WARNING
Switch off the supply voltage before working on the relay or connecting or disconnecting it with other devices or PC. Switch the supply voltage on only after all works has been completed.

CAUTION
The program runs after transferring it to the relay. It is recommended to transfer the program before wiring the relay. Otherwise ensure that all peripheral devices are disconnected from relay outputs before transferring the program.

1. Specifications

Table 1 General specification

Power supply		24 (9…30) V DC
Power consumption, max.		8 W
Galvanic isolation		no
Reverse polarity protection		yes
Inputs	Digital	16
	Analog	8
Outputs	Digital	14
	Analog	2
Network interface		2 × RS485
Protocol		Modbus-RTU, Modbus-ASCII
Mode		Master/Slave
Baud rate		9.6…115.2 kbit/s
Galvanic isolation		1500 V / 1 s
Extension modules		up to 2 PRM
Real-time clock accuracy		± 3 s / day
Backup battery		CR2032
Dimensions (with terminal blocks)		123 × 108 × 58 mm
Mounting		DIN-rail (35 mm)
Weight		approx. 250 g

Table 2 Digital inputs

HIGH level	8.5…30 V / 2…5 mA
LOW level	-3…+5 V / 0…15 mA
Pulse length, min.	5 ms
Response time, max.	30 ms
Pulse frequency, max.	200 Hz
Galvanic isolation	no

Table 3 Analog inputs

ADC resolution		12 bit
Sampling time, max.		1 ms
Galvanic isolation		no
Analog mode 1 (Linear input)		
Input signal		0-10 V, 4-20 mA, 0-300 kΩ
Input resistance for 0-10 V input		10 kΩ
Basic error		±0.5 %
Temperature influence		±0.5 % / 10 °C
Analog mode 2 (Temperature sensors)		
Input signal		see Tab. 4
Least significant bit value		1 °C
Basic error	PTC thermistors	±1.5 %
	NTC thermistors	±1.0 %
Temperature influence		±0.5 % / 10 °C
Digital mode		
Nominal input voltage		24 V DC
HIGH/LOW threshold (adjustable in ALP)		2.5…10 V
LOW/HIGH threshold (adjustable in ALP)		3…10.5 V
Pulse length, min.		5 s
Signal frequency, max.		100 Hz

Table 4 Sensors (analog mode 2)

Sensor	Measurement range
RTD	
Pt 500 (α = 0.00385 °C⁻¹)	–200…+850 °C
500P (α = 0.00391 °C⁻¹)	–200…+850 °C
Cu 500 (α = 0.00426 °C⁻¹)	–50...+200 °C
500M (α = 0.00428 °C⁻¹)	–180...+200 °C
Ni500 (α = 0.00617 °C⁻¹)	–60...+180 °C
Cu 1000 (α = 0.00426 °C⁻¹)	–50...+200 °C
1000M (α = 0.00428 °C⁻¹)	–180...+200 °C
Pt 1000 (α = 0.00385 °C⁻¹)	–200...+850 °C
1000P (α = 0.00391 °C⁻¹)	–200...+850 °C
Ni 1000 (α = 0.00617 °C⁻¹)	–60...+180 °C
Thermistors / NTC	
B57861S series, 2 kΩ, $B_{25/100}$ = 3560K	–55…+100 °C
B57861S series, 3 kΩ, $B_{25/100}$ = 3988K	–55…+145 °C
B57861S series, 5 kΩ, $B_{25/100}$ = 3988K	–35…+145 °C
B57861S series, 10 kΩ, $B_{25/100}$ = 3988K	–35…+155 °C
B57861S series, 30 kΩ, $B_{25/100}$ = 3964K	–20…+155 °C
B57861S series, 50 kΩ, $B_{25/100}$ = 3760K	–10…+155 °C
NTC 3435, 10 kΩ	–40…+105 °C
NTC 3977, 10 kΩ	–40…+125 °C
Thermistors / PTC	
KTY82-110	–55…+150 °C
KTY82-120	
KTY82-121	
KTY82-122	
KTY82-150	
KTY82-151	

Table 5 Digital outputs

Type		relay (NO)
Switching capacity	AC	5 A, 250 V AC (resistive load)
	DC	3 A, 30 V DC
Load current at 5 V DC, min.		10 mA
Service life, electrical	AC	200,000 switching cycles
	DC	100,000 switching cycles
Galvanic isolation		individual
between outputs		1780 V
against other circuits		2300 V

Table 6 Analog outputs

Output signal		4-20 mA, 0-10 V
External voltage supply		15…30 V
Basic error, max.		±0.5%
Temperature influence		±0.5% / 10°C
DAC resolution		12 bit
Load resistance	R_I (4-20 mA), max.	300 Ω
	R_U (0-10 V), min.	1 kΩ
Galvanic isolation		510 V / 1 s, individual

2. Operating conditions

The device is designed for natural convection cooling.
The following environmental conditions must be observed:

- clean, dry and controlled environment, low dust level
- closed non-hazardous areas, free of corrosive or flammable gases

Table 7 Operating conditions

Condition	Permissible range
Operating temperature	-40…+55 °C
Relative humidity	up to 80 % (at +25 °C, non-condencing)
Attitude	up to 2000 m above sea level
IP code	IP20
EMC immunity	conforms to IEC 61000-6-2
EMC emission	conforms to IEC 61000-6-4

3. Installation

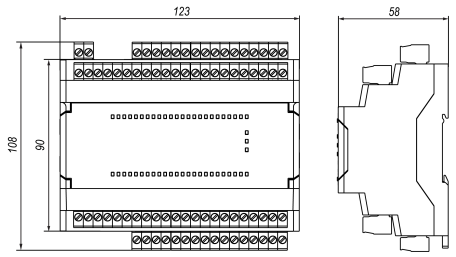


Fig. 1 Dimensions

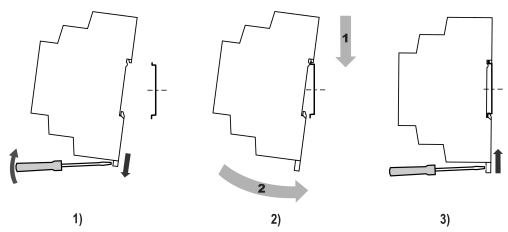


Fig. 2

Installation:

1. Place the device on a DIN rail as shown in *Fig. 2*.
2. Press the device firmly against the DIN rail in the direction of arrow 2 until the latch locks.

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3. Wire the device using the supplied terminal blocks.

Removing:

1. Take off the terminal blocks without disconnecting wires.
2. Insert a screwdriver into the eyelet of the slide interlock.
3. Loosen the slide interlock and then remove the relay from the DIN rail.

PR102 is equipped with plug-in terminal blocks which enable quick replacement of the device without disconnecting the existing wiring.

4. Digital inputs

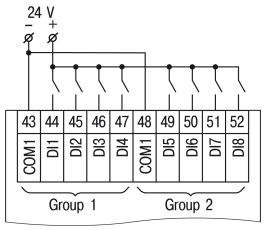


Fig. 3 Switch contacts wiring

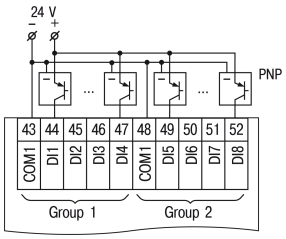


Fig. 4 PNP sensors wiring

5. Analog inputs

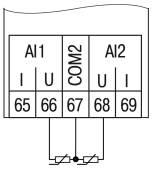


Fig. 5 RTD sensors wiring

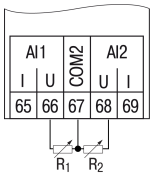


Fig. 6 Resistance sensors wiring

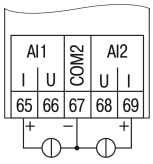


Fig. 7 Current sensors wiring

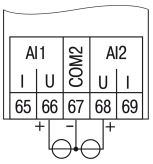


Fig. 8 Voltage sensors wiring

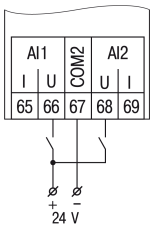


Fig. 9 Switch contacts wiring (digital mode)

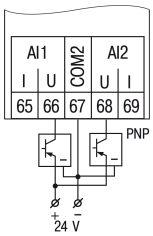


Fig. 10 PNP sensors wiring (digital mode)

6. Output wiring

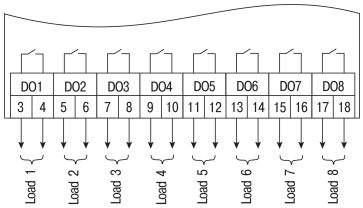


Fig. 11 Relay outputs

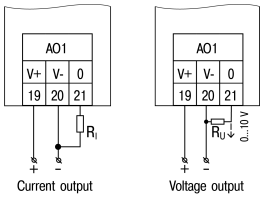


Fig. 12 Analog outputs

7. Extension modules

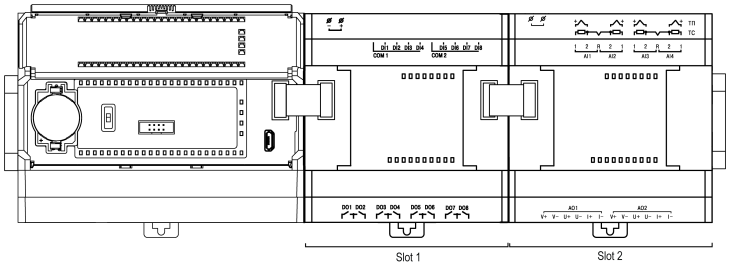


Fig. 13 Extension modules connection

8. RS485 interface

Use terminating resistors if necessary.

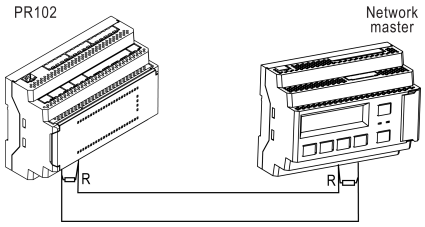


Fig. 14 PR102 as Slave

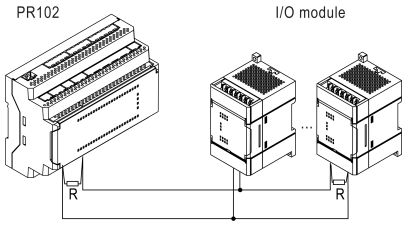


Fig. 15 PR102 as Master

9. Controls and interfaces

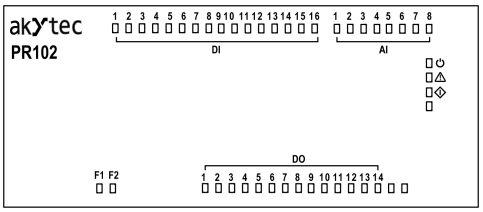


Fig. 16 Front view

Table 8 Indicators

LED	Color	State	Description
⏻	green	ON	Power on
⚠	red	ON	– program checksum error – retain memory error – system error
		flashing	Overheating
F1	green	—	Programmable
F2	green	—	
DI1…DI16	green	ON	Logical 1 on input
AI1…AI8	green	ON	Logical 1 on input (digital mode)
DO1…DO14	green	ON	Output is on
⏀	red	ON	24 V DC power off, powered over USB, program stopped
	green	ON	24 V DC power on, program runs
	red / green	red – ON green – fast flashing	24 V DC power on, program is being transferred to device

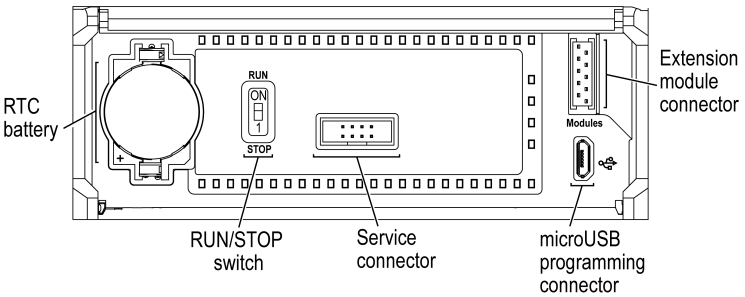


Fig. 17 Front cover open

10. Scope of delivery

PR102	1
Short guide	1
Terminal blocks (set)	1

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