive, inductive or capacitive load ‣ Frequency range 47...63 Hz	331
222-1FF00	SM 222 - Digital output ‣ 8 solid-state outputs ‣ AC 230 V/ DC 400 V ‣ Output current 0.5 A	334
222-1HD10	SM 222 - Digital output ‣ 4 isolated relay outputs ‣ AC 230 V/ DC 30 V ‣ Output current 5 A	334
222-1HD20	SM 222 - Digital output ‣ 4 isolated relay outputs ‣ AC 230 V/ DC 30 V ‣ Output current 16 A	334
222-1HF00	SM 222 - Digital output ‣ 8 relay outputs ‣ AC 230 V/ DC 30 V ‣ Output current 5 A	334
222-2BL10	SM 222 - Digital output ‣ 32 outputs ‣ Output current 1 A	337
KSD222-1BH00	SM 222 Set - Digital output ‣ 16 outputs ‣ LED status display on conversion module UB48D ‣ Output current 0.5 A	337
KS222-1BH00	SM 222 Set - Digital output ‣ 16 outputs ‣ LED status display on conversion module UB48 ‣ Output current 0.5 A	337
Digital in/output modules		
223-1BF00	SM 223 - Digital in-/output ‣ 8 channels (as input or output) ‣ Output current 1 A ‣ Diagnostics function	340
223-2BL10	SM 223 - Digital in-/output ‣ 16 inputs/ 16 outputs ‣ DC 24 V ‣ Output current 1 A	340



Digital input modules

Signal modules digital | Digital input modules

221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
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Order number	221-1BF00	221-1BF10	221-1BF21	221-1BF30
Figure				
Type	SM 221	SM 221	SM 221	SM 221
General information				
Note	-	-	-	-
Features	▸ 8 inputs	▸ 8 inputs, ▸ Delay time 0.2 ms	▸ 8 alarm inputs ▸ Delay time 0.2 ms	▸ 8 inputs
Current consumption/power loss				
Current consumption from backplane bus	25 mA	25 mA	25 mA	25 mA
Power loss	2 W	2 W	2 W	2 W
Technical data digital inputs				
Number of inputs	8	8	8	8
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	-	-	-	-
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 0...5 V	DC 0...5 V	DC 0...5 V	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V	DC 15...28.8 V	DC 15...28.8 V	DC 15...28.8 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	-	-	-
Input current for signal "1"	7 mA	7 mA	7 mA	7 mA
Connection of Two-Wire-BEROs possible	✓	✓	✓	✓
Max. permissible BERO quiescent current	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Input delay of "0" to "1"	3 ms	0.2 ms	0.2 ms	3 ms
Input delay of "1" to "0"	3 ms	0.2 ms	0.2 ms	3 ms
Number of simultaneously utilizable inputs horizontal configuration	8	8	8	8
Number of simultaneously utilizable inputs vertical configuration	8	8	8	8
Input characteristic curve	IEC 61131-2, type 1	IEC 61131-2, type 1	IEC 61131-2, type 1	IEC 61131-2, type 1
Initial data size	1 Byte	1 Byte	1 Byte	1 Byte
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	none	none	none	none
Group error display	none	none	none	none

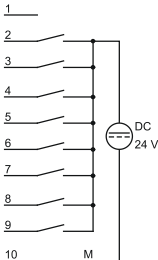
Signal modules digital Digital input modules						
221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			

Order number	221-1BF00	221-1BF10	221-1BF21	221-1BF30
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	8	8	8	8
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	1	1	1	1
Output bytes	0	0	0	0
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	60 g	90 g	90 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

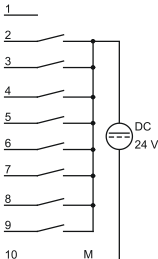
Connections, Interfaces

Signal modules digital Digital input modules						
221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			

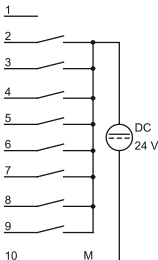
221-1BF00



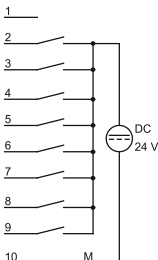
221-1BF10



221-1BF21



221-1BF30



Digital input modules

Signal modules digital | Digital input modules

221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
--	--	--	---	-------------	--	--

Order number	221-1BF50	221-1BH00	221-1BH10	221-1BH30
Figure				
Type	SM 221	SM 221	SM 221	SM 221
General information				
Note	-	-	-	-
Features	▸ 8 inputs ▸ Active low input	▸ 16 inputs ▸ LED status display on the conversion module UB4x	▸ 16 inputs	▸ 16 inputs
Current consumption/power loss				
Current consumption from backplane bus	10 mA	35 mA	40 mA	45 mA
Power loss	2 W	3.5 W	3.5 W	3.5 W
Technical data digital inputs				
Number of inputs	8	16	16	16
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	-	-	-	-
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 15...28.8 V	DC 0...5 V	DC 0...5 V	DC 0...5 V
Input voltage for signal "1"	DC 0...5 V	DC 15...28.8 V	DC 15...28.8 V	DC 15...28.8 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	-	-	-
Input current for signal "1"	7 mA	7 mA	7 mA	7 mA
Connection of Two-Wire-BEROs possible	✓	✓	✓	✓
Max. permissible BERO quiescent current	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Input delay of "0" to "1"	3 ms	3 ms	3 ms	3 ms
Input delay of "1" to "0"	3 ms	3 ms	3 ms	3 ms
Number of simultaneously utilizable inputs horizontal configuration	8	16	16	16
Number of simultaneously utilizable inputs vertical configuration	8	16	16	16
Input characteristic curve	-	IEC 61131-2, type 1	IEC 61131-2, type 1	IEC 61131-2, type 1
Initial data size	1 Byte	2 Byte	2 Byte	2 Byte

Signal modules digital | Digital input modules

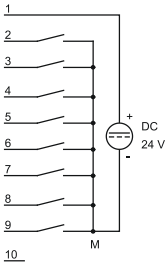
221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
--	--	--	---	-------------	--	--

Order number	221-1BF50	221-1BH00	221-1BH10	221-1BH30
Status information, alarms, diagnostics				
Status display	green LED per channel	none	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	none	none	none	none
Group error display	none	none	none	none
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	8	16	16	16
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	1	2	2	2
Output bytes	0	0	0	0
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	100 g	70 g	90 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

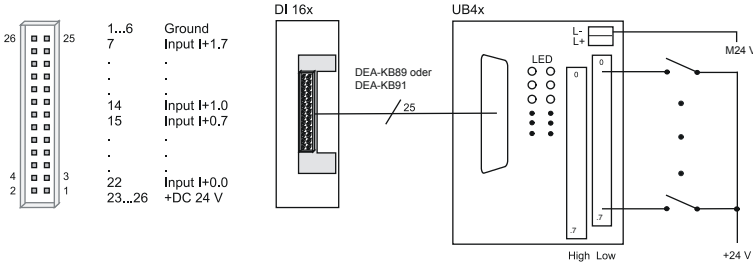
Connections, Interfaces

Signal modules digital Digital input modules						
221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			

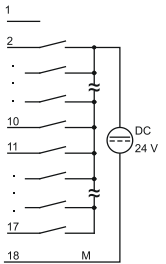
221-1BF50



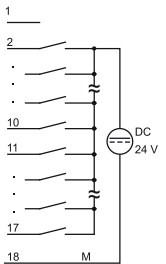
221-1BH00



221-1BH10



221-1BH30



Digital input modules

Signal modules digital | Digital input modules

221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
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Order number	221-1BH50	221-1BH51	221-1FD00	221-1FF20
Figure				
Type	SM 221	SM 221	SM 221	SM 221
General information				
Note	-	-	-	-
Features	16 inputs - Active low input - LED status display on conversion module UB4x	16 inputs - Active low input	4 inputs - AC/DC 90...230 V - Isolation per channel	8 inputs - AC/DC 60...230 V
Current consumption/power loss				
Current consumption from backplane bus	40 mA	20 mA	40 mA	60 mA
Power loss	3.5 W	3.5 W	2 W	3 W
Technical data digital inputs				
Number of inputs	16	16	4	8
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	-	-	-	-
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	AC/DC 90...230 V	AC/DC 60...230 V
Input voltage for signal "0"	DC 15...28.8 V	DC 15...28.8 V	AC/DC 0...35 V	AC/DC 0...35 V
Input voltage for signal "1"	DC 0...5 V	DC 0...5 V	AC/DC 90...230 V	AC/DC 60...230 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	50...60 Hz	50...60 Hz
Input resistance	-	-	136 kΩ	136 kΩ
Input current for signal "1"	7 mA	7 mA	-	-
Connection of Two-Wire-BEROs possible	✓	✓	-	-
Max. permissible BERO quiescent current	1.5 mA	1.5 mA	-	-
Input delay of "0" to "1"	3 ms	3 ms	25 ms	25 ms
Input delay of "1" to "0"	3 ms	3 ms	25 ms	25 ms
Number of simultaneously utilizable inputs horizontal configuration	16	16	4	8
Number of simultaneously utilizable inputs vertical configuration	16	16	4	8
Input characteristic curve	-	-	-	-
Initial data size	2 Byte	2 Byte	4 Bit	1 Byte

Signal modules digital | Digital input modules

221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
--	--	--	---	-------------	--	--

Order number	221-1BH50	221-1BH51	221-1FD00	221-1FF20
Status information, alarms, diagnostics				
Status display	none	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	none	none	none	none
Group error display	none	none	none	none
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	✓	-
Between channels of groups to	16	16	1	8
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	2	2	1	1
Output bytes	0	0	0	0
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	70 g	90 g	90 g	100 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

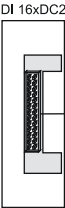
Connections, Interfaces

Signal modules digital Digital input modules						
221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		

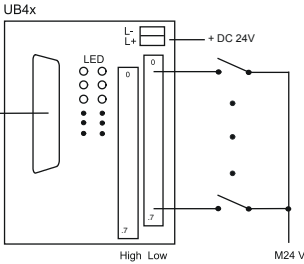


26	25	1...6	Ground
		7	Input I+1.7
		14	Input I+1.0
		15	Input I+0.7
4	3	22	Input I+0.0
2	1	23...26	+DC 24 V

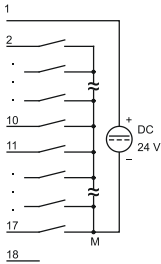
DI 16xDC24V NPN



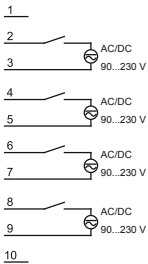
UB4x



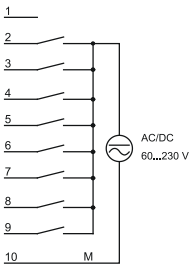












Digital input modules

Signal modules digital | Digital input modules

221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
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Order number	221-1FF30	221-1FF50	221-2BL10	KSD221-1BH00
Figure				
Type	SM 221	SM 221	SM 221	SM 221, Set
General information				
Note	-	-	-	-
Features	8 inputs - AC/DC 24...48 V	8 inputs - AC 180...265 V	32 inputs	16 inputs - LED status display on conversion module UB48D
Current consumption/power loss				
Current consumption from backplane bus	60 mA	80 mA	40 mA	35 mA
Power loss	2 W	3 W	6.5 W	3.5 W
Technical data digital inputs				
Number of inputs	8	8	32	16
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	-	-	-	-
Rated value	AC/DC 24...48 V	AC/DC 180...265 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	AC/DC 0...8 V	AC/DC 0...150 V	DC 0...5 V	DC 0...5 V
Input voltage for signal "1"	AC/DC 18...48 V	AC/DC 180...265 V	DC 15...28.8 V	DC 15...28.8 V
Input voltage hysteresis	-	-	-	-
Frequency range	50...60 Hz	50...60 Hz	-	-
Input resistance	16.4 kΩ	136 kΩ	-	-
Input current for signal "1"	-	-	7 mA	7 mA
Connection of Two-Wire-BERs possible	-	-	✓	✓
Max. permissible BERO quiescent current	-	-	1.5 mA	1.5 mA
Input delay of "0" to "1"	25 ms	25 ms	3 ms	3 ms
Input delay of "1" to "0"	25 ms	25 ms	3 ms	3 ms
Number of simultaneously utilizable inputs horizontal configuration	8	8	16	16
Number of simultaneously utilizable inputs vertical configuration	8	8	16	16
Input characteristic curve	-	-	IEC 61131-2, type 1	IEC 61131-2, type 1
Initial data size	1 Byte	1 Byte	4 Byte	2 Byte

Signal modules digital | Digital input modules

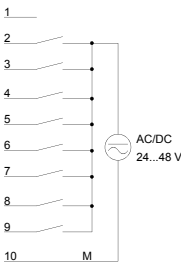
221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		
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Order number	221-1FF30	221-1FF50	221-2BL10	KSD221-1BH00
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	none
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	none	none	none	none
Group error display	none	none	none	none
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	8	8	16	16
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	1	1	4	2
Output bytes	0	0	0	0
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	50.8 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	90 g	90 g	140 g	70 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

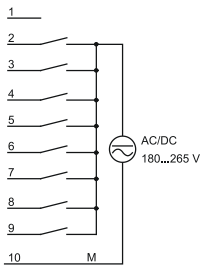
Connections, Interfaces

Signal modules digital Digital input modules						
221-1BF00 221-1BF10 221-1BF21 221-1BF30	221-1BF50 221-1BH00 221-1BH10 221-1BH30	221-1BH50 221-1BH51 221-1FD00 221-1FF20	221-1FF30 221-1FF50 221-2BL10 KSD221-1BH00	KS221-1BH00		

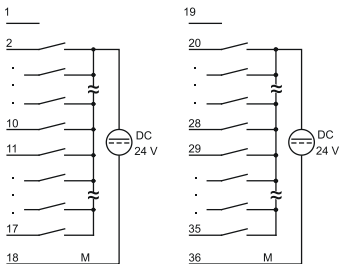
221-1FF30



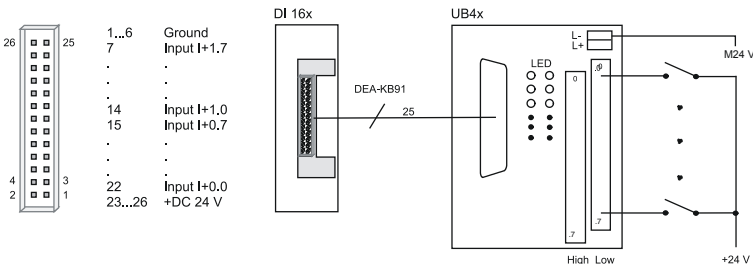
221-1FF50



221-2BL10



KSD221-1BH00



Digital input modules

Signal modules digital | Digital input modules

221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			

Order number	KS221-1BH00			
Figure				
Type	SM 221, Set			
General information				
Note	-			
Features	▶ 16 inputs ▶ LED status display on conversion module UB48			
Current consumption/power loss				
Current consumption from backplane bus	35 mA			
Power loss	3.5 W			
Technical data digital inputs				
Number of inputs	16			
Cable length, shielded	1000 m			
Cable length, unshielded	600 m			
Rated load voltage	-			
Current consumption from load voltage L+ (without load)	-			
Rated value	DC 20.4...28.8 V			
Input voltage for signal "0"	DC 0...5 V			
Input voltage for signal "1"	DC 15...28.8 V			
Input voltage hysteresis	-			
Frequency range	-			
Input resistance	-			
Input current for signal "1"	7 mA			
Connection of Two-Wire-BERs possible	✓			
Max. permissible BERO quiescent current	1.5 mA			
Input delay of "0" to "1"	3 ms			
Input delay of "1" to "0"	3 ms			
Number of simultaneously utilizable inputs horizontal configuration	16			
Number of simultaneously utilizable inputs vertical configuration	16			
Input characteristic curve	IEC 61131-2, type 1			
Initial data size	2 Byte			

Signal modules digital Digital input modules						
221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			

Order number	KS221-1BH00			
Status information, alarms, diagnostics				
Status display	none			
Interrupts	no			
Process alarm	no			
Diagnostic interrupt	no			
Diagnostic functions	no			
Diagnostics information read-out	none			
Supply voltage display	none			
Group error display	none			
Channel error display	none			
Isolation				
Between channels	-			
Between channels of groups to	16			
Between channels and backplane bus	✓			
Insulation tested with	DC 500 V			
Datasizes				
Input bytes	2			
Output bytes	0			
Parameter bytes	0			
Diagnostic bytes	0			
Housing				
Material	PPE / PA 6.6			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm			
Weight	70 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	yes			

Connections, Interfaces

Signal modules digital Digital input modules						
221-1BF00	221-1BF50	221-1BH50	221-1FF30	KS221-1BH00		
221-1BF10	221-1BH00	221-1BH51	221-1FF50			
221-1BF21	221-1BH10	221-1FD00	221-2BL10			
221-1BF30	221-1BH30	221-1FF20	KSD221-1BH00			



26

25

4

2

3

1

1...6

7

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14

15

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22

23...26

Ground

Input I+1,7

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.

Input I+1,0

Input I+0,7

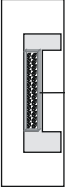
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Input I+0,0

+DC 24 V

DI 16x



DEA-KB91

25

UB4x

L-

L+

LED

0

7

7

High Low

M24 V

+24 V

Digital input with counter

Signal modules digital | Digital input with counter

221-1BH20

Order number	221-1BH20					
Figure						
Type	SM 221					
General information						
Note	-					
Features	▸ 16 inputs ▸ 2 inputs are configurable as counter ▸ LED status display					
Current consumption/power loss						
Current consumption from backplane bus	85 mA					
Power loss	3.5 W					
Technical data digital inputs						
Number of inputs	16					
Cable length, shielded	1000 m					
Cable length, unshielded	600 m					
Rated load voltage	-					
Reverse polarity protection of rated load voltage	-					
Current consumption from load voltage L+ (without load)	-					
Rated value	DC 20.4...28.8 V					
Input voltage for signal "0"	DC 0...5 V					
Input voltage for signal "1"	DC 15...28.8 V					
Input voltage hysteresis	-					
Frequency range	-					
Input resistance	-					
Input current for signal "1"	7 mA					
Connection of Two-Wire-BERs possible	✓					
Max. permissible BERO quiescent current	1.5 mA					
Input delay of "0" to "1"	3 ms					
Input delay of "1" to "0"	3 ms					
Number of simultaneously utilizable inputs horizontal configuration	16					
Number of simultaneously utilizable inputs vertical configuration	16					
Input characteristic curve	IEC 61131-2, type 1					
Initial data size	6 Byte					

Signal modules digital | Digital input with counter

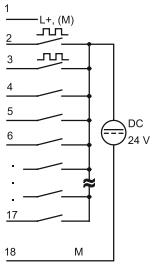
221-1BH20

Order number	221-1BH20					
Technical data counters						
Number of counters	1					
Counter width	32 Bit					
Maximum input frequency	100 kHz					
Maximum count frequency	400 kHz					
Mode incremental encoder	✓					
Mode pulse / direction	✓					
Mode pulse	✓					
Mode frequency counter	✓					
Mode period measurement	✓					
Gate input available	-					
Latch input available	-					
Reset input available	-					
Counter output available	-					
Status information, alarms, diagnostics						
Status display	green LED per channel					
Interrupts	no					
Process alarm	no					
Diagnostic interrupt	no					
Diagnostic functions	no					
Diagnostics information read-out	none					
Supply voltage display	none					
Group error display	none					
Channel error display	none					
Isolation						
Between channels	-					
Between channels of groups to	16					
Between channels and backplane bus	✓					
Insulation tested with	DC 500 V					
Datasizes						
Input bytes	6					
Output bytes	6					
Parameter bytes	5					
Diagnostic bytes	0					
Housing						
Material	PPE / PA 6.6					
Mounting	Profile rail 35 mm					
Mechanical data						
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm					
Weight	90 g					
Environmental conditions						
Operating temperature	0 °C to 60 °C					
Storage temperature	-25 °C to 70 °C					
Certifications						
UL508 certification	yes					

Connections, Interfaces

Signal modules digital Digital input with counter						
221-1BH20						

221-1BH20



Digital output modules

Signal modules digital | Digital output modules

222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

Order number	222-1BF00	222-1BF10	222-1BF20	222-1BF30
Figure				
Type	SM 222	SM 222	SM 222	SM 222, ECO
General information				
Note	-	-	-	-
Features	8 outputs - Output current 1 A	8 outputs - Output current 2 A	8 outputs - Isolation in 4 groups per 2 outputs - Output current 2 A	8 outputs - Output current 0.5 A
Current consumption/power loss				
Current consumption from backplane bus	70 mA	70 mA	70 mA	70 mA
Power loss	2 W	3 W	3 W	2 W
Technical data digital outputs				
Number of outputs	8	8	8	8
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Current consumption from load voltage L+ (without load)	10 mA	10 mA	10 mA	10 mA
Total current per group, horizontal configuration, 40°C	8 A	10 A	4 A	4 A
Total current per group, horizontal configuration, 60°C	8 A	10 A	4 A	4 A
Total current per group, vertical configuration	8 A	10 A	4 A	4 A
Output current at signal "1", rated value	1 A	2 A	2 A	0.5 A
Output delay of "0" to "1"	150 µs	150 µs	150 µs	max. 100 µs
Output delay of "1" to "0"	100 µs	100 µs	100 µs	max. 350 µs
Minimum load current	-	-	-	-
Lamp load	5 W	5 W	5 W	5 W
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	✓	✓	✓	✓
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz	max. 10 Hz	max. 10 Hz
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-52 V)	L+ (-52 V)	L+ (-52 V)
Short-circuit protection of output	yes, electronic	yes, electronic	yes, electronic	yes, electronic
Trigger level	1.5 A	3 A	3 A	1 A
Number of operating cycle of relay outputs	-	-	-	-
Switching capacity of contacts	-	-	-	-
Output data size	1 Byte	1 Byte	1 Byte	1 Byte

Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

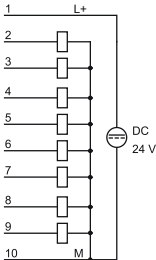
Order number	222-1BF00	222-1BF10	222-1BF20	222-1BF30
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	green LED per group	green LED per group	green LED per group	green LED per group
Group error display	red SF LED	red SF LED	red LED per group	red SF LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	✓	-
Between channels of groups to	8	8	2	8
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	1	1	1	1
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	100 g	100 g	90 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

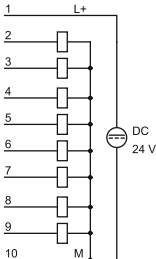
222-1BF00





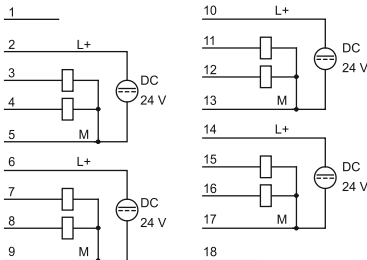
222-1BF10





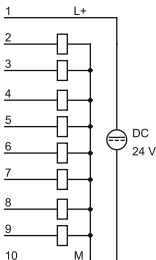
222-1BF20





222-1BF30





Digital output modules

Signal modules digital | Digital output modules

222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

Order number	222-1BF50	222-1BH00	222-1BH10	222-1BH20
Figure				
Type	SM 222	SM 222	SM 222	SM 222
General information				
Note	-	-	-	-
Features	8 Low-Side outputs - Output current 0.5 A	16 outputs - Output current 0.5 A - LED status display on conversion module UB4x	16 outputs - Output current 1 A	16 outputs - Output current 2 A
Current consumption/power loss				
Current consumption from backplane bus	50 mA	120 mA	120 mA	120 mA
Power loss	1.5 W	3.5 W	3.5 W	3.5 W
Technical data digital outputs				
Number of outputs	8	16	16	16
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Current consumption from load voltage L+ (without load)	15 mA	10 mA	10 mA	10 mA
Total current per group, horizontal configuration, 40°C	4 A	8 A	10 A	10 A
Total current per group, horizontal configuration, 60°C	4 A	8 A	10 A	10 A
Total current per group, vertical configuration	4 A	8 A	10 A	10 A
Output current at signal "1", rated value	0.5 A	0.5 A	1 A	2 A
Output delay of "0" to "1"	30 µs	150 µs	150 µs	150 µs
Output delay of "1" to "0"	100 µs	100 µs	100 µs	100 µs
Minimum load current	-	-	-	-
Lamp load	5 W	5 W	5 W	5 W
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	✓	✓	✓	✓
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz	max. 10 Hz	max. 10 Hz
Internal limitation of inductive shut-off voltage	+45 V	L+ (-52 V)	L+ (-52 V)	L+ (-52 V)
Short-circuit protection of output	yes, electronic	yes, electronic	yes, electronic	yes, electronic
Trigger level	1.7 A	1.5 A	1.5 A	3 A
Number of operating cycle of relay outputs	-	-	-	-
Switching capacity of contacts	-	-	-	-
Output data size	1 Byte	2 Byte	2 Byte	2 Byte

Signal modules digital | Digital output modules

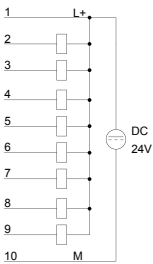
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

Order number	222-1BF50	222-1BH00	222-1BH10	222-1BH20
Status information, alarms, diagnostics				
Status display	green LED per channel	none	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	green LED per group	none	green LED per group	green LED per group
Group error display	red SF LED	none	red SF LED	red SF LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	8	16	16	16
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	1	2	2	2
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	90 g	80 g	90 g	100 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

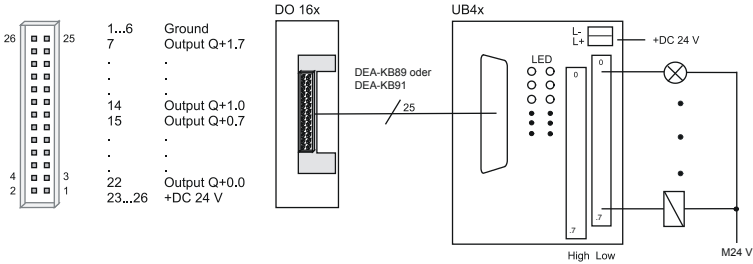
Connections, Interfaces

Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

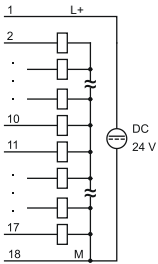
222-1BF50



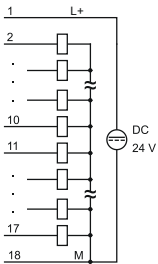
222-1BH00



222-1BH10



222-1BH20



Digital output modules

Signal modules digital | Digital output modules

222-1BF00 222-1BF10 222-1BF20 222-1BF30	222-1BF50 222-1BH00 222-1BH10 222-1BH20	222-1BH30 222-1BH50 222-1BH51 222-1DB00	222-1FF00 222-1HD10 222-1HD20 222-1HF00	222-2BL10 KSD222-1BH00 KS222-1BH00		
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Order number	222-1BH30	222-1BH50	222-1BH51	222-1DB00
Figure				
Type	SM 222, ECO	SM 222	SM 222	SM 222
General information				
Note	-	-	-	-
Features	16 outputs - Output current 0.5 A	16 Low-Side outputs - Output current 0.5 A	16 Low-Side outputs - Output current 0.5 A	2 outputs - AC 100...240 V - Output current 2 A - Software dimmer for resistive, inductive or capacitive load - Frequency range 47...63 Hz
Current consumption/power loss				
Current consumption from backplane bus	120 mA	120 mA	90 mA	190 mA
Power loss	3.5 W	3.5 W	2.5 W	6 W
Technical data digital outputs				
Number of outputs	16	16	16	2
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	AC 100...240 V
Current consumption from load voltage L+ (without load)	10 mA	10 mA	25 mA	15 mA
Total current per group, horizontal configuration, 40°C	8 A	8 A	8 A	4 A
Total current per group, horizontal configuration, 60°C	8 A	8 A	8 A	3 A
Total current per group, vertical configuration	8 A	8 A	8 A	4 A
Output current at signal "1", rated value	0.5 A	0.5 A	0.5 A	2 A
Output delay of "0" to "1"	max. 100 µs	100 µs	30 µs	max. 1 AC cycle
Output delay of "1" to "0"	max. 350 µs	150 µs	100 µs	max. 1 AC cycle
Minimum load current	-	-	-	-
Lamp load	5 W	5 W	5 W	460 W
Parallel switching of outputs for redundant control of a load	not possible	not possible	possible (only outputs group)	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	✓	✓	✓	-
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz	-
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz	-
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz	max. 10 Hz	-
Internal limitation of inductive shut-off voltage	L+ (-52 V)	+45 V	+45 V	-
Short-circuit protection of output	yes, electronic	yes, electronic	yes, electronic	yes, electronic
Trigger level	1 A	1.5 A	1.7 A	4 A

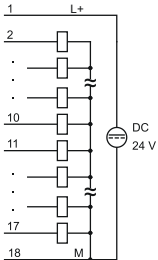
Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

Order number	222-1BH30	222-1BH50	222-1BH51	222-1DB00
Number of operating cycle of relay outputs	-	-	-	-
Switching capacity of contacts	-	-	-	-
Output data size	2 Byte	2 Byte	2 Byte	4 Byte
Status information, alarms, diagnostics				
Status display	green LED per channel	none	green LED per channel	none
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	yes, parameterizable
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	possible
Supply voltage display	green LED per group	none	green LED per group	green LED per group
Group error display	red SF LED	none	red SF LED	red SF LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	16	16	16	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 4000 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	2	2	2	4
Parameter bytes	0	0	0	17
Diagnostic bytes	0	0	0	10
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	90 g	80 g	90 g	70 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	-

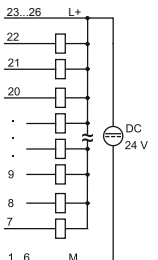
Connections, Interfaces

Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

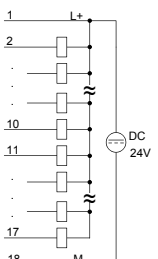
222-1BH30



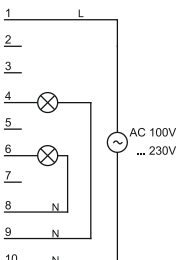
222-1BH50



222-1BH51



222-1DB00



Digital output modules

Signal modules digital | Digital output modules

222-1BF00 222-1BF10 222-1BF20 222-1BF30	222-1BF50 222-1BH00 222-1BH10 222-1BH20	222-1BH30 222-1BH50 222-1BH51 222-1DB00	222-1FF00 222-1HD10 222-1HD20 222-1HF00	222-2BL10 KSD222-1BH00 KS222-1BH00		
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Order number	222-1FF00	222-1HD10	222-1HD20	222-1HF00
Figure				
Type	SM 222	SM 222	SM 222	SM 222
General information				
Note	-	-	-	-
Features	8 solide-state outputs - AC 230 V/ DC 400 V - Output current 0.5 A	4 isolated relay outputs - AC 230 V/ DC 30 V - Output current 5 A	4 isolated relay outputs - AC 230 V/ DC 30 V - Output current 16 A	8 relay outputs - AC 230 V/ DC 30 V - Output current 5 A
Current consumption/power loss				
Current consumption from backplane bus	150 mA	160 mA	200 mA	300 mA
Power loss	1.5 W	2 W	2 W	2 W
Technical data digital outputs				
Number of outputs	8	4	4	8
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	AC 230 V	AC 230 V	AC 230 V	DC 30 V/ AC 230 V
Current consumption from load voltage L+ (without load)	-	-	-	-
Total current per group, horizontal configuration, 40°C	4 A	5 A	16 A	8 A
Total current per group, horizontal configuration, 60°C	4 A	5 A	16 A	8 A
Total current per group, vertical configuration	4 A	5 A	16 A	8 A
Output current at signal "1", rated value	0.5 A	5 A	16 A	5 A
Output delay of "0" to "1"	5 ms	10 ms	10 ms	10 ms
Output delay of "1" to "0"	1 ms	5 ms	10 ms	5 ms
Minimum load current	-	-	-	-
Lamp load	-	-	-	-
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	-	-	-	-
Switching frequency with resistive load	max. 0.5 Hz	max. 10 Hz	max. 10 Hz	max. 10 Hz
Switching frequency with inductive load	-	-	-	-
Switching frequency on lamp load	-	-	-	-
Internal limitation of inductive shut-off voltage	-	-	-	-
Short-circuit protection of output	-	-	-	-
Trigger level	-	-	-	-
Number of operating cycle of relay outputs	-	10 ⁷	10 ⁷	10 ⁷
Switching capacity of contacts	-	5 A	16 A	5 A
Output data size	1 Byte	1 Byte	1 Byte	1 Byte

Signal modules digital | Digital output modules

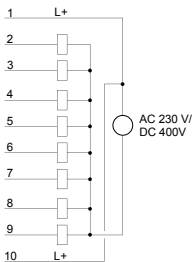
222-1BF00 222-1BF10 222-1BF20 222-1BF30	222-1BF50 222-1BH00 222-1BH10 222-1BH20	222-1BH30 222-1BH50 222-1BH51 222-1DB00	222-1FF00 222-1HD10 222-1HD20 222-1HF00	222-2BL10 KSD222-1BH00 KS222-1BH00		
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Order number	222-1FF00	222-1HD10	222-1HD20	222-1HF00
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	none	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	none
Supply voltage display	none	none	none	none
Group error display	none	none	none	none
Channel error display	none	none	none	none
Isolation				
Between channels	-	✓	✓	-
Between channels of groups to	-	1	1	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	1	1	1	1
Parameter bytes	0	0	0	0
Diagnostic bytes	0	0	0	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	100 g	100 g	120 g	110 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

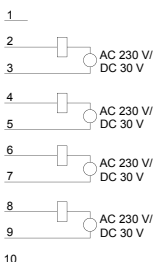
Connections, Interfaces

Signal modules digital Digital output modules						
222-1BF00 222-1BF10 222-1BF20 222-1BF30	222-1BF50 222-1BH00 222-1BH10 222-1BH20	222-1BH30 222-1BH50 222-1BH51 222-1DB00	222-1FF00 222-1HD10 222-1HD20 222-1HF00	222-2BL10 KSD222-1BH00 KS222-1BH00		

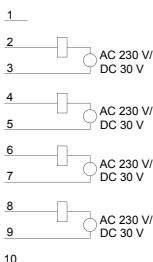
222-1FF00



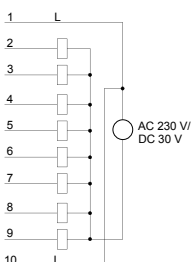
222-1HD10



222-1HD20



222-1HF00



Digital output modules

Signal modules digital | Digital output modules

222-1BF00 222-1BF10 222-1BF20 222-1BF30	222-1BF50 222-1BH00 222-1BH10 222-1BH20	222-1BH30 222-1BH50 222-1BH51 222-1DB00	222-1FF00 222-1HD10 222-1HD20 222-1HF00	222-2BL10 KSD222-1BH00 KS222-1BH00		
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Order number	222-2BL10	KSD222-1BH00	KS222-1BH00	
Figure				
Type	SM 222	SM 222, Set	SM 222, Set	
General information				
Note	-	-	-	
Features	▸ 32 outputs ▸ Output current 1 A	▸ 16 outputs ▸ LED status display on conversion module UB48D ▸ Output current 0.5 A	▸ 16 outputs ▸ LED status display on conversion module UB48 ▸ Output current 0.5 A	
Current consumption/power loss				
Current consumption from backplane bus	180 mA	120 mA	120 mA	
Power loss	6.5 W	3.5 W	3.5 W	
Technical data digital outputs				
Number of outputs	32	16	16	
Cable length, shielded	1000 m	1000 m	1000 m	
Cable length, unshielded	600 m	600 m	600 m	
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	
Current consumption from load voltage L+ (without load)	15 mA	10 mA	10 mA	
Total current per group, horizontal configuration, 40°C	10 A	8 A	8 A	
Total current per group, horizontal configuration, 60°C	10 A	8 A	8 A	
Total current per group, vertical configuration	10 A	8 A	8 A	
Output current at signal "1", rated value	1 A	0.5 A	0.5 A	
Output delay of "0" to "1"	150 µs	150 µs	150 µs	
Output delay of "1" to "0"	100 µs	100 µs	100 µs	
Minimum load current	-	-	-	
Lamp load	5 W	-	-	
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	
Parallel switching of outputs for increased power	not possible	not possible	not possible	
Actuation of digital input	✓	✓	✓	
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz	
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz	
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz	max. 10 Hz	
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-52 V)	L+ (-52 V)	
Short-circuit protection of output	yes, electronic	yes, electronic	yes, electronic	
Trigger level	1.5 A	1.5 A	1.5 A	
Number of operating cycle of relay outputs	-	-	-	
Switching capacity of contacts	-	-	-	
Output data size	4 Byte	2 Byte	2 Byte	

Signal modules digital Digital output modules						
222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

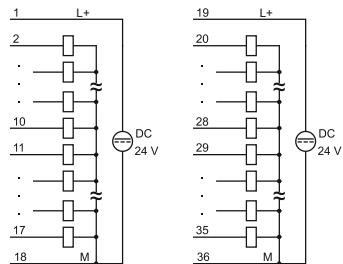
Order number	222-2BL10	KSD222-1BH00	KS222-1BH00	
Status information, alarms, diagnostics				
Status display	green LED per channel	none	none	
Interrupts	no	no	no	
Process alarm	no	no	no	
Diagnostic interrupt	no	no	no	
Diagnostic functions	no	no	no	
Diagnostics information read-out	none	none	none	
Supply voltage display	green LED per group	none	none	
Group error display	red SF LED	none	none	
Channel error display	none	none	none	
Isolation				
Between channels	-	-	-	
Between channels of groups to	16	16	16	
Between channels and backplane bus	✓	✓	✓	
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	
Datasizes				
Input bytes	0	0	0	
Output bytes	4	2	2	
Parameter bytes	0	0	0	
Diagnostic bytes	0	0	0	
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	50.8 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	
Weight	150 g	80 g	80 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

Connections, Interfaces

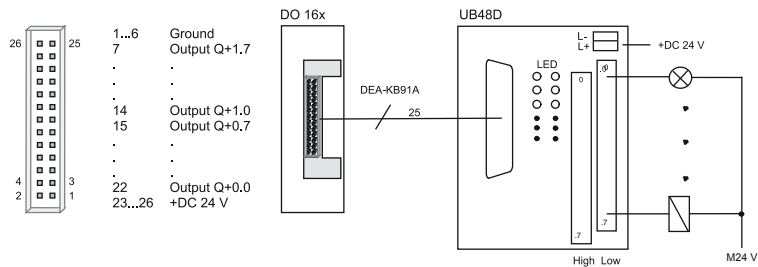
Signal modules digital | Digital output modules

222-1BF00	222-1BF50	222-1BH30	222-1FF00	222-2BL10		
222-1BF10	222-1BH00	222-1BH50	222-1HD10	KSD222-1BH00		
222-1BF20	222-1BH10	222-1BH51	222-1HD20	KS222-1BH00		
222-1BF30	222-1BH20	222-1DB00	222-1HF00			

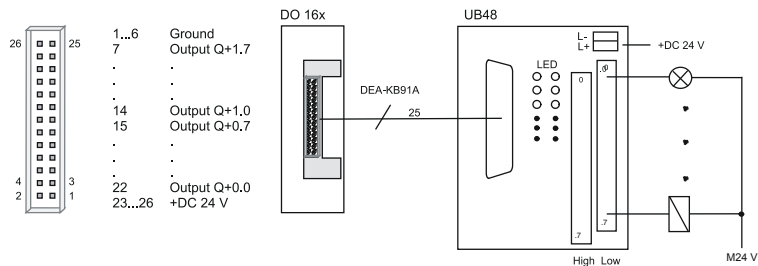
222-2BL10



KSD222-1BH00



KS222-1BH00



Digital in/output modules

Signal modules digital Digital in/output modules						
223-1BF00 223-2BL10						

Order number	223-1BF00	223-2BL10		
Figure				
Type	SM 223	SM 223		
General information				
Note	-	-		
Features	› 8 channels (as input or output) › Output current 1 A › Diagnostics function	› 16 inputs/ 16 outputs › DC 24 V › Output current 1 A		
Current consumption/power loss				
Current consumption from backplane bus	65 mA	120 mA		
Power loss	2 W	6.5 W		
Technical data digital inputs				
Number of inputs	8	16		
Cable length, shielded	1000 m	1000 m		
Cable length, unshielded	600 m	600 m		
Rated load voltage	-	-		
Current consumption from load voltage L+ (without load)	-	-		
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V		
Input voltage for signal "0"	DC 0...5 V	DC 0...5 V		
Input voltage for signal "1"	DC 15...28.8 V	DC 15...28.8 V		
Input voltage hysteresis	-	-		
Frequency range	-	-		
Input resistance	-	-		
Input current for signal "1"	7 mA	7 mA		
Connection of Two-Wire-BEROs possible	✓	✓		
Max. permissible BERO quiescent current	1.5 mA	1.5 mA		
Input delay of "0" to "1"	3 ms	3 ms		
Input delay of "1" to "0"	3 ms	3 ms		
Number of simultaneously utilizable inputs horizontal configuration	8	8		
Number of simultaneously utilizable inputs vertical configuration	8	8		
Input characteristic curve	IEC 61131-2, type 1	IEC 61131-2, type 1		
Initial data size	1 Byte	2 Byte		
Technical data digital outputs				
Number of outputs	8	16		
Cable length, shielded	1000 m	1000 m		
Cable length, unshielded	600 m	600 m		
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V		
Reverse polarity protection of rated load voltage	-	-		

Signal modules digital | Digital in/output modules

223-1BF00
223-2BL10

Order number	223-1BF00	223-2BL10		
Current consumption from load voltage L+ (without load)	10 mA	10 mA		
Output current at signal "1", rated value	1 A	1 A		
Output delay of "0" to "1"	150 µs	150 µs		
Output delay of "1" to "0"	100 µs	100 µs		
Minimum load current	-	-		
Lamp load	5 W	5 W		
Parallel switching of outputs for redundant control of a load	not possible	not possible		
Parallel switching of outputs for increased power	not possible	not possible		
Actuation of digital input	✓	✓		
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz		
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz		
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz		
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-52 V)		
Short-circuit protection of output	yes, electronic	yes, electronic		
Trigger level	1.7 A	1.7 A		
Number of operating cycle of relay outputs	-	-		
Switching capacity of contacts	-	-		
Output data size	1 Byte	2 Byte		
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel		
Interrupts	no	no		
Process alarm	no	no		
Diagnostic interrupt	no	no		
Diagnostic functions	no	no		
Diagnostics information read-out	none	none		
Supply voltage display	green LED	green LED		
Group error display	red SF LED	red SF LED		
Channel error display	none	none		
Isolation				
Between channels	-	-		
Between channels of groups to	8	16		
Between channels and backplane bus	✓	✓		
Insulation tested with	DC 500 V	DC 500 V		
Datasizes				
Input bytes	1	2		
Output bytes	1	2		
Parameter bytes	0	0		
Diagnostic bytes	0	0		

Signal modules digital | Digital in/output modules

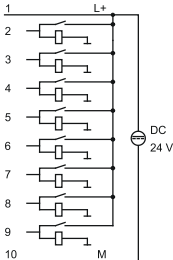
223-1BF00
223-2BL10

Order number	223-1BF00	223-2BL10		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm		
Weight	100 g	150 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

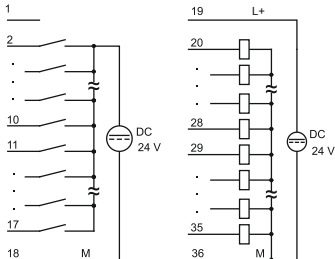
Connections, Interfaces

Signal modules digital Digital in/output modules						
223-1BF00 223-2BL10						

223-1BF00



223-2BL10



Signal modules analog

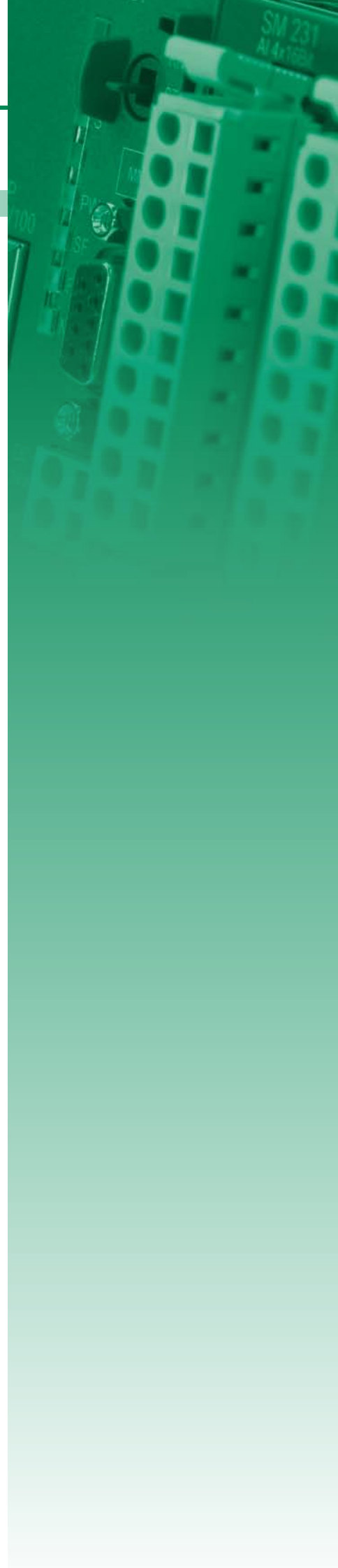


Structure and Function

Analog modules for connection of sensors and actuators are the interface of the PLC to the process. Analog input modules acquire the analog control signals from the process level and transform them into interpretable signals for the control. Analog output modules convert the internal control signals into signals suitable for the process level. There are analog modules with 4 to 8 channels available.

Characteristics

- Large selection, 4 and 8 channel, available for various measurement encoders (U, I, TC, R)
- Electrically isolated to the backplane bus
- Compact design
- LED Status Indicator
- Maintenance-free cage-clamp technology
- Label cards included
- Front connector included
- Assembly with 35 mm profile rail
- 24 month warranty



Overview

Order no.	Name/Description	Page
Analog input modules		
231-1BD30	SM 231 - Analog input ECO ▶ 4 inputs ▶ Configurable ▶ Voltage +/-10 V	346
231-1BD40	SM 231 - Analog input ECO ▶ 4 inputs ▶ Configurable ▶ Current 4...20 mA, +/-20 mA	346
231-1BD53	SM 231 - Analog input ▶ 4 inputs ▶ Configurable ▶ Voltage, current ▶ Resistance ▶ Resistance thermometer, thermocouple	346
231-1BD60	SM 231 - Analog input ▶ 4 input 12 bit ▶ Current 4...20 mA ▶ Potential separated per channel	346
231-1BD70	SM 231 - Analog input ▶ 4 input 12 bit ▶ Voltage +/-10 V ▶ Potential separated per channel	350
231-1BF00	SM 231 - Analog input ▶ 8 inputs ▶ Configurable ▶ Voltage 0...60 mV ▶ Resistance thermometer, thermocouple	350
231-1FD00	SM 231 - Analog input FAST ▶ 4 fast inputs ▶ Configurable ▶ Voltage, current ▶ Cycle time 0.8 ms	350
Analog output modules		
232-1BD30	SM 232 - Analog output ECO ▶ 4 outputs ▶ Configurable ▶ Voltage +/-10 V, 0...10 V	354
232-1BD40	SM 232 - Analog output ECO ▶ 4 outputs ▶ Configurable ▶ Current 0(4)...20mA	354
232-1BD51	SM 232 - Analog output ▶ 4 outputs ▶ Configurable ▶ Voltage, current	354
Analog in/output modules		
234-1BD50	SM 234 - Analog in-/output ▶ 2 inputs/2 outputs ▶ Configurable ▶ Voltage, current	358
234-1BD60	SM 234 - Analog in-/output ▶ 4 inputs/2 outputs ▶ Configurable ▶ Voltage, current ▶ Resistance, resistance thermometer	358
Combination modules		
238-2BC00	SM 238C - Digital in-/output, counter, analog in-/output ▶ 16 (12) digital inputs ▶ 0 (4) digital outputs ▶ max. 3 counter ▶ 4 analog inputs ▶ 2 analog outputs	363

Analog input modules

Signal modules analog | Analog input modules

231-1BD30
231-1BD40
231-1BD53
231-1BD60

231-1BD70
231-1BF00
231-1FD00

Order number	231-1BD30	231-1BD40	231-1BD53	231-1BD60
Figure				
Type	SM 231, ECO	SM 231, ECO	SM 231	SM 231
General information				
Note	-	-	-	-
Features	4 inputs - Configurable - Voltage +/-10 V	4 inputs - Configurable - Current 4...20 mA, +/-20 mA	4 inputs - Configurable - Voltage, current - Resistance - Resistance thermometer, thermocouple	4 input 12 bit - Current 4...20 mA - Potential separated per channel
Current consumption/power loss				
Current consumption from backplane bus	120 mA	120 mA	280 mA	280 mA
Power loss	0.6 W	0.6 W	1.4 W	1.4 W
Technical data analog inputs				
Number of inputs	4	4	4	4
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	-	-	-	-
Voltage inputs	✓	-	✓	-
Min. input resistance (voltage range)	100 kΩ	-	20 MΩ	-
Input voltage ranges	-10 V ... +10 V	-	-50 mV ... +50 mV -400 mV ... +400 mV -4 V ... +4 V -10 V ... +10 V	-
Operational limit of voltage ranges	+/-0.2%	-	+/-0.3% ... +/-0.6%	-
Operational limit of voltage ranges with SFU	-	-	-	-
Basic error limit voltage ranges	+/-0.1%	-	+/-0.2% ... +/-0.4%	-
Basic error limit voltage ranges with SFU	-	-	-	-
Destruction limit current	-	-	-	-
Current inputs	-	✓	✓	✓
Max. input resistance (current range)	-	110 Ω	85 Ω	20 Ω
Input current ranges	-	-20 mA ... +20 mA +4 mA ... +20 mA	-20 mA ... +20 mA 0 mA ... +20 mA +4 mA ... +20 mA	+4 mA ... +20 mA
Operational limit of current ranges	-	+/-0.2% ... +/-0.5%	+/-0.3% ... +/-0.8%	-
Operational limit of current ranges with SFU	-	-	-	-
Radical error limit current ranges with SFU	-	+/-0.1% ... +/-0.2%	+/-0.2% ... +/-0.5%	-
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Resistance inputs	-	-	✓	-

Signal modules analog | Analog input modules

231-1BD30	231-1BD70					
231-1BD40	231-1BF00					
231-1BD53	231-1FD00					
231-1BD60						

Order number	231-1BD30	231-1BD40	231-1BD53	231-1BD60
Resistance ranges	-	-	0 ... 60 Ohm 0 ... 600 Ohm 0 ... 3000 Ohm 0 ... 6000 Ohm	-
Operational limit of resistor ranges	-	-	+/-0.4% ... +/-0.8%	-
Operational limit of resistor ranges with SFU	-	-	-	-
Basic error limit	-	-	+/-0.2% ... +/-0.4%	-
Basic error limit with SFU	-	-	-	-
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	-	✓	-
Resistance thermometer ranges	-	-	Pt100, Pt1000 KTY81-152 Ni100, Ni1000 Cu50 KTY81-110 KTY81-120 KTY81-121 KTY81-122 KTY81-150 KTY81-151	-
Operational limit of resistance thermometer ranges	-	-	+/-0.4% ... +/-1.4%	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Basic error limit thermoresistor ranges	-	-	+/-0.2% ... +/-0.7%	-
Basic error limit thermoresistor ranges with SFU	-	-	-	-
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	-	✓	-
Thermocouple ranges	-	-	type J type K type N type R type S type E type T	-
Operational limit of thermocouple ranges	-	-	+/-1.5%	-
Operational limit of thermocouple ranges with SFU	-	-	-	-
Basic error limit thermoelement ranges	-	-	+/-1.0%	-
Basic error limit thermoelement ranges with SFU	-	-	-	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	-	✓	-
External temperature compensation	-	-	✓	-
Internal temperature compensation	-	-	✓	-
Internal temperature compensation	-	-	5 K	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	13	13	16	12
Measurement principle	successive approximation	successive approximation	Sigma-Delta	successive approximation

Signal modules analog Analog input modules						
231-1BD30	231-1BD70					
231-1BD40	231-1BF00					
231-1BD53	231-1FD00					
231-1BD60						

Order number	231-1BD30	231-1BD40	231-1BD53	231-1BD60
Basic conversion time	2 ms / channel	2 ms / channel	7 ms ... 272 ms	-
Noise suppression for frequency	f=50 Hz...400 Hz	f=50 Hz...400 Hz	none	-
Initial data size	8 Byte	8 Byte	8 Byte	8 Byte
Status information, alarms, diagnostics				
Status display	none	none	none	none
Interrupts	no	no	yes	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	yes, parameterizable	no
Diagnostic functions	no	no	yes	no
Diagnostics information read-out	none	none	possible	none
Supply voltage display	none	none	none	none
Group error display	red SF LED	red SF LED	none	none
Channel error display	none	none	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	✓
Between channels of groups to	-	-	-	1
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	-	-	-	✓
Max. potential difference between circuits	-	-	-	DC 75 V/ AC 60 V
Max. potential difference between inputs (Ucm)	DC 2 V	DC 2 V	DC 4 V	DC 75 V/ AC 60 V
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	DC 75 V/ AC 60 V
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	8	8	8	8
Output bytes	0	0	0	0
Parameter bytes	12	12	12	3
Diagnostic bytes	0	0	12	0
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm
Weight	90 g	90 g	100 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

Signal modules analog Analog input modules						
231-1BD30	231-1BD70					
231-1BD40	231-1BF00					
231-1BD53	231-1FD00					
231-1BD60						



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Analog input modules

Signal modules analog | Analog input modules

231-1BD30
231-1BD40
231-1BD53
231-1BD60

231-1BD70
231-1BF00
231-1FD00

Order number	231-1BD70	231-1BF00	231-1FD00	
Figure				
Type	SM 231	SM 231	SM 231	
General information				
Note	-	-	-	
Features	▸ 4 input 12 bit ▸ Voltage +/-10 V ▸ Potential separated per channel	▸ 8 inputs ▸ Configurable ▸ Voltage 0...60 mV ▸ Resistance thermometer, thermocouple	▸ 4 fast inputs ▸ Configurable ▸ Voltage, current ▸ Cycle time 0.8 ms	
Current consumption/power loss				
Current consumption from backplane bus	280 mA	280 mA	300 mA	
Power loss	1.4 W	1.4 W	1.5 W	
Technical data analog inputs				
Number of inputs	4	8	4	
Cable length, shielded	200 m	200 m	200 m	
Rated load voltage	-	-	-	
Current consumption from load voltage L+ (without load)	-	-	-	
Voltage inputs	✓	✓	✓	
Min. input resistance (voltage range)	83 kΩ	2 MΩ	10 MΩ	
Input voltage ranges	-10 V ... +10 V	0 mV ... +60 mV	-400 mV ... +400 mV -4 V ... +4 V -10 V ... +10 V	
Operational limit of voltage ranges	-	-	+/-0.2% ... +/-0.4%	
Operational limit of voltage ranges with SFU	-	-	-	
Basic error limit voltage ranges	-	+/-0.1%	+/-0.1% ... +/-0.3%	
Basic error limit voltage ranges with SFU	-	-	-	
Destruction limit current	-	-	-	
Current inputs	-	-	✓	
Max. input resistance (current range)	-	-	57 Ω	
Input current ranges	-	-	+4 mA ... +20 mA -20 mA ... +20 mA	
Operational limit of current ranges	-	-	+/-0.2% ... +/-0.5%	
Operational limit of current ranges with SFU	-	-	-	
Radical error limit current ranges with SFU	-	-	+/-0.1% ... +/-0.3%	
Radical error limit current ranges with SFU	-	-	-	
Destruction limit current inputs (electrical current)	-	-	-	
Destruction limit current inputs (voltage)	-	-	-	
Resistance inputs	-	-	-	
Resistance ranges	-	-	-	
Operational limit of resistor ranges	-	-	-	
Operational limit of resistor ranges with SFU	-	-	-	

Signal modules analog | Analog input modules

231-1BD30 231-1BD40 231-1BD53 231-1BD60	231-1BD70 231-1BF00 231-1FD00					
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Order number	231-1BD70	231-1BF00	231-1FD00	
Basic error limit	-	-	-	
Basic error limit with SFU	-	-	-	
Destruction limit resistance inputs	-	-	-	
Resistance thermometer inputs	-	✓	-	
Resistance thermometer ranges	-	Pt100	-	
Operational limit of resistance thermometer ranges	-	-	-	
Operational limit of resistance thermometer ranges with SFU	-	-	-	
Basic error limit thermoresistor ranges	-	±0.15% (2-wire) ±0.15% (4-wire)	-	
Basic error limit thermoresistor ranges with SFU	-	-	-	
Destruction limit resistance thermometer inputs	-	-	-	
Thermocouple inputs	-	✓	-	
Thermocouple ranges	-	type J type K type T	-	
Operational limit of thermocouple ranges	-	-	-	
Operational limit of thermocouple ranges with SFU	-	-	-	
Basic error limit thermoelement ranges	-	±0.1% (Compensation external) ±1.0% (internal)	-	
Basic error limit thermoelement ranges with SFU	-	-	-	
Destruction limit thermocouple inputs	-	-	-	
Programmable temperature compensation	-	✓	-	
External temperature compensation	-	✓	-	
Internal temperature compensation	-	✓	-	
Internal temperature compensation	-	4 K	-	
Technical unit of temperature measurement	-	-	-	
Resolution in bit	12	16	16	
Measurement principle	successive approximation	Sigma-Delta	successive approximation	
Basic conversion time	-	6.75 ms ... 268 ms	0.2 ms/channel	
Noise suppression for frequency	-	50 Hz and 60 Hz	-	
Initial data size	8 Byte	16 Byte	8 Byte	
Status information, alarms, diagnostics				
Status display	none	none	none	
Interrupts	no	yes	yes	
Process alarm	no	no	yes, parameterizable	
Diagnostic interrupt	no	yes, parameterizable	yes, parameterizable	
Diagnostic functions	no	yes	yes	
Diagnostics information read-out	none	possible	possible	
Supply voltage display	none	none	none	
Group error display	none	red SF LED	none	
Channel error display	none	red LED per channel	red LED per channel	

Signal modules analog Analog input modules						
231-1BD30	231-1BD70					
231-1BD40	231-1BF00					
231-1BD53	231-1FD00					
231-1BD60						

Order number	231-1BD70	231-1BF00	231-1FD00	
Isolation				
Between channels	✓	-	-	
Between channels of groups to	1	-	-	
Between channels and backplane bus	✓	✓	✓	
Between channels and power supply	✓	-	-	
Max. potential difference between circuits	DC 75 V/ AC 60 V	-	-	
Max. potential difference between inputs (Ucm)	DC 75 V/ AC 60 V	DC 15 V	DC 2 V	
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	-	-	
Max. potential difference between inputs and Mana (Ucm)	-	-	-	
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 15 V	DC 75 V/ AC 60 V	
Max. potential difference between Mintern and outputs	-	-	-	
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	
Datasizes				
Input bytes	8	16	8	
Output bytes	0	0	0	
Parameter bytes	3	12	34	
Diagnostic bytes	0	12	12	
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	
Weight	90 g	90 g	90 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

Connections, Interfaces

Signal modules analog | Analog input modules

231-1BD30 231-1BD40 231-1BD53 231-1BD60	231-1BD70 231-1BF00 231-1FD00					
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231-1BD70



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231-1BF00



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Analog output modules

Signal modules analog | Analog output modules

232-1BD30
232-1BD40
232-1BD51

Order number	232-1BD30	232-1BD40	232-1BD51	
Figure				
Type	SM 232, ECO	SM 232, ECO	SM 232	
General information				
Note	-	-	-	
Features	▸ 4 outputs ▸ Configurable ▸ Voltage +/-10 V, 0...10 V	▸ 4 outputs ▸ Configurable ▸ Current 0(4)...20mA	▸ 4 outputs ▸ Configurable ▸ Voltage, current	
Current consumption/power loss				
Current consumption from backplane bus	60 mA	60 mA	75 mA	
Power loss	2.7 W	1.5 W	1.8 W	
Technical data analog outputs				
Number of outputs	4	4	4	
Cable length, shielded	200 m	200 m	200 m	
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	
Reverse polarity protection of rated load voltage	✓	✓	✓	
Current consumption from load voltage L+ (without load)	100 mA	50 mA	60 mA	
Voltage output short-circuit protection	✓	-	✓	
Voltage outputs	✓	-	✓	
Min. load resistance (voltage range)	5 kΩ	-	1 kΩ	
Max. capacitive load (current range)	1 μF	-	1 μF	
Max. inductive load (current range)	7 mA	-	30 mA	
Output voltage ranges	-10 V ... +10 V 0 V ... +10 V	-	-10 V ... +10 V +1 V ... +5 V 0 V ... +10 V	
Operational limit of voltage ranges	+/-0.4%	-	+/-0.4% ... +/-0.8%	
Basic error limit voltage ranges	+/-0.2%	-	+/-0.2% ... +/-0.4%	
Destruction limit against external applied voltage	-	-	-	
Current outputs	-	✓	✓	
Max. in load resistance (current range)	-	350 Ω	500 Ω	
Max. inductive load (current range)	-	10 mH	10 mH	
Max. inductive load (current range)	-	13 V	12 V	
Output current ranges	-	0 mA ... +20 mA +4 mA ... +20 mA	0 mA ... +20 mA +4 mA ... +20 mA -20 mA ... +20 mA	
Operational limit of current ranges	-	+/-0.4%	+/-0.3% ... +/-0.8%	
Basic error limit current ranges	-	+/-0.2%	+/-0.2% ... +/-0.5%	

Signal modules analog | Analog output modules

232-1BD30
232-1BD40
232-1BD51

Order number	232-1BD30	232-1BD40	232-1BD51	
Destruction limit against external applied voltage	-	-	-	
Settling time for ohmic load	1.5 ms	0.03 ms	0.05 ms	
Settling time for capacitive load	3 ms	-	0.5 ms	
Settling time for inductive load	-	1.5 ms	0.1 ms	
Resolution in bit	12	12	12	
Conversion time	0.7 ms / all channels	0.7 ms / all channels	0.45 ms / channel	
Substitute value can be applied	no	no	no	
Output data size	8 Byte	8 Byte	8 Byte	
Status information, alarms, diagnostics				
Status display	none	none	none	
Interrupts	no	no	yes	
Process alarm	no	no	no	
Diagnostic interrupt	no	no	yes, parameterizable	
Diagnostic functions	no	no	yes	
Diagnostics information read-out	none	none	possible	
Supply voltage display	green LED	green LED	none	
Group error display	none	none	red SF LED	
Channel error display	none	none	none	
Isolation				
Between channels	-	-	-	
Between channels of groups to	-	-	-	
Between channels and backplane bus	✓	✓	✓	
Between channels and power supply	✓	✓	✓	
Max. potential difference between circuits	-	-	-	
Max. potential difference between inputs (Ucm)	-	-	-	
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	
Max. potential difference between inputs and Mana (Ucm)	-	-	-	
Max. potential difference between inputs and Mintern (Uiso)	-	-	-	
Max. potential difference between Mintern and outputs	-	-	-	
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	
Datasizes				
Input bytes	0	0	0	
Output bytes	8	8	8	
Parameter bytes	8	8	8	
Diagnostic bytes	0	0	4	

Signal modules analog | Analog output modules

Signal modules analog Analog output modules						
232-1BD30						
232-1BD40						
232-1BD51						

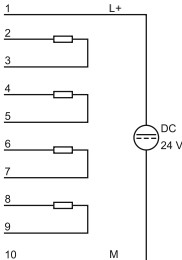
Order number	232-1BD30	232-1BD40	232-1BD51	
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm	
Weight	80 g	80 g	100 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

Connections, Interfaces

Signal modules analog Analog output modules						
232-1BD30						
232-1BD40						
232-1BD51						

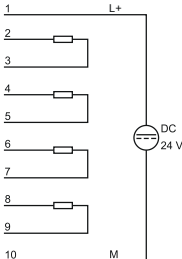
232-1BD30





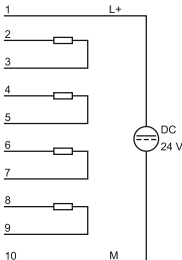
232-1BD40





232-1BD51





Analog in/output modules

Signal modules analog Analog in/output modules					
234-1BD50 234-1BD60					

Order number	234-1BD50	234-1BD60		
Figure				
Type	SM 234	SM 234		
General information				
Note	-	-		
Features	▸ 2 inputs/2 outputs ▸ Configurable ▸ Voltage, current	▸ 4 inputs/2 outputs ▸ Configurable ▸ Voltage, current ▸ Resistance, resistance thermometer		
Current consumption/power loss				
Current consumption from backplane bus	100 mA	100 mA		
Power loss	2.9 W	2.9 W		
Technical data analog inputs				
Number of inputs	2	4		
Cable length, shielded	200 m	200 m		
Rated load voltage	DC 24 V	DC 24 V		
Reverse polarity protection of rated load voltage	✓	✓		
Current consumption from load voltage L+ (without load)	70 mA	70 mA		
Voltage inputs	✓	✓		
Min. input resistance (voltage range)	100 kΩ	120 kΩ		
Input voltage ranges	+1 V ... +5 V 0 V ... +10 V -10 V ... +10 V	+1 V ... +5 V 0 V ... +10 V -10 V ... +10 V -400 mV ... +400 mV -4 V ... +4 V		
Operational limit of voltage ranges	-	+/-0.3% ... +/-0.7%		
Operational limit of voltage ranges with SFU	-	-		
Basic error limit voltage ranges	+/-0.2% ... +/-0.6%	+/-0.2% ... +/-0.5%		
Basic error limit voltage ranges with SFU	-	-		
Destruction limit current	-	-		
Current inputs	✓	✓		
Max. input resistance (current range)	50 Ω	90 Ω		
Input current ranges	+4 mA ... +20 mA 0 mA ... +20 mA -20 mA ... +20 mA	+4 mA ... +20 mA 0 mA ... +20 mA -20 mA ... +20 mA		
Operational limit of current ranges	-	+/-0.3% ... +/-0.8%		
Operational limit of current ranges with SFU	-	-		
Basic error limit current ranges	+/-0.3% ... +/-0.8%	+/-0.2% ... +/-0.5%		
Radical error limit current ranges with SFU	-	-		
Destruction limit current inputs (electrical current)	-	-		

Signal modules analog | Analog in/output modules

234-1BD50
234-1BD60

Order number	234-1BD50	234-1BD60		
Destruction limit current inputs (voltage)	-	-		
Resistance inputs	-	✓		
Resistance ranges	-	0 ... 600 Ohm 0 ... 3000 Ohm		
Operational limit of resistor ranges	-	+/-0.4%		
Operational limit of resistor ranges with SFU	-	-		
Basic error limit	-	+/-0.2%		
Basic error limit with SFU	-	-		
Destruction limit resistance inputs	-	-		
Resistance thermometer inputs	-	✓		
Resistance thermometer ranges	-	Pt100 Pt1000 Ni100 Ni1000		
Operational limit of resistance thermome- ter ranges	-	+/-0.4% ... +/-1.0%		
Operational limit of resistance thermome- ter ranges with SFU	-	-		
Basic error limit thermoresistor ranges	-	+/-0.2% ... +/-0.5%		
Basic error limit thermoresistor ranges with SFU	-	-		
Destruction limit resistance thermometer inputs	-	-		
Thermocouple inputs	-	-		
Thermocouple ranges	-	-		
Operational limit of thermocouple ranges	-	-		
Operational limit of thermocouple ranges with SFU	-	-		
Basic error limit thermoelement ranges	-	-		
Basic error limit thermoelement ranges with SFU	-	-		
Destruction limit thermocouple inputs	-	-		
Programmable temperature compensation	-	-		
External temperature compensation	-	-		
Internal temperature compensation	-	-		
Internal temperature compensation	-	-		
Technical unit of temperature measure- ment	-	-		
Resolution in bit	16	16		
Measurement principle	Sigma-Delta	Sigma-Delta		
Basic conversion time	6.75 ms - 268 ms	7 ms - 272 ms		
Noise suppression for frequency	50 Hz and 60 Hz	50 Hz and 60 Hz		
Initial data size	4 Byte	4 Byte		

Signal modules analog | Analog in/output modules

234-1BD50
234-1BD60

Order number	234-1BD50	234-1BD60		
Technical data analog outputs				
Number of outputs	2	2		
Cable length, shielded	200 m	200 m		
Rated load voltage	DC 24 V	DC 24 V		
Reverse polarity protection of rated load voltage	✓	✓		
Current consumption from load voltage L+ (without load)	70 mA	70 mA		
Voltage output short-circuit protection	✓	✓		
Voltage outputs	✓	✓		
Min. load resistance (voltage range)	1 kΩ	1 kΩ		
Max. capacitive load (current range)	1 μF	1 μF		
Max. inductive load (current range)	30 mA	30 mA		
Output voltage ranges	-10 V ... +10 V +1 V ... +5 V 0 V ... +10 V	-10 V ... +10 V +1 V ... +5 V 0 V ... +10 V		
Operational limit of voltage ranges	-	+/-0.4% ... +/-0.8%		
Basic error limit voltage ranges	+/-0.2% ... +/-0.6%	+/-0.2% ... +/-0.4%		
Destruction limit against external applied voltage	-	-		
Current outputs	✓	✓		
Max. in load resistance (current range)	500 Ω	500 Ω		
Max. inductive load (current range)	10 mH	10 mH		
Max. inductive load (current range)	14 V	13 V		
Output current ranges	-20 mA ... +20 mA +4 mA ... +20 mA 0 mA ... +20 mA	-20 mA ... +20 mA +4 mA ... +20 mA 0 mA ... +20 mA		
Operational limit of current ranges	-	+/-0.3% ... +/-0.8%		
Basic error limit current ranges	+/-0.3% ... +/-0.8%	+/-0.2% ... +/-0.5%		
Destruction limit against external applied voltage	-	-		
Settling time for ohmic load	0.05 ms	0.3 ms		
Settling time for capacitive load	0.5 ms	1 ms		
Settling time for inductive load	0.1 ms	0.5 ms		
Resolution in bit	12	12		
Conversion time	2.5 ms/all channels	1.5 ms/channel		
Substitute value can be applied	yes	yes		
Output data size	4 Byte	4 Byte		
Status information, alarms, diagnostics				
Status display	none	none		
Interrupts	yes	yes		
Process alarm	no	no		
Diagnostic interrupt	yes, parameterizable	yes, parameterizable		
Diagnostic functions	yes	yes		
Diagnostics information read-out	possible	possible		
Supply voltage display	green LED	none		
Group error display	red SF LED	red SF LED		
Channel error display	none	none		

Signal modules analog | Analog in/output modules

234-1BD50
234-1BD60

Order number	234-1BD50	234-1BD60		
Isolation				
Between channels	-	-		
Between channels of groups to	-	-		
Between channels and backplane bus	✓	✓		
Between channels and power supply	✓	✓		
Max. potential difference between circuits	-	-		
Max. potential difference between inputs (Ucm)	-	DC 4 V		
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	-		
Max. potential difference between inputs and Mana (Ucm)	-	-		
Max. potential difference between inputs and Mintern (Uiso)	-	DC 75 V/ AC 60 V		
Max. potential difference between Mintern and outputs	-	-		
Insulation tested with	DC 500 V	DC 500 V		
Datasizes				
Input bytes	4	8		
Output bytes	4	4		
Parameter bytes	14	18		
Diagnostic bytes	12	12		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm	25.4 mm x 76 mm x 88 mm		
Weight	110 g	100 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

Signal modules analog Analog in/output modules					
234-1BD50 234-1BD60					

234-1BD50



1 L+ DC 24 V

2

3 IN 

4

5 IN 

6

7 OUT 

8

9 OUT 

10 M

234-1BD60



1 L+

2

3 IN 

4 

5

6 

7 

8

9 

10 

11 Rx 

12

13 

14

15

16 

17

18 M

Combination modules

Signal modules analog | Combination modules

238-2BC00

Order number

Figure

Type

General information

Note

Features

Current consumption/power loss

Current consumption from backplane bus

Power loss

Technical data digital inputs

Number of inputs

Cable length, shielded

Cable length, unshielded

Rated load voltage

Current consumption from load voltage L+
(without load)

Rated value

Input voltage for signal "0"

Input voltage for signal "1"

Input voltage hysteresis

Frequency range

Input resistance

Input current for signal "1"

Connection of Two-Wire-BEROs possible

Max. permissible BERO quiescent current

Input delay of "0" to "1"

Input delay of "1" to "0"

Number of simultaneously utilizable inputs
horizontal configurationNumber of simultaneously utilizable inputs
vertical configuration

Input characteristic curve

Initial data size

238-2BC00



SM 238C, Digital In-/Output, Counter, Analog In-/Output

-

- 16 (12) digital inputs
- 0 (4) digital outputs
- max. 3 counter
- 4 analog inputs
- 2 analog outputs

280 mA

5.5 W

16

1000 m

600 m

-

-

DC 20.4...28.8 V

DC 0...5 V

DC 15...28.8 V

-

-

-

7 mA

✓

1.5 mA

3 ms

3 ms

16

16

IEC 61131-2, type 1

16 Byte

Signal modules analog Combination modules						
238-2BC00						

Order number	238-2BC00			
Technical data digital outputs				
Number of outputs	4			
Cable length, shielded	1000 m			
Cable length, unshielded	600 m			
Rated load voltage	DC 20.4...28.8 V			
Reverse polarity protection of rated load voltage	-			
Current consumption from load voltage L+ (without load)	20 mA			
Total current per group, horizontal configuration, 40°C	4 A			
Total current per group, horizontal configuration, 60°C	2 A			
Total current per group, vertical configuration	4 A			
Output voltage signal "1" at min. current	L+ (-125 mV)			
Output voltage signal "1" at max. current	L+ (-0.8 V)			
Output current at signal "1", rated value	1 A			
Output delay of "0" to "1"	150 µs			
Output delay of "1" to "0"	100 µs			
Minimum load current	-			
Lamp load	5 W			
Parallel switching of outputs for redundant control of a load	not possible			
Parallel switching of outputs for increased power	not possible			
Actuation of digital input	✓			
Switching frequency with resistive load	max. 1000 Hz			
Switching frequency with inductive load	max. 0.5 Hz			
Switching frequency on lamp load	max. 10 Hz			
Internal limitation of inductive shut-off voltage	L+ (-52 V)			
Short-circuit protection of output	yes, electronic			
Trigger level	1.5 A			
Number of operating cycle of relay outputs	-			
Switching capacity of contacts	-			
Output data size	16 Byte			
Technical data analog inputs				
Number of inputs	4			
Cable length, shielded	200 m			
Rated load voltage	DC 24 V			
Reverse polarity protection of rated load voltage	✓			
Current consumption from load voltage L+ (without load)	70 mA			
Voltage inputs	✓			
Min. input resistance (voltage range)	120 kΩ			

Signal modules analog | Combination modules

238-2BC00

Order number	238-2BC00				
Input voltage ranges	+1 V ... +5 V 0 V ... +10 V -10 V ... +10 V -400 mV ... +400 mV -4 V ... +4 V				
Operational limit of voltage ranges	+/-0.3% ... +/-0.7%				
Operational limit of voltage ranges with SFU	-				
Basic error limit voltage ranges with SFU	+/-0.2% ... +/-0.5%				
Basic error limit voltage ranges with SFU	-				
Destruction limit current	-				
Current inputs	✓				
Max. input resistance (current range)	90 Ω				
Input current ranges	+4 mA ... +20 mA 0 mA ... +20 mA -20 mA ... +20 mA				
Operational limit of current ranges	+/-0.3% ... +/-0.8%				
Operational limit of current ranges with SFU	-				
Basic error limit current ranges	+/-0.2% ... +/-0.5%				
Radical error limit current ranges with SFU	-				
Destruction limit current inputs (electrical current)	-				
Destruction limit current inputs (voltage)	-				
Resistance inputs	✓				
Resistance ranges	0 ... 600 Ohm 0 ... 3000 Ohm				
Operational limit of resistor ranges	+/-0.4%				
Operational limit of resistor ranges with SFU	-				
Basic error limit	+/-0.2%				
Basic error limit with SFU	-				
Destruction limit resistance inputs	-				
Resistance thermometer inputs	✓				
Resistance thermometer ranges	Pt100 Pt1000 Ni100 Ni1000				
Operational limit of resistance thermometer ranges	+/-0.4% ... +/-1.0%				
Operational limit of resistance thermometer ranges with SFU	-				
Basic error limit thermoresistor ranges	+/-0.2% ... +/-0.5%				
Basic error limit thermoresistor ranges with SFU	-				
Destruction limit resistance thermometer inputs	-				
Thermocouple inputs	-				
Thermocouple ranges	-				
Operational limit of thermocouple ranges	-				

Signal modules analog Combination modules						
238-2BC00						

Order number	238-2BC00			
Operational limit of thermocouple ranges with SFU	-			
Basic error limit thermoelement ranges	-			
Basic error limit thermoresistor ranges with SFU	-			
Destruction limit thermocouple inputs	-			
Programmable temperature compensation	-			
External temperature compensation	-			
Internal temperature compensation	-			
Internal temperature compensation	-			
Technical unit of temperature measurement	-			
Resolution in bit	16			
Measurement principle	Sigma-Delta			
Basic conversion time	7 ms - 272 ms			
Noise suppression for frequency	50 Hz and 60 Hz			
Initial data size	8 Byte			
Technical data analog outputs				
Number of outputs	2			
Cable length, shielded	200 m			
Rated load voltage	DC 24 V			
Reverse polarity protection of rated load voltage	✓			
Current consumption from load voltage L+ (without load)	70 mA			
Voltage output short-circuit protection	✓			
Voltage outputs	✓			
Min. load resistance (voltage range)	1 kΩ			
Max. capacitive load (current range)	1 μF			
Max. inductive load (current range)	30 mA			
Output voltage ranges	-10 V ... +10 V +1 V ... +5 V 0 V ... +10 V			
Operational limit of voltage ranges	+/-0.4% ... +/-0.8%			
Basic error limit voltage ranges with SFU	+/-0.2% ... +/-0.4%			
Destruction limit against external applied voltage	-			
Current outputs	✓			
Max. in load resistance (current range)	500 Ω			
Max. inductive load (current range)	10 mH			
Max. inductive load (current range)	13 V			
Output current ranges	-20 mA ... +20 mA 0 mA ... +20 mA 0 mA ... +20 mA			
Operational limit of current ranges	+/-0.3% ... +/-0.8%			
Radical error limit current ranges with SFU	+/-0.2% ... +/-0.5%			
	-			
Settling time for ohmic load	0.3 ms			
Settling time for capacitive load	1 ms			
Settling time for inductive load	0.5 ms			

Signal modules analog | Combination modules

238-2BC00

Order number	238-2BC00				
Resolution in bit	12				
Conversion time	1.50 ms				
Substitute value can be applied	yes				
Output data size	4 Byte				
Status information, alarms, diagnostics					
Status display	yes				
Interrupts	yes				
Process alarm	yes, parameterizable				
Diagnostic interrupt	yes, parameterizable				
Diagnostic functions	yes				
Diagnostics information read-out	possible				
Supply voltage display	green LED per group				
Group error display	red SF LED				
Channel error display	none				
Isolation					
Between channels	-				
Between channels of groups to	-				
Between channels and backplane bus	✓				
Between channels and power supply	✓				
Max. potential difference between circuits	-				
Max. potential difference between inputs (U _{cm})	DC 4 V				
Max. potential difference between Mana and Mintern (U _{iso})	-				
Max. potential difference between inputs and Mana (U _{cm})	-				
Max. potential difference between inputs and Mintern (U _{iso})	DC 75 V/ AC 60 V				
Max. potential difference between Mintern and outputs	-				
Insulation tested with	DC 500 V				
Datasizes					
Input bytes	8 + 16				
Output bytes	4 + 16				
Parameter bytes	18 + 71				
Diagnostic bytes	12 + 12				
Housing					
Material	PPE / PA 6.6				
Mounting	Profile rail 35 mm				
Mechanical data					
Dimensions (WxHxD)	50.8 mm x 76 mm x 88 mm				
Weight	150 g				
Environmental conditions					
Operating temperature	0 °C to 60 °C				
Storage temperature	-25 °C to 70 °C				
Certifications					
UL508 certification	yes				

Connections, Interfaces

Signal modules analog Combination modules					
238-2BC00					

238-2BC00



AI

1 L+ +DC 24 V

2

3 V CH0

4 A

5

6 V CH1

7 A

8

9 V CH2

10 A

11

12 V CH3

13

14 CH4

15

16 CH5

17

18 M ANA

DI

1 L+ +DC 24 V

2 (A1)

3 (B1)

4 (A2)

5 (B2)

6 (A3)

7 (B3)

8 (G1)

9 (L1)

10 (G2)

11 (L2)

12 (G3)

13 (L3)

DIO

14 +DC 24 V

15

16

17 M

18 M

Communication processors



Structure and Function

Communications processors are used to connect different target and source systems, e.g. via Ethernet to higher-level ERP systems or serially to scanners, printers and other peripherals.

CP 240 - serial

The communication processors CP 240 serial enable the serial process coupling to different target and source systems. Depending on the module they have a RS232C and/or a RS485 interface.

CP 240 - EnOcean

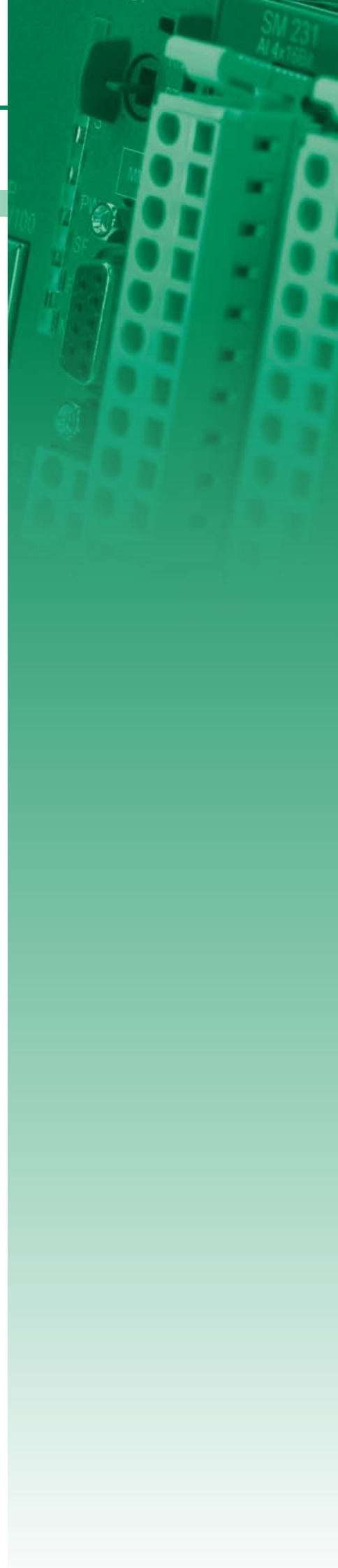
The CP 240 EnOcean enables process coupling on the basis of the EnOcean wireless communication. EnOcean is a battery-free radio system that, due to the short signal duration of 0.5 ms and 10 mW transmitting power, has an energy requirement of only 50 µWs. Here, the system uses the energy from the smallest changes in pressure or temperature to power the sensors.

CP 240 - M-Bus

In the case of the CP 240 M-Bus, the process coupling takes place on the basis of the M-Bus communication. The M-Bus System (Metering Bus) is a European-standardized 2-wire fieldbus for acquiring consumption data. Here, the data is transmitted serially via a reverse polarity protected 2-wire line from slave systems (meters) to a master system.

Characteristics

- Support for all standard protocols (ASCII, STX/ETX, 3964(R), RK512 and Modbus (master, slave))
- Internal communication via VIPA FCs
- Compact design
- LED status indicator
- Electrically isolated to the backplane bus
- Assembly with 35 mm profile rail
- 24 month warranty



Overview

Order no.	Name/Description	Page
RS232/422/485 and other CPs		
240-1DA10	CM 240 - Mini-switch › 4 Ports for 10/100 MBit/s › "plug and play" through Auto-MDI/MDIX-crossover for 100BASE-TX and 10BASE-T › LEDs for activity, speed and collision	372
240-1BA20	CP 240 - Communication processor › RS232 interface	372
240-1CA20	CP 240 - Communication processor › RS485 interface	372
240-1CA21	CP 240 - Communication processor › RS422/485 interface	372
240-1EA20	CP 240 - Communication processor › 16 Byte parameter data › The transceiver module works at 868.3 MHz	375
240-1FA20	CP 240 - Communication processor › M-Bus master, potential separated › up to 6 slaves	375
Fieldbus master modules		
208-1CA00	IM 208CAN - CANopen master › CANopen master › 125 CAN slaves connectable › Project engineering under VIPA WinCoCT › 40 Transmit PDOs, 40 Receive PDOs	378
208-1DP01	IM 208DP - PROFIBUS-DP master › PROFIBUS-DP master › 125 DP slaves connectable	378
208-1DP11	IM 208DPO - PROFIBUS-DP master › PROFIBUS-DP master › 16 DP slaves connectable › FO interface	378

RS232/422/485 and other CPs

Communication processors | RS232/422/485 and other CPs

240-1DA10 240-1BA20 240-1CA20 240-1CA21	240-1EA20 240-1FA20					
--	------------------------	--	--	--	--	--

Order number	240-1DA10	240-1BA20	240-1CA20	240-1CA21
Figure				
Type	CM 240, 4port Mini-Switch	CP 240, PtP RS232	CP 240, RS485	CP 240, RS422/485
General information				
Note	-	-	-	-
Features	4 Ports for 10/100 MBit/s "plug and play" through Auto-MDI/MDIX-crossover for 100BASE-TX and 10BASE-T - LEDs for activity, speed and collision	RS232 interface	RS485 interface	RS422/485 interface
Current consumption/power loss				
Current consumption from backplane bus	450 mA	150 mA	150 mA	150 mA
Power loss	2 W	0.75 W	0.75 W	0.75 W
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	possible	possible	possible
Supply voltage display	none	yes	yes	yes
Group error display	none	red LED	red LED	red LED
Channel error display	none	none	none	none
Functionality Sub-D interfaces				
Type	-	-	-	-
Type of interface	-	RS232	RS485	RS422/485
Connector	-	Sub-D, 9-pin, male	Sub-D, 9-pin, female	Sub-D, 9-pin, female
Electrically isolated	-	✓	✓	✓
MPI	-	-	-	-
MP ² (MPI/RS232)	-	-	-	-
Point-to-point interface	-	✓	✓	✓
Point-to-point communication				
PtP communication	-	✓	✓	✓
Interface isolated	✓	✓	✓	✓
RS232 interface	-	✓	-	-
RS422 interface	-	-	-	✓
RS485 interface	-	-	✓	✓
Connector	RJ45	Sub-D, 9-pin, male	Sub-D, 9-pin, female	Sub-D, 9-pin, female
Transmission speed, min.	10 Mbit/s	150 bit/s	150 bit/s	150 bit/s
Transmission speed, max.	100 Mbit/s	115.2 kbit/s	115.2 kbit/s	115.2 kbit/s
Cable length, max.	-	15 m	1200 m	1200 m

Communication processors | RS232/422/485 and other CPs

240-1DA10 240-1BA20 240-1CA20 240-1CA21	240-1EA20 240-1FA20					
--	------------------------	--	--	--	--	--

Order number	240-1DA10	240-1BA20	240-1CA20	240-1CA21
Point-to-point protocol				
ASCII protocol	-	✓	✓	✓
STX/ETX protocol	-	✓	✓	✓
3964(R) protocol	-	✓	✓	✓
RK512 protocol	-	✓	✓	✓
USS master protocol	-	-	-	-
Modbus master protocol	-	✓	✓	✓
Modbus slave protocol	-	✓	✓	✓
Special protocols	-	-	-	-
Datasizes				
Input bytes	-	16	16	16
Output bytes	-	16	16	16
Parameter bytes	-	16	16	16
Diagnostic bytes	-	0	0	0
Housing				
Material	PPE / PA 6.6	PPE	PPE	PPE
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm
Weight	50 g	80 g	80 g	80 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

Communication processors RS232/422/485 and other CPs					
240-1DA10 240-1BA20 240-1CA20 240-1CA21	240-1EA20 240-1FA20				

240-1DA10



4 x RJ45



① Transmit +

② Transmit -

③ Receive +

④ -

⑤ -

⑥ Receive -

⑦ -

⑧ -

DC 5 ... 24 V



① Ground

② 0 V

③ + DC 24 V

240-1BA20



RS232



① DCD

② RxD

③ TxD

④ DTR

⑤ GND

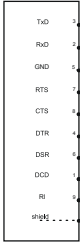
⑥ DSR

⑦ RTS

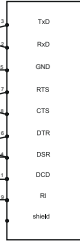
⑧ CTS

⑨ RI

CP240



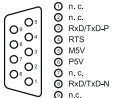
Peripheral



240-1CA20



RS485



① n.c.

② n.c.

③ RxD/TxD-P

④ RTS

⑤ MSV

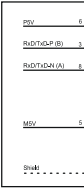
⑥ PSV

⑦ n.c.

⑧ RxD/TxD-N

⑨ n.c.

CP 240



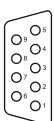
Peripheral



240-1CA21



RS422/485



① n.c.

② Tx-D-P (line B) - RS422

③ Rx-D-P (line B) - (RS422)

④ /Rx-D/TxD-P (line B) - (RS485)

⑤ RTS

⑥ MSV

⑦ PSV

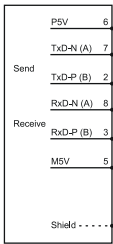
⑧ Tx-D-N (line A) - RS422

⑨ Rx-D-N (line A) - RS422

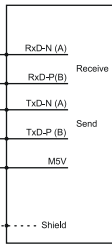
⑩ /Rx-D/TxD-N (line A) - (RS485)

⑪ n.c.

CP 240



Peripheral



RS232/422/485 and other CPs

Communication processors | RS232/422/485 and other CPs

240-1DA10
240-1BA20
240-1CA20
240-1CA21

240-1EA20
240-1FA20

Order number	240-1EA20	240-1FA20			
Figure					
Type	CP 240, EnOcean	CP 240, M-Bus			
General information					
Note	-	-			
Features	▸ 16 Byte parameter data ▸ The transceiver module works at 868.3 MHz	▸ M-Bus master, potential separated ▸ up to 6 slaves			
Current consumption/power loss					
Current consumption from backplane bus	120 mA	300 mA			
Power loss	0.75 W	1.5 W			
Status information, alarms, diagnostics					
Status display	yes	yes			
Interrupts	no	no			
Process alarm	no	no			
Diagnostic interrupt	no	no			
Diagnostic functions	no	no			
Diagnostics information read-out	none	none			
Supply voltage display	yes	yes			
Group error display	red LED	red LED			
Channel error display	none	none			
Functionality Sub-D interfaces					
Type	-	-			
Type of interface	-	-			
Connector	-	-			
Electrically isolated	-	-			
MPI	-	-			
MP21 (MPI/RS232)	-	-			
Point-to-point interface	-	-			
Point-to-point communication					
PtP communication	-	-			
Interface isolated	-	✓			
RS232 interface	-	-			
RS422 interface	-	-			
RS485 interface	-	-			
Connector	SMA antenna socket	-			
Transmission speed, min.	-	300 bit/s			
Transmission speed, max.	9.6 kbit/s	9.6 kbit/s			
Cable length, max.	-	-			

Communication processors RS232/422/485 and other CPs						
240-1DA10 240-1BA20 240-1CA20 240-1CA21	240-1EA20 240-1FA20					

Order number	240-1EA20	240-1FA20		
Point-to-point protocol				
ASCII protocol	-	-		
STX/ETX protocol	-	-		
3964(R) protocol	-	-		
RK512 protocol	-	-		
USS master protocol	-	-		
Modbus master protocol	-	-		
Modbus slave protocol	-	-		
Special protocols	EnOcean	M-Bus master		
Datasizes				
Input bytes	16	16		
Output bytes	16	16		
Parameter bytes	16	16		
Diagnostic bytes	0	0		
Housing				
Material	PPE	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm		
Weight	80 g	80 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

Communication processors | RS232/422/485 and other CPs

240-1DA10 240-1BA20 240-1CA20 240-1CA21	240-1EA20 240-1FA20					
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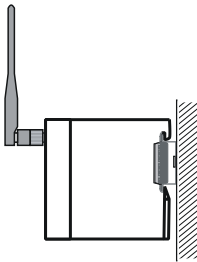
240-1EA20



ANT.



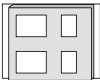
① SMA antenna



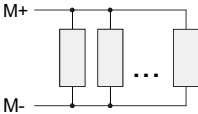
240-1FA20



M-Bus



1 ① M+
2 ② M-



Fieldbus master modules

Communication processors Fieldbus master modules						
208-1CA00						
208-1DP01						
208-1DP11						

Order number	208-1CA00	208-1DP01	208-1DP11	
Figure				
Type	IM 208CAN, CANopen master	IM 208DP, PROFIBUS-DP master	IM 208DP0, PROFIBUS-DP master FO interface	
General information				
Note	-	-	-	
Features	▸ CANopen master ▸ 125 CAN slaves connectable ▸ Project engineering under VIPA WinCoCT ▸ 40 Transmit PDOs, 40 Receive PDOs	▸ PROFIBUS-DP master ▸ 125 DP slaves connectable	▸ PROFIBUS-DP master ▸ 16 DP slaves connectable ▸ FO interface	
Current consumption/power loss				
Current consumption from backplane bus	300 mA	450 mA	450 mA	
Power loss	1.5 W	2 W	2 W	
Status information, alarms, diagnostics				
Status display	yes	yes	yes	
Interrupts	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Process alarm	no	yes, parameterizable	yes, parameterizable	
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Diagnostic functions	yes	yes	yes	
Diagnostics information read-out	possible	possible	possible	
Supply voltage display	none	none	none	
Group error display	red LED	red LED	red LED	
Channel error display	none	none	none	
Functionality Sub-D interfaces				
Type	-	-	-	
Type of interface	CAN	RS485	FOC	
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, female	2-pin FOC POF/HCS	
Electrically isolated	✓	✓	✓	
MPI	-	-	-	
MP ² I (MPI/RS232)	-	-	-	
Point-to-point interface	-	-	-	
Housing				
Material	PPE	PPE	PPE	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	

Communication processors | Fieldbus master modules

208-1CA00
208-1DP01
208-1DP11

Order number	208-1CA00	208-1DP01	208-1DP11	
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	
Weight	80 g	90 g	100 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

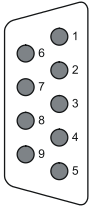
Connections, Interfaces

Communication processors Fieldbus master modules						
208-1CA00 208-1DP01 208-1DP11						

208-1CA00



CAN



① n. c.

② CAN low

③ CAN Ground

④ n. c.

⑤ shield

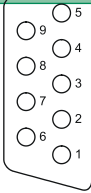
⑥ optional Ground

⑦ CAN high

⑧ n. c.

⑨ n. c.

DP RS485



① shield

② n. c.

③ RxD/TxD-P (line

④ RTS

⑤ M5V

⑥ P5V

⑦ n. c.

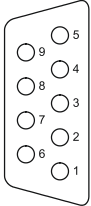
⑧ RxD/TxD-N (line

⑨ n.c.

208-1DP01



DP RS485



① M5V

② n. c.

③ RxD/TxD-P (line B)

④ RTS

⑤ M5V

⑥ P5V

⑦ n. c.

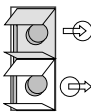
⑧ RxD/TxD-N (line A)

⑨ n.c.

208-1DP11



LWL



① Rx

② Tx

380

B)

A)

SLIO

100V

200V

300S

500S

HMI

Teleservice

StarterKits

Safety

Solutions

Software

Accessories

Appendix

Function modules



Structure and Function

Function modules are intelligent modules, the technological tasks such as position determination, counting and positioning, and other complex functions in the automation run autonomously.

FM 250 - SSI Modules

The SSI module enables the connection of absolute coded reading recorders with an SSI interface. The module converts the serial information of the reading recorder into parallel information and makes this available to the controller. There is a possibility to transmit the data in gray or binary code. In addition to the SSI signals clock, data and encoder supply there are two additional outputs that can be set or reset when crossing.

FM 250 - Counter

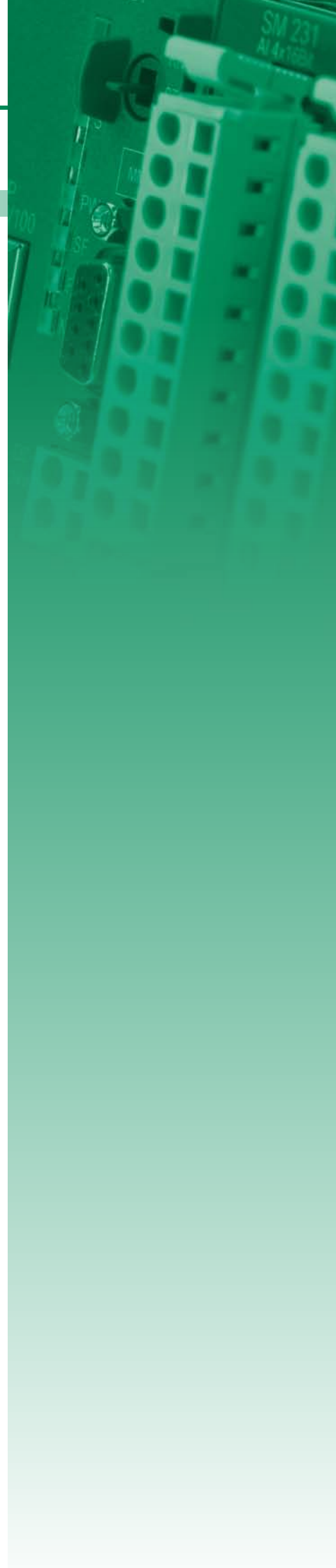
The counter counts the pulses of the connected sensor and processes these stimuli according to the selected module. The module has 2 or 4 channels at a width of 32 bit or 16 bit respectively, with 20 counter modes and two DC 24 V outputs, which are controlled depending on the mode.

FM 253/254 – Positioning Modules

Positioning modules can be used for point-to-point positioning and for complex travel profiles with the highest standards of accuracy, dynamism and speed. The FM 253 is a Positioning module for controlling a stepper motor. Stepper motors are used when maximum torque at low speeds is required and the target position is to be achieved and maintained without overshooting. The FM 254 is a positioning module for controlling a servo drive. The module operates independently and is controlled by a corresponding application program from the CPU. The module has 3 inputs for connecting limit switches and can control 2 outputs.

Characteristics

- Compact design
- LED status indicator
- Electrically isolated to the backplane bus
- Assembly with 35 mm profile rail
- 24 month warranty



Overview

Order no.	Name/Description	Page
Counter modules		
250-1BA00	FM 250 - Counter module › 2/4 channels with 32/16 Bit › DC 24 V or via backplane bus › Free configurable DC 24 V outputs (1 A) › Up to 1 MHz	384
SSI modules		
250-1BS00	FM 250S - SSI module › 1 SSI channel › Direct power supply to the SSI transducer › Baud rate: 100/300/600 kBit/s (default: 300 kBit/s) › 2 configurable digital outputs, one may be used as hold input	388
Positioning modules		
253-1BA00	FM 253 - Positioning module › Positioning module for 1axis drive with stepper › 3 inputs for connecting end switches and 2 outputs	392
254-1BA00	FM 254 - Positioning module › Positioning module for 1axis drive with servo › For drives with an analog set point interface (+/-10 V control voltage) › 3 inputs for connecting end switches and 2 outputs	392

Counter modules

Function modules Counter modules						
250-1BA00						

Order number	250-1BA00			
Figure				
Type	FM 250			
General information				
Note	-			
Features	▸ 2/4 channels with 32/16 Bit ▸ DC 24 V or via backplane bus ▸ Free configurable DC 24 V outputs (1 A) ▸ Up to 1 MHz			
Current consumption/power loss				
Current consumption from backplane bus	80 mA			
Power loss	2.5 W			
Technical data digital inputs				
Number of inputs	6			
Cable length, shielded	1000 m			
Cable length, unshielded	600 m			
Rated load voltage	DC 24 V			
Reverse polarity protection of rated load voltage	✓			
Current consumption from load voltage L+ (without load)	-			
Rated value	-			
Input voltage for signal "0"	DC 0...5 V			
Input voltage for signal "1"	DC 15...28.8 V			
Input voltage hysteresis	-			
Frequency range	-			
Input resistance	2 kΩ			
Input current for signal "1"	14 mA			
Connection of Two-Wire-BERs possible	-			
Max. permissible BERO quiescent current	-			
Input delay of "0" to "1"	0.8 μs			
Input delay of "1" to "0"	0.8 μs			
Number of simultaneously utilizable inputs horizontal configuration	6			
Number of simultaneously utilizable inputs vertical configuration	6			
Input characteristic curve	-			
Initial data size	10 Byte			

Function modules | Counter modules

250-1BA00

Order number	250-1BA00					
Technical data digital outputs						
Number of outputs	2					
Cable length, shielded	1000 m					
Cable length, unshielded	600 m					
Rated load voltage	DC 24 V					
Reverse polarity protection of rated load voltage	✓					
Current consumption from load voltage L+ (without load)	10 mA					
Total current per group, vertical configuration	2 A					
Output voltage signal "1" at min. current	L+ (-125 mV)					
Output voltage signal "1" at max. current	L+ (-0.8 V)					
Output current at signal "1", rated value	1 A					
Output current, permitted range to 40°C	-					
Output current, permitted range to 60°C	-					
Output delay of "0" to "1"	max. 100 µs					
Output delay of "1" to "0"	max. 500 µs					
Minimum load current	-					
Lamp load	10 W					
Parallel switching of outputs for redundant control of a load	not possible					
Parallel switching of outputs for increased power	not possible					
Actuation of digital input	-					
Switching frequency with resistive load	max. 1000 Hz					
Switching frequency with inductive load	max. 0.5 Hz					
Switching frequency on lamp load	max. 10 Hz					
Internal limitation of inductive shut-off voltage	L+ (-52 V)					
Short-circuit protection of output	yes, electronic					
Trigger level	3 A					
Number of operating cycle of relay outputs	-					
Switching capacity of contacts	-					
Output data size	10 Byte					
Technical data counters						
Number of counters	2					
Counter width	1x32 Bit / 2x16 Bit					
Maximum input frequency	1 MHz					
Maximum count frequency	1 MHz					
Mode incremental encoder	✓					
Mode pulse / direction	✓					
Mode pulse	✓					
Mode frequency counter	✓					
Mode period measurement	✓					
Gate input available	✓					
Latch input available	-					

Function modules Counter modules						
250-1BA00						

Order number	250-1BA00			
Reset input available	✓			
Counter output available	✓			
Status information, alarms, diagnostics				
Status display	yes			
Interrupts	no			
Process alarm	no			
Diagnostic interrupt	no			
Diagnostic functions	no			
Diagnostics information read-out	none			
Supply voltage display	yes			
Group error display	red LED			
Channel error display	none			
Isolation				
Between channels	-			
Between channels of groups to	-			
Between channels and backplane bus	✓			
Between channels and power supply	-			
Max. potential difference between circuits	-			
Max. potential difference between inputs (Ucm)	-			
Max. potential difference between Mana and Mintern (Uiso)	-			
Max. potential difference between inputs and Mana (Ucm)	-			
Max. potential difference between inputs and Mintern (Uiso)	-			
Max. potential difference between Mintern and outputs	-			
Insulation tested with	DC 500 V			
Datasizes				
Input bytes	10			
Output bytes	10			
Parameter bytes	4			
Diagnostic bytes	0			
Housing				
Material	PPE / PA 6.6			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm			
Weight	230 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	yes			

Connections, Interfaces

Function modules Counter modules						
250-1BA00						

250-1BA00



1 — L+

2 — IN1 counter 0/1

3 — IN2 counter 0/1

4 — IN3 counter 0/1

5 — OUT0 counter 0/1

6 — IN4 counter 2/3

7 — IN5 counter 2/3

8 — IN6 counter 2/3

9 — OUT1 counter 2/3

10 — M

⊖

DC

24 V

SSI modules

Function modules SSI modules						
250-1BS00						

Order number	250-1BS00				
Figure					
Type	FM 250S				
General information					
Note	-				
Features	▸ 1 SSI channel ▸ Direct power supply to the SSI transducer ▸ Baud rate: 100/300/600 kBit/s (default: 300 kBit/s) ▸ 2 configurable digital outputs, one may be used as hold input				
Current consumption/power loss					
Current consumption from backplane bus	120 mA				
Power loss	1 W				
Technical data digital inputs					
Number of inputs	2				
Cable length, shielded	1000 m				
Cable length, unshielded	600 m				
Rated load voltage	DC 24 V				
Reverse polarity protection of rated load voltage	✓				
Current consumption from load voltage L+ (without load)	-				
Rated value	-				
Input voltage for signal "0"	Differential signal RS422				
Input voltage for signal "1"	Differential signal RS422				
Input voltage hysteresis	-				
Frequency range	-				
Input resistance	-				
Input current for signal "1"	-				
Connection of Two-Wire-BERs possible	-				
Max. permissible BERO quiescent current	-				
Input delay of "0" to "1"	-				
Input delay of "1" to "0"	-				
Number of simultaneously utilizable inputs horizontal configuration	-				
Number of simultaneously utilizable inputs vertical configuration	-				
Input characteristic curve	-				
Initial data size	4 Byte				

Function modules | SSI modules

250-1BS00

Order number	250-1BS00					
Technical data digital outputs						
Number of outputs	2					
Cable length, shielded	1000 m					
Cable length, unshielded	600 m					
Rated load voltage	DC 24 V					
Reverse polarity protection of rated load voltage	✓					
Current consumption from load voltage L+ (without load)	5 mA					
Total current per group, horizontal configuration, 40°C	2 A					
Total current per group, horizontal configuration, 60°C	2 A					
Total current per group, vertical configuration	2 A					
Output voltage signal "1" at min. current	L+ (-0.8 V)					
Output voltage signal "1" at max. current	L+ (-125 mV)					
Output current at signal "1", rated value	1 A					
Output current, permitted range to 40°C	-					
Output current, permitted range to 60°C	-					
Output current at signal "0" max. (residual current)	-					
Output delay of "0" to "1"	max. 100 µs					
Output delay of "1" to "0"	max. 350 µs					
Minimum load current	-					
Lamp load	5 W					
Parallel switching of outputs for redundant control of a load	not possible					
Parallel switching of outputs for increased power	not possible					
Actuation of digital input	-					
Switching frequency with resistive load	max. 1000 Hz					
Switching frequency with inductive load	max. 0.5 Hz					
Switching frequency on lamp load	max. 10 Hz					
Internal limitation of inductive shut-off voltage	L+ (-52 V)					
Short-circuit protection of output	yes, electronic					
Trigger level	1.8 A					
Number of operating cycle of relay outputs	-					
Switching capacity of contacts	-					
Output data size	4 Byte					
Status information, alarms, diagnostics						
Status display	yes					
Interrupts	no					
Process alarm	no					
Diagnostic interrupt	no					
Diagnostic functions	no					
Diagnostics information read-out	none					

Function modules SSI modules						
250-1BS00						

Order number	250-1BS00			
Supply voltage display	yes			
Group error display	yes			
Channel error display	none			
Isolation				
Between channels	-			
Between channels of groups to	-			
Between channels and backplane bus	✓			
Between channels and power supply	-			
Max. potential difference between circuits	-			
Max. potential difference between inputs (Ucm)	-			
Max. potential difference between Mana and Mintern (Uiso)	-			
Max. potential difference between inputs and Mana (Ucm)	-			
Max. potential difference between inputs and Mintern (Uiso)	-			
Max. potential difference between Mintern and outputs	-			
Insulation tested with	DC 500 V			
Datasizes				
Input bytes	4			
Output bytes	4			
Parameter bytes	6			
Diagnostic bytes	0			
Housing				
Material	PPE / PA 6.6			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm			
Weight	100 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	yes			

Connections, Interfaces

Function modules SSI modules						
250-1BS00						

250-1BS00



1 L+

2 Clock +

3 Clock -

4 Direction +

5 Direction -

6 Vers. SSI

7 M SSI

8 E/A .0

9 E/A .1

10 M

DC

24 V

Positioning modules

Function modules Positioning modules						
253-1BA00 254-1BA00						

Order number	253-1BA00	254-1BA00		
Figure				
Type	FM 253	FM 254		
General information				
Note	-	-		
Features	- Positioning module for 1axis drive with stepper 3 inputs for connecting end switches and 2 outputs	- Positioning module for 1axis drive with servo - For drives with an analog set point interface (+/-10 V control voltage) 3 inputs for connecting end switches and 2 outputs		
Current consumption/power loss				
Current consumption from backplane bus	500 mA	200 mA		
Power loss	3 W	2.5 W		
Status information, alarms, diagnostics				
Status display	yes	yes		
Interrupts	no	no		
Process alarm	no	no		
Diagnostic interrupt	no	no		
Diagnostic functions	no	no		
Diagnostics information read-out	none	none		
Supply voltage display	yes	yes		
Group error display	red LED	red LED		
Channel error display	none	none		
Datasizes				
Input bytes	16	16		
Output bytes	16	16		
Parameter bytes	18	18		
Diagnostic bytes	0	0		
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm		
Weight	70 g	130 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

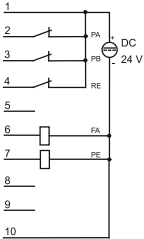
Function modules Positioning modules						
253-1BA00 254-1BA00						

253-1BA00



Stepper

- 1 ○ PULSE_P
- 2 ○ DIR_P
- 3 ○ reserved
- 4 ○ reserved
- 5 ○ Ground
- 6 ○ PULSE_N
- 7 ○ DIR_N
- 8 ○ reserved
- 9 ○ reserved
- 10 ○ reserved



1 PA
2 PB
3 RE
4 PA
5 PE
6 PA
7 PE
8
9
10

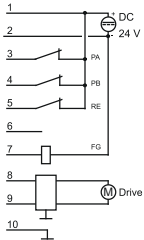
DC 24 V

254-1BA00



ENCODER

- 1 ○ +24 V
- 2 ○ +5 V
- 3 ○ R+
- 4 ○ B+
- 5 ○ A+
- 6 ○ Ground
- 7 ○ R-
- 8 ○ B-
- 9 ○ A-



1 PA
2 PB
3 RE
4 PA
5 PE
6 FG
7
8 Drive
9
10

DC 24 V

Interface modules



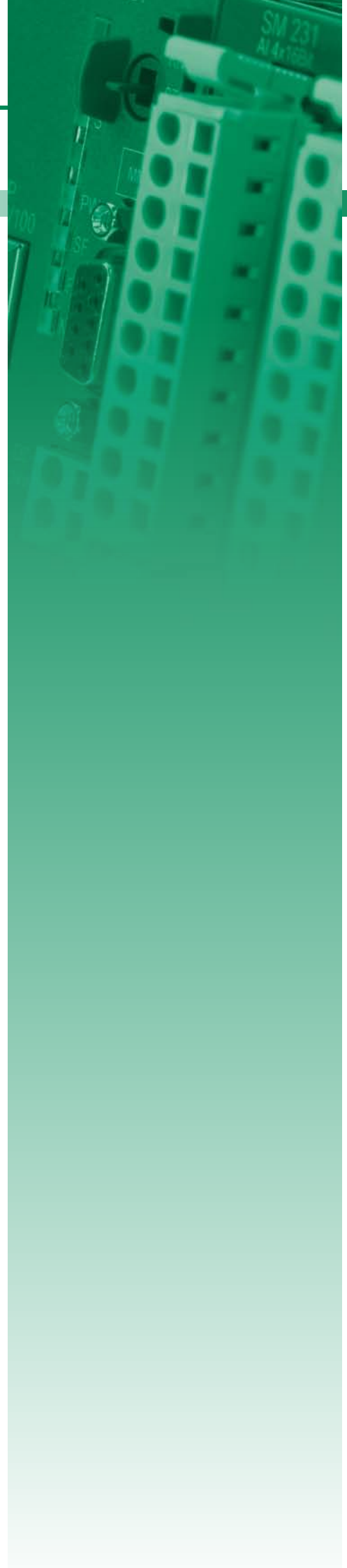
Structure and Function

Interface modules extend deployed control systems with up to three peripheral lines (central max. 32 modules).

Fieldbus slave modules are used for the decentralized expansion of control systems (with a fieldbus master interface in or on the CPU) with up to 128 fieldbus slave modules, plus peripheral modules.

Characteristics (Fieldbus slave modules)

- › Available for PROFIBUS, CANopen, INTERBUS, DeviceNet, Ethernet
- › Cross manufacturer mixed operation is possible
- › Depending on the version also with fiber-optic interface
- › Advanced diagnostics
- › Electrically isolated to the backplane bus
- › LED status indicator
- › Compact design
- › Assembly with 35 mm profile rail
- › 24 month warranty



Overview

Order no.	Name/Description	Page
Row interface connection		
260-1AA00	IM 260 - Interface module ‣ Only be used in conjunction with the PC 288 or a CPU	396
261-1CA00	IM 261 - Interface module ‣ Only be used in conjunction with the PC 288 or a CPU	396
Fieldbus slave modules without I/Os		
253-1CA01	IM 253CAN - CANopen slave ‣ CANopen slave ‣ 10 Rx and 10 Tx PDO ‣ 2 SDOs ‣ PDO linking ‣ PDO mapping	399
253-1CA30	IM 253CAN - CANopen slave ECO ‣ CANopen slave ‣ 10 Rx and 10 Tx PDO ‣ 2 SDOs ‣ PDO linking ‣ PDO mapping	399
253-1DN00	IM 253DN - DeviceNET slave ‣ Group 2 only Device - employs predefined connection set ‣ Baud rates: 125, 250, 500 kBit/s ‣ For max. 32 peripheral modules (8 analog)	399
253-1DP01	IM 253DP - PROFIBUS-DP slave ‣ PROFIBUS-DP slave (DP-V0, DP-V1) ‣ For max. 32 peripheral modules (16 analog) ‣ 244 Byte input and 244 Byte output data	399
253-1DP11	IM 253DPO - PROFIBUS-DP slave ‣ PROFIBUS-DP slave (DP-V0, DP-V1) ‣ For max. 32 peripheral modules (16 analog) ‣ 244 Byte input and 244 Byte output data	402
253-1DP31	IM 253DP - PROFIBUS-DP slave ECO ‣ PROFIBUS-DP slave (DP-V0, DP-V1) ‣ For max. 8 peripheral modules ‣ 244 Byte input and 244 Byte output data	402
253-1IB00	IM 253IBS - INTERBUS slave ‣ INTERBUS slave ‣ For 16 input and 16 output modules	402
253-1NE00	IM 253NET - Ethernet slave ‣ Ethernet coupler with Modbus/TCP and Siemens S5 Header protocol ‣ For max. 32 peripheral modules ‣ Max. 256 Byte I/O data ‣ RJ45 jack 100BaseTX, 10BaseT	402

Row interface connection

Interface modules Row interface connection						
260-1AA00 261-1CA00						

Order number	260-1AA00	261-1CA00		
Figure				
Type	IM 260, Basic interface	IM 261, Row interface		
General information				
Note	-	-		
Features	Only be used in conjunction with the PC 288 or a CPU	Only be used in conjunction with the PC 288 or a CPU		
Technical data power supply				
Power supply (rated value)	DC 24 V	-		
Power supply (permitted range)	DC 20.4...28.8 V	-		
Reverse polarity protection	✓	-		
Current consumption (no-load operation)	50 mA	-		
Current consumption (rated value)	1.9 A	-		
Inrush current	-	-		
Max. current drain at backplane bus	4 A	1.5 A		
Max. current drain load supply	-	-		
Power loss	2 W	1 W		
Status information, alarms, diagnostics				
Status display	yes	yes		
Interrupts	no	no		
Process alarm	no	no		
Diagnostic interrupt	no	no		
Diagnostic functions	no	no		
Diagnostics information read-out	none	none		
Supply voltage display	yes	yes		
Group error display	none	none		
Channel error display	none	none		
Hardware configuration				
Racks, max.	4	1		
Modules per rack, max.	16	16		
Number of digital modules, max.	16	16		
Number of analog modules, max.	16	16		

Interface modules | Row interface connection

260-1AA00 261-1CA00						
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Order number	260-1AA00	261-1CA00		
Housing				
Material	PPE / PA 6.6	PPE		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm		
Weight	100 g	90 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

Interface modules Row interface connection						
260-1AA00 261-1CA00						

260-1AA00



IM 260

Basic interface
OUT





+ DC 24 V
- 0 V

261-1CA00



IM 261

Row interface
IN



OUT



Fieldbus slave modules without I/Os

Interface modules | Fieldbus slave modules without I/Os

253-1CA01	253-1DP11
253-1CA30	253-1DP31
253-1DN00	253-1IB00
253-1DP01	253-1NE00

Order number	253-1CA01	253-1CA30	253-1DN00	253-1DP01
Figure				
Type	IM 253CAN, CANopen slave	IM 253CAN, CANopen slave	IM 253DN, DeviceNET slave	IM 253DP, PROFIBUS-DP slave
General information				
Note	-	-	-	-
Features	▸ CANopen slave ▸ 10 Rx and 10 Tx PDO ▸ 2 SDOs ▸ PDO linking ▸ PDO mapping	▸ CANopen slave ▸ 10 Rx and 10 Tx PDO ▸ 2 SDOs ▸ PDO linking ▸ PDO mapping	▸ Group 2 only Device - employs predefined connection set ▸ Baud rates: 125, 250, 500 kBit/s ▸ For max. 32 peripheral modules (8 analog)	▸ PROFIBUS-DP slave (DP-V0, DP-V1) ▸ For max. 32 peripheral modules (16 analog) ▸ 244 Byte input and 244 Byte output data
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	50 mA	50 mA	50 mA	70 mA
Current consumption (rated value)	800 mA	300 mA	800 mA	1 A
Inrush current	65 A	60 A	65 A	65 A
I ² t	0.85 A²s	0.4 A²s	0.85 A²s	0.85 A²s
Max. current drain at backplane bus	3.5 A	0.8 A	3.5 A	3.5 A
Max. current drain load supply	-	-	-	-
Power loss	2 W	1.5 W	2 W	2.5 W
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	yes, parameterizable	no	yes, parameterizable
Process alarm	no	no	no	yes, parameterizable
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	no	yes, parameterizable
Diagnostic functions	yes, parameterizable	yes, parameterizable	yes	yes, parameterizable
Diagnostics information read-out	possible	possible	none	possible
Supply voltage display	yes	yes	yes	green LED
Service Indicator	-	-	-	-
Group error display	yes	yes	yes	yes
Channel error display	none	none	none	none

Interface modules Fieldbus slave modules without I/Os						
253-1CA01	253-1DP11					
253-1CA30	253-1DP31					
253-1DN00	253-1IB00					
253-1DP01	253-1NE00					

Order number	253-1CA01	253-1CA30	253-1DN00	253-1DP01
Hardware configuration				
Racks, max.	1	1	1	1
Modules per rack, max.	32	8	32	32
Number of digital modules, max.	32	8	32	32
Number of analog modules, max.	16	8	8	16
Communication				
Fieldbus	CANopen	CANopen	DeviceNet	PROFIBUS-DP to EN 50170
Type of interface	CAN	CAN	CAN	RS485
Connector	Sub-D, 9-pin, male	Sub-D, 9-pin, male	5-pin Open Style Connector	Sub-D, 9-pin, female
Topology	Linear bus with bus termination at both ends	Linear bus with bus termination at both ends	Linear bus with bus termination at both ends	Linear bus with bus termination at both ends
Electrically isolated	✓	✓	✓	✓
Number of participants, max.	127	127	64	125
Node addresses	1 - 99	1 - 99	0 - 63	1 - 99
Transmission speed, min.	10 kbit/s	10 kbit/s	125 kbit/s	9.6 kbit/s
Transmission speed, max.	1 Mbit/s	1 Mbit/s	500 kbit/s	12 Mbit/s
Address range inputs, max.	80 Byte	80 Byte	256 Byte	244 Byte
Address range outputs, max.	80 Byte	80 Byte	256 Byte	244 Byte
Number of TxPDOs, max.	10	10	-	-
Number of RxPDOs, max.	10	10	-	-
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm
Weight	100 g	90 g	90 g	100 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

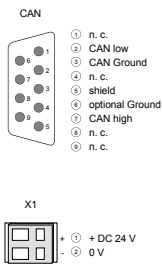
Connections, Interfaces

Interface modules | Fieldbus slave modules without I/Os

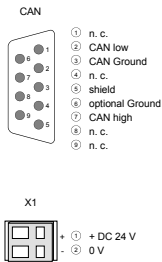
253-1CA01
253-1CA30
253-1DN00
253-1DP01

253-1DP11
253-1DP31
253-1IB00
253-1NE00

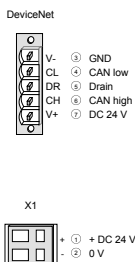
253-1CA01



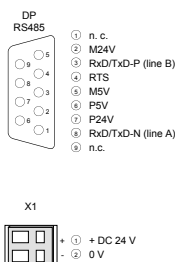
253-1CA30



253-1DN00



253-1DP01



Fieldbus slave modules without I/Os

Interface modules Fieldbus slave modules without I/Os						
253-1CA01	253-1DP11					
253-1CA30	253-1DP31					
253-1DN00	253-1IB00					
253-1DP01	253-1NE00					

Order number	253-1DP11	253-1DP31	253-1IB00	253-1NE00
Figure				
Type	IM 253DPO, PROFIBUS-DP slave	IM 253DP, PROFIBUS-DP slave	IM 253IBS, INTERBUS slave	IM 253NET, Ethernet slave
General information				
Note	-	-	-	-
Features	▸ PROFIBUS-DP slave (DP-V0, DP-V1) ▸ For max. 32 peripheral modules (16 analog) ▸ 244 Byte input and 244 Byte output data	▸ PROFIBUS-DP slave (DP-V0, DP-V1) ▸ For max. 8 peripheral modules ▸ 244 Byte input and 244 Byte output data	▸ INTERBUS slave ▸ For 16 input and 16 output modules	▸ Ethernet coupler with Modbus/TCP and Siemens S5 Header protocol ▸ For max. 32 peripheral modules ▸ Max. 256 Byte I/O data ▸ RJ45 jack 100BaseTX, 10BaseT
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	70 mA	50 mA	50 mA	80 mA
Current consumption (rated value)	1 A	300 mA	800 mA	1 A
Inrush current	65 A	60 A	60 A	65 A
I _{Δt}	0.85 A²s	0.4 A²s	0.6 A²s	0.85 A²s
Max. current drain at backplane bus	3.5 A	0.8 A	3.5 A	3.5 A
Max. current drain load supply	-	-	-	-
Power loss	2.5 W	1.5 W	2 W	2.5 W
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	yes, parameterizable	no	no
Process alarm	yes, parameterizable	yes, parameterizable	no	no
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	no	no
Diagnostic functions	yes, parameterizable	yes, parameterizable	no	no
Diagnostics information read-out	possible	possible	none	possible
Supply voltage display	green LED	green LED	green LED	yes
Service Indicator	-	-	-	-
Group error display	red SF LED	red SF LED	red LED	red LED
Channel error display	none	none	none	none
Hardware configuration				
Racks, max.	1	1	1	1
Modules per rack, max.	32	8	16	32
Number of digital modules, max.	32	8	16	32
Number of analog modules, max.	16	8	4	16

Interface modules | Fieldbus slave modules without I/Os

253-1CA01 253-1CA30 253-1DN00 253-1DP01	253-1DP11 253-1DP31 253-1IB00 253-1NE00					
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Order number	253-1DP11	253-1DP31	253-1IB00	253-1NE00
Communication				
Fieldbus	PROFIBUS-DP to EN 50170	PROFIBUS-DP to EN 50170	INTERBUS-S to DIN 19258	Ethernet MODBUS/TCP and Siemens S5 Header
Type of interface	FOC	RS485	RS422	Ethernet 10/100 MBit
Connector	2-pin FOC POF/HCS	Sub-D, 9-pin, female	Sub-D, 9-pin, male (in) and female (out)	RJ45
Topology	Line structure with two-wire FOC	Linear bus with bus termination at both ends	Ring with integrated return line	Star topology
Electrically isolated	✓	✓	✓	✓
Number of participants, max.	125	125	256	8
Node addresses	1 - 99	1 - 125	-	IP V4 address
Transmission speed, min.	9.6 kbit/s	9.6 kbit/s	-	10 Mbit/s
Transmission speed, max.	12 Mbit/s	12 Mbit/s	500 kbit/s	100 Mbit/s
Address range inputs, max.	244 Byte	244 Byte	20 Byte	256 Byte
Address range outputs, max.	244 Byte	244 Byte	20 Byte	256 Byte
Number of TxPDOs, max.	-	-	-	-
Number of RxPDOs, max.	-	-	-	-
Housing				
Material	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6	PPE / PA 6.6
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm	25.4 mm x 76 mm x 78 mm
Weight	110 g	90 g	100 g	90 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

Interface modules Fieldbus slave modules without I/Os						
253-1CA01 253-1CA30 253-1DN00 253-1DP01	253-1DP11 253-1DP31 253-1IB00 253-1NE00					

253-1DP11



LWL

IN

- ① Send
- ② Receive

OUT

- ③ Send
- ④ Receive

X1

- ① + DC 24 V
- ② 0 V

253-1DP31



DP slave RS485

- ① n.c.
- ② M24V
- ③ RxD/TxD-P (line B)
- ④ RTS
- ⑤ MSV
- ⑥ P5V
- ⑦ P24V
- ⑧ RxD/TxD-N (line A)
- ⑨ n.c.

X1

- ① + DC 24 V
- ② 0 V

253-1IB00



IBS Inbound bus line

- ① DO
- ② DI
- ③ GND1
- ④ GND
- ⑤ n.c.
- ⑥ IDO
- ⑦ DI1
- ⑧ +5V
- ⑨ reserved

DC 24 V

- 1 +
- 2 -

IBS Outbound bus line

- ① DO
- ② DI
- ③ GND1
- ④ GND
- ⑤ n.c.
- ⑥ IDO
- ⑦ DI1
- ⑧ +5V
- ⑨ reserved

253-1NE00



NET RJ45

- ① Transmit +
- ② Transmit -
- ③ Receive +
- ④ -
- ⑤ -
- ⑥ Receive -
- ⑦ -
- ⑧ -

X1

- ① + DC 24 V
- ② 0 V

200V accessories



Structure and Function

System accessories expand the use of the system and facilitate starting.

Note: Front connectors and label strips are supplied with the modules.

Memory Extension

MMC cards can be used to store program and data.

Bus Connectors

By using backplane bus connectors, communication between the modules is realized. The backplane bus connectors are insulated and available in various designs (1, 2, 4 or 8 times width).

35 mm Profile Rail

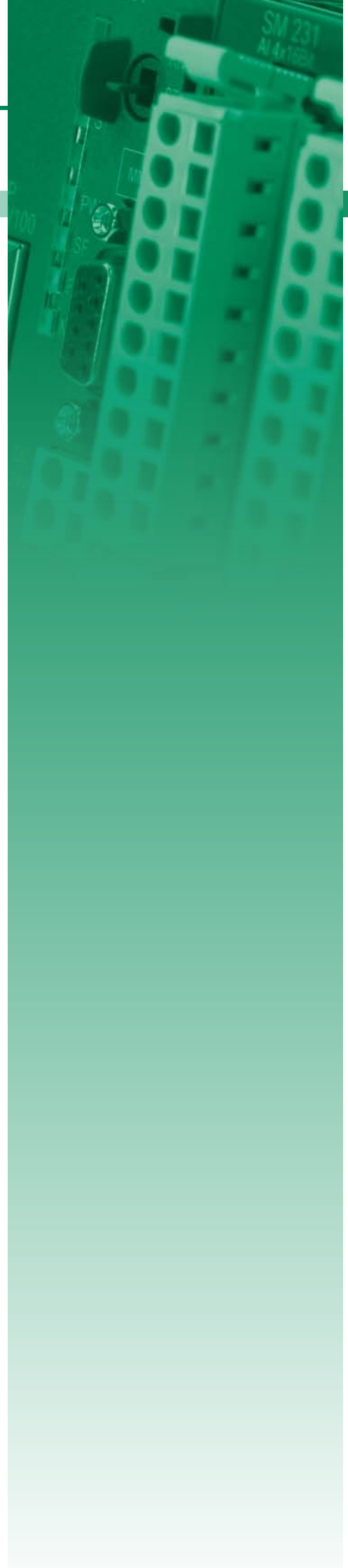
With the help of 35 mm profile rails, the respective modules can be mounted directly on the mounting surface. The profile rail is can be ordered in various lengths.

Front Connectors

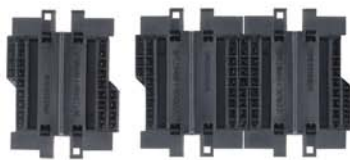
The front connectors are supplied with the CPU and signal modules, but can also be ordered separately as spare parts.

Manuals

The technical documentation of the respective modules encompasses various manuals with the necessary hardware and programming information, detailed descriptions of each module, and instructions for structure and assembly.



Bus connectors



Order number	Type	Description	Note
290-0AA10	Bus connector	1-tier	
290-0AA20	Bus connector	2-tier	
290-0AA40	Bus connector	4-tier	
290-0AA80	Bus connector	8-tier	

35 mm profile rail



Order number	Type	Description	Note
290-1AF00	35 mm profile rail	length 2000 mm	
290-1AF30	35 mm profile rail	length 530 mm	

Front connector



Order number	Type	Description	Note
292-1AF00	Front connector	10 pin with cage clamps (included in the scope of delivery of signal modules)	
292-1AH00	Front connector	18 pin with cage clamps (included in the scope of delivery of signal modules)	

Cables



Order number	Type	Description	Note
260-1XY05	Connection cable	Connection cable for interface modules, length 0.5 m	
260-1XY10	Connection cable	Connection cable for interface modules, length 1.0 m	
260-1XY20	Connection cable	Connection cable for interface modules, length 2.0 m	
260-1XY25	Connection cable	Connection cable for interface modules, length 2.5 m	

Antennas, connectors etc.



Order number	Type	Description	Note
970-0CM00	CM 240 - Jack	For communication processor CM 240 - mini switch, external DC 24 V power supply	
970-0DN00	CM 240 - Jack	For communication processor CM 240 - mini switch, external DC 24 V power supply	
240-0EA00	CP 240 - Portable Antenna	EnOcean Antenna portable, incl. SMA connector	
240-0EA10	CP 240 - Magnetic base antenna	EnOcean Antenna magnetic base, incl. 150 cm cable and SMA connector	

MMC memory



Order number	Type	Description	Note
953-0KX10	MMC - MultiMediaCard	Extension memory for VIPA CPUs 11x, 21x, 24x, 31x, 51x, and 208-1DP01, CC 03 (for load memory not necessary)	

Labelling

Order number	Type	Description	Note
292-1XY10	Labelling cards	I/O labelling, perforated, 10 sheets each 8 cards	
292-1XY20	Clip-on cards	Module labelling, perforated, 10 sheets each 108 cards	
292-1XY00	Labelling cards	I/O labelling, with transparent cover foil, 10 pieces	

Manuals and operating instructions



Order number	Title	Contents	Language
HB97D	Manual System 200V - Compendium, German	HB97D_PS-CM, HB97D_SM, HB97D_CP, HB97D_IM, HB97D_FM	DE
HB97E	Manual System 200V - Compendium, English	HB97E_PS-CM, HB97E_SM, HB97E_CP, HB97E_IM, HB97E_FM	EN
HB97D_CP	Manual System 200V - German	CP 240 Communication processors	DE
HB97E_CP	Manual System 200V - English	CP 240 Communication processors	EN
HB97D_CPU	Manual System 200V - German	CPU 21x, incl. operations list	DE
HB97E_CPU	Manual System 200V - English	CPU 21x, incl. operations list	EN
HB99D_CPU	Manual System 200V - German	CPU 24x, incl. operations list	DE
HB99E_CPU	Manual System 200V - English	CPU 24x, incl. operations list	EN
HB97D_FM	Manual System 200V - German	FM - Function modules	DE
HB97E_FM	Manual System 200V - English	FM - Function modules	EN
HB97D_IM	Manual System 200V - German	IM - Interface modules	DE
HB97E_IM	Manual System 200V - English	IM - Interface modules	EN
HB97D_PS-CM	Manual System 200V - German	PS-CM - Power supply / Expansion modules	DE
HB97E_PS-CM	Manual System 200V - English	PS-CM - Power supply / Expansion modules	EN
HB97E_SM-AIO	Manual System 200V - English	SM-AIO - Analog Signal modules	EN