

PM Modular PLCs & Remote I/O



PM Modular PLCs & Remote I/O

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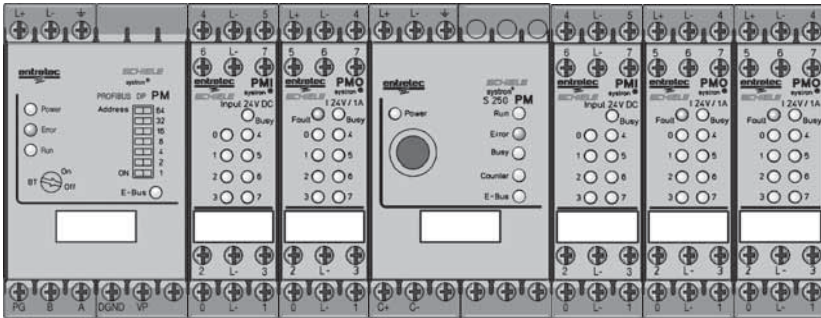


Index

Analog input modules	5.23
Interface module	5.16
Measuring and monitoring relays	5.35 - 5.38
Potentiometer module.....	5.32
Process module.....	5.30
Process module analog input.....	5.22, 5.24 - 5.28
Process modules.....	5.18 - 5.20
Process modules counter.....	5.29
Process modules systron.....	5.31
Stepper motor controller	5.34
systron PM	5.2 - 5.3, 5.21
systron PM Bus module CAN-Master	5.7, 5.9 - 5.15
systron PMBM Expansion	5.6
systron S 200	5.4
systron S 250 & S 250c	5.5, 5.8
Terminal block	5.33

systron® PM System configuration

Bus module and S 250, each with input and output modules



Directly at the bus:
8 digital inputs
8 digital transistor outputs

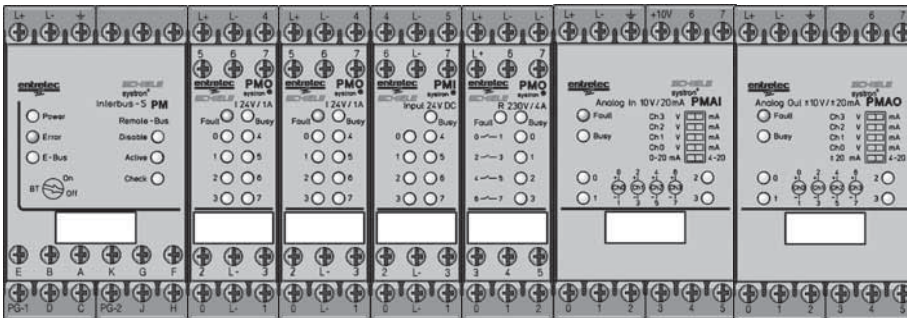
and

8 digital inputs
16 digital transistor outputs,
which are monitored by the S 250.
Data being designated for the bus module are
written into a defined flag word field in the S 250
memory.

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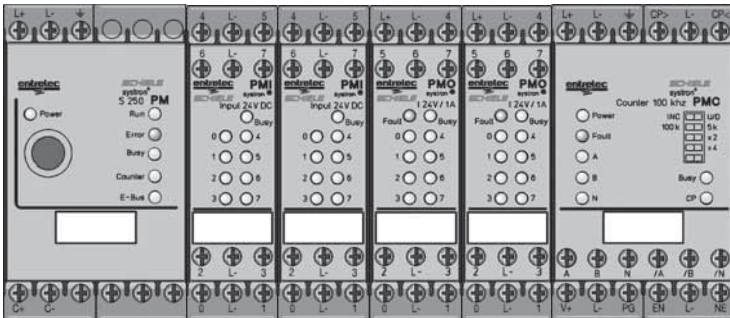
PM INTERBUS and MODBUS with input and output modules

When using INTERBUS and MODBUS, information is exchanged in data blocks. Therefore, expansion modules used with these systems must be grouped to avoid address gaps.

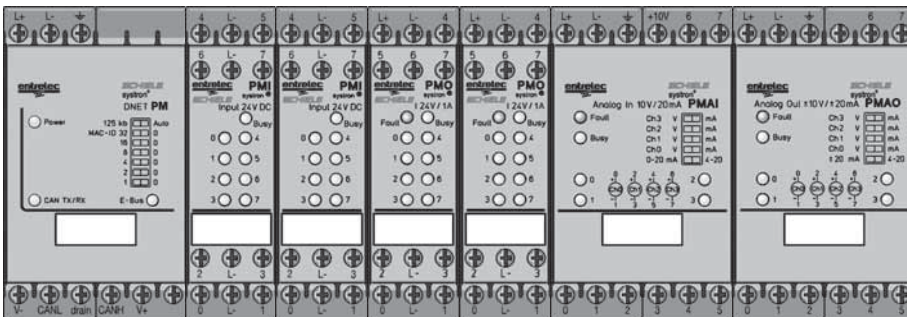


Using a non-grouped configuration would result in
an address gap of 8 bits at the PMI and 12 bits at
the PMO relay. These gaps occur because INTER-
BUS always transmits in 16 bit word size.
If MODBUS was used with the I/O configuration
shown, there would be only one address gap of
4 bits at the PMO relay. This gap occurs because
MODBUS transmits data in byte size.

S 200/ S 250



PM DeviceNet with input and output modules



systron® PM System configuration

Some rules for the configuration of a systron® PM module block:

- The number of expansion modules is limited by the power available to the bus/interface modules or the CPU.

	Output current / mA Operating temperature		Power consumption	
	up to 45 °C	up to 55 °C	internal / mA	
Bus modules				
CAN	400	400	PMI	10
DEVICENET	400	400	PMO	40
INTERBUS	500	400	PMAI	80
PROFIBUS DP	400	400	PMAO	80
MODBUS	500	400	PMC	130
Schiele E/A-Bus	500	400	PMT	250
			PMM	50
			PMM adjust.	60
Interface modules			PMP	10
RS 232 / 485	500	400	PMSC	50
			S 250(c)	--
CPUs			PMBM	80
S 200 / S 250 / S 250c	500	400	PMCI	100

Switching power supply recommended is the systron® PS.

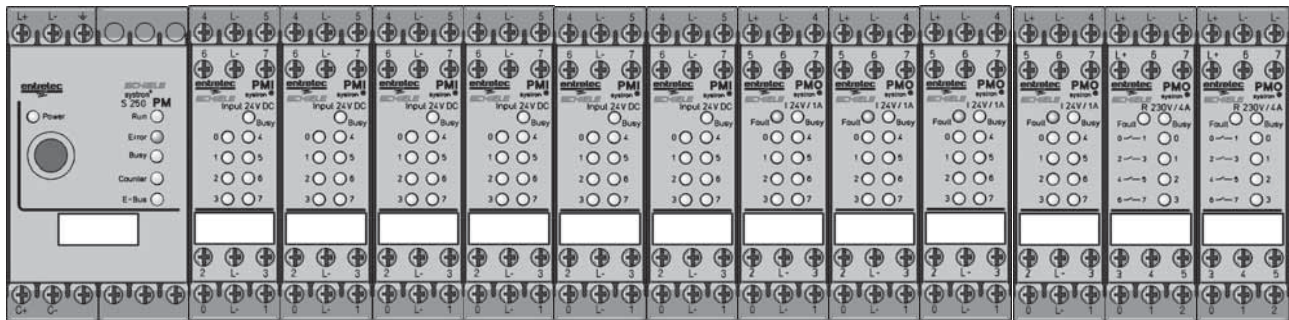
The output voltage is compatible with all process modules in identical type housing.

Power supply, systron® PS, versions are:

- 24 VDC/1A
- 24 VDC/ 1.5 A
- 24 VDC/2A
- 24 VDC/5A

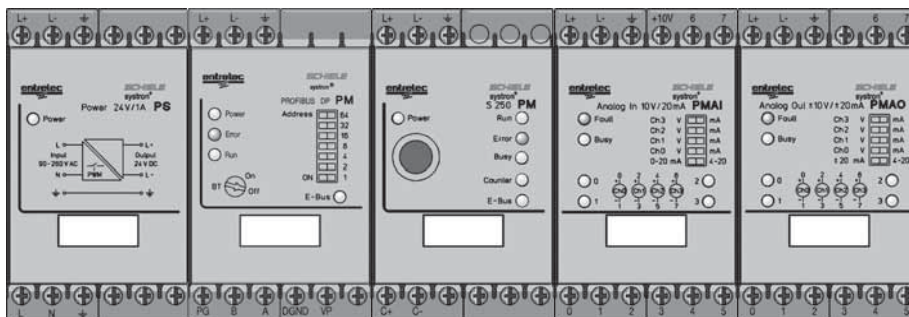
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- maximum 12 expansion modules can be connected to one bus module, one interface module or one CPU.
- in one block, up to 6 expansion modules of the same type may be connected, e. g. 6 PMI or 6 PMO (relay or transistor).



- For proper configuration, the following module sequence must be followed:
 First: Bus/Interface/PLC modules
 Next: Expansion modules
 Exception: systron® S 250/S 250c. These PLCs can be placed between bus/interface modules and expansion modules.
 They may also be placed between expansion modules. In such cases, the bus/interface modules will communicate with modules between itself and the PLC; the PLC will communicate with the expansion modules adjacent to it.

Power supply Bus module PLC Expansion modules
 Interface module
 S 200/ 250(c)






Operation

The S 200 is the CPU for process modules. Per application requirements, connect I/O modules and intelligent modules by a flat ribbon cable. S 200 contains an operating memory (EEPROM) for 2k instructions and a full range of programming commands. The programming system is compatible with the WINDOWS operating system and complies with IEC 1131-3.

- Integrated EEPROM memory for 2048 instructions
- Expandable with up to 12 expansion modules systron® PM
- Programming interface RS 232
- High-speed counter input (max. 10 kHz)
- Electrical isolation between external supply, processor, programming interface and high-speed counter

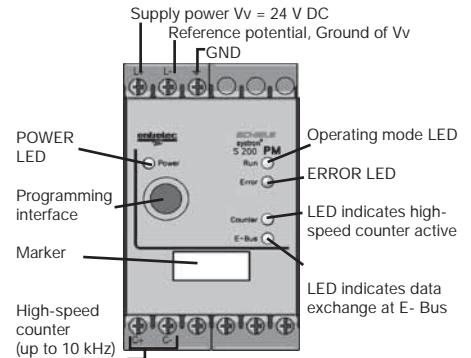
■ Approvals:  **UL1604 Class 1, Div. 2 Groups A, B, C, and D Hazardous Locations**

Bus modules systron® PM	Catalog No.
systron® S 200	2 423 410 00
Accessories	
Connection cable S 200 - PC	2 423 419 00
Programming software prosys200	
acc. to IEC 1131-3	
German	2 423 405 50
English	2 423 405 51
French	2 423 405 52
System Manual systron® S 200/ S 250	
German	2 423 402 50
English	2 423 402 51
French	2 423 402 52

Technical data

Supply voltage	20...30 V DC
Power consumption	60...320 mA at 24 V, depending on configuration
Residual ripple	< 10% diode
Reverse polarity protection	500 mA up to 45 °C
Supply for expansion modules	400 mA up to 55 °C
Built-in memory	4 KByte EEPROM/2048 Instructions
Maximum configuration	
Inputs digital	48
Inputs analog	24
Outputs digital	48
	24
Outputs analog	24
Timers	32
Counters	32
High-speed counter	1, 10 kHz
Instructions	
Flags bit	2 K
Flags word	512
Retentive flag words	256
Cycle time	16
	2.4 ms/ K
	4 ms/ K
Programming interface	RS 232, electrically isolated Socket, 8-pin, Mini-DIN
Display of operating status	
POWER	green LED
ERROR	red LED
Expansion bus (E-Bus)	green LED
High-speed counter (Counter)	green LED
RUN	green LED
Dielectric withstand	
External connections against internal connections	acc. to VDE 0160, 500 V AC
Vibration and shock acc. to IEC 68-2-6	10...57 Hz constant amplitude 0.15 mm 57...150 Hz constant acceleration 2 G
Noise immunity	acc. to IEC 801-2 acc. to IEC 801-4
Operating temperature	0 ... +55 °C
Storage temperature	- 25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Design



Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

Max. no. of expansion modules per S 200

48	digital inputs with 6 PMI modules
48	digital outputs with 6 PMO transistor modules
	or
	mixed configuration with PMO Relay, but 6 PMO modules maximum
24	digital outputs with 6 PMO Relay modules
24	analog inputs with 6 PMAI
24	analog outputs with 6 PMAO
4	high-speed counters PMC
8	BALLUFF linear displacement transducers with 2 PMT
24	potentiometers with 6 potentiometer modules PMP
24	values with 6 measuring and monitoring relays PMM

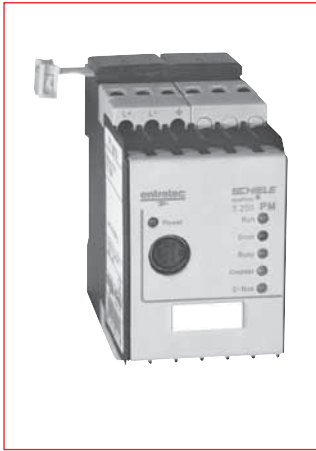
Integrated functions

- max. 48 inputs / 48 outputs digital
- max. 24 inputs/ 24 outputs analog
- 512 bit- and 256 word flags
- 32 timers, 32 counters
- cycle time 2.4 ms for 1024 binary instructions
- arithmetics and PID controller integrated in the operating system

systron® S 250 & S 250c

Intelligence at the bus

PM Modular
PLCs & Remote I/O



Operation

The CPUs S 250 and S 250c offer the same functions as the S 200 - and more: the ability to connect them to a bus system. Further, both PLCs have a 4 k memory which makes them suitable also as a stand-alone PLC for more complex applications.

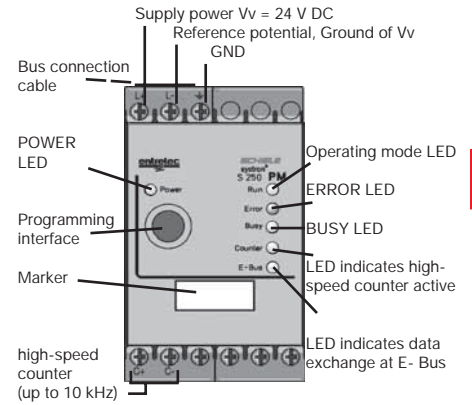
S 250 - decentral intelligence at the bus

S 250 can preprocess data which makes bus communication much faster. S 250 can also be used where processes must continue in case of bus failures. Data exchange between bus module and PLC is done by a defined flag word range.

S 250c - with clock and high capacity data memory

S 250c additionally offers an integrated real-time clock and a retentive memory range of 5887 flag words - ideal for receipt management and similar applications.

Design



- Integrated EEPROM memory for 4096 instructions
- Can be connected to bus modules and interface modules systron® PM
- At S 250c: real-time clock integrated
- high-capacity retentive memory
- Expandable with up to 12 expansion modules systron® PM
- Programming interface RS 232
- High-speed counter input (max. 10 kHz)
- Electrical isolation between external supply, processor, programming interface, and high-speed counter

Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
systron® S 250	2 423 411 00
systron® S 250c	2 423 411 10
Accessories	
Connection cable S 200 - PC	2 423 419 00
Programming software prosys200 acc. to IEC 1131-3	
German	2 423 405 50
English	2 423 405 51
French	2 423 405 52
System Manual systron® S 200/ S 250	
German	2 423 402 50
English	2 423 402 51
French	2 423 402 52

Integrated functions

- max. 48 inputs/48 outputs digital
- max. 24 inputs/24 outputs analog
- 512 bit- and 256 word flags
- 32 timers, 32 counters
- cycle time 2.4 ms for 1024 binary instructions
- arithmetics and PID controller integrated in the operating system, S 250c has an additional clock module

Bus systems and S 250/ S 250c

The combining of bus system <-> S 250/ S 250c is done by a bus module systron® PM. Data to be exchanged are offered in a defined flag word range of the S 250. It is therefore not possible to access directly to I/O modules. If this is necessary, I/O modules can be placed between a bus module and a PLC. Following combinations are possible:

INTERBUS _____ S 250(c)
 PROFIBUS-DP _____
 MODBUS _____
 CANopen _____
 DeviceNet _____

Interface modules _____
 RS 232 and _____
 RS 485 _____

Max. no. of expansion modules per S 250/ S 250c

12 Expansion modules maximum;
max. 6 expansion modules per type

PMI	6
PMO	6
PMAI	6
PMAO	6
PMC	4
PMT	2
PMM	6
PMP	6
PMSC	4 (only with S250c)
PMBM	1
PMCI	2

No. of modules also depend on power consumption.

Technical data

Supply voltage		20...30 V DC
Power consumption		60...320 mA at 24 V, depending on configuration
Residual ripple		< 10%
Reverse polarity protection		diode
Supply for expansion modules		500 mA up to 45 °C 400 mA up to 55 °C
Built-in memory		8 KByte/4096 Instructions
Type of memory	S 250: S 250c:	EEPROM NVRAM (int. battery, life > 10 years)
Maximum configuration		
Inputs digital		48
Inputs analog		24
Outputs digital	Transistor Relay	48 24
Outputs analog		24 24
Timers		32
Counters		32
High-speed counter		1, 10 kHz
Instructions		
Flags	Bit / word	4 K 512 / 256
Retentive flag words	S 250: 48	S 250c: 6143 (5887 rem.)
Retentivity buffer		10 years without external supply power
Cycle time	Bit/ Word	2,4 ms/ K 4 ms/ K
Programming interface		RS 232, electrically isolated Socket, 8-pin, Mini-DIN
Dielectric withstand		
External connections <-> internal connections		acc. to VDE 0160, 500 V AC
Vibration and shock	acc. to IEC 68-2-6	10...57 Hz constant amplitude 0,15 mm 57...150 Hz constant acceleration 2 G
Noise immunity		acc. to IEC 801-2 acc. to IEC 801-4
Degree of protection	Terminals Housing	IP 20 IP 50
Ambient temperature		
Operating temperature		0 ... +55 °C
Storage temperature		- 25 ... +75 °C
Terminals, screw		max. 2 x 14 AWG (2 x 2,5 mm ²)
Weight		0,44 lb (200 g)
Dimensions (W x H x D)		45 x 82,5 x 100 mm

systron® PMBM Expansion Schiele E/A Bus master

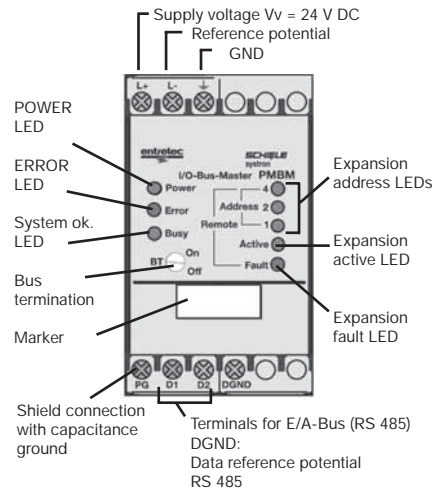
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Operation

The systron® PMBM Schiele I/O bus master module provides a link on a two-wire cable between the S 250c CPU and a remote station such as the S 400, Man Machine Interface IMM 40-70 (except IMM 20) and process module PM E/A. A maximum of 7 remote expansions with a total of 112 logical Inputs, 112 logical Outputs and 56 Analog Inputs and Outputs and 7 high speed counters are allowed. These remote I/Os are automatically seen by the S 250c as their own I/Os. The network is programmed with the usual programming software of the S 250c.

Design



- Simple protocol E/A bus Master
- Up to 7 expansion units connectable to systron® S 250 and S250c

Approvals:

Modules systron® PMBM	Catalog No.
Bus module Schiele E/A-Bus master	2 423 476 00
Accessories	
System Manual systron® S 200 / S 250	
German	2 423 402 50
English	2 423 402 51
French	2 423 402 52

Technical data

Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	
external (onto 24 V DC)	≤ 30...50 mA
internal (from PM)	≤ 80 mA
Interface	RS 485
Transmission rate	187.5 kBaud
Distance to	
- next station	max. 600 m
- total	max. 600 m
System configuration	
Number of slave stations	7 expansions like S 400, PM E/A or IMM
Amount of remote I/O operands:	
7 Digital Input and Output words	
56 Analog Input and Output words	
7 Input words for high speed counters	
Display of operational status	
POWER (Power)	green LED
ERROR (Error)	red LED
System OK (Busy)	green LED
Expansion address (Address)	3 x green LED
Expansion active (Active)	green LED
Expansion fault (Fault)	red LED
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
E/A bus/ CPU	yes
Dielectric withstanding according to VDE 0160	
External <-> internal connections	500 V AC, 1 minute
External <-> bus connections	500 V AC, 1 minute
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Maximum configuration

Up to 7 remote expansions with a total I/O amount of (remote I/O operands):

- 112 digital Inputs (7 Input words)
- 112 digital Outputs (7 Output words)
- 56 analog Inputs and Outputs (112 I/O words)
- 7 high speed counters (7 Input words) depending on the number of locally connected I/Os onto the S 250 CPU

systron® PM Bus module CAN-Master

PM Modular
PLCs & Remote I/O

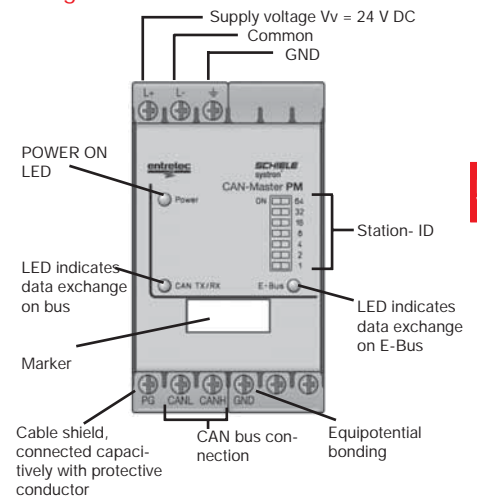


Operation

The bus module CAN-Master, combined with I/O modules systron® PM, processes data of sensors and actuators from various manufacturers, thus enabling communication by a simple protocol.

PM CAN-Master works together with an S 250 or S 250c.
CAN-Master is able to start a CAN bus system.
Data can be exchanged by Process Data Objects.

Design



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CAN-Master

- Can start-up a CAN bus system
- Works together with a S 250 or S 250c
- Automatic baud rate detection
- High transmission reliability
- Extremely short reaction times

Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM		Catalog No.
Bus module CAN-Master		2 423 427 10
Accessories		
System Manual		
	German	2 423 403 50
	English	2 423 403 51
	French	2 423 403 52

Technical data

Complying with	DS301/ DS-401
Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Reverse polarity protection	Diode
Electrical isolation L+ / L- <-> internal supply	DC/ DC converters
CAN <-> internal bus	Optocoupler
Reaction to supply interruption	10 ms bypass time at 24 V rated voltage
Interface	ISO/ DIS 11898
Protocol	CANopen Min-Boot-up
Device profile	-
Recommended cable	CAN
Transmission rate	20 kbps / 125 kbps / 250 kbps / 500 kbps
Expansion	max. 1000 m at 20 kbps max. 100 m at 500 kbps
System configuration	
Number of stations	max. 127
Address setting	DIP switches
Internal supply for expansion modules	
0° ... +55° C	400 mA
PLC Interface	S 250 (c)
Noise immunity	acc. IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
CAN bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> CAN connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Maximum configuration

Per PM CAN module

- 48 digital inputs with 6 PMI modules
- 48 digital outputs 6 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 16 analog inputs with 4 PMAI
- 16 analog outputs with 4 PMAO
- 2 counter modules PMC
- 8 BALLUFF linear displacement transducers with 2 positioning modules PMT
- > max. 2 PMT or 4 PMAI/ PMAO modules total
- 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

systron® S 250 & S250c

Intelligence at the bus

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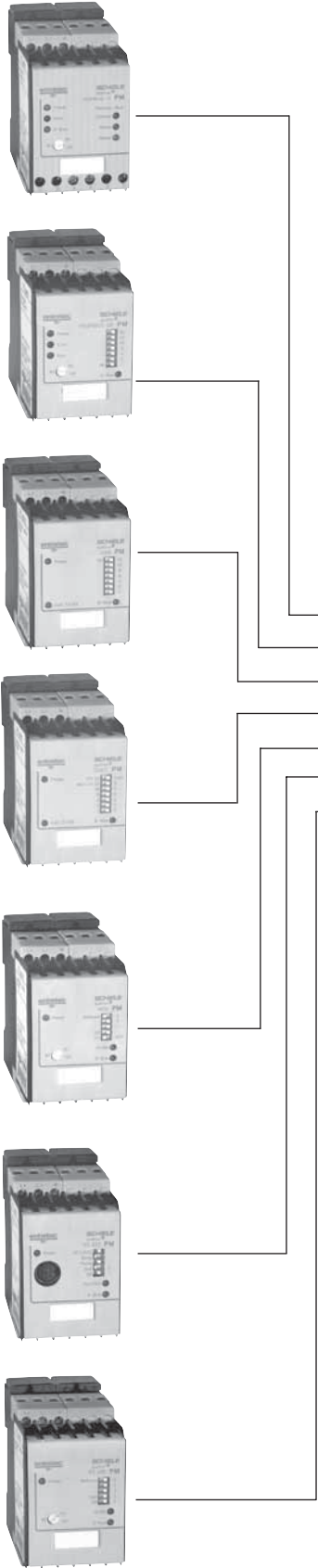
CANopen

DeviceNet™

MODBUS

RS 232

RS 485



- Data pre-processing for bus communication
- Continues processing if bus fails
- Powerful PLC single station

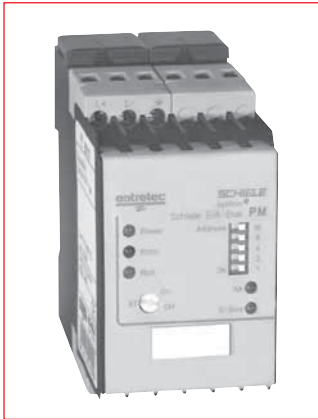


- S 250:**
- 4 k instructions
 - up to 12 expansion modules to be connected
 - for use with or without fieldbus module

- S 250c:**
- Also includes
- real-time clock integrated as program module
 - high-capacitive retentive data storage
 - 10 years buffer time without external supply voltage

systron® PM Bus module Schiele E/A Bus

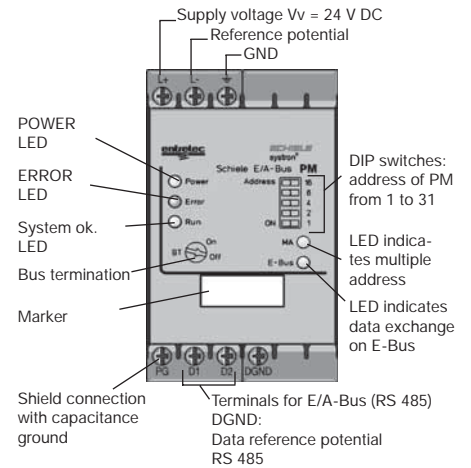
PM Modular
PLCs & Remote I/O



Operation

Schiele E/A-Bus is the simple link between Schiele PLCs, the man-machine interfaces and the process modules.
With a two-wire cable you can combine systron® S 800, S 400, man machine interfaces (except IMM 20), and all process modules.
This network is programmed with the standard programming software of the master-PLC.

Design



- Simple protocol
- Up to 31 expansion units connectable to systron® S 800,
- Up to 7 expansion units connectable to systron® S 400

■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module Schiele E/A-Bus	2 423 420 00
Accessories	
System Manual bus modules/interface modules	
German	2 423 403 50
English	2 423 403 51
French	2 423 403 52

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

per PM Schiele E/A-Bus module:

- 32 digital inputs with 4 PMI modules
- 32 digital outputs 4 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 16 analog inputs with 4 PMAI
- 16 analog outputs with 4 PMAO
- 2 counter modules PMC
- 2 stepper motor controllers PMSC
- 24 potentiometers with 6 potentiometer modules PMP

Technical data

Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Interface	RS 485
Transmission rate	187.5 kBaud
Distance to	
- next station	max. 600 m
- total	max. 600 m
System configuration	
Number of stations	31 (S 800), 7 (S 400)
Address setting	DIP switches
Internal supply for expansion modules	
0° ... +45°C	500 mA
0° ... +55°C	400 mA
Max. number of expansion modules	12
Display of operational status	
POWER	green LED
ERROR	red LED
Expansion bus (E-Bus)	green LED
Multiple address	green LED
RUN	green LED
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
E/A bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> bus connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

systron® PM Bus module CANopen

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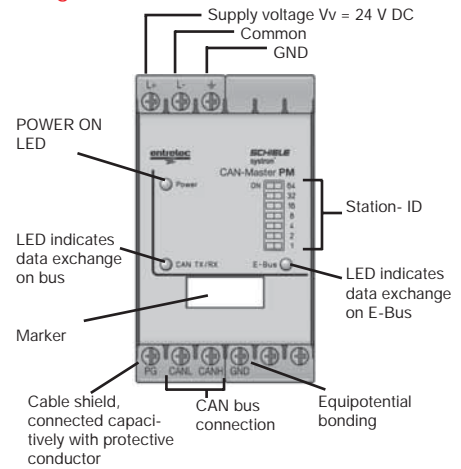


Operation

The bus module CANopen, combined with I/O modules systron® PM, processes data of sensors and actuators from various manufacturers, thus enabling communication by a simple protocol.


PM CANopen supports direct access to device parameters as well as time-critical process communication.

Design



CANopen

- Simple I/O system
- Automatic baud rate detection
- High transmission reliability
- Extremely short reaction times

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module CANopen	2 423 427 00
Accessories	
System Manual	
German	2 423 403 50
English	2 423 403 51
French	2 423 403 52

Maximum configuration

PM CANopen

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

Per PM CAN module

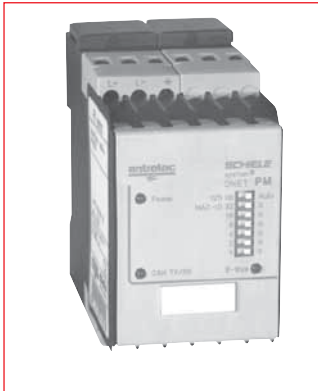
- 48 digital inputs with 6 PMI modules
- 48 digital outputs 6 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 16 analog inputs with 4 PMAI
- 16 analog outputs with 4 PMAO
- 2 counter modules PMC
- 8 BALLUFF linear displacement transducers with 2 positioning modules PMT
- > max. 2 PMT or 4 PMAI/ PMAO modules total
- 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

Technical data

Complying with	DS301/ DS-401
Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Reverse polarity protection	Diode
Electrical isolation L+/ L- <-> internal supply	DC/ DC converters
CAN <-> internal bus	Optocoupler
Reaction to supply interruption	10 ms bypass time at 24 V rated voltage
Interface	ISO/ DIS 11898
Protocol	CANopen
Device profile	I/O module
Recommended cable	CAN
Transmission rate	20 kbps / 125 kbps / 250 kbps / 500 kbps
Expansion	max. 1000 m at 20 kbps max. 100 m at 500 kbps
System configuration	
Number of stations	max. 127
Address setting	DIP switches
Internal supply for expansion modules	
0° ... +55° C	400 mA
Max. number of expansion modules	12
Noise immunity	acc. IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
CAN bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> CAN connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

systron® PM Bus module DeviceNet

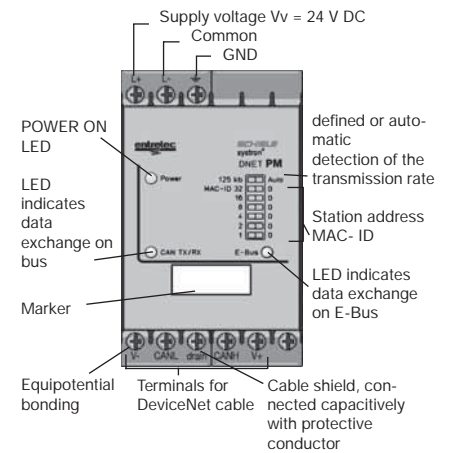
PM Modular
PLCs & Remote I/O



Operation


The bus module DeviceNet in combination with the I/O modules systron® PM, processes data of sensors and actuators of different sources, so they can communicate by a simple protocol. It allows implementation of both simple and complex devices, and supports common communication as master/slave and multimaster. The DeviceNet communication allows users to define the information sent between devices using the connection-based scheme.

Design



DeviceNet™

- Simple I/O system
- One MAC ID only for digital and analog data
- Automatic baud rate detection

■ Approvals:  UL1604 Class 1, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module DeviceNet	2 423 426 00
Accessories	
System Manual bus modules/ interface modules	
German	2 423 403 50
English	2 423 403 51
French	2 423 403 52

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

Technical data

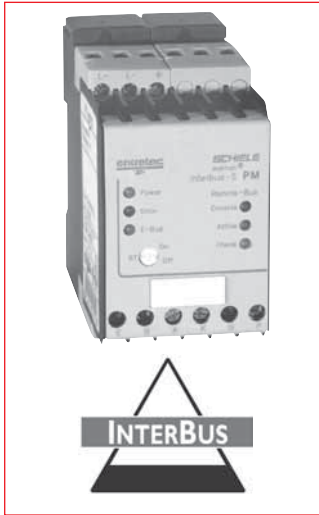
Complying with	DeviceNet Specification, Rel. 2.0
Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Reverse polarity protection	Diode
Electrical isolation L+/ L- <-> internal supply	DC/ DC converter
CAN <-> internal bus	Optocoupler
Reaction to supply interruption	10 ms bypass time at 24 V rated voltage
Interface	ISO/ DIS 11898
Protocol	DeviceNet
Device profile	Generic Device
Recommended cable	DeviceNet
Transmission rate	125 kbps/ 250 kbps / 500 kbps
Expansion	max. 500 m at 125 kbps max. 250 m at 250 kbps max. 100 m at 500 kbps
System configuration	
Number of stations	max. 64
Address setting	DIP switch
Internal supply for expansion modules	400 mA
0° ... +55° C	
Max. number of expansion modules	12
Display of operational status	
POWER	green LED
CAN TX/RX	green LED
Expansion bus (E-Bus)	green LED
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
CAN bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> CAN connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

per PM DeviceNet module

- 48 digital inputs with 6 PMI modules
- 48 digital outputs 6 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 20 analog inputs with 5 PMAI
- 20 analog outputs with 5 PMAO
- 2 counter modules PMC
- 8 BALLUFF linear displacement transducers with 2 positioning modules PMT
- 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

systron® PM Bus module InterBus

5



Operation

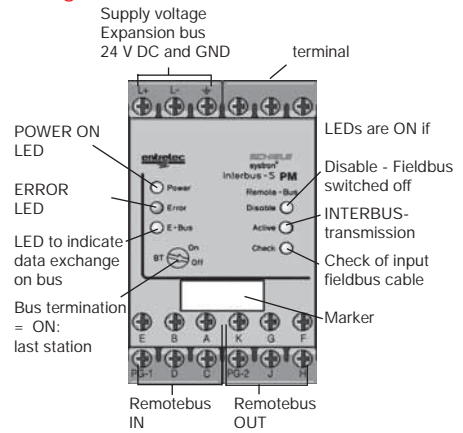
The fast bus to collect sensor signals and control actuators. 2048 I/O signals are transferred within about 4 ms.

Depending on the master used, up to 256 stations can be connected to it. The bus module allows transmission of a maximum of 4 words in reading mode and 4 words in writing mode.

Interface modules are available for many different manufacturers' control and plug-in cards for PCs. INTERBUS bus interface module complies with EN 50 254 and is certified as number 29.

Certificate no. 29

Design



- Fast collecting of sensor signals and controlling actuators

Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
PM INTERBUS	2 423 421 00
Accessories	
System Manual bus modules/ interface modules	
German	2 423 403 50
English	2 423 403 51
French	2 423 403 52

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- Internal supply for expansion modules 400 mA max.

Technical data

Complying with Certification	EN 50 254 No. 29
Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Interface	
Transmission rate	500 kB
Distance to next station	400 m
total	12 km
System configuration	
Number of stations	depending on bus master
Address setting	depending on physical arrangement
Internal supply for expansion modules	
0° ... +45°C	500 mA
0° ... +55°C	400 mA
Max. number of expansion modules	12
Data quantity	read 4 words
	write 4 words
Display of operational status	
POWER	green LED
ERROR	red LED
Expansion bus (E-Bus)	green LED
Remote-Bus not active	red LED
Remote-Bus active	green LED
Remote-Bus Check	green LED
RUN	--
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
Remote-Bus IN/ CPU	yes
Remote-Bus IN/ Remote-Bus Out	--
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> bus connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

per PM INTERBUS module:

- 48 digital inputs with 6 PMI modules
- 48 digital outputs 6 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 4 analog inputs with 1 PMAI
- 4 analog outputs with 1 PMAO
- 2 counter modules PMC
- 8 BALLUFF linear displacement transducers with 2 positioning modules PMT
- 2 potentiometer modules PMP
- 1 PLC S 250 or S 250c

Data quantity:

Read 4 words, write 4 words

Terminal arrangement:

incoming fieldbus			outgoing fieldbus		
Pin no.	Signal	Color	Pin no.	Signal	Color
A	/DO1	green	F	/DO2	green
B	DO1	yellow	G	DO2	yellow
C	/DI1	pink	H	/DI2	pink
D	DI1	grey	J	DI2	grey
E	GND1	brown	K	GND2	brown

systron® PM Bus module Profibus DP

PM Modular
PLCs & Remote I/O



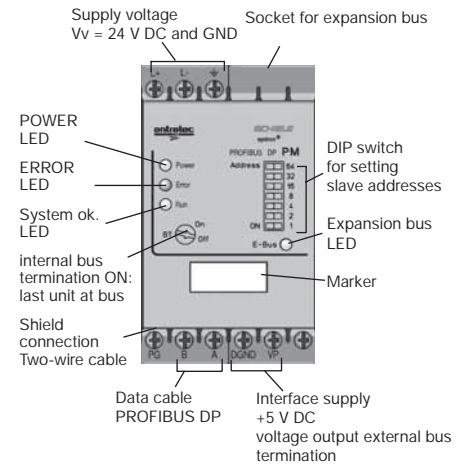
Operation

The bus to transmit larger quantities of data. In slave mode, PROFIBUS DP interface module is capable of transmitting max. 128 bytes reading and 128 bytes writing. Adjustment to baud rate set on master is done automatically, max. transfer rate being 1.5 Mbaud. PROFIBUS DP module complies with EN 50 170 and is certified.

Certificate no. Z00116



Design



■ Slave acc. to EN 50 170

■ Approvals: 1604 Class I, Div. 2 Groups I, II, III, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module PROFIBUS DP	2 423 422 00
Accessories	
System Manual bus modules/ interface modules	
German	2 423 403 50
English	2 423 403 51
French	2 423 403 52
Interface adapter PROFIBUS DP	2 423 422 90
Tool disk with GSD files a. o.	2 426 401 50

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

Technical data

Complying with Certification	EN 50 170 no. Z00116
Supply voltage	24 V DC
Voltage range including ripple	20...30 V
Power consumption	60...320 mA
Interface	
Transmission rate	up to 1.5 MB
Distance to next station total	depending on cable type and repeater as above
System configuration	
Number of stations	125 slaves max.
Address setting	DIP switches
Internal supply for expansion modules	
0° ... +55°C	400 mA
Max. number of expansion modules	12
Data quantity	read 128 bytes write 128 bytes
Display of operational status	
POWER	green LED
ERROR	red LED
Expansion bus (E-Bus)	green LED
RUN	green LED
Noise immunity	acc. to IEC 1000-4-5, class 3
Electrical isolation	
Supply/ CPU	yes
Bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External <-> bus connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

per PROFIBUS DP module:

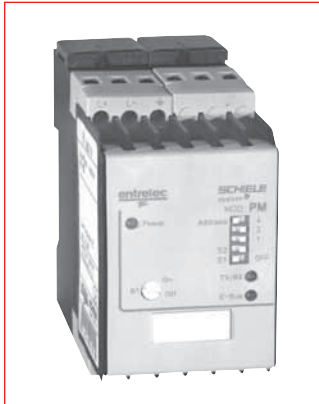
- 48 digital inputs with 6 PMI modules
- 48 digital outputs 6 PMO transistor modules or a mixed configuration with PMO relay, but 6 PMO modules maximum
- 24 digital outputs with 6 PMO relay modules
- 20 analog inputs with 5 PMAI
- 20 analog outputs with 5 PMAO
- 3 counter modules PMC
- 4 BALLUFF linear displacement transducers with 1 positioning module PMT
- 24 potentiometers with 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

Terminal arrangement:

Socket Pin no.	Bus module connection
1	PG
3	B
5	DGND
6	VP
8	A
	other terminals not connected

systron® PM Bus module MODBUS

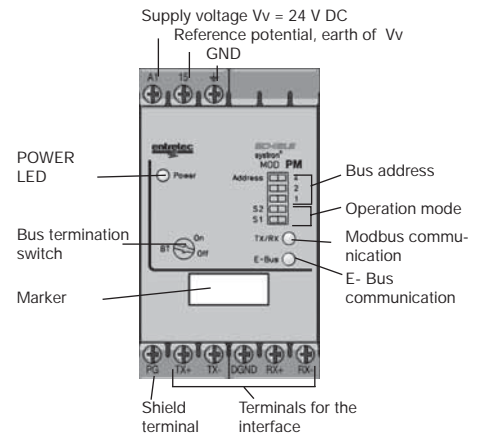
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Operation

Designed to be used on MODBUS/ J-Bus as well as for ASCII- and RTU-protocol.
Default address and baud rate can be set by front-mounted DIP switches.
Addresses and several intelligent functions can be configured by software (analog scaling, analog input with threshold detection and logical output dedicated).
The MODBUS module complies with the MODBUS protocol.
The software package below is used to test and configure the system.

Design



- Standard protocol for RS 485 interfaces
- MODBUS protocol is often integrated in visualization packages

■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module MODBUS	2 423 425 00
Accessories	
Configuration Kit including software, connection cable and system manual	
German	2 423 425 60
English	2 423 425 61
French	2 423 425 62

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 500 mA max.

Technical data

Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Interface	RS485 2-/ 4-wire
Transmission rate	300...38.400 Baud settable by software
Max. distance to next station total	1200 m
	1200 m
System configuration	
Number of stations	8, settable by DIP- Schalter, 247 by software
Address setting	DIP switches/ software
Internal supply for expansion modules	
0° ... +45°C	500 mA
0° ... +55°C	400 mA
Max. no. of expansion modules	12
Data quantity	48 digital inputs/ 20 analog inputs
	48 digital outputs/ 20 analog output
Display of operational status	
POWER	green LED
Expansion bus (E-Bus)	green LED
Communication	green LED
Noise immunity	to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
Bus/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External connections <-> bus connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

per PM MODBUS

- 6 PMI
- 6 PMO Transistor
- 6 PMO Relay
- 5/ 6 * PMAI
- 5/ 6 * PMAO
- 5/ 6 * PMC
- 5/ 6 * PMT
- 6 PMP
- 4 PMSC
- 1 S 250 or S 250c

* 5 Module maximum including all functions, and 6 modules without "intelligent" functions.

systron® PM Bus module MODBUS RS232

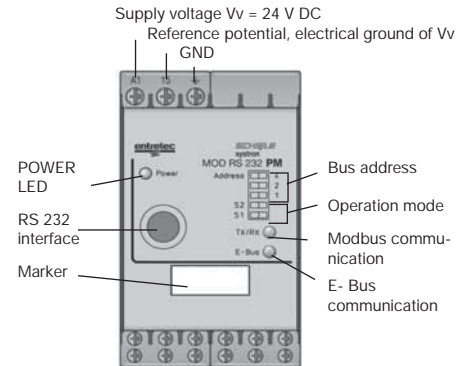
PM Modular
PLCs & Remote I/O



Operation

Designed to be used on MODBUS/ J-Bus as well as for ASCII- and RTU-protocol.
Address and baud rate can be set by front-mounted DIP switches.
By software it is possible to configure addresses and several intelligent functions (analog scaling, analog input with threshold detection and logical output dedicated).
The MODBUS module complies with the MODBUS protocol.
Via a RS 232 interface on the front face, data can be exchanged by PC or by S 250.

Design



- Standard protocol for RS 232 interfaces
- MODBUS protocol is often integrated in visualization packages
- Access on flag words of a S 250 which is configured as expansion device

■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Bus modules systron® PM	Catalog No.
Bus module MODBUS RS 232	2 423 425 10
Accessories	
Configuration Kit including software connection cable and system manual	
German	2 423 425 60
English	2 423 425 61
French	2 423 425 62
Connection cable PC-PM RS 232	2 423 419 00

Maximum configuration

- ø 12 Expansion modules total
- ø max. 6 of each type
- ø internal supply for expansion modules 500 mA max.

per PM MODBUS

- 6 PMI
- 6 PMO Transistor > one type
- 6 PMO Relay
- 5/ 6 * PMAI
- 5/ 6 * PMAO
- 5/ 6 * PMC > one type
- 2 PMT
- 6 PMP
- 4 PMSC
- 1 S 250 or S 250c

* Max. 5 Module including all functions, and 6 modules without "intelligent" functions.

Technical data

Supply voltage	24 V DC
Voltage range including ripple	20...30 V DC
Power consumption	60...320 mA
Interface	RS 232 - 8 pin Mini-DIN
Transmission rate	300...38.400 Baud settable by software
Max. distance	15 m
System configuration	
Number of stations	1
Address setting	DIP switches/ software
Internal supply for expansion modules	
0° ... +45°C	500 mA
0° ... +55° C	400 mA
Max. no. of expansion modules	12
Data quantity	48 digital inputs/ 20 analog inputs
	48 digital outputs/ 20 analog output
Display of operational status	
POWER	green LED
Expansion bus (E-Bus)	green LED
Communication	green LED
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Electrical isolation	
Supply/ CPU	yes
Interface/ CPU	yes
Dielectric withstanding voltage acc. to VDE 0160	
External <-> internal connections	500 V AC
External connections <-> bus connections	500 V AC
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Interface module PM RS 232

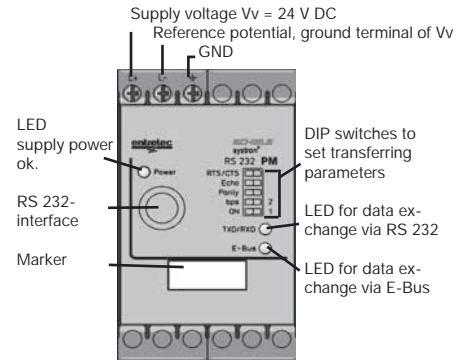
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Operation

An interface module can be controlled via an RS232 serial port available on each personal computer. Transmission speed and format can be set by DIP switches on the front face. In accordance with the specifications for serial interfaces, the maximum distance between PC and PM RS 232 is 15 m. Data is transferred by a simple ASCII protocol. Select to transmit with or without transmission monitoring (Checksum). Timeout monitoring can be configured.

Design



- Used to register and control sensor and actuator signals via serial interface RS 232

■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog No.
PM RS 232	2 423 423 00
Accessories	
System Manual bus modules/ interface modules	
English	2 423 403 51
German	2 423 403 50
French	2 423 403 52
Connection cable PC-PM RS 232	2 423 419 00
Tool disk with examples	2 426 401 50

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

per RS 232 module:

- 48 digital inputs with 6 PMI modules
- 48 digital outputs with 6 PMO transistor modules
- or
- a mixed configuration together with PMO relay, but 6 PMO maximum
- 24 digital outputs with 6 PMO relay modules
- 24 analog inputs with 6 PMAI
- 24 analog outputs with 6 PMAO
- 6 high-speed counters with 6 PMC
- 20 BALLUFF linear displacement transducers with 6 PMT modules
- 24 potentiometers with 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

Technical data

Supply voltage	20...30 V
Power consumption	60...320 mA
Electrical isolation	
Supply/ processor	yes
Interface/ processor	yes
Supply voltage failure	10 ms bypass time at 24 V rated voltage longer interrupt: system stop supply voltage restart: system start-up
Interfaces	
Type of interface	8-pin Mini-DIN
Setting	DIP switches
Transmission rate/Baud	1200 / 9600 / 19200 / 38400
Recommended cable	low-capacitive cable at 38.4 kb/s
Protocol	Schiele RS
Distance to the next station / total	15 m
System configuration	
No. of stations / address setting	1
Internal supply for expansion modules	
0 ... 45 °C	500 mA
0 ... 55 °C	400 mA
Number of expansion modules	12
Diagnostic functions	
Power	LED green
RxD/ TxD	LED green
Expansion bus	LED green
Dielectric withstand	
External connections <-> internal connections	acc. to VDE 0160, 500 V AC
Noise immunity	acc. to IEC 1000-4-4, stage 3, 2 kV
Degree of protection	
Housing	IP 50
Terminals	IP 20
Ambient temperature	
Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C
Weight	0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

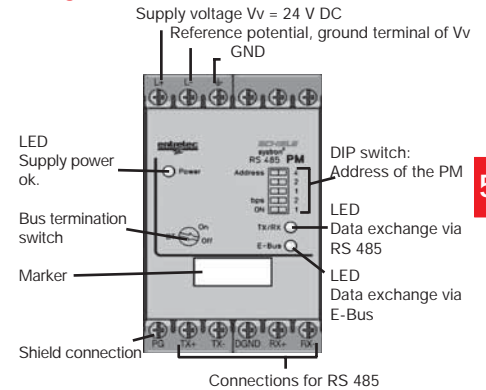
Interface module PM RS 485



Operation

With one RS 485 interface, it is possible to operate with eight other interface modules. Because of the noise immune data transfer, it is possible to transfer data up to 1200 m. Data is transferred by a simple ASCII protocol. Select to transmit with or without transmission monitoring (Checksum). Timeout monitoring can be configured.

Design



- Up to 8 interface modules
- Distances up to 1200 meters

■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog No.
PM RS 485	2 423 424 00
Accessories	
System Manual bus modules/ interface modules	
English	2 423 403 51
German	2 423 403 50
French	2 423 403 52
Tool disk with examples	2 426 401 50

Maximum configuration

- 12 Expansion modules total
- max. 6 of each type
- internal supply for expansion modules 400 mA max.

per RS 485 module:

- 48 digital inputs with 6 PMI modules
- 48 digital outputs with 6 PMO transistor modules
- or
- a mixed configuration together with PMO relay, but 6 PMO maximum
- 24 digital outputs with 6 PMO relay modules
- 24 analog inputs with 6 PMAI
- 24 analog outputs with 6 PMAO
- 6 high-speed counters with 6 PMC
- 20 BALLUFF linear displacement transducers with 6 PMT modules
- 24 potentiometers with 6 potentiometer modules PMP
- 1 PLC S 250 or S 250c

Technical data

Supply voltage	20...30 V
Power consumption	60...320 mA
Electrical isolation	
L+/ L- against internal supply	DC/ DC converter
RS 232/ 485 against internal bus	Optocoupler
Interface	
Setting	DIP switches
Transmission rate/ Baud	1200 / 9600 / 19200 / 38400
Recommended cable	E/A-Bus cable
Distance	
to the next station	1200 m
total	1200 m
System configuration	
Number of stations	8
Address setting	DIP switches
Internal supply for expansion modules	
0 ... 45 °C	500 mA
0 ... 55 °C	400 mA
Number of expansion modules	12
Display of operational status	
Power	LED green
RxD/ TxD	LED green
Expansion bus	LED green
Dielectric withstand	
External connections <-> internal connections	acc. to VDE 0160, 500 V AC
Noise immunity	acc. to IEC 1000-4-4, stage 3, 2 kV
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals	Screw terminals, max. 2 x 2.5 mm ²
Ambient temperature	
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Weight	0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Process modules

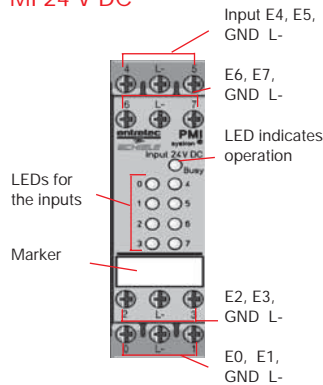
Digital input PMI

for 24 VDC inputs & 120 VAC inputs

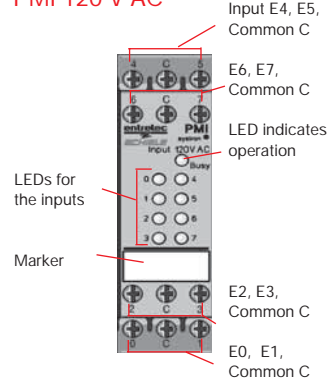
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PMI 24 V DC



PMI 120 V AC



- 8 inputs 24 V DC or 120 V AC
- Electrical isolation in groups of 8
- Internal power consumption of 10 mA

Technical data

No. of inputs	8	
Electrical isolation	Optocoupler	
Supply voltage L+	24 V DC	120 V AC (47...63 Hz)
"0" signal	-5...+5 V	0...20 V AC
"1" signal	13...+30 V	79...132 V AC
Input current at 24 V DC / 120 V AC		
"0" signal	< 1 mA	typ. 8.3 mA at 50 Hz
"1" signal	typ. 5.3 mA	typ. 10 mA at 60 Hz
Delay time/ switching time		
"0" -> "1"	typ. 3 ms	typ. 10 ms
"1" -> "0"	typ. 6 ms	typ. 40 ms
Quadrature-axis comp. between L- terminals/ C terminals	1 A	1 A
Max. number of PMI per		
S 200/ S 250	6	
INTERBUS	6	
PROFIBUS-DP	6	
Schiele E/A-Bus	4	
Modbus	6	
CAN	6	
DeviceNet	6	
RS 232	6	
RS 485	6	
Addressing	automatic -> configuration	
Display of operating status		
Operating status	green Busy-LED = OK	
Switching state	green LED per input	
Data exchange		
INTERBUS/ PROFIBUS-DP	approx. 0.23 ms per module	
Schiele E/A-Bus	approx. 0.4 ms per module	
Power consumption		
internal	10 mA	
Dielectric withstand		
external <-> internal connection (PM)	acc. to VDE 0160: 500 V AC	acc. to VDE 0110: 2.5
kV AC		
Ambient temperature		
Operating temperature	0 ... +55 °C	
Storage temperature	-25 ... +75 °C	
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)	
Degree of protection		
Terminals	IP 20	
Housing	IP 50	
Weight	.29 lb (130 g)	0.3 lb (140 g)
Dimensions (W x H x D)	22.5 mm x 82.5 mm x 100 mm	



■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules

PMI digital input modules

Digital input modules are used to process binary signals from limit switches, push buttons, and proximity switches and send these to the bus module via a ribbon cable. Signals are electrically isolated, momentary noise pulses are suppressed.

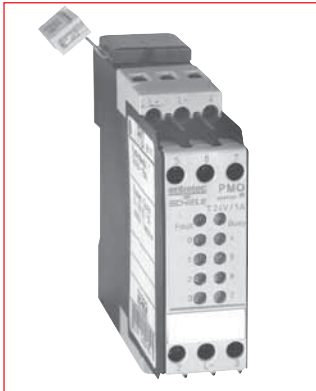
LEDs allow at-a-glance information on all states.

Inputs are designed for connection of single-wire cables. When used in conjunction with the terminal block, two- or three-wire cables can be connected.

Accessories	Catalog no.
PMI 24 V DC inputs	2 423 430 00
PMI 120 V AC inputs	2 423 431 00

Process modules

Digital output PMO transistor



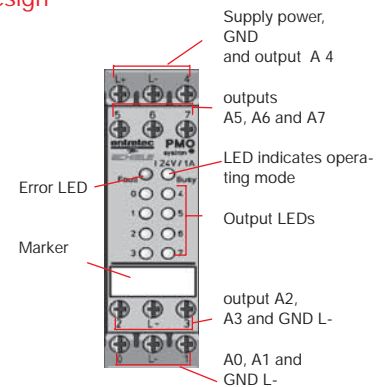
Operation

The digital output modules PMO are used to convert signals arriving by bus and bus module and to control actuators on site.


The presence of external supply and short circuit/overload are monitored, displayed by LED, and passed on to the bus module.

The outputs of the transistor module are short-circuit proof.

Design



- 8 transistor outputs
- 24 V DC/ 1 A
- Total current max. 4 A, short-circuit and overload proof
- Electrically isolated in groups of 8
- Internal power consumption max. 40 mA, external 25 mA at 24 V DC + load

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMO Transistor	2 423 451 00

Technical data

Supply voltage L+	24 V DC
Voltage range including ripple	20...30 V including ripple
No. of outputs	8
Electrical isolation	Optocoupler
Output voltage at "1" signal	min. L+ -0,5 V
Output current at "1" signal	max. 1 A
Short-circuit and overload protection	electronic
Delay time/ switching time	
"0" --> "1"	typ. 35 µs
"1" --> "0"	typ. 600 µs
Max. total amount of current between L- terminals	4 A
Max. no. of PMO per	
S 200/ S 250	6
INTERBUS	6
PROFIBUS-DP	6
Schiele E/A-Bus	4
Modbus	6
CAN	6
DeviceNet	6
RS 232	6
RS 485	6
Addressing	automatic -> physical arrangement
Display of operational status	
Module status	green Busy-LED
Switching status	green LED per output
Data exchange	
INTERBUS/ PROFIBUS-DP	approx. 0.23 ms per module
Schiele E/A-Bus	approx. 0.4 ms per module
Power consumption	
internal	40 mA
external (at 24 V, without load)	max. 25 mA + 3.5 mA/ active output
Dielectric withstand	
external <-> internal connections (PM)	acc. to VDE 0160: 500 V AC
Ambient temperature	
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Degree of protection	
Terminals	IP 20
Housing	IP 50
Weight	0.35 lb (150 g)
Dimensions (W x H x D)	22.5 x 82.5 x 100 mm

Process modules Digital output PMO relay

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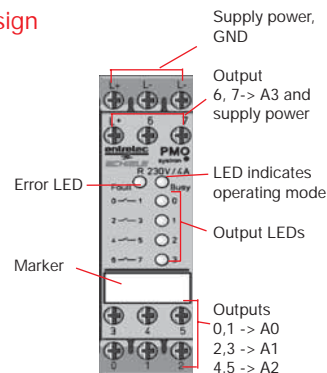



- 4 relay outputs 230 V AC/ 4 A
- Relay wired with varistor
- Leakage current max. 1 mA at 230 V
- Electrically isolated in groups of 1
- Internal power consumption 40 mA, external 50 mA at 24 V DC

Operation

The digital output modules PMO are used to convert signals arriving by bus and bus module and to control actuators on site. The presence of external supply and short-circuit/overload are monitored, displayed by LED, and passed on to the bus module.

Design



■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMO Relay	2 423 450 00

Technical data

Supply voltage L+	24 V DC
Voltage range including ripple	20...30 V DC including ripple
No. of outputs	4
Electrical isolation	Optocoupler/relay contacts
Delay time/ switching time	
"0" --> "1"	typ. 7 ms
"1" --> "0"	typ. 30 ms
Output current at "1" signal	
Resistive load (AC1)	230 V AC/ 4 A
Inductive load (AC11)	230 V AC/ 1.5 A
Short-circuit and overload protection	no
Max. total amount of current between L- terminals	1 A
Max. no. of PMO per	
S 200/ S 250	6
INTERBUS	6
PROFIBUS-DP	6
Schiele E/A-Bus	6
Modbus	6
CAN	6
DeviceNet	6
RS 232	6
RS 485	6
Addressing	automatic -> physical arrangement
Display of operational status	
Module status	green Busy-LED
Switching status	green LED per output
Data exchange	
INTERBUS/ PROFIBUS-DP	approx. 0.23 ms per module
Schiele E/A-Bus	approx. 0.4 ms per module
Power consumption	
internal	max. 40 mA
external (at 24 V, without load)	max. 5 mA + 11 mA per active output
Dielectric withstand	
external -> internal connections (PM)	acc. to VDE 0160 , 500 V AC
Noise immunity check acc. to IEC 801-4	Stage 3, 2 kV
Degree of protection	
Terminals	IP 20
Housing	IP 50
Ambient temperature	
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.37 lb (170 g)
Dimensions (W x H x D)	22.5 x 82.5 x 100 mm

systron® PM

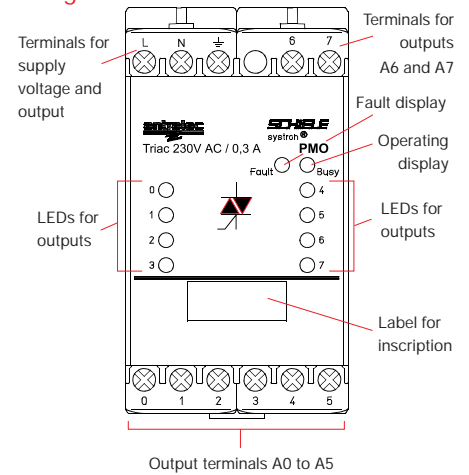
Digital output module PMO AC



Operation

The digital output module PMO AC is used to convert signals arriving by bus and bus module and to control actuators on site. The presence of an external supply and fault behavior is monitored and displayed on the module. The outputs are protected with an internal fuse. Zero Crossing Detection is used on the output Triac command.

Design



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- 8 Triac Outputs, 120/230 V AC, 0.3A, 50/60 Hz
- Electrical isolation : Optocoupler (2.5 kV AC)
- Internal fuse
- Zero crossing detection
- Suitable for all SCHIELE PM Process Modules

■ Approvals: UL1604 Class 1, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
Type	
Digital output module PMO AC	2 423 452 00

Maximum configuration

per PMO Device output module	
6	CPU S200 / S250 / S250c
6	Bus module CANOpen
6	Bus module DeviceNet
6	Bus module Interbus
6	Bus module Modbus
6	Bus module Profibus DP
6	Bus module Schiele I/O bus
4	Bus module RS232 / RS485

Technical data

Power supplies	
Supply voltage	90 ... 260 V AC (47...63Hz)
Outputs	
Number	8
Electrical isolation	optocouplers
Total Output current per module	
Rated value (up to 55°C) and (up to 45°C)	max. 2.4 A and max. 3.2 A
Output current per channel	
Rated value (up to 45°C)	max. 0.4 A (max. 0.3 A 45°C to 55°C)
For inductive load acc. To IEC 947-5-1 AC14	max. 0.3 A
Motor starter size	NEMA 4 (corresponding to Entelec DL65N and DL90N)
Parallel operation of 2 outputs	
For redundant load switching / to increase load capacity	Two outputs can be paralld/without an increase in load capacity
Leakage current	max. 1 mA
Protection against total current	Internal fuse
Protection against short-circuit	
Delay times of outputs	None
Switching time	
Zero Crossing Detection	max. 11 msec. at 50 Hz, max. 9 msec. at 60 Hz
Status indication	Yes
Module Status	green Busy LED
Switching state	1 green LED per output
Fault condition	1 red LED (absence or too low voltage)
EMC Behavior	
ESD / Burst	
Interference suppression degree	EN 61000-4-2 Level 3 (6/8kV) / EN 61000-4-4 Level 3 (1 kV)
Data exchange	EN 55022, Class B
Power consumption	
Internal (derived from PM)	approx. 0.5 ms per module
External (120 VAC 60 Hz, no load) / (230 VAC 50 Hz, no load)	max. 25 mA /max. 20 mA / max. 14 mA
Other characteristics	
Voltage withstand:	2,5 kV
Extern. Connections L, N, 0...7 against internal acc. VDE 0160	0°C to +55°C
Operating temperature	-25°C to + 75°C
Storage temperature	IP 20 / IP 50
Degree of protection	14 AWG (2.5 mm ²), stranded, 12 AWG (4 mm ²), solid
Terminals, screw	0.49 lb (0.22 kg)
Weight	45 x 82.5 x 100 mm
Dimensions (WxHxD)	

Process module analog input PMAI 10 V / 20 mA

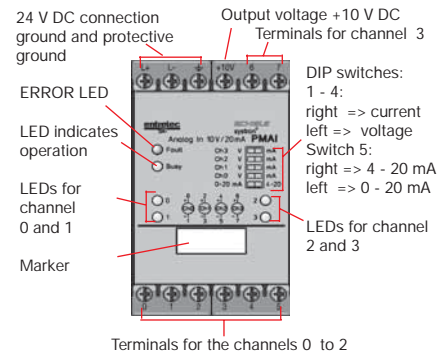
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Operation

This analog input module converts signals directly on site and transfers them via ribbon cable to the bus module.
Interference-prone transmission of analog values over long distances thus become unnecessary.

Design



- 4 channels, 12 bit resolution
- Selectable: 0 ... 10V, 0 ... 20 mA or 4 ... 20 mA
- Electrical isolation between CPU and external supply
- Internal power consumption 80 mA, external 60 mA at 24 V DC

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMAI 10 V/ 20 mA	2 423 435 00

Technical data

Supply voltage	24 V DC
Voltage range	20...30 V DC including ripple (max. 3 V)
Reverse-polarity protection	Diode
Number of inputs	4
Electrical isolation external supply <-> analog parts, not inputs <-> inputs	CPU <-> analog part,
Input range	selectable: 0...10 V or 0/ 4...20 mA per channel
Resolution	12 Bit
Conversion time	0.7 ms per channel
Input resistance	> 100 kOhm
Voltage range	< 230 Ohm
Current range	
Accuracy	10 V ± (0.4 % of measuring value + 4 D) at 25 °C
Accuracy	20 mA ± (0.3 % of measuring value + 4 D) at 25 °C
Temperature drift	max. 100 ppm/ K
Permissible input current at current input	max. ± 45 mA
Overvoltage protection	
Current input	max. ± 30 V against GND
Voltage input	max. ± 10 V
Number representation	
Complement-on-two	INTERBUS, PROFIBUS-DP, MODBUS, E/A- BUS S 800 DEVICENET
Sign + amount	CAN, E/A- BUS S 400
Power consumption	
internal (from PM)	80 mA
external (24 V, no load)	50 mA
Cable length, shielded	10 m
Max. number of PMAI per	
S 200/ S 250	6
INTERBUS	1
PROFIBUS-DP	5
Schiele E/A-Bus	4
Modbus	6
CAN	4
DeviceNet	5
RS 232/ RS 485	6
Addressing	automatic -> physical arrangement
Data exchange	approx. 1.6 ms per module
Display of operational status	
Status of input	green LED per module, intensity depending on signal
Error message	red Fault LED in case of Vv missing or overload
Dielectric withstand	acc. to VDE 0160: 500 V AC
Noise immunity check	acc. to IEC 801- 4 stage 3, 2 kV
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.66 lb (300 g)
Dimensions (W x H x D)	45 mm x 82.5 mm x 100 mm

Analog input modules

PMAI TC Thermocouple J, K & T



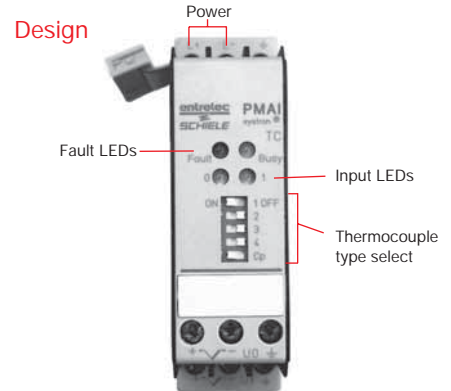
Operation

The analog input module converts signals directly on site and transfers them via ribbon cable to the bus module for transmission via fieldbus. Transmission of the digitized analog signal on the bus is interference free.

The 2 analog values are transmitted by each bus cycle.


The new modules "2-channels" small housing have been designed to give resolution and special input type, i.e., thermocouples.

These modules are fully linearized and the cold junction compensation is provided with the PMAI TC model.



Technical data

No. of inputs		2
Electrical isolation		external supply, bus and inputs; no isolation between inputs
In groups of		2
Input ranges		Thermocouples J, K and T ± 80 mV, with temperature range from -270°C to +1372°C Unipolar or bipolar Front dip switches
Input type		2 inputs, 0... 10V
Range setting	Voltage	2 wires
Input resistance		16 bits
Type of connection		2ms
Resolution		2.894 µV
Conversion time / input	Voltage	1 K
Accuracy	Thermocouple	Yes
Software linearization		Yes, switchable for differential measurement
Cold junction compensation		
Power supply		
Supply voltage		24 VDC
Permanent range includes ripple		+20 to 30 VDC
Power consumption	Internally	40 mA
	Externally	60mA
EMC Behavior		
Electromagnetic immunity acc. to EN 50082-2		ESD: EN 6100-4-2, level 3 (6/8kV) RF Fields: EN 61000-4-3, level 3 (10 V/m) Burst: EN 61000-4-4, level 4 (2 V) Surge: EN 61000-4-5, level 4 (2/4 kV) Conducted RF: EN 61000-4-6, level 3 (10 V) 0.5 kVAC
Dielectric withstand acc. to VDE 0160		
Other characteristics		
Inputs		LED green, signal dependent intensity
Busy		LED green
Fault		LED red (absence or too low voltage)
Operating temperature		0 °C to +55 °C
Terminals		Pluggable screw terminals, 1 x 14 AWG (2.5mm ²)
Dimensions (W x H x D)		22.5 x 82.5 x 100mm (0.886 x 3.25 x 3.94)
Weight		0.15 kb (0.33 lb)

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

	Catalog no.
PMAI Thermocouple module	2 423 460 20

Process module analog input

PMAI PT 100 - 70... 220°C / 0... 100°C

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Operation

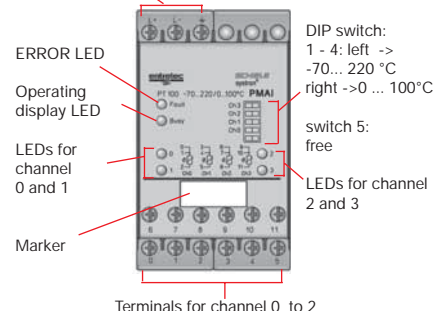
Converts measuring values of up to 4 temperature sensors PT100.

The unit also offers the following functions:

- Linearizing of values
- Check on wire cracks
- Measuring error compensation

Design

24 V DC connection
ground and protective ground



- 4 channels PT100, 2/3 wire connection,
- Selectable: -70...220°C / 0...100°C
- External supply 24 V DC / 80 mA required
- Internal power consumption 80 mA, external 60 mA at 24 V DC

■ Approvals: UL485 LISTED UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

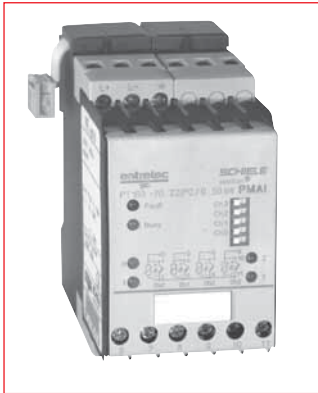
Interface modules	Catalog no.
PMAI PT100 -70...220/0...100°C	2 423 436 00

Technical data

Supply voltage	24 V DC
Voltage range	20...30 V DC including ripple (max. 3 V)
Reverse polarity protection	Diode
Number of inputs	4
Electrical isolation	Optocoupler
Input range	selectable -70°C ... +220°C or 0°C ... +100°C /channel
Conversion principle	successive approximation
Measuring principle	PT100 3-wire
Resolution	-70°C ... 220°C: 0.3 K / 0°C ... 100°C: 0.1 K
Conversion time	10 ms per channel
Supply current	2.5125 mA
Input resistance	> 1 MOhm
Accuracy	± (0.2 % of measuring value) at 25°C
Temperature drift	max. 100 ppm/ K
Overvoltage protection	max. -15 V DC... +24 V DC against GND
Number representation	INTERBUS, PROFIBUS-DP, MODBUS, E/A-BUS S 800 DEVICENET
Complement-on-two	CAN, E/A-BUS S 400
Sign + amount	
Power consumption	80 mA
internal (from PM)	70 mA
external (24 V, no load)	
Cable length shielded	Cable resistance: max. 5 Ω per wire
Max. number of PMAI per	
S 200/ S 250	6
INTERBUS	1
PROFIBUS-DP	5
Schiele E/A-Bus	4
Modbus	6
CAN	4
DeviceNet	5
RS 232/ RS 485	6
Addressing	automatic -> physical arrangement
Data exchange	approx. 1.6 ms per module
Display of operational status	
Input status	green LED per input, intensity signal-dependent
Error message	red Fault LED if Vv fails
Dielectric withstand	acc. to VDE 0160: 500 V AC
Noise immunity test	acc. to IEC 801-5
Ambient temperature	
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.55 lb (250 g)
Dimensions (W x H x D)	45 mm x 82.5 mm x 100 mm

Process module analog input

PMAI PT 100 - 70... 220°C / 0... 50mV°C



Operation

Process module analog input for PT100 connection. Converts input signals of a PT100 sensor into digital signals and transfers them to the bus module, interface module, or CPU by a ribbon cable.

Design

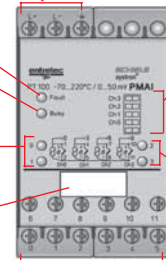
24 V DC connection ground and protective ground

ERROR LED

Operation status LED

LEDs for channel 0 and 1

Marker




DIP switches:
1 - 4: left -> Pt100 -70... 220 °C
right -> 0...50 mV for thermocoupler

Switch 5: free

LEDs for channel 2 and 3

Terminals for channel 0 to 3

- 4 channels Pt100, 2/3-wire connection,
- Selectable: -70...220°C/ 0...50 mV
- External supply 24 V DC/ 80 mA required
- Internal power supply 80 mA, external 60 mA at 24 V DC

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMAI Pt100 -70...220°C/0...50mV	2 423 437 00

Technical data

Supply voltage	24 V DC
Voltage range	20...30 V DC including ripple (max. 3 V)
Reverse polarity protection	Diode
Number of inputs	4
Electrical isolation	Optocoupler
Input range	selectable -70°C ... +220°C or thermocoupler successive approximation
Conversion principle	PT100 3-wire
Measuring principle	-70°C ... 220°C: 0.3 K / 0...50 mV: 12.2 mV
Resolution	20 ms per channel
Conversion time	2.5125 mA
Supply current	> 1 MOhm
Input resistance	Pt100: ± 0.1 % / 0...50 mV: ± 0.3 %
Amplification error	Pt100: ± 5 Digits / 0...50 mV: ± 10 Digits
Offset error	max. 100 ppm/ K
Temperature drift	max. - 15 V DC...+24 V DC against GND
Overvoltage protection	
Number representation	INTERBUS, PROFIBUS-DP, MODBUS, E/A-BUS S 800
Complement-on-two	DEVICENET
Sign + amount	CAN, E/A-BUS S 400
Power consumption	
internal (from PM)	80 mA
external (24 V, no load)	60 mA
Cable length shielded	voltage input 10 m
	Pt 100 input Cable resistance: max. 5 Ω per wire
Max. number of PMAI per	
S 200/ S 250	6
INTERBUS	1
PROFIBUS-DP	5
Schiele E/A-Bus	6
Modbus	6
CAN	4
DeviceNet	5
RS 232/ RS 485	6
Addressing	automatic -> physical arrangement
Data exchange	approx. 1.6 ms per module
Display of operational status	
Input status	green LED per input, intensity signal-dependent
Error message	red Fault LED if Vv fails
Dielectric withstand	acc. to VDE 0160: 500 V AC
Noise immunity test	acc. to IEC 801-5
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.55 lb (250 g)
Dimensions (W x H x D)	45 mm x 82.5 mm x 100 mm

Process module analog input PMAI PT 100 0... 330°C / 0... 10V


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Operation

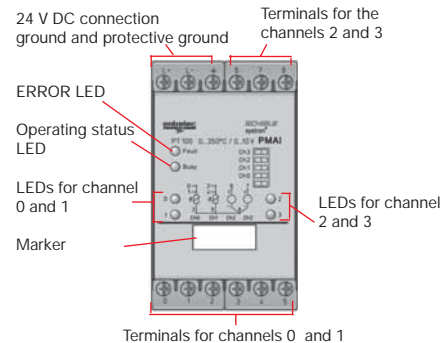
This analog module offers two channels for PT100 temperature sensors and two further channels for analog input signals in 0...10 V range.

- 2 channels Pt100, 2/3-wire connection, 2 channels 0...10 V
- External supply 24 V DC / 80 mA required
- Internal power consumption 80 mA, external 60 mA at 24 V DC

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMAI Pt100 0...330°C/0...10V	2 423 438 00

Design

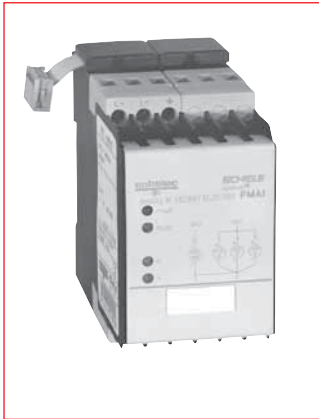


Technical data

Supply voltage Voltage range Reverse polarity protection Number of inputs Electrical isolation	24 V DC 20...30 V DC including ripple (max. 3 V) Diode 4 Optocoupler
Input range Conversion principle Measuring principle Resolution Conversion time Supply current Input resistance channel 2/3 Amplification error Offset error Temperature drift Overvoltage protection	channel 0,1: 0°C ... +330°C, channel 2,3: voltage 0...10 V successive approximation PT100 3-wire 0°C ... 330°C: 0.3 K / 0...10 V: 2.44 mV 20 ms per channel 2.5125 mA > 100 kOhm Pt100: ± 0.1 % / 0...10 V: ± 0,4 % Pt100: ± 2 Digits / 0...10 V: ± 4 Digits max. 100 ppm/ K max. - 15 V DC...+24 V DC against GND
Number representation Complement-on-two Sign + amount	INTERBUS, PROFIBUS-DP, MODBUS, E/A- Bus S 800 DEVICENET CAN, E/A-Bus S 400
Power consumption internal (from PM) external (24 V, no load) Cable length shielded	80 mA 60 mA voltage input 10 m Pt 100 input Cable resistance: max. 5 Ω per wire
Max. number of PMAI per S 200/ S 250 INTERBUS PROFIBUS-DP Schiele E/A-Bus Modbus CAN DeviceNet RS 232/ RS 485 Addressing Data exchange	6 1 5 4 6 4 5 6 automatic -> physical arrangement approx. 1.6 ms per module
Display of operational status Input status Error message Dielectric withstand Noise immunity test	green LED per input, intensity signal-dependent red Fault LED if Vv fails acc. to VDE 0160: 500 V AC acc. to IEC 801-5
Ambient temperature Operating temperature Storage temperature Terminals, screw Weight Dimensions (W x H x D)	0 ... +55 °C -25 ... +75 °C max. 2 x 14 AWG (2 x 2.5 mm ²) 0.55 lb (250 g) 45 mm x 82.5 mm x 100 mm

Process module analog input

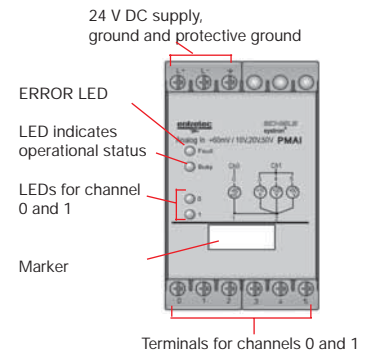
PMAI 60 mV / 10, 20, 50V




Operation

This analog module was developed to measure and monitor load status of a battery.

Design



- 1 channel, 0...60 mV
- 1 channel 0 ... 10, 20 or 50 V
- electrical isolation between CPU and external supply
- power consumption 80 mA internal (E-Bus), external supply: 80 mA at 24 V DC

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMAI 60 mV/ 10, 20, 50 V	2 423 439 00

Technical data

Supply voltage	24 V DC								
Voltage range	20...30 V DC including ripple (max. 3 V)								
Reverse polarity protection	Diode								
Number of inputs	2								
Resolution	12 Bit								
Conversion time	15 ms per channel								
Cable length, shielded	10 m								
Input resistance	<table border="1"> <tr> <td>0 ... 60 mV</td> <td>30 kΩ</td> </tr> <tr> <td>0...10 V input</td> <td>100 kΩ</td> </tr> <tr> <td>0...20 V input</td> <td>200 kΩ</td> </tr> <tr> <td>0...50 V input</td> <td>500 kΩ</td> </tr> </table>	0 ... 60 mV	30 kΩ	0...10 V input	100 kΩ	0...20 V input	200 kΩ	0...50 V input	500 kΩ
0 ... 60 mV	30 kΩ								
0...10 V input	100 kΩ								
0...20 V input	200 kΩ								
0...50 V input	500 kΩ								
Offset error	± 8 digits								
Error limitation	± 0.4 of the measured value								
Conversion principle	successive approximation								
Overvoltage protection	<table border="1"> <tr> <td>0</td> <td>max. ± 50 V against GND</td> </tr> <tr> <td>1</td> <td>max. ± 80 V against GND</td> </tr> </table>	0	max. ± 50 V against GND	1	max. ± 80 V against GND				
0	max. ± 50 V against GND								
1	max. ± 80 V against GND								
Electrical isolation	yes, CPU <-> analog circuit, external supply <-> analog circuit, not inputs <-> inputs								
Power consumption	<table border="1"> <tr> <td>internal (PM)</td> <td>80 mA</td> </tr> <tr> <td>external (24 V)</td> <td>80 mA</td> </tr> </table>	internal (PM)	80 mA	external (24 V)	80 mA				
internal (PM)	80 mA								
external (24 V)	80 mA								
Number representation	INTERBUS, PROFIBUS-DP, MODBUS, E/A-Bus S 800								
Complement-on-two	DEVICENET								
Sign + amount	CAN, E/A-Bus S 400								
Max. number of PMAI per									
S 200/ S 250(c)	6								
INTERBUS	1								
PROFIBUS-DP	5								
Schleie E/A-Bus	4								
Modbus	6								
CAN	4								
DeviceNet	5								
RS 232/ RS 485	6								
Addressing	automatic -> physical arrangement								
Data exchange	approx. 1.6 ms per module								
Display of operational status									
Input status	green LED per module, intensity depending on signal								
Error messages	red Fault LED if Vv missing								
Dielectric withstand	according to VDE 0160: 500 V AC								
Noise immunity test	according to IEC 801- 4 stage 3, 2 kV								
Ambient temperature									
Operating temperature	0 ... +55 °C								
Storage temperature	-25 ... +75 °C								
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)								
Weight	0.66 lb (300 g)								
Dimensions (W x H x D)	45 mm x 82.5 mm x 100 mm								

Process module analog input PMAO

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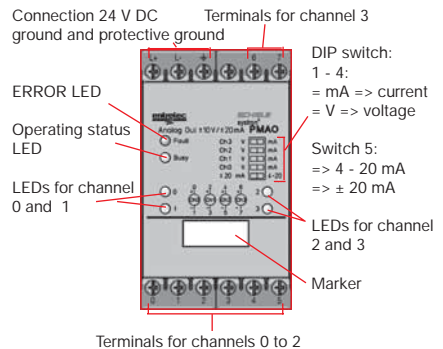


Operation


The PMAO module converts digital values into analog values and transfers them to the corresponding channel.

Each of these channels can be set to one of three possible ranges.

Design



- 4 channels, resolution 12 Bit
- Ranges $\pm 10\text{ V}$, $\pm 20\text{ mA}$, 4...20 mA settable
- Electrical isolation between CPU and internal supply
- Internal power consumption 80 mA, external 70 mA at 24 V DC + load

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMAO	2 423 455 00

Technical data

Supply voltage

Voltage range
Reverse polarity protection
Number of outputs
Electrical isolation

Output ranges

Resolution
Conversion rate
Accuracy
Voltage output
Current output

Value representation

Complement-on-two

Sign + amount

Power consumption

internal (from PM)
external (24 V, no load)
Cable length, shielded

Max. number of PMAO per

S 200/ S 250
INTERBUS
PROFIBUS-DP
Schiele E/A-Bus
Modbus
CAN
DeviceNet
RS 232/ RS 485
Addressing

Data exchange per module

Display of operational status

Output status
Error message
Dielectric withstand
Noise immunity check
Vibration and shock tests

Degree of protection

Terminals
Housing

Ambient temperature

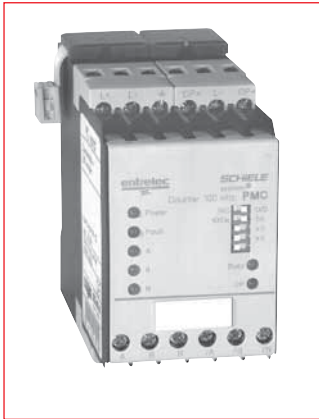
Operation temperature
Storage temperature
Terminals, screw
Weight
Dimensions (W x H x D)

	24 V DC 20...30 V DC including ripple Diode 4 CPU <-> analog part, external supply <-> Analog, not outputs <-> outputs
	selectable $\pm 10\text{ V}$, $\pm 20\text{ mA}$ or 4 ... 20 mA per channel 12 Bit (11 Bit + sign) 1 ms per channel < 0.7 % Load $\geq 2\text{ KOhm}$ f. Ia $\leq 5\text{ mA}$, short-circuit proof Load 50 - 500 Ohm, no-load proof
	INTERBUS, PROFIBUS-DP, MODBUS, E/A-Bus S 800 DEVICENET CAN, E/A-Bus S 400
	80 mA 70 mA without load, 180 mA maximum max. 10 m
	6 1 5 4 6 4 5 6 automatic -> physical arrangement INTERBUS: 1.3 ms, PROFIBUS-DP: 1.6 ms
	green LED per output red Fault LED, if Vv fails acc. to VDE 0160, 500 V AC acc. to IEC 801-4, stage 3, 2 kV acc. to IEC68-2-6
	IP 20 IP 50
	0 ... +55 °C -25 ... +75 °C max. 2 x 14 AWG (2 x 2.5 mm ²) 0.48 lb (220 g) 45 mm x 82.5 mm x 100 mm

Process modules counter

PMC for 5 V encoders

PMC for 24 V encoders



Operation

The counter module is used to collect and pre-process fast incremental encoder pulses. Its functions are selectable by DIP switches for up/ down counting of pulses or frequency measurement.

Counter modules are available for 5 V and 24 V- signals. Encoder using inverted signals can also be connected.

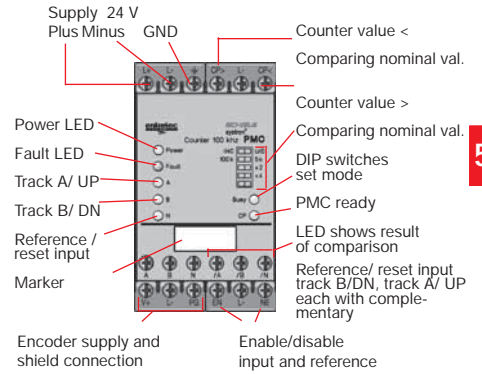
PMC offers the following operating modes:

- o Incremental encoder
- o Counting up/ down
- o Pulse + direction measurement
- o Frequency measurement


Encoders are powered from the counter module. For time-critical applications, actual count values can be compared to pre-set values directly inside the module.

Therefore, actual pulse count values are available in each bus cycle.

Design



- Counting pulses (up, down)
- Encoder evaluation x 1/ x 2/x 4
- Adjustable filter
- Inputs for counter enable and reference
- Counting frequency 100 kHz
- 16 Bit wide counter for counter value/position value
- 2 comparator outputs
- Frequency measurement up to 32.767 KHz

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

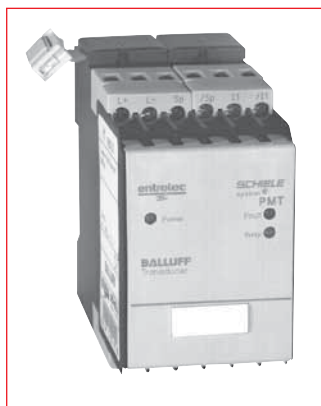
Interface modules	Catalog no.
Accessories	
PMC for 5 V encoders	2 423 471 00
PMC for 24 V encoders	2 423 470 00

Technical data

Supply voltage	24 V DC
Voltage range	Vv 20...30 V DC including ripple
Reverse-polarity protection	Diode
Encoder supply output V _g (V+, L-)	Version 5 V: 4.75 V...5.5 V, max. 200 mA Version 24 V: 19...29 V (L+ - 1 V)
Max. input voltage 5 V version / 24 V version	1 mA / 4.4 mA
Input voltage L+ max. / L+ min.	35 V / 30 V
Encoder cable: type and -length	
Without push-pull signals (supplied)	min. 4 (5) wires, shielded
With push-pull signals (without supply)	min. 7 (8) wire, twisted pairs, shielded
Control inputs EN and NE	
Max. input voltage	0- Signal 11 V
Min. input voltage	1- Signal 17 V
Max. and min. input voltage	35 V/ -12 V
Control inputs CP> and CP<	
Type	24 V switched, load to L-
Max. / min. output current	1- Signal 300 mA / L+ - 3 V
Max. output current	0- Signal 0.5 V
Overload protection	thermal and current limitation
Inductive load	free-wheeling diode to L-
Power consumption	
Internal (from PM)	130 mA
External (at 24 V, without load)	110 mA
Max. number of PMC per	
S200/ S 250	2
INTERBUS	2
PROFIBUS-DP	3
Schiele E/A-Bus	2
Modbus	3
CAN	3
DeviceNet	3
RS 232	3
RS 485	3
Addressing	automatic -> physical arrangement
Number representation of counter value	
16 Bit complement-by-two	DEVICENET, MODBUS, INTERBUS, PROFIBUS-DP, E/A-Bus S 800 CAN, E/A-Bus S 400
Sign + 15 bit integer	
Dielectric withstand	
External <-> internal connections (PM)	acc. to VDE 0160, 500 V AC
Noise immunity test	acc. to IEC 801-4 , stage 3, 2 kV
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.5 lb (230 g)
Dimensions (W x H x D)	45 mm x 82.5 mm x 100 mm

Process module Linear positioning PMT

5




Operation

BALLUFF displacement transducers BTL are linear positioning modules for sensing linear displacements and positions without touching and with high precision. The measuring principle is not effected by shock and vibration and thus is suitable for use under extreme environmental conditions.

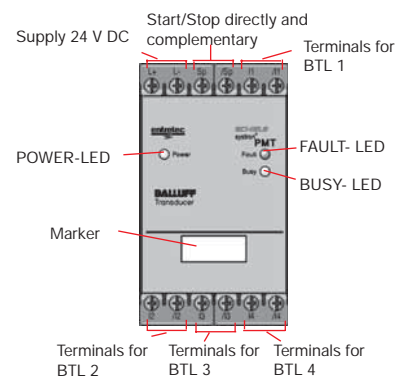
Four BALLUFF displacement transducers can be connected to the positioning module. Correction of values measured is accomplished within the module, the zero position can be set for each BTL where required.

- 4 BALLUFF displacement transducers connectable
- Measuring range 50 - 3550 mm, resolution 10 µm
- Power consumption internal 250 mA, external 30 mA at 24 V DC

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
Positioning module PMT	2 423 475 00

Design



Technical data

Supply voltage	24 V ± 10 %
Electrical isolation	Optocoupler
Number of inputs	4
Resolution	10 µm
Actual positioning data	max. 0.5 ms <-> 2 Hz
Correction of measuring values	settable via bus
Selection of positioning data	each BTL active, activation of the BTL via bus
Controlling BTL2-I1	
INIT signals	start measurement
Level	1 µs
Pulse length	
Position data from BTL2- I1	
Inputs	SP and SP (START/ STOP)
Position signal	Magnet position determines time signal for bus High frequency counter and microcontroller activated by 2 nd edge
Distance BTL <-> module	max. 500 m between BTL2-I1 and PMT
Data exchange	approx. 1.3 ms bei INTERBUS and PROFIBUS-DP
Addressing	automatic -> physical arrangement
Max. number of PMT per	
S 200/ S 250	2
INTERBUS	2
PROFIBUS DP	1
Schiele E/A-Bus	0
Modbus	2
CAN	1
DeviceNet	1
RS 232	2
RS 485	2
Power consumption	
internal	(5 V) - 250 mA; over expansion bus
external	(24 V) - 30 mA
Display of operational status	
Supply voltage	green Power-LED
Data exchange	green Busy-LED
Error message	red Fault LED
Ambient temperature	
Operating temperature	0° ... +55° C
Storage temperature	-25° ... +75° C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.44 lb (200 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

Process modules systron®

Computer interface

PMCI RS 232 & PMCI RS 485

PM Modular
PLCs & Remote I/O

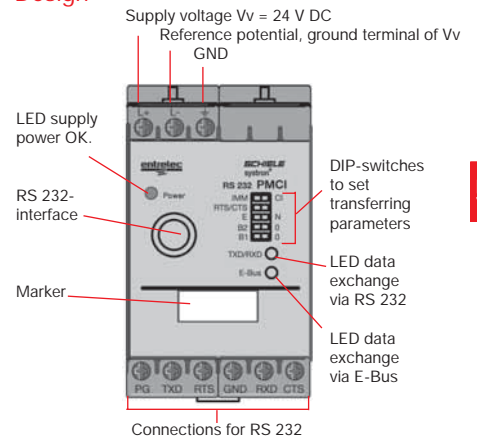
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Operation

The expansion module PMCI together with an S 250 or S 250c CPU allows the system to manage and to communicate with an RS 232 or RS 485 device (Barcode reader or printer). The ASCII characters sent and received are managed through the CPU with the use of functional blocks TEGT and REGT. A 32 kB memory text can store text with variable data locations which can be called with a message number. The connection of an IMM 20 display is also allowed. The selection of this device is made by front DIP-switches.

Design



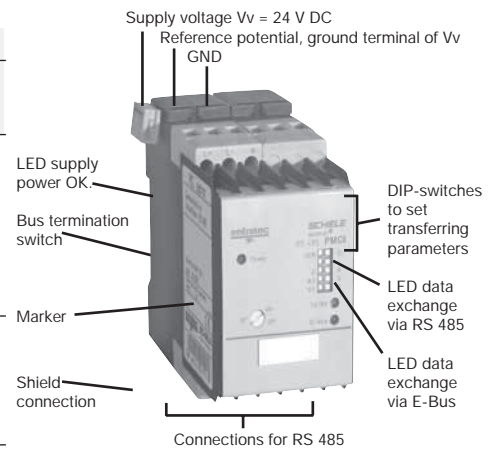
- Connects to RS 232 / RS 485 equipment including barcode readers or printers
- Baud rate and communication parameter can be set by front-face DIP switches
- Expansion module for CPU systron® PM S 250 or S 250c
- Using functional blocks TEGT and REGT from Prosys
- Connection with a modem and dial command planned
- 32 kB EEPROM text memory

■ Approvals: in process

Expansion Module systron® PMCI	Catalog no.
Expansion Module PMCI RS 232	2 423 477 00
Expansion Module PMCI RS 485	2 423 477 10
PC / PMCI RS 232, cable 2,5 m	2 423 419 00

Technical data

Supply voltage	20...30 V DC
Power consumption	60 mA
External 24 V DC	max. 100 mA
Internal onto PM bus	
Electrical isolation	
Power supply / internal bus	yes
RS 232 / 485 / internal bus	yes
Supply voltage failure	10 ms with nominal 24 V DC voltage longer interrupt: system stop supply voltage restart: system start-up
Interface	
Connections	RS 232 or RS 485
Parameters configuration	8 point Mini DIN and screw terminals micro-switch DIP on front face
EEPROM text memory	32 kB
Transmission speed (bauds)	300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400
Recommended cable	low-capacitance for 38.4 kb/s
Protocol	S 400-MEM (IMM 20), ASCII (send / receive)
Distance	12 m max., 1200 m to 38.4 kb/s RS 485
Topology	point-to-point
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV
Dielectric withstand VDE 0160	
External connections <-> internal connections	500 V AC, 1 minute
External connections <-> connections to the bus	500 V AC, 1 minute
Ambient temperature	
Operating temperature range	0 ... 55 °C
Storage temperature range	-25 ... +75 °C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm



Potentiometer module PMP

5




Operation

The PMP module is used to set nominal values, times, comparative values and other values in a range between 0 and 255.

This value is then transferred as an 8 bit word to the PLC, bus module, or interface module for further evaluation.

■ 4 Potentiometers

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
Potentiometer module PMP	2 423 434 00

Technical data

Supply voltage	no external supply voltage required
Number of potentiometers	4
Settable ranges	0...255
Internal power consumption	10 mA
Resolution	8 Bit
Data exchange time per module	approx. 0.8 s
Max. number of PMP per	
S 200/ S 250	6
INTERBUS	2
PROFIBUS-DP	6
Schiele E/A-Bus	6
MODBUS	6
CANopen	6
DeviceNet	6
RS232	6
RS485	6
Display of operational status	green LED
Ambient temperature	
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Degree of protection	
Housing	IP 50
Weight	0.26 lb (120 g)
Dimensions (W x H x D)	22.5 mm x 82.5 mm x 100 mm


Terminal block PMB



Operation

The PMB is a distribution terminal block. The block can be placed between two PM I/O modules. The PMB's ribbon cable is used as a pass through from one PM module to the second PM module.

- No influence on the total number of I/O modules per bus module
- Quadrature-axis component of current per terminal bar is max. 6 A.

■ Approvals:  UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
Terminal block PMB	2 423 479 00

Technical data

Number of terminals

Voltage proof	12
Current proof	max. 250 V
Power consumption internal	max. 6 A total current per terminal row none

Dielectric withstand

External connections <-> external connections and internal connections (PM) tested to VDE 0160	1500 V AC
Shock and vibration tested to IEC 68-2-6	10 ... 57 Hz constant amplitude 0.15 mm 57 ... 150 Hz constant acceleration 2 G

Degree of protection

Terminals	IP 20
Housing	IP 50

Ambient temperature

Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.26 lb (120 g)
Dimensions (W x H x D)	22.5 mm x 82.5 mm x 100 mm

Stepper motor controller syston® PMSC

5

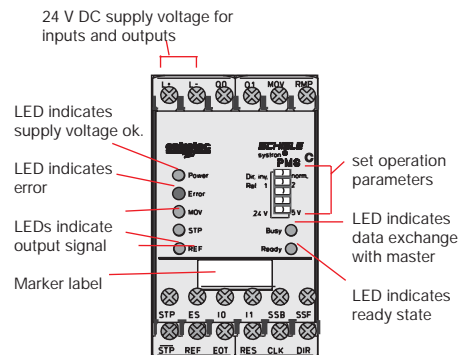


Operation

Intelligent controller made for positioning jobs with stepper motors. PMSC calculates a symmetrical movement profile out of configuration and positioning data. Controlling the stepper motor is done by an additional amplifier. Typical applications are food and processing facilities.

This controller can be connected to S 250c, Modbus and PM E/A bus modules (other bus modules: please contact us).

Design



- Designed for motor amplifiers with 5 V or 24 V inputs
- Direction, output voltage, reference selection settable by DIP switches

■ Approvals: UL1604 Class I, Div. 2 Groups
LISTED A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
Positioning module syston® PM	
Stepper motor controller PMSC	2 423 473 00

Technical data

Characteristics

Supply voltage

Voltage range including ripple
Power consumption

Output current max.
Reverse polarity protection
Input level

Output level

Velocity ranges

Positioning
Reference movement
Reference movement
Number of PMSC per bus module/ CPU
Output pulse width of a cycle

Display of operation status

Supply voltage (POWER)
Error indication (ERROR)
Data exchange via E-Bus (BUSY)
Ready
Output signals for the motor (MOV, STP, REF)
Noise immunity

Electrical isolation

L+ / L- against internal supply
I/O against internal supply

Isolation tests according to VDE 0160

External <-> internal connections
External connections <-> Bus terminals

Ambient temperature

Operating temperature
Storage temperature

Degree of protection

Terminals
Housing
Terminals, screw
Weight
Dimensions (W x H x D)

24 V DC	
20...30 V DC	
internal, at 24 V	50 mA
external	100 mA
	10 mA
	Diode
1 Signal	> 17 V
0 Signal	< 5 V
setting 5 V	4.5 ... 5.5 V
setting 24 V	V +/- - 4 V

1 ... 50000 Pulses/ s	
rapid pace	1 ... 25000 Pulses/ s
crawling pace	1 ... 1500 Pulses/ s
max.	4 for S 250c, 4 for MODBUS, 1 for E/A-Bus
up to 10000 pulses/s: approx. 20 µs, more: approx. 10 µs	

Supply voltage (POWER)	green LED
Error indication (ERROR)	red LED
Data exchange via E-Bus (BUSY)	green LED
Ready	green LED
Output signals for the motor (MOV, STP, REF)	green LED
Noise immunity	acc. to IEC 1000-4-4, class 3, 2 kV

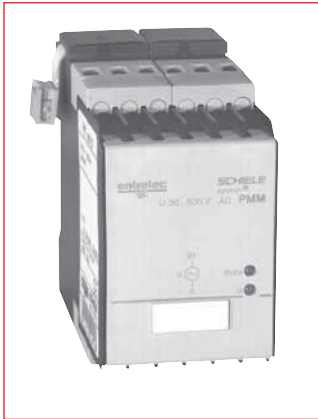
L+ / L- against internal supply	Optocoupler
I/O against internal supply	Optocoupler

External <-> internal connections	500 V AC
External connections <-> Bus terminals	500 V AC

Operating temperature	0 ... +55°C
Storage temperature	-25 ... +75°C

Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	approx. 0.55 lb (250 g)
Dimensions (W x H x D)	45 x 82.5 x 100 mm

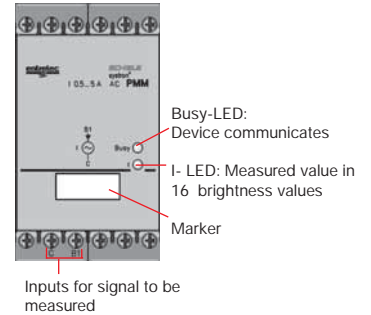
Measuring and monitoring relays for bus connection PMM current converter, basic version



Operation

The PMMI measures alternating current up to 5 A. An external current transformer is needed to measure currents greater than 5 A.

Design



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■ Approvals: UL1604 Class I, Div. 2 Groups A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMMI, basic version	2 423 440 00

Technical data

Measuring range

Frequency
 Max. permissible input current
 Accuracy at operating temperature 23°C

0.5...5 A AC
 50 and 60 Hz
 7 A AC
 ± 1 % of accumulated value at 50 Hz
 ± 1.5 % of accumulated value at 60 Hz

Measuring input

No. of inputs
 Electrical isolation
 Digital resolution
 Analog resolution
 Measuring cycle
 Signal sampling time
 Input resistance
 Power consumption at E-Bus (internally from PM)
 Energizing time after starting the bus module
 Module delay time after starting E-Bus (Self test)
 Addressing

1
 up to 2.5 kV AC
 8 Bit
 20 mA
 200 ms
 1 ms
 < 50 mΩ
 50 mA
 1.5 sec
 -> depending on bus module
 944 ms
 corresponding to physical arrangement

Max. no. of modules per

S 200/ S 250
 INTERBUS
 PROFIBUS-DP
 SCHIELE EA-Bus
 MODBUS
 CAN
 DeviceNet
 RS232
 RS485

6
 6
 6
 4
 6
 6
 6
 6

Dielectric withstand

Measuring circuit <-> internal connections PM
 Noise resistance test

acc. to VDE 0160, 500 V AC
 acc. to IEC 801- 4 stage 3, 2 kV

Ambient temperature

Operating temperature
 Storage temperature

0...55°C/ beneath PMO 0...45° C
 -25°C...75°C

Degree of protection

Terminals
 Housing
 Terminals, screw
 Weight
 Dimensions (W x H x D)

IP 20
 IP 50
 max. 2 x 14 AWG (2 x 2.5 mm²)
 0.4 lb (180 g)
 45 x 82.5 x 100 mm

Measuring and monitoring relays for bus connection PMM current converter, adjustable version

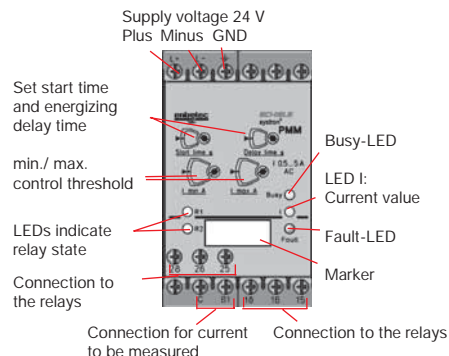
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Operation

The PMMI measures alternating current up to 5 A. An external current transformer is needed to measure currents greater than 5 A. When exceeding the thresholds adjusted, the integrated relay will de-energize. The low and the high threshold as well as starting time and delay time can be adjusted by external turn-switches.

Design



- 2 integrated relays, 250 V/ 4 A
- Low and high threshold adjustable
- Adjustable starting time
- Adjustable delay time

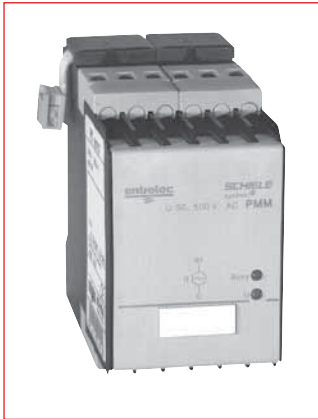
■ Approvals:

Interface modules	Catalog no.
Accessories	
PMMI, adjustable	2 423 442 00

Technical data

Supply voltage Voltage range including ripple	24 V DC 20...30 V DC
Measuring range Frequency Permissible input current max. Accuracy at operating temperature 23°C	0.5...5 A AC 50 and 60 Hz 7 A AC 1 % of accumulated value at 50 Hz 1.5 % of accumulated value at 60 Hz
Measuring input No. of inputs Electrical isolation Digital resolution/ analog resolution Measuring cycle Signal sampling time Input resistance	1 up to 2.5 kV 8 Bit / 20 mA 200 mA 1 ms < 50 mΩ
Output circuit Switching voltage Switching current Power consumption at E-Bus (internally from PM) Power consumption 24 V Adjustable delay time	Relay, 1 SPDT contact 250 V AC 4 A to AC 1/ 1.5 A to AC 15 60 mA 30 mA max. 15 sec
Max. no. of modules per S 200/ S 250 INTERBUS PROFIBUS-DP SCHIELE E/A-Bus MODBUS CAN DeviceNet RS232 RS485	6 6 6 4 6 6 6 6 6
Display of operational status Operation status Error display Display of current value Display relay state	green LED red LED green LED, Intensity depending on signal yellow LED
Dielectric withstand Measuring circuit <-> internal connections PM Noise resistance test	acc. to VDE 0110, 2.5 kV acc. to IEC 801-4 stage 3, 2 kV
Ambient temperature Operating temperature Storage temperature	0...55°C/ beneath PMO 0...45° C -25°C...75°C
Degree of protection Terminals Housing Terminals, screw Weight Dimensions (W x H x D)	IP 20 IP 50 max. 2 x 14 AWG (2 x 2.5 mm ²) 0.53 lb (240 g) 45 x 82.5 x 100 mm

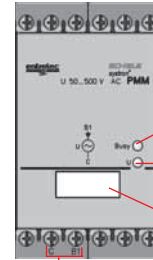
Measuring and monitoring relays for bus connection PMM voltage converter, basic version



Operation

The PMMU measures alternating voltage up to 500 V AC. An external transformer is needed to measure voltage greater than 500 V AC.


Design



Busy-LED:
Device communicates
U- LED: Measured value in
16 brightness values
Marker

Inputs for signal to be
measured

5

■ Approvals:  UL1604 Class I, Div. 2 Groups
A, B, C, and D Hazardous Locations

Interface modules	Catalog no.
Accessories	
PMMU, basic version	2 423 445 00

Technical data

Measuring range	50...500 V AC
Frequency	50 and 60 Hz
Max. permissible input voltage	530 V
Max. permissible input current	2.7 mA (50 Hz)
Accuracy at operating temperature 23°C	± 1 % of accumulated value at 50 Hz ± 1.5 % of accumulated value at 60 Hz
Measuring input	
No. of inputs	1
Electrical isolation	up to 2.5 kV AC
Digital resolution	8 Bit / 2 V
Measuring cycle	200 ms
Signal sampling time	1 ms
Power consumption at E-Bus (internally from PM)	50 mA
Max. no. of modules per	
S 200/ S 250	6
INTERBUS	6
PROFIBUS-DP	6
SCHIELE E/A-Bus	4
MODBUS	6
CAN	6
DeviceNet	6
RS232	6
RS485	6
Display of operational status	
Operation status	green LED
Display of voltage	green LED, Intensity depending on signal
Dielectric withstand	
Measuring circuit <-> internal connections PM	2.5 kV AC acc. to VDE 0160
Noise resistance test	acc. to IEC 801- 4 stage 3, 2 kV
Ambient temperature	
Operating temperature	0...55°C/ beneath PMO 0...45° C
Storage temperature	-25°C...75°C
Degree of protection	
Terminals	IP 20
Housing	IP 50
Terminals, screw	max. 2 x 14 AWG (2 x 2.5 mm ²)
Weight	0.46 lb (210 g)
Dimensions (W x H xD)	45 x 82.5 x 100 mm

Measuring and monitoring relays for bus connection PMM voltage converter, adjustable version

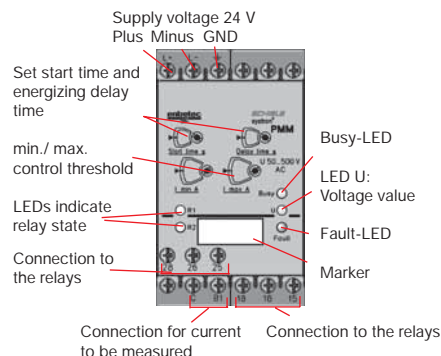
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Operation

The PMMU measures alternating voltage up to 500 V AC. An external transformer is needed to measure voltage greater than 500 V AC. When exceeding the thresholds adjusted, the integrated relay will de-energize. The low and the high threshold as well as starting time and delay time can be adjusted by external turn-switches.

Design



- 2 integrated relays, 250 V/ 4 A
- Upper and lower threshold adjustable
- Adjustable starting time
- Adjustable delay time

■ Approvals:

Interface modules	Catalog no.
Accessories	
PMMU, adjustable	2 423 447 00

Technical data

Supply voltage Voltage range including ripple	24 V DC 20...30 V DC
Measuring range Frequency Max. permissible input voltage Max. input current Accuracy at operating temperature at 23°C	50...500 V AC 50 and 60 Hz 530 V 2.7 mA 1 % of accumulated value at 50 Hz 2 % of accumulated value at 60 Hz
Measuring input No. of inputs Electrical isolation Digital resolution/ analog resolution Measuring cycle Signal sampling time Output circuit Switching voltage Switching current Power consumption at E-Bus (internally from PM) Power consumption 24 V	1 yes, up to 2.5 kV AC 8 Bit / 2 V 200 ms 1 ms Relay, 1 SPDT contact 250 V AC 4 A to AC 1 / 1.5 A to AC 15 60 mA 30 mA
Max. no. of modules per S 200/ S 250 INTERBUS PROFIBUS-DP SCHIELE E/A-Bus MODBUS CAN DeviceNet RS232 RS485	6 6 6 4 6 6 6 6 6 6
Display of operational status Operation status Error display Display voltage value Display relay state	green LED red LED green LED, Intensity depending on signal yellow LED
Dielectric withstand Measuring circuit <-> internal connections PM Noise resistance test	acc. to VDE 0110, 2.5 kV acc. to IEC 801-4 stage 3, 2 kV
Ambient temperature Operating temperature Storage temperature	0...55°C/ beneath PMO 0...45° C -25°C...75°C
Degree of protection Terminals Housing Terminals, screw Weight Dimensions (W x H x D)	IP 20 IP 50 max. 2 x 14 AWG (2 x 2.5 mm ²) 0.6 lb (270 g) 45 x 82.5 x 100 mm