Controls

I/O-System 1000

I/O-System 1000

Contents

Product information

Complies with the strictest requirements
The availability of EtherNet/IP-based bus systems lays the foundations for new automation concepts in the field of machine and systems engineering — the performance limits of established bus systems are then eliminated.

The L-force I/O system 1000 offers highly deterministic control of input and output modules, which also includes importing touch probe inputs, such as those required for synchronised movements in clocked production processes. A minimum internal cycle time, in combination with a time stamp, ensures that the I/O system 1000 itself meets the strictest speed requirements here. As such, it is also suitable for use in realtime-based architectures.

At the very first glance, the system impresses with its slimline design, as well as its clearly structured labelling and diagnostics concept. The I/O modules, which offer space for 8 connections, require just 12.5 mm of space on the conventional DIN rail.

User-oriented connection technique
The "internals" of the I/O system are also user friendly down to the last detail: the I/O compound module, consisting of terminal block with backplane bus connection and electronics protected against polarity reversal, has a modular structure. This allows a defective electronic module to changed when maintenance work needs to be performed without the wiring from the base module having to be disconnected. Service engineers know that this eliminates a common source of errors – incorrect wiring. The stepped design of the connection level also offers advantages, including tension spring connection technology and permanent wiring, which has proven itself on standard terminals for years. For the wiring itself, a simple screwdriver is sufficient. The simple and clear system of labelling and wiring for the new system also makes it a breeze to combine modules to create complete stations. The integrated backplane bus allows up to 64 modules to be connected in any desired sequence by simply plugging them in without the need for any wiring.

Compact structure
- Slimline design
- 8 connection points in a width of just 12.5 mm
- Tried-and-tested tension spring technology
- Stair-step shaped, space-saving wiring level
- Consistent separation of electronics and the wiring level
- Up to 64 modules can be connected
- Automatic connection via the backplane bus

Performance and robustness
- Gold-plated contacts guarantee a secure connection between the modules
- Fault-tolerant protocols secure maximum availability – even in the event of individual frame errors
- The large bandwidth of 48 MBits/s allows extremely fast response times without telegram overheads

Product information

Permanent wiring
- 2-part concept: base module and electronic module
- The electronics can be replaced during maintenance work without touching the wiring
- The item designation remains on the base module
- Codes prevent the incorrect module type from being connected

>Fast diagnostics
- Clearly structured labelling and diagnostics concept
- Bright LEDs are easy to see, even in poorly illuminated control cabinets
- One LED and one labelling field is clearly assigned to each channel

Easy connection
- Circuit diagram and connection plan printed directly on the module
- Side: detailed view
- Front: simplified view, also visible when the modules have been installed

Integrated shield connection
- Brackets are available as accessories for shield buses
- Direct installation of standard 10 x 3 busbars on the I/O station
- Shield connection possible with standard cable attachments and shield clamps

No tools required for installation
- Direct snap-in installation on the DIN rail
- Individual module or entire station can be fitted
- Complete blocks can subsequently be attached to the DIN rail
- The release levers remain open, allowing complete stations to be fitted and removed

Skalierbares Versorgungskonzept
- Hauptversorgung ist fester Bestandteil des Buskopplers und versorgt sowohl Elektronik als auch die I/O-Ebene
- Optional zusätzliche I/O-Versorgung, falls mehr als 10 A Ausgangsstrom benötigt werden
- Optional zusätzliche I/O- und Elektronikversorgung bei extrem großen Stationsaufbauten
- Jede neue I/O-Versorgung bildet eine Potenzialinsel

Functions and features

Bus coupler module

Mode	Product key
Bus coupler	
CANopen	EPM-S110
PROFIBUS	EPM-S120
EtherCAT	EPM-S130
PROFINET	EPM-S140
DeviceNet	EPM-S150
Modbus TCP/IP	EPM-S160

► Scope of supply: bus coupler module, including power supply module

Input and output modules

Mode		Product key
Digital I/O	Abbreviated designation	
Inputs	DI 2, DC 24 V	EPM-S200
	DI 4, DC 24 V	EPM-S201
	DI 8, DC 24 V	EPM-S202
	DI 4, DC 24 V	EPM-S203
	DI 2, 2 µs, DC 24 V	EPM-S207
	DI 2, NPN, DC 24 V	EPM-S204
	DI 4, NPN, DC 24 V	EPM-S205
	DI 8, NPN, DC 24 V	EPM-S206
Outputs	DO 2, DC 24 V, 0.5 A	EPM-S300
	DO 4, DC 24 V, 0.5 A	EPM-S301
	DO 8, DC 24 V, 0.5 A	EPM-S302
	DO 2, DC 24 V, 2 A	EPM-S306
	DO 4, DC 24 V, 2 A	EPM-S309
	DO2, DC 24 V, 1 µs	EPM-S310
	DO 2, NPN, DC 24 V, 0.5 A	EPM-S303
	DO 4, NPN, DC 24 V, 0.5 A	EPM-S304
	DO 8, NPN, DC 24 V, 0.5 A	EPM-S305
RELAY	Relay 2, AC 230 V, 3 A	EPM-S308

► Scope of supply: I/O compound module (base module + electronic module)

Functions and features

Input and output modules

Mode		Product key
Analog I/O	Abbreviated designation	
Inputs	AI 2, 12-bit, 0 ... 10 V	EPM-S400
	AI 4, 12-bit, 0 ... 10 V	EPM-S401
	AI 2, 12-bit, 0/4 ... 20 mA	EPM-S402
	AI 4, 12-bit, 0/4 ... 20 mA	EPM-S403
	AI 2, 16-bit , -10 V ... 10 V	EPM-S406
	AI 2, 16-bit, 0/4 ... 20 mA	EPM-S408
Outputs	AO 2, 12-bit, 0 ... 10 V	EPM-S500
	AO 4, 12-bit, 0 ... 10 V	EPM-S501
	AO 2, 12-bit, 0/4 ... 20 mA	EPM-S502
	AO 4, 12-bit, 0/4 ... 20 mA	EPM-S503

► Scope of supply: I/O compound module (base module + electronic module)

Function modules

Mode		Product key
Product	Abbreviated designation	
Temperature measurement	AI 4, 16-bit, resistor	EPM-S404
	AI 2, 16-bit, Thermo	EPM-S405
Counter	Counter 1, DC 24 V	EPM-S600
	Counter 2, DC 24 V	EPM-S601
	Counter 1, DC 5 V	EPM-S602
	Counter 2, DC 24 V	EPM-S603
Encoder evaluation	SSI	EPM-S604
Technology modules	PWM	EPM-S620
	RS -232	EPM-S640
	RS -422/485	EPM-S650

► Scope of supply: I/O compound module (base module + electronic module)

Functions and features

Power supply modules

Mode		Product key
Product	Abbreviated designation	
Power supply modules	Power BC	EPM-S700
	Power DC 24 V	EPM-S701
	Power DC 24 V / 24 V	EPM-S702

► Scope of supply for EPM-S700: electronic module
Scope of supply for EPM-S701 ... 702: I/O compound module (base module + electronic module)

Potential distribution modules

Mode		Product key
Product	Abbreviated designation	
Potential distribution modules	Supply 8 x DC 24 V	EPM-S910
	Supply 8 x DC 0 V	EPM-S911
	Supply 4 x DC 24 V / 0 V	EPM-S912

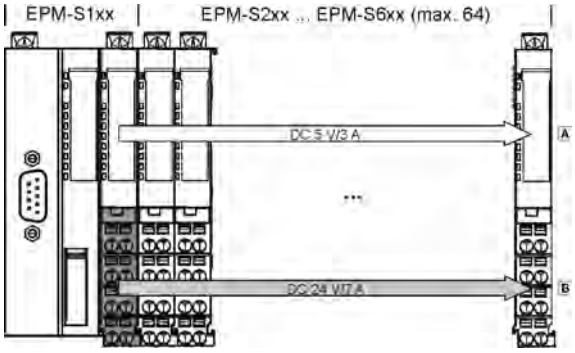
Compiling an I/O system

The I/O system 1000 can be used to create a very individual, tailored system for the most diverse of applications. A total of up to 64 I/O modules can be integrated.

Operation with bus coupler

The bus couplers are used to connect the I/O system to a control via a bus system, in which a 24V power supply module, the so-called main power supply, is integrated.

Properties of the power supply unit:
- 5V electronic supply of the bus coupler itself, as well as the connected modules.
  Maximum output current 3 A
- 24V I/O supply for the inputs and outputs of the connected modules
  Maximum output current 7 A (10 A if no UL-conformity is required in the field of deployment)

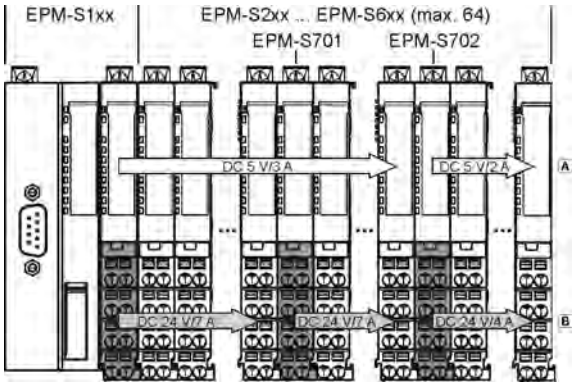


A: Electronics supply
B: I/O supply

Extension with power supply modules

In comprehensive systems, operation with just the DC supply via the bus coupler is sometimes not enough. In cases such as these, the I/O system can be extended with additional power supply modules.

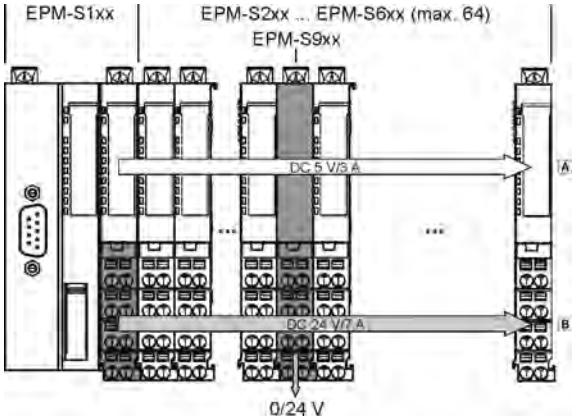
Depending on which supply is insufficient, there are two different modules available:
- Power supply module EPM-S701
  Additional I/O supply (7 A)
- Power supply module EPM-S702
  Additional electronics supply (2 A) and I/O supply (4 A)



A: Electronics supply
B: I/O supply

External supply

The I/O system can also be used to supply 24V consumers. This is particularly useful when using active sensors which need to be connected using three-wire conductors. Power distribution modules EPM-S91□ which, depending on their design, provide24 V and 0 V for connection of external sensor technology are available for this.



A: Electronics supply
B: I/O supply

Standards and operating conditions

Conformity			
			2006/95/EC
CE			Low-Voltage Directive
Approval			
UL 508C			Programmable Controller (File-No. E343358)
Enclosure			
EN 60529			IP20
Climatic conditions			
Storage (EN 60068-2-14)			Temperature: -25 °C ... +70 °C
Transport (EN 60068-14)			Temperature: -25 °C ... +70 °C
Operation (EN 61131-2)			Temperature: 0 °C ... +60 °C
Site altitude			
Amsl	H_{max}	[m]	3000
Vibration resistance			
Vibration (EN 60068-2-6)			1 g
Mechanical shock (EN 60068-2-27)			15 g
Noise emission			
EN 61000-6-4			Limit class A
Noise immunity			
EN 61000-4-2			ESD: Severity 3
EN 61000-4-6			150 kHz ... 80 MHz, 10 V/m 80% AM (1 kHz)
EN 61000-4-3			80 kHz ... 1000 MHz, 10 V/m 80% AM (1 kHz)
EN 61000-4-4			Burst: Severity 3
EN 61000-4-5			Surge: Severity 3
Insulation resistance			
IEC 61131-2			Overvoltage category III Above 2000 m amsl overvoltage category II
Insulation voltage to reference earth/PE			
EN 61800-5-1	U_{AC}	[V]	500
Electrical isolation			
			500 V between I/O supply, electronic supply and fieldbus
Protective insulation of control circuits			
EN 61800-5-1			Safe mains isolation: double/reinforced insulation

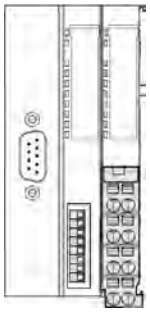
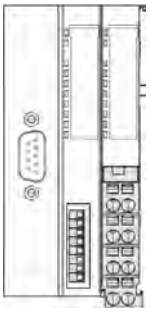
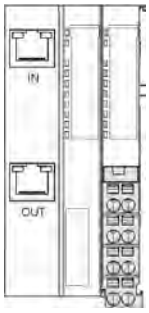
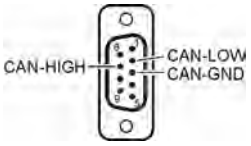
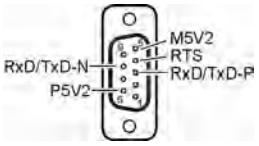
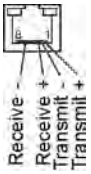
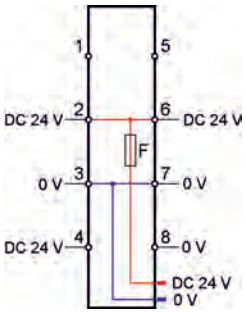
Rated data

					
Product key					
			EPM-S110	EPM-S120	EPM-S130
Mode					
Bus coupler			CANopen	PROFIBUS	EtherCAT
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Max. input current					
	$I_{in,max}$	[A]	0.95	0.90	0.95
Output current					
Backplane bus	I_{out}	[A]	3		
I/O supply	I_{out}	[A]	7 [1)]		
Output voltage					
I/O supply	U_{out}	[V]	24		
Max. number of I/O modules					
			64		
Diagnostics					
Voltage supply			Supply OK / fuse defective		
Bus diagnostics			RUN-LED as per CANopen Ready for operation System error	Ready for operation System error	
Fusing					
			Via power supply module		
Communication					
Communication profile			CANopen, DS301 V4.02	PROFIBUS-DP-V0 PROFIBUS-DP-V1	EtherCAT (CoE)
Node					
			Slave		
Baud rate					
	b		10 kbps ... 1 Mbps	9.6 kbps ... 12 Mbps	100 Mbps
Number of bus nodes					
			127	With repeaters: 125 Without repeaters: 32	max. 65535
Number of PDOs					
			16 Rx / 16 Tx	244 bytes	4 kbytes
Device description file					
			EDS	GSE	XML (Modular Device Profile MDP)

[1)] Can used up to 10 A without UL-approval.

Rated data

					
Product key					
			EPM-S110	EPM-S120	EPM-S130
Mode					
Bus coupler			CANopen	PROFIBUS	EtherCAT
Connection					
			Sub-D connection, 9-pin		RJ45, double
Dimensions					
	h x b x t	[mm]	100 x 48 x 8.6		
Mass					
	m	[kg]	0.16		

Product key	EPM-S110	EPM-S120	EPM-S130
			
			
			

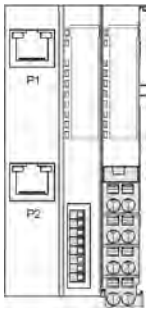
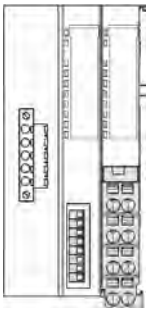
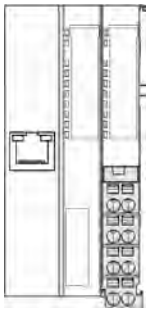
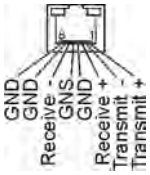
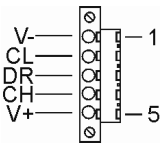
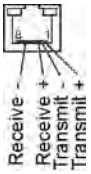
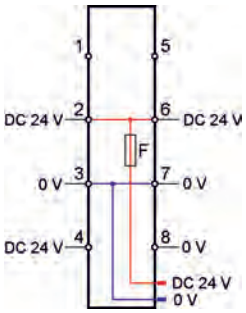
Rated data

					
Product key					
			EPM-S140	EPM-S150	EPM-S160
Mode					
Bus coupler			PROFINET	DeviceNet	Modbus TCP/IP
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Max. input current					
	$I_{in,max}$	[A]	0.95		
Output current					
Backplane bus	I_{out}	[A]	3		
I/O supply	I_{out}	[A]	7 [1)]		
Output voltage					
I/O supply	U_{out}	[V]	24		
Max. number of I/O modules					
			64		
Diagnostics					
Voltage supply			Supply OK / fuse defective		
Bus diagnostics			Ready for operation System error		
Fusing					
			Via power supply module		
Communication					
Communication profile			PROFINET (RT/IRT)	DeviceNet	Modbus TCP/IP
Node					
			Device	Slave	
Baud rate					
	b		100 Mbps	500 kbps	100 Mbps
Number of bus nodes					
			255	64	
Number of PDOs					
			512 bytes	256 bytes	1 kbytes
Device description file					
			GSDML	EDS	

[1)] Can used up to 10 A without UL-approval.

Rated data

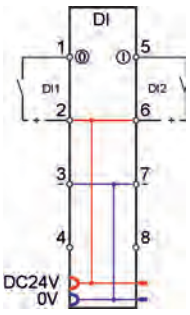
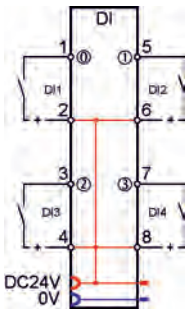
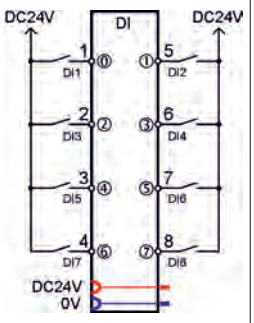
					
Product key					
			EPM-S140	EPM-S150	EPM-S160
Mode					
Bus coupler			PROFINET	DeviceNet	Modbus TCP/IP
Connection					
			RJ45, double	Pluggable terminal 5-pole	RJ45
Dimensions					
	h x b x t	[mm]	100 x 48 x 8.6		
Mass					
	m	[kg]	0.16		

Product key	EPM-S140	EPM-S150	EPM-S160
			
			
			

Rated data

► Positive switching

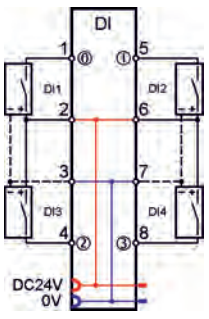
					
Product key					
			EPM-S200	EPM-S201	EPM-S202
Mode					
Abbreviated designation			DI 2, DC 24 V	DI 4, DC 24 V	DI 8, DC 24 V
Digital inputs					
Number			2	4	8
Input filter delay time		[ms]	3		
Connection system			1-/2-/3-wire technology	1-/2-wire technology	1-wire technology
Input level			IEC 61121-2 type 1 "0": 0 ... 5 V "1": 15 ... 28.8 V		
Wiring			PNP		
Input current					
Backplane bus	I_{in}	[A]	55		60
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Communication					
Width in the input process image			8 bits 2 bits with bus coupler EPM-S110	8 bits 4 bits with bus coupler EPM-S110	8 bits
Parameter data (PROFIBUS/PROFINET)					
Diagnostics					
Module status			Ready for operation / error		
Signal status			1 LED per channel		
Time stamp					
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S200	EPM-S201	EPM-S202
			

Rated data

► Positive switching

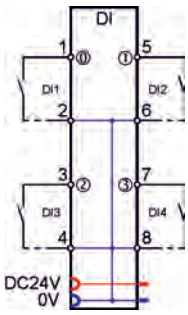
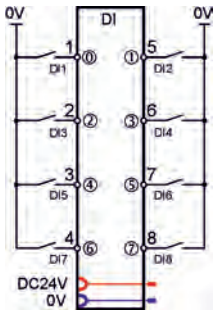
				
Product key				
			EPM-S203	EPM-S207
Mode				
Abbreviated designation			DI 4, DC 24 V	DI 2, 2 µs, DC 24 V
Digital inputs				
Number			4	2
Input filter delay time		[ms]	3	0.002 ... 3
Connection system			1-/2-/3-wire technology	
Input level			IEC 61121-2 type 1 "0": 0 ... 5 V "1": 15 ... 28.8 V	
Wiring			PNP	
Input current				
Backplane bus	I_{in}	[A]	55	85
Rated voltage				
DC	$U_{N, DC}$	[V]	24	
Communication				
Width in the input process image			8 bits 4 bits with bus coupler EPM-S110	4 ... 60 bytes
Parameter data (PROFIBUS/PROFINET)				6 bytes
Diagnostics				
Module status			Ready for operation / error	
Signal status			1 LED per channel	
Time stamp				Yes
Dimensions				
	h x b x t	[mm]	100 x 12.5 x 8.6	
Mass				
	m	[kg]	0.060	

Product key		
	EPM-S203	EPM-S207
		

Rated data

► Negative switching

					
Product key					
			EPM-S204	EPM-S205	EPM-S206
Mode					
Abbreviated designation			DI 2, NPN, DC 24 V	DI 4, NPN, DC 24 V	DI 8, NPN, DC 24 V
Digital inputs					
Number			2	4	8
Input filter delay time		[ms]	3		
Connection system			1-/2-/3-wire technology	1-/2-wire technology	1-wire technology
Input level			IEC 61121-2 type 1 "0": 0 ... 5 V "1": 15 ... 28.8 V		
Wiring			NPN		
Input current					
Backplane bus	I_{in}	[A]	60		65
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Communication					
Width in the input process image			8 bits 2 bits with bus coupler EPM-S110	8 bits 4 bits with bus coupler EPM-S110	8 bits
Diagnostics					
Module status			Ready for operation / error		
Signal status			1 LED per channel		
Time stamp					
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key		
EPM-S204	EPM-S205	EPM-S206
		

Rated data

► Positive switching

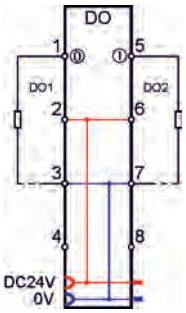
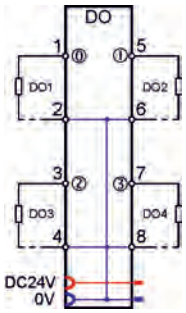
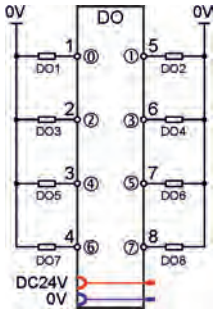
					
Product key					
			EPM-S300	EPM-S301	EPM-S302
Mode					
Abbreviated designation			DO 2, DC 24 V, 0.5 A	DO 4, DC 24 V, 0.5 A	DO 8, DC 24 V, 0.5 A
Digital outputs					
Number			2	4	8
Output filter delay time	T	[µs]	30 ... 175		
Connection system			1-/2-/3-wire technology	1-/2-wire technology	1-wire technology
Wiring			PNP		
Input current					
Backplane bus	I_{in}	[A]	55		65
I/O supply	I_{in}	[A]	5 [1)]	10 [1)]	15 [1)]
Output current					
per channel	I_{out}	[A]	0.50		
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Switching frequency					
Ohmic load	f_{ch}	[Hz]	1000		
Inductive load	f_{ch}	[Hz]	0.50		
Lamp load	f_{ch}	[Hz]	10.0		
Communication					
Width in the input process image					
Width in the output process image			8 bits 2 bits with bus coupler EPM-S110	8 bits 4 bits with bus coupler EPM-S110	8 bits
Parameter data (PROFIBUS/PROFINET)					

[1)] + load current.

Rated data

► Positive switching

					
Product key					
			EPM-S300	EPM-S301	EPM-S302
Mode					
Abbreviated designation			DO 2, DC 24 V, 0.5 A	DO 4, DC 24 V, 0.5 A	DO 8, DC 24 V, 0.5 A
Diagnostics					
Module status			Ready for operation / error / overload		
Signal status			1 LED per channel		
Short-circuit strength					
			Electronic		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S300	EPM-S301	EPM-S302
			

Rated data

► Positive switching

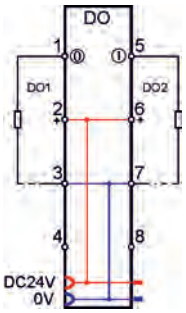
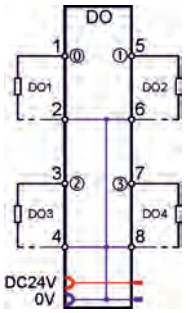
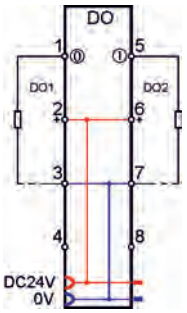
					
Product key					
			EPM-S306	EPM-S309	EPM-S310
Mode					
Abbreviated designation			DO 2, DC 24 V, 2 A	DO 4, DC 24 V, 2 A	DO2, DC 24 V, 1 µs
Digital outputs					
Number			2	4	2
Output filter delay time	T	[µs]	30 ... 175		1
Connection system			1-/2-/3-wire technology	1-/2-wire technology	
Wiring			PNP		
Input current					
Backplane bus	I_{in}	[A]	55		85
I/O supply	I_{in}	[A]	5 [1]	10 [1]	14 [1]
Output current					
per channel	I_{out}	[A]	2.00 [2]		0.50
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Switching frequency					
Ohmic load	f_{ch}	[Hz]	1000		15000
Inductive load	f_{ch}	[Hz]	0.50		15000
Lamp load	f_{ch}	[Hz]	10.0		15000
Communication					
Width in the input process image					4 bytes
Width in the output process image			8 bits 2 bits with bus coupler EPM-S110	8 bits 4 bits with bus coupler EPM-S110	4 ... 60 bytes
Parameter data (PROFIBUS/PROFINET)					2 bytes

[1] + load current.
[2] On the EPM-S309, the max. total current is 4 A.

Rated data

► Positive switching

					
Product key					
			EPM-S306	EPM-S309	EPM-S310
Mode					
Abbreviated designation			DO 2, DC 24 V, 2 A	DO 4, DC 24 V, 2 A	DO2, DC 24 V, 1 µs
Diagnostics					
Module status			Ready for operation / error / overload		
Signal status			1 LED per channel		
Short-circuit strength					
			Electronic		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S306	EPM-S309	EPM-S310
			

Rated data

► Negative switching

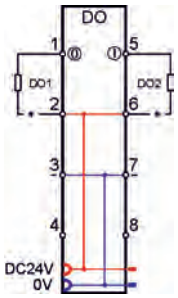
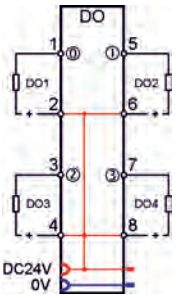
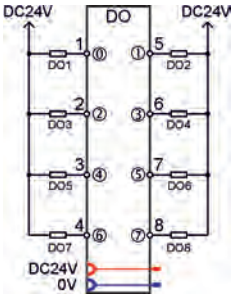
					
Product key					
			EPM-S303	EPM-S304	EPM-S305
Mode					
Abbreviated designation			DO 2, NPN, DC 24 V, 0.5 A	DO 4, NPN, DC 24 V, 0.5 A	DO 8, NPN, DC 24 V, 0.5 A
Digital outputs					
Number			2	4	8
Output filter delay time	T	[µs]	30 ... 175		
Connection system			1-/2-/3-wire technology	1-/2-wire technology	1-wire technology
Wiring			NPN		
Input current					
Backplane bus	I_{in}	[A]	60	65	70
I/O supply	I_{in}	[A]	3 [1)]	5 [1)]	10 [1)]
Output current					
per channel	I_{out}	[A]	0.50		
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Switching frequency					
Ohmic load	f_{ch}	[Hz]	1000		
Inductive load	f_{ch}	[Hz]	0.50		
Lamp load	f_{ch}	[Hz]	10.0		
Communication					
Width in the output process image			8 bits 2 bits with bus coupler EPM-S110	8 bits 4 bits with bus coupler EPM-S110	8 bits

[1)] + load current.

Rated data

► Negative switching

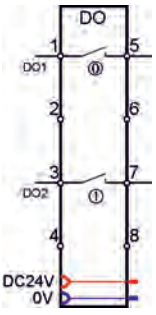
					
Product key					
			EPM-S303	EPM-S304	EPM-S305
Mode					
Abbreviated designation			DO 2, NPN, DC 24 V, 0.5 A	DO 4, NPN, DC 24 V, 0.5 A	DO 8, NPN, DC 24 V, 0.5 A
Diagnostics					
Module status			Ready for operation / error / overload		
Signal status			1 LED per channel		
Short-circuit strength					
			Electronic		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S303	EPM-S304	EPM-S305
			

[1] + load current.

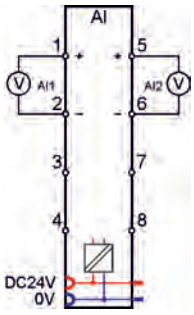
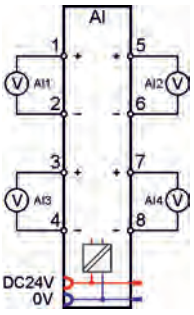
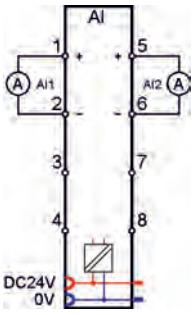
Rated data

			
Product key			
			EPM-S308
Mode			
Abbreviated designation			Relay 2, AC 230 V, 3 A
Relay outputs			
Number			2
Contact			NO contact
Input current			
Backplane bus	I_{in}	[A]	55
Rated voltage			
DC	$U_{N, DC}$	[V]	30
AC	$U_{N, AC}$	[V]	230
Output current			
per channel	I_{out}	[A]	3.00
Switching frequency			
Ohmic load	f_{ch}	[Hz]	100
Communication			
Width in the output process image			8 bits 2 bits with bus coupler EPM-S110
Diagnostics			
Module status			Ready for operation / error
Signal status			1 LED per channel
Dimensions			
	h x b x t	[mm]	100 x 12.5 x 8.6
Mass			
	m	[kg]	0.060

Product key	
	EPM-S308
	

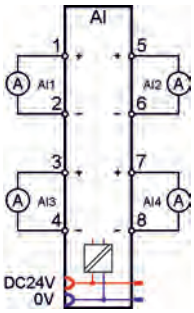
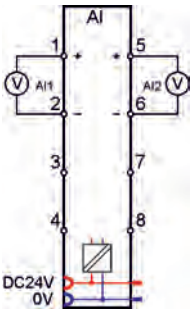
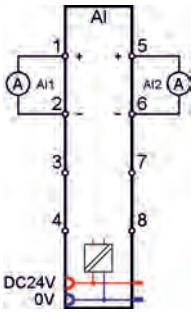
Rated data

					
Product key					
			EPM-S400	EPM-S401	EPM-S402
Mode					
Abbreviated designation			AI 2, 12-bit, 0 ... 10 V	AI 4, 12-bit, 0 ... 10 V	AI 2, 12-bit, 0/4 ... 20 mA
Analog inputs					
Number			2	4	2
Voltage	U_{DC}	[V]	0 ...10		
Current	I	[mA]			0 ... 20 4 ... 20
Input filter limit frequency		[kHz]	1.00		
Resolution			12 bits		
Usage error limit		[%]	± 0.3		± 0.3 at 0 ... 20 mA ± 0.5 at 4 ... 20 mA
Basic error limit (at 25 °C)		[%]	± 0.2		± 0.2 at 0 ... 20 mA ± 0.3 at 4 ... 20 mA
A/D conversion time	T	[ms]	4 (all channels)	8 (all channels)	4 (all channels)
Input current					
Backplane bus	I_{in}	[A]	70		
I/O supply	I_{in}	[A]	15		
Rated voltage					
DC	$U_{N, DC}$	[V]			
Communication					
Width in the input process image			4 bytes	8 bytes	4 bytes
Parameter data (PROFIBUS/PROFINET)			6 bytes	8 bytes	6 bytes
Diagnostics					
Module status			Ready for operation / error		
Signal status			1 LED per channel		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S400	EPM-S401	EPM-S402
			

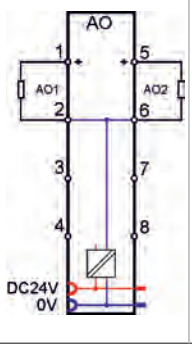
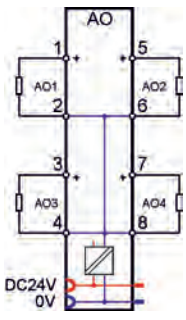
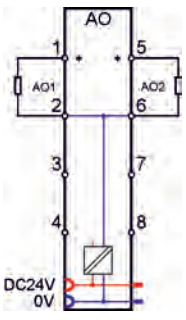
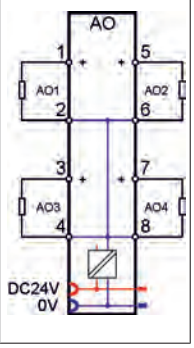
Rated data

Product key					
			EPM-S403	EPM-S406	EPM-S408
Mode					
Abbreviated designation			AI 4, 12-bit, 0/4 ... 20 mA	AI 2, 16-bit , -10 V ... 10 V	AI 2, 16-bit, 0/4 ... 20 mA
Analog inputs					
Number			4	2	
Voltage	U_{DC}	[V]		-10 ... 10	
Current	I	[mA]	0 ... 20 4 ... 20		0 ... 20 4 ... 20
Input filter limit frequency		[kHz]	1.00		
Resolution			12 bits	16 bits	
Usage error limit		[%]	± 0.3 at 0 ... 20 mA ± 0.5 at 4 ... 20 mA	± 0.2	
Basic error limit (at 25 °C)		[%]	± 0.2 at 0 ... 20 mA ± 0.3 at 4 ... 20 mA	± 0.1	
A/D conversion time	T	[ms]	8 (all channels)	0.24 (all channels)	
Input current					
Backplane bus	I_{in}	[A]	70	60	
I/O supply	I_{in}	[A]	15	20	15
Rated voltage					
DC	$U_{N, DC}$	[V]			
Communication					
Width in the input process image			8 bytes	4 bytes	
Parameter data (PROFIBUS/PROFINET)			8 bytes	20 bytes	
Diagnostics					
Module status			Ready for operation / error		
Signal status			1 LED per channel		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S403	EPM-S406	EPM-S408
			

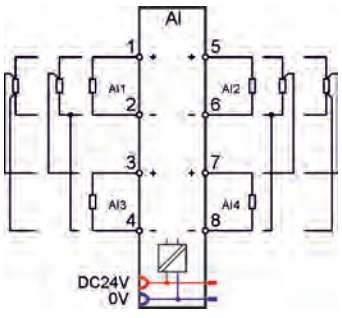
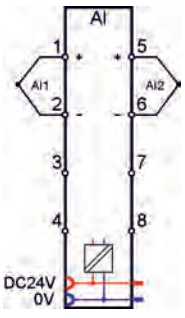
Rated data

						
Product key						
			EPM-S500	EPM-S501	EPM-S502	EPM-S503
Mode						
Abbreviated designation			AO 2, 12-bit, 0 ... 10 V	AO 4, 12-bit, 0 ... 10 V	AO 2, 12-bit, 0/4 ... 20 mA	AO 4, 12-bit, 0/4 ... 20 mA
Analog outputs						
Number			2	4	2	4
Voltage	U_{DC}	[V]	0 ... 10			
Current	I	[mA]			0/4 ... 20	
Resolution			12 bits			
Usage error limit		[%]	± 0.3		± 0.4 at 0 ... 20 mA ± 0.5 at 4 ... 20 mA	
Basic error limit (at 25 °C)		[%]	± 0.2		± 0.2 at 0 ... 20 mA ± 0.3 at 4 ... 20 mA	
D/A conversion time	T	[ms]	2 (all channels)			
Input current						
Backplane bus	I_{in}	[A]	80			
I/O supply	I_{in}	[A]	35		55	95
Rated voltage						
DC	$U_{N, DC}$	[V]				
Communication						
Width in the input process image			4 bytes	8 bytes	4 bytes	8 bytes
Parameter data (PROFIBUS/PROFINET)			8 bytes	10 bytes	8 bytes	10 bytes
Diagnostics						
Module status			Ready for operation / error			
Signal status			1 LED per channel (overload, short circuit, parameter entry error)			
Dimensions						
	h x b x t	[mm]	100 x 12.5 x 8.6			
Mass						
	m	[kg]	0.060			

Product key					
		EPM-S500	EPM-S501	EPM-S502	EPM-S503
					

Rated data

				
Product key				
			EPM-S404	EPM-S405
Mode				
Abbreviated designation			AI 4, 16-bit, resistor	AI 2, 16-bit, Thermo
Analog inputs				
Number			4 / (2)	2
Voltage	U_{DC}	[V]		
Resolution			16 bits	
Usage error limit		[%]	± 0.4	
		[K]		≥ ± 1.5 [1]
Basic error limit (at 25 °C)		[%]	± 0.2	
		[K]		≥ ± 1.0 [1]
A/D conversion time	T	[ms]		4 ... 325 [2]
Connection system			2-wire technology (3-/4-wire technology)	
Input current				
Backplane bus	I_{in}	[A]	75	
I/O supply	I_{in}	[A]	30	
Thermal sensor				
			PT100, PT1000 NI100, NI1000 Resistor	Thermocouple type: Thermocouple type: J, K, N, R, S, T, B, C, E, L
Communication				
Width in the input process image			8 bytes	4 bytes
Parameter data (PROFIBUS/PROFINET)			34 bytes	22 bytes
Diagnostics				
Module status			Ready for operation / error	
Signal status			1 LED per channel	
Dimensions				
	h x b x t	[mm]	100 x 12.5 x 8.6	
Mass				
	m	[kg]	0.060	

Product key		
	EPM-S404	EPM-S405
		

[1] Dependent on the sensor and interference frequency suppression.
[2] Dependent on the configuration and filter settings.

Measuring range

Product key			EPM-S404	EPM-S405
Sensor measuring range				
PT100	T	[°C]	-200 ... 850	
PT1000	T	[°C]	-200 ... 850	
NI100	T	[°C]	-60 ... 250	
NI1000	T	[°C]	-60 ... 250	
Resistor	R	[Ω]	60/600/3000/6000	
Thermocouple type B	T	[°C]		0 ... 1820
Thermocouple type C	T	[°C]		0 ... 2315
Thermocouple type E	T	[°C]		-270 ... 1000
Thermocouple type J	T	[°C]		-210 ... 1200
Thermocouple type K	T	[°C]		-270 ... 1372
Thermocouple type L	T	[°C]		-200 ... 900
Thermocouple type N	T	[°C]		-270 ... 1300
Thermocouple type R	T	[°C]		-50 ... 1769
Thermocouple type S	T	[°C]		-50 ... 1769
Thermocouple type T	T	[°C]		-270 ... 400
Voltage	U_{DC}	[mV]		-80 ... 80

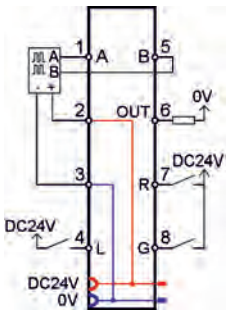
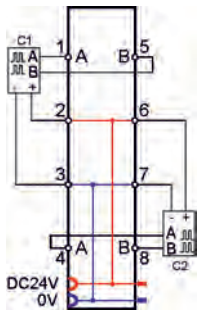
Rated data

				
Product key				
			EPM-S600	EPM-S601
Mode				
Abbreviated designation			Counter 1, DC 24 V	Counter 2, DC 24 V
Digital inputs				
Number			1	2
Input level			HTL	
Input filter limit frequency		[kHz]	100	
Counter width		[Bit]	32	
Counting frequency		[kHz]	400	
Digital outputs				
Number			1	
Input current				
Backplane bus	I_{in}	[A]	75	
I/O supply	I_{in}	[A]	20 [1)]	15 [1)]
Output current				
per channel	I_{out}	[A]	0.50	
Rated voltage				
DC	$U_{N, DC}$	[V]	24	
Communication				
Width in the input process image			12 bytes	
Width in the output process image			10 bytes	12 bytes
Parameter data (PROFIBUS/PROFINET)			21 bytes	42 bytes

[1)] + encoder power consumption.

Rated data

				
Product key				
			EPM-S600	EPM-S601
Mode				
Abbreviated designation			Counter 1, DC 24 V	Counter 2, DC 24 V
Diagnostics				
Module status			Ready for operation / error	
Signal status			1 LED per counter input 1 LED per control input 1 LED per output	
Counter function				
			Read, set Latch function	Read, set
Alarm function				
			Yes	
Control inputs				
			Latch, reset, gate	
Dimensions				
	h x b x t	[mm]	100 x 12.5 x 8.6	
Mass				
	m	[kg]	0.060	

Product key		
	EPM-S600	EPM-S601
		

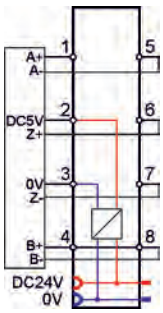
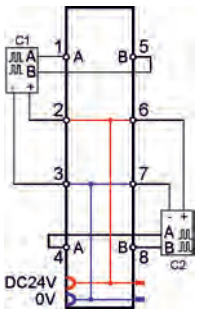
Rated data

				
Product key				
			EPM-S602	EPM-S603
Mode				
Abbreviated designation			Counter 1, DC 5 V	Counter 2, DC 24 V
Digital inputs				
Number			1	2
Input level			TTL	HTL
Input filter limit frequency		[kHz]	500	100
Counter width		[Bit]	32	
Counting frequency		[kHz]	2000	400
Digital outputs				
Number				
Input current				
Backplane bus	I_{in}	[A]	75	100
I/O supply	I_{in}	[A]	20 [1)]	15 [1)]
Output current				
per channel	I_{out}	[A]		
Rated voltage				
DC	$U_{N, DC}$	[V]		
Communication				
Width in the input process image			8 bytes	12 bytes
Width in the output process image			10 bytes	4 bytes
Parameter data (PROFIBUS/PROFINET)			22 bytes	8 bytes

[1)] + encoder power consumption.

Rated data

				
Product key				
			EPM-S602	EPM-S603
Mode				
Abbreviated designation			Counter 1, DC 5 V	Counter 2, DC 24 V
Diagnostics				
Module status			Ready for operation / error	
Signal status			1 LED per counter input 1 LED per control input 1 LED per output	
Counter function				
			Read, set	Read
Alarm function				
			Yes	
Control inputs				
			Reset	
Dimensions				
	h x b x t	[mm]	100 x 12.5 x 8.6	
Mass				
	m	[kg]	0.060	

Product key		
	EPM-S602	EPM-S603
		

3.2

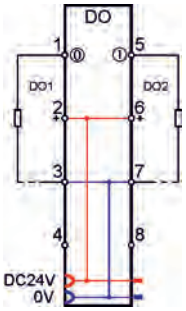
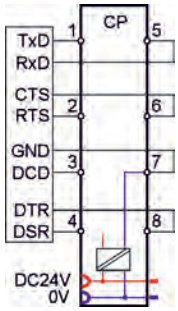
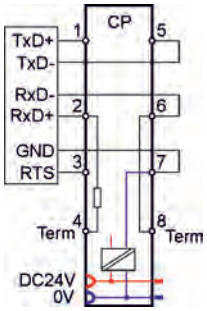
Rated data

					
Product key					
			EPM-S620	EPM-S640	EPM-S650
Mode					
Abbreviated designation			PWM	RS -232	RS -422/485
Outputs					
Number			2		
Level				RS 232	RS 422 / 485
Delay time					
	T	[µs]	1		
Switching frequency					
	f_{ch}	[kHz]	20		
Input current					
Backplane bus	I_{in}	[A]	85	100	
I/O supply	I_{in}	[A]	15 [1)]	10 [1)]	
Output current					
per channel	I_{out}	[A]	0.50		
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Communication					
Hardware handshake				RTS/CTS	
Protocols				ASCII, STX/ETX, 3964 (R)	
Width in the input process image			4 bytes	max. 60 bytes	
Width in the output process image			12 bytes	max. 60 bytes	
Parameter data (PROFIBUS/PROFINET)			8 bytes	17 bytes	
Max. baud rate					
	b	[kBit/s]		115	

[1)] + load current.

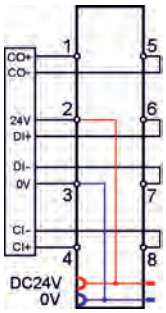
Rated data

					
Product key					
			EPM-S620	EPM-S640	EPM-S650
Mode					
Abbreviated designation			PWM	RS -232	RS -422/485
Diagnostics					
Module status			Ready for operation / error		
Signal status			1 LED per channel	1 TxD LED, 1 RxD LED	
Short-circuit strength					
			Electronic		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 8.6		
Mass					
	m	[kg]	0.060		

Product key			
	EPM-S620	EPM-S640	EPM-S650
			

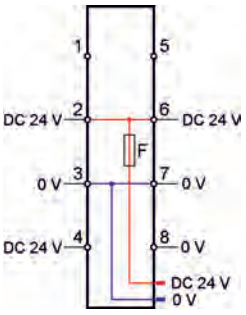
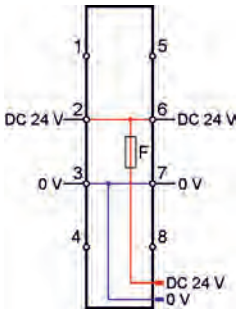
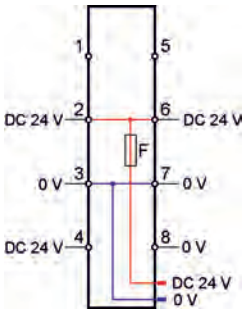
Rated data

			
Product key			
			EPM-S604
Mode			
Abbreviated designation			SSI
Inputs			
Number			1
Level			RS 422
Frequency	f_{in}	[kHz]	12 ... 6000
Input current			
Backplane bus	I_{in}	[A]	70
I/O supply	I_{in}	[A]	30
Rated voltage			
DC	$U_{N, DC}$	[V]	24
Communication			
Width in the input process image			6 bytes
Parameter data (PROFIBUS/PROFINET)			33 bytes
Diagnostics			
Module status			Ready for operation / error
Signal status			1 LED per encoder input
Evaluation function			3 comparisons, 2 limit values
Dimensions			
	h x b x t	[mm]	100 x 12.5 x 8.6
Mass			
	m	[kg]	0.060

Product key	
	EPM-S604
	

Rated data

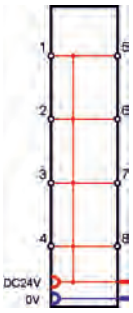
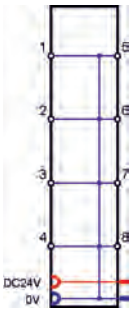
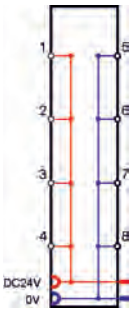
					
Product key					
			EPM-S700	EPM-S701	EPM-S702
Mode					
Abbreviated designation			Power BC	Power DC 24 V	Power DC 24 V / 24 V
Rated voltage					
DC	$U_{N, DC}$	[V]	24		
Supply voltage					
Electronics	U_{in}	[V]	DC 24 (20.4 ... 28.8)		DC 24 (20.4 ... 28.8)
Output current					
Backplane bus	I_{out}	[A]			
I/O supply	I_{out}	[A]	7 [1]		4
Electrical isolation					
			500 V between I/O supply, electronic supply and fieldbus	not connected to the I/O supply voltage of the modules to the left	not connected to the I/O supply voltage of the modules to the left 500 V between I/O supply and electronic supply
Diagnostics					
Voltage supply			Supply OK / fuse defective		
Fusing					
			Internal		
Polarity reversal protection					
			Present		
Dimensions					
	h x b x t	[mm]	56 x 12.5 x 7.2	100 x 12.5 x 8.6	
Mass					
	m	[kg]	0.030	0.060	

Product key	EPM-S700	EPM-S701	EPM-S702
			

[1] Can used up to 10 A without UL-approval.

Rated data

					
Product key					
			EPM-S910	EPM-S911	EPM-S912
Mode					
Abbreviated designation			Supply 8 x DC 24 V	Supply 8 x DC 0 V	Supply 4 x DC 24 V / 0 V
Rated voltage					
DC	$U_{N, DC}$	[V]	24	0	0 24
Rated current					
	I_N	[A]	10.0		
Dimensions					
	h x b x t	[mm]	100 x 12.5 x 6.3		
Mass					
	m	[kg]	0.050		

Product key	EPM-S910	EPM-S911	EPM-S912
			

Bracket for shield bus

Standard 10 x 3 busbars can be connected directly to the I/O system using the bracket for shield buses. The shield connection with standard cable attachments and shield clamps can be used.

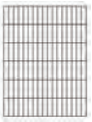
Mode		Features	Product key
Bracket for shield bus		• Installation of standard metal rails for shield connections directly on the module (VPE 10 pieces)	EPM-S900

CAN bus connector

The connector is used to connect the CAN to inverters which are provided with a Sub-D connection for the CAN bus. An integrated CAN terminating resistor can be switched on/off. Internal spring terminals make the use of special mounting tools superfluous. The switch setting can be read from two sides.

Mode		Features	Product key
"Node" CAN bus connector		• Sub-D, 90° • Screw terminals	EPM-T950
"Terminating" CAN bus connector		• Sub-D, 90° • Screw terminals • Integrated terminating resistor	EPM-T951
"Straight" CAN bus connector		• Sub-D, 180° • Screw terminals • Switchable terminating resistor	EPM-T952
CAN bus connector "switch"		• Sub-D, 90° • Spring-loaded terminal • Switchable terminating resistor	EWZ0046

Labelling strip

Mode		Features	Product key
Labelling strip		• DIN A4 white, precut Material: PET (water and oil resistant) Printing using a standard laser printer 102 labelling strips per sheet (VPE 10 sheets)	EPM-S990