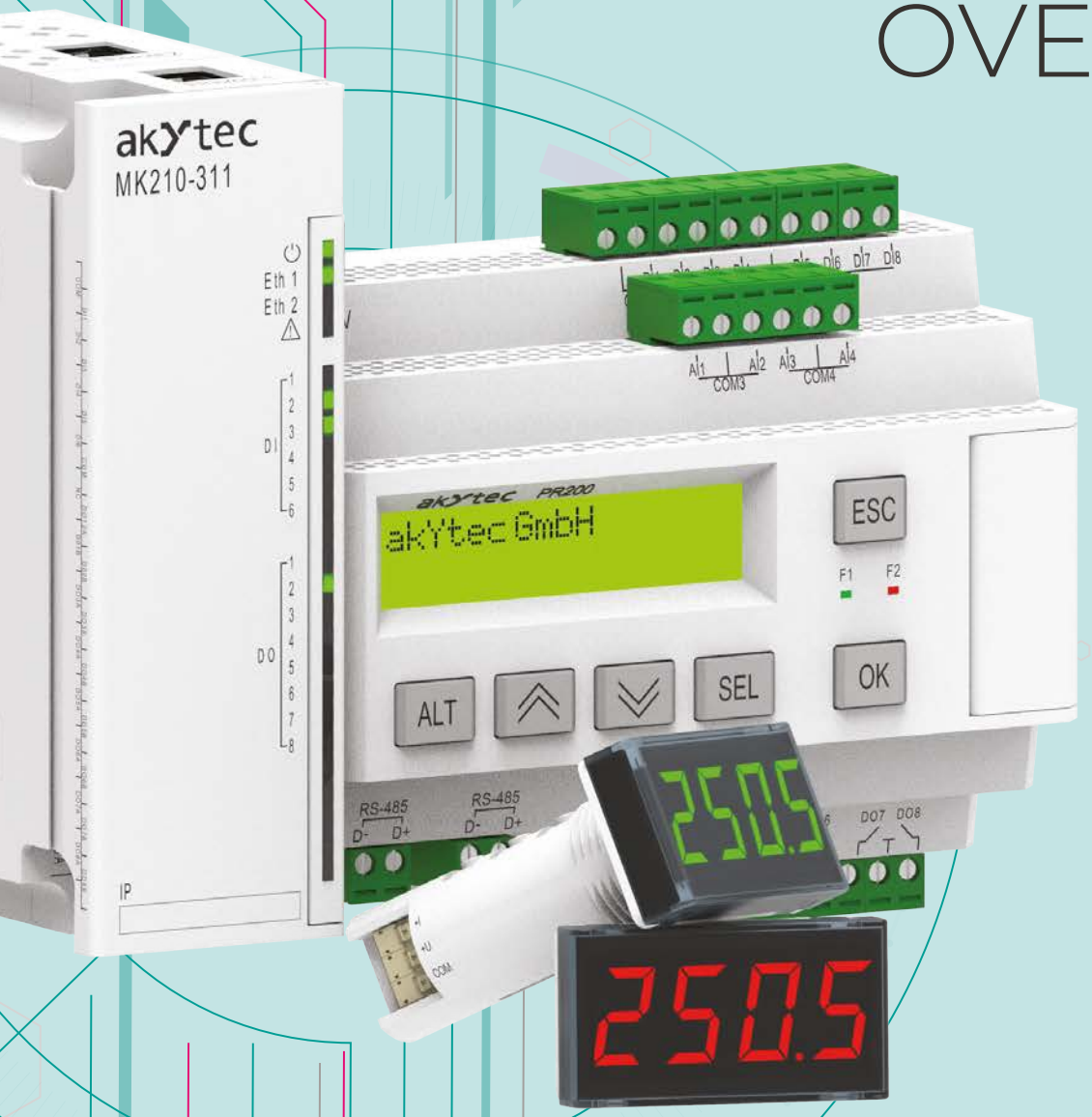
akytec

2022 PRODUCT OVERVIEW



DISPLAYS
MINI-PLCs
I/O-MODULES
INTERFACE CONVERTERS
PROCESS CONTROLLERS
TRANSMITTERS
DATA LOGGER

FRESH WIND FROM HANOVER

As a progressive company from Hanover, Germany, we develop and distribute innovative automation technology and industrial electronic products. This includes ready-to-install control panels, display modules, Mini-PLCs and other devices.

akYtec was founded in 2010 by experienced and highly qualified specialists from the fields of electronics development and automation technology. The company focuses on developing and distributing industrial automation technology, such as controllers with integrated touch screens. Integrating external technology and manufacturing partners allows akYtec to adapt flexibly to customer needs at any time. akYtec brings together key technologies and know-how to develop products.

We cooperate with many respectable and professional distributors and system integrators in different countries.

„We offer affordable but reliable products that can be flexibly adapted by taking advantage of the existing resources of our development partners to the requirements of our customers."

Alex Holm, Managing director of akYtec GmbH

ITP11 / ITP11-G

The ITP11 is a universal, microprocessor controlled display unit for monitoring industrial processes. The measured values are scalable. The ITP11 is designed to be connected to any transmitter with a 4-20 mA output. It requires no auxiliary power and is supplied directly from the current loop.
This device has a compact enclosure that fits into a standard Ø22.5 mm mounting cutout, which provides quick and easy installation of many displays of this kind to be accommodated on a control panel or at the control cabinet door.

Functions and features:

- Visualization of any 4-20 mA signal received from a relevant output of a sensor, PLC, I/O module, etc.
- Signal scaling
- Adjustable decimal point position
- Display of up to four 14 mm high digits including the decimal point
- Square root function (for special transmitters)
- Damping of the measured signal
- Alarm function (blinking when exceeding the setpoints)
- Error indication when exceeding the measuring limits
- Access protection

Standard variants	Description	Enclosure
ITP11	ITP11 with red LED color	48 x 26 x 65 mm Panel mount
ITP11-G	ITP11 with green LED color	

Display color	RED GREEN
Analog input 4-20 mA	4-20 mA
Loop-powered (4-20 mA)	4-20 mA
Easy mounting in Ø 22.5 mm borehole	
Save time for installation	
Compact size	
Can be installed in a push-button box	
Accuracy 0.2%	0.2
IP Code (on the front)	IP65
Ambient temperature	+80°C -40°C

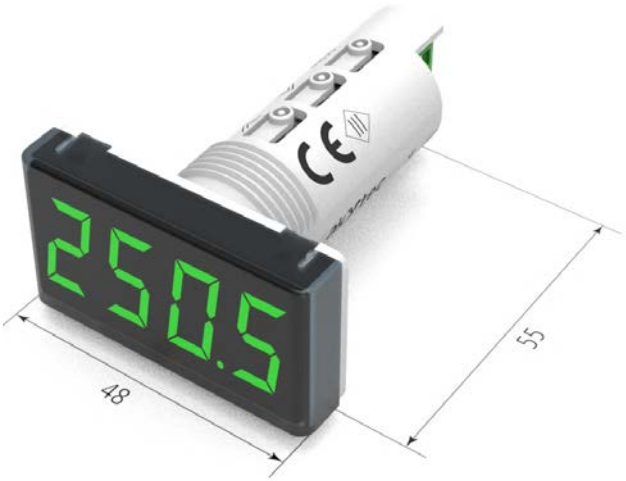
Areas of application:

The 4-20 mA process indicator ITP11 is particularly suitable for the fast and easy installation of visual display systems for various processes, such as water supply or thermal processing. The ITP11 can be used as an additional standalone display unit for on-site process visualization or as a part of a complex visual display system.

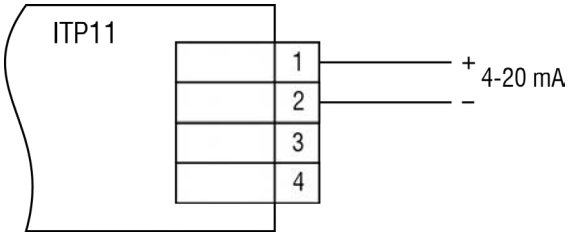
Technical data:

Power supply	from current loop
Input signal	4-20 mA (2-wire)
Input	1
Measuring range	3.8-22.5 mA
Guaranteed normal operation	3.2-25 mA
Voltage drop, max.	4 V
Accuracy	0.2 % + 1 digit
Display	4-digit, 7-segment LED display
Character height	14 mm
Display colour	red or green
Sampling rate (without damping)	1 reading/s
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III
Ambient temperature	-40...+80 °C
Storage temperature	-25...+80 °C
Humidity	up to 80% (non-condensing)

Dimensions:



Electrical connection:



ITP11-R-W / ITP11-G-W

The ITP11-W is a universal applicable display unit for monitoring of industrial processes. It connects to any 4-20mA output to visualise the present signal. This process display requires no auxiliary power and is supplied directly from the current loop. The ITP11-W is delivered in a dust-tight and water-resistant IP65-rated enclosure suitable for DIN-rail or wall mounting as well as a firm fixation on a tube (up to ø200mm).

Functions and features:

- Visualization of any 4-20mA signal received from a relevant output of a sensor, PLC, I/O module, etc.
- Display of up to four 14 mm high digits including the decimal point
- Signal scaling
- Damping of the measured signal
- Square root calculation
- Access protection
- Wall, DIN rail or tube (ø20...200 mm) mounting
- Dust-tight and water-resistant IP65-rated enclosure

Standard variants	Description	Enclosure
ITP11-R-W	ITP11-W with red LED	70 x 50 x 28 mm DIN rail / Wall / Tube
ITP11-G-W	ITP11-W with green LED	

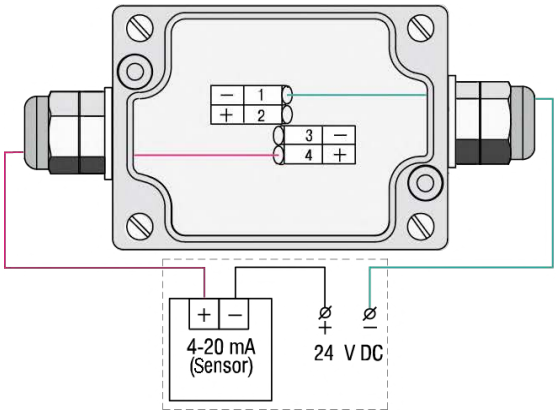
Display color	RED GREEN
Analog input 4-20 mA	4-20 mA
DIN rail mounting	DIN
Wall mounting	WALL
Tube mounting (ø20...200mm)	TUBE
Accuracy 0.2%	0.2
IP Code (on the front)	IP65
Ambient temperature	+80°C -40°C

Technical data:

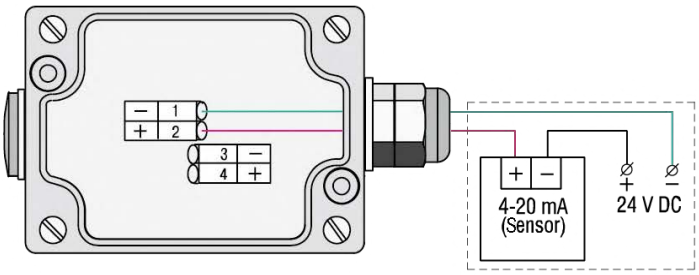
Supply current	from current loop
Voltage drop, max.	10 V
Input signal	4-20 mA
Measuring range	3.8...22.5 mA
Accuracy	0.2% + 1 digit
Sampling rate	1 reading / s
Ambient temperature	-40...+80 °C
Protection class	III
IP Code	IP65
Dimensions	70 x 50 x 28 mm
Weight	approx. 150 g
Mounting	DIN rail, wall, tube
Cable clamping range	Ø 3...6 mm

Wiring diagrams:

Two-side connection:



Connection from the right:



Mounting types:

ITP14 / ITP14-G

The ITP14 is a universally-applicable process display for monitoring and control of industrial processes. This display features a configurable current/voltage input and an NPN transistor output. The NPN transistor output makes it possible to implement on-off control of a low voltage relay up to 42 V DC / 200 mA.
This device has a compact enclosure that fits into a standard Ø22.5 mm mounting cutout, which provides quick and easy installation of many displays of this kind to be accommodated on a control panel or at the control cabinet door.

Functions and features:

- Analog input 0-5 mA, 0(4)-20 mA, 0(2)-10 V
- Display of up to four 14 mm high digits including the decimal point
- Signal scaling
- ON/OFF control with an NPN output
- Square root function (for special transmitters)
- Damping of the measured signal
- Alarm function (blinking when exceeding the setpoints)
- Error indication when the input signal is out of range
- Error indication when wire break or short circuit

Standard variants	Description	Enclosure
ITP14	ITP14 with red LED	48 x 26 x 65 mm Panel mount
ITP14-G	ITP14 with green LED	

Display color	RED GREEN
Configurable input for linear current or voltage singals	AI mA,V
NPN transistor output to control a low voltage relay (up to 42V DC / 200mA)	DO NPN
Power supply	24 V DC
Easy mounting in Ø 22.5 mm borehole	
Compact size	
Push-button box installation option	
Accuracy 0.2%	0.2
IP Code (on the front)	IP65
Ambient temperature	+60°C -40°C

Areas of application:

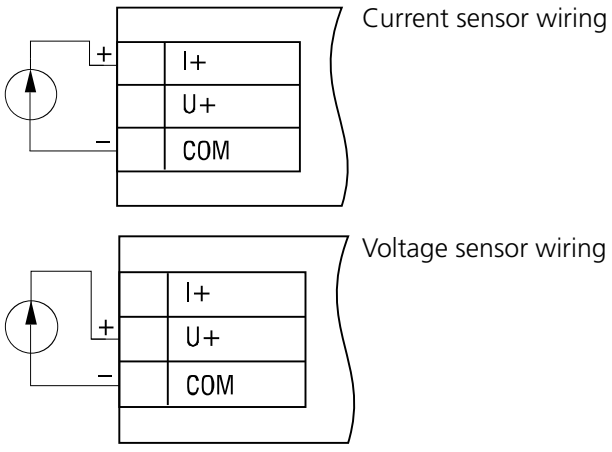
The universal display ITP14 is particularly suitable for the fast and easy installation of visual display systems for various processes, such as water supply, thermal processing, and many others. The ITP14 can be used as an additional stand-alone display unit for on-site process visualization or as a part of a complex visual display system.

Technical data:

Power supply	24 (10…30) V DC
Power consumption, max.	1 W
Input	1
Input signal	0-5 mA, 0(4)-20 mA, 0(2)-10 V
Sampling time	0.3 s
Accuracy	± (0,2% FS + 1 digit)
Temperature influence	≤ 0,2% / 10 °C
Input resistance	0-5 mA, 0(4)-20 mA ≤ 120 ohm / 0(2)-10 V ≥ 250 kohm
Output	1
Type	NPN transistor
Loading capacity	200 mA, 42 V DC
Display colour	red or green
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III
Ambient temperature	-40…+60 °C
Storage temperature	-25…+55 °C
Humidity	up to 80% (non-condensing)

Dimensions:

Electrical connection:



ITP15

The ITP15 Bar Graph Display is a compact process indicator that is intended to visualize an analog input signal in the range from 0 to 100% with 10 bars 10% each. The input signal can be either a linear voltage signal of 0(2)-10 V or a current signal of 0(4)-20 mA. Due to cylindrical form of the mounting part of the enclosure, the device can be positioned either vertically or horizontally without changing the mounting cutout. The ITP15 fits into a standard cutout of Ø22.5 mm. The cutouts of the same diameter are commonly used for mounting standard signal lamps or push buttons at control cabinets or panels.
Along with indication, a simple on-off control can be implemented with the NPN transistor output of the ITP15. This output can control a load of up to 200 mA, 42 VDC.

Functions and features:

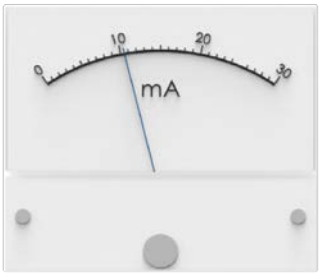
- Bar graph indication of the measured value
- Display range 0...100%
- 10 two-color bars (green/red) 10% each
- Configurable analog input (0-5 mA, 0(4)-20 mA, 0(2)-10 V)
- ON/OFF control with an NPN-transistor output
- 2 modes of blinking (fast/slow)
- Alarm settings

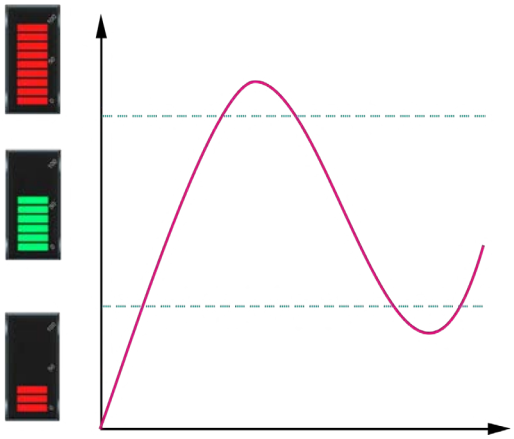
10 two-color bars	RED GREEN
Configurable input for linear current or voltage signals	AI mA,V
NPN-transistor output (42V DC, up to 200mA)	DO NPN
Power supply	24 V DC
On-off control	ON OFF
Effortless installation in a Ø 22.5 mm mounting cutout	
Compact size	
Push-button box installation option	
IP Code (on the front)	IP65
Ambient temperature	+60°C -40°C

Technical data:

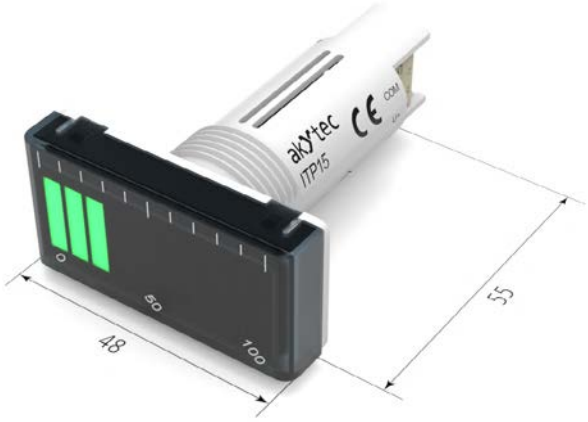
Power supply	24 (10…30) V DC
Power consumption, max.	1 W
Input	1
Input signal	0-5 mA, 0(4)-20 mA, 0(2)-10 V
Sampling time	0.3 s
Input resistance	0-5 mA, 0(4)-20 mA ≤ 120 ohm / 0(2)-10 V ≥ 250 kohm
Output	1
Type	NPN transistor
Loading capacity	200 mA, 42 V DC
Bargraph	10 two-color bars (LED)
Bars color	red/green
Resolution	10 %
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III
Ambient temperature	-40…+60 °C
Storage temperature	-25…+55 °C
Humidity	up to 80% (non-condensing)

The bars can change their color if the process value crosses the setpoints.

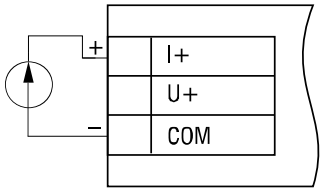




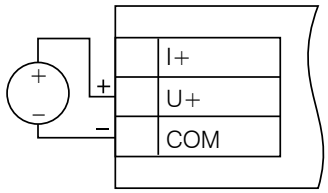
Dimensions:



Electrical connection:



Current sensor wiring



Voltage sensor wiring

ITP16 / ITP16-G

The ITP16 is a temperature indicator for monitoring and control of industrial processes. This display features a configurable analog input for various RTD, TC or linear voltage signals and a digital output. The NPN transistor output makes it possible to implement on-off control of a low voltage relay (up to 42 V DC / 200 mA).
This device has a compact enclosure that fits into a standard Ø22.5 mm mounting cutout, which provides quick and easy installation of many displays of this kind to be accommodated on a control panel or at the control cabinet door.

Functions and features:

- Support for a wide range of RTDs and TCs
- Display of up to four 14 mm high digits including the decimal point
- Linear voltage signal scaling
- Adjustable decimal point position
- Square root function (for special transmitters)
- Damping of the measured signal
- Alarm function (blinking of the measured signal)
- Error indication when the input signal is out of range
- Error indication when wire break or short circuit

Standard variants	Description	Enclosure
ITP16	ITP16 with red LED	48 x 26 x 65 mm Panel mount
ITP16-G	ITP16 with green LED	

Display color	RED GREEN
Configurable input for a wide range of RTDs and TCs	AI TC,RTD
NPN transistor output to control a low voltage relay (up to 42V DC / 200mA)	DO NPN
Power supply	24 V DC
Easy mounting in Ø 22.5 mm borehole	
Compact size	
Push-button box installation option	
Accuracy 0.2%	0.2
IP Code (on the front)	IP65
Ambient temperature	+60°C -40°C

Areas of application:

The universal display ITP16 is particularly suitable for the fast and easy installation of visual display systems for various thermal processes. The ITP16 can be used as an additional stand-alone display unit for on-site process visualization or as a part of a complex visual display system.

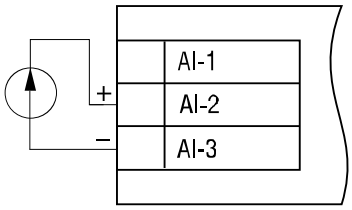
Technical data:

Power supply	24 (10…30) V DC
Power consumption, max.	1 W
Input	1
Input signal	TC, RTD, 0-1 V, -50…+50mV
Sampling time	2 s
Accuracy	± 0.2% FS
Temperature influence	≤ 0,2% / 10 °C
Output	1
Type	NPN transistor
Loading capacity	200 mA, 42 V DC
LED colour	red or green
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III
Ambient temperature	-40…+60 °C
Storage temperature	-25…+55 °C
Humidity	up to 80% (non-condensing)

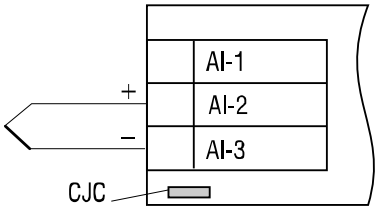
Dimensions:

Electrical connection:

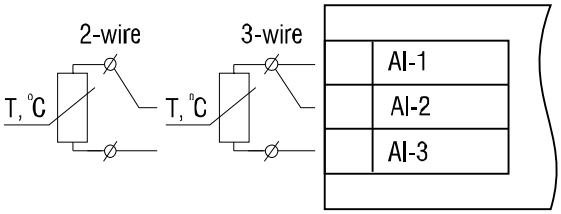
Voltage signal wiring



TC sensor wiring



RTD sensor wiring



SMI2 / SMI2-G

The SMI2 is a universally applicable display unit for monitoring industrial processes.This digital display is intended to visualize any signal communicated to its RS485 interface within the Modbus network which this display is integrated into. This device has a compact enclosure that fits into a standard Ø22.5 mm mounting cutout, which provides quick and easy installation of many displays of this kind to be accommodated on a control panel or at the control cabinet door.

Functions and features:

- Visualization of any value transmitted on the RS485 network
- Display of up to four 14 mm high digits including the decimal point
- Support for Modbus RTU and Modbus ASCII
- Modbus Master or Modbus Slave in the network
- Support for several variable types (INT, WORD, FLOAT,...)

Standard variants	Description	Enclosure
SMI2	SMI2 with red LED	48 x 26 x 65 mm Panel mount
SMI2-G	SMI2 with green LED	

Display color	RED GREEN
Protocol Modbus RTU/ASCII	Modbus
RS485 interface	RS485
Master or Slave in the Modbus network	MASTER SLAVE
Power supply	24 V DC
Easy mounting in ø 22.5 mm borehole	
Compact size	
Push-button box installation option	
IP Code (on the front)	IP65
Ambient temperature	+70°C -40°C

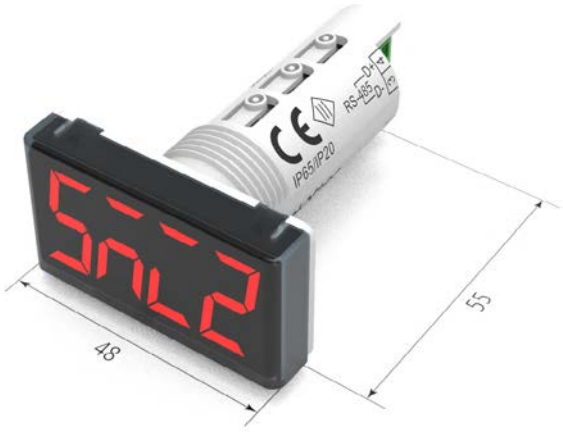
Areas of application:

In any Modbus network, the RS485 Display SMI2 can be utilized as an additional stand-alone display unit for on-site process visualization or as a part of a complex visual display system. This digital display can be quickly and easily integrated into the existing network with the enclosed configuration software.

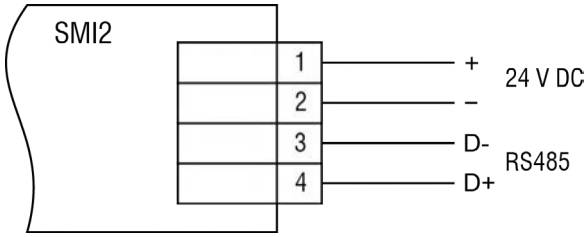
Technical data:

Power supply	12 / 24 (10.5...30) V DC
Power consumption, max.	1.5 W
Protocols	Modbus RTU / ASCII (Master / Slave)
Interface	RS485 (2-wire bus)
Baud rate	2.4...115.2 kbit/s
Display	4-digit, 7-segment LED display
Character height	14 mm
Display colour	red
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III
Ambient temperature	-40...+70 °C
Storage temperature	-25...+70 °C
Humidity	up to 80% (non-condensing)
Galvanic isolation	yes

Dimensions:



Electrical connection:



Mini-PLCs overview

Programmable relays of akYtec are small PLCs. Devices of this type can also be called intelligent relays, small logic controllers, compact PLCs, mini-PLCs, etc. The control algorithms of these devices are created directly by the user, and can't be read from the internal memory after the upload, making these simple PLCs versatile in the residential and municipal sectors, in agriculture, as well as in various industrial sectors. Future adaptations of the system can be updated by the user using the freely available and easy-to-use akYtec ALP software, without any need to modify the circuit.

Overview table:

				
Device	**PR200**	**PR103**	**PR102**	**PR100**
I/O points	22	26	40	20
Digital inputs	8	6	16	8
Fast digital inputs (100 kHz)	-	4	-	-
Digital outputs	8	8	14	8
Analog inputs	4	6	8	4
Type	4-20 mA, 0-10 V, 0-4 kohm	NTC, PTC, PT1000, 4-20mA, 0-10V, 0-300 kohm		4-20 mA, 0-10 V
Analog outputs	2	2	2	-
Type	4-20 mA, 0-10 V (on device variant)	4-20 mA, 0-10 V (configurable)		-
Ethernet	-	1	-	-
RS485	up to 2	2	2	1
Extension (PRM)	up to 2	up to 2	up to 2	-

PR200

The PR200 Programmable Relay is a multifunctional and easy-to-use device designed in a plastic enclosure for DIN rail mounting as an alternative to the PLC. This mini PLC is available in several versions depending on the supply voltage (24V DC or 230V AC) and the set of built-in inputs and outputs (digital, analog, or their combination).
This device features a programmable 2-line 32-character LCD display. On option, one or two RS485 interfaces are available for implementing a Modbus communication either in Master or in Slave mode. A user-friendly programming software, akYtec ALP, is included free of charge.

Functions and features:

- Up to built-in 8DI + 8DO + 4AI + 2AO + LCD + 2xRS485 in one device
- Configurable inputs for 4-20mA, 0-10V, 0-4000ohm (PTC, KTY thermistors, Pt1000)
- Up to 2xRS485 interfaces with Modbus RTU / ASCII | Master/Slave
- Versatile programming of LCD display
- Configuration with the function buttons or using ALP software
- 2 programmable LEDs
- PRM-expandable: up to 32 additional I/O points over an internal bus with no loss in performance
- Real-time clock

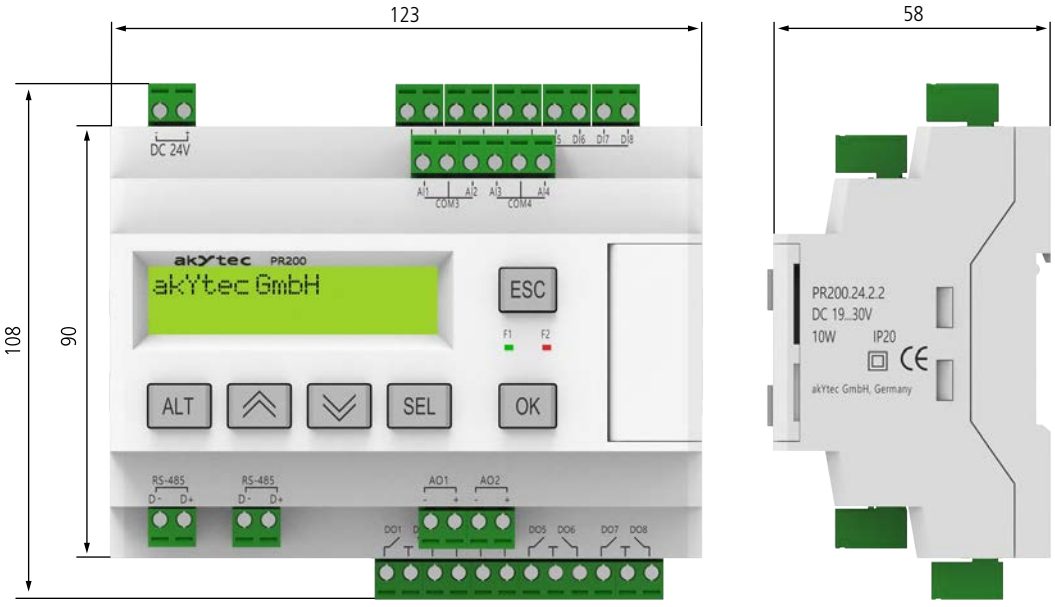
Possible areas of application:

- Building automation
- Indoor and outdoor lighting, shop window lighting, access systems
- Technical equipment such as pumps, fans, compressors, presses
- Conveyor and filling systems

8 digital inputs	8 DI
Up to 8 digital outputs	8 DO
Up to 4 analog inputs	4 AI
Up to 2 analog outputs	2 AO
LCD display	LCD
Protocol Modbus RTU/ASCII	Modbus
Up to 2 RS485 interfaces	RS485
USB interface	
DIN rail mounting	DIN
Ambient temperature	+50°C -20°C

Standard variant	Description	Enclosure
PR200.24.1.1	24 V DC, 8DI + 6DO, LCD, 1x RS485 (Modbus RTU/ASCII)	123 x 108 x 58 mm, DIN rail
PR200.24.2.0	24 V DC, 8DI + 8DO + 4AI + 2AO (4-20 mA), LCD	
PR200.24.2.2	24 V DC, 8DI + 8DO + 4AI + 2AO (4-20 mA), LCD, 2x RS485 (Modbus RTU/ASCII)	
PR200.24.4.0	24 V DC, 8DI + 8DO + 4AI + 2AO (0-10 V), LCD	
PR200.24.4.2	24 V DC, 8DI + 8DO + 4AI + 2AO (0-10 V), LCD, 2x RS485 (Modbus RTU/ASCII)	
PR200.230.1.1	230 V AC, 8DI + 6DO, LCD, 1x RS485 (Modbus RTU/ASCII)	
PR200.230.2.0	230 V AC, 8DI + 8DO + 4AI + 2AO (4-20 mA), LCD	
PR200.230.2.2	230 V AC, 8DI + 8DO + 4AI + 2AO (4-20 mA), LCD, 2x RS485 (Modbus RTU/ASCII)	
PR200.230.4.0	230 V AC, 8DI + 8DO + 4AI + 2AO (0-10 V), LCD	
PR200.230.4.2	230 V AC, 8DI + 8DO + 4AI + 2AO (0-10 V), LCD, 2x RS485 (Modbus RTU/ASCII)	

Dimensions:

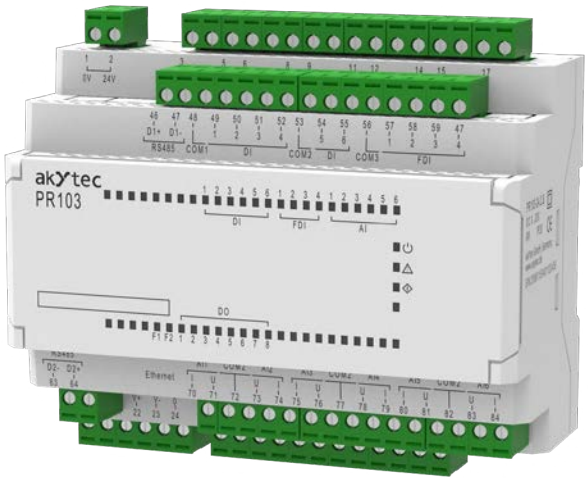


Technical data:

	PR200.230.1	PR200.230.2	PR200.24.1	PR200.24.2
General				
Power supply	230 (90...264) V AC; 50 (47…63) Hz		24 (19...30) V DC	
Power consumption, max.	10 VA	17 VA	10 W	
Integrated voltage source	–	24±3 V DC, 100 mA	–	
Display	LCD with backlight, 2-line, 2x16-characters		LCD with backlight, 2-line, 2x16-characters	
Function keys	6		6	
Real-Time Clock	Backup 8 years (CR2032)		Backup 8 years (CR2032)	
Mounting	DIN rail (switchboard / distribution box)		DIN rail (switchboard / distribution box)	
Ambient temperature	-20...+55 °C		-20...+55 °C	
IP code	IP20		IP20	
Dimensions	123 x 108 x 58 mm		123 x 108 x 58 mm	
Weight	approx. 350 g		approx. 350 g	
Programming				
Programming environment	akYtec ALP		akYtec ALP	
Programming language	FBD		FBD	
ROM	128 kB		128 kB	
Retain memory	1016 Byte		1016 Byte	
Interfaces				
RS485	optional, up to 2 x		optional, up to 2 x	
Protocols	Modbus RTU / ASCII (Master / Slave)		Modbus RTU / ASCII (Master / Slave)	
Baud rate	9.6...115.2 kbit/s		9.6...115.2 kbit/s	
Programming interface	Mini-USB		Mini-USB	
Digital inputs				
Quantity	8		8	
Type	Switch contact		Switch contact, PNP with open collector, digital signals -3…+30 VDC	
Logical states				
1	159...264 V AC (0.75...1.5 mA)		15...30 V DC (5 mA)	
0	0...40 V AC (0...0.5 mA)		-3...+5 V DC (0...1 mA)	
Galvanic isolation	in groups of 4		in groups of 4	
Universal inputs				
Quantity	-	4	-	4
Mode	-	Analog / Digital	-	Analog / Digital
Galvanic isolation	none		none	
Analog input	-	0-10 V, 4-20 mA, 0...4 kohm	-	0-10 V, 4-20 mA, 0...4 kohm
ADC resolution	12 bit		12 bit	
Digital outputs				
Quantity	6	8	6	8
Type	relay (NO)		relay (NO)	
Galvanic isolation	in groups of 2		in groups of 2	
Switching capacity				
AC	5 A, 250 V (resistive load)		5 A, 250 V (resistive load)	
DC	3 A, 30 V		3 A, 30 V	
Minimum load current	10 mA (at 5 V DC)		10 mA (at 5 V DC)	
Analog outputs				
Quantity	-	2	-	2
Type	-	4-20 mA	-	4-20 mA
Loading capacity	-	12...30 V, max. 1 kohm	-	12...30 V, max. 1 kohm
DAC resolution	10 bit		10 bit	

PR103

PR103 is a mini PLC with extended communication capabilities thanks to Ethernet interface and two RS485 interfaces supporting Modbus TCP and RTU/ASCII protocols. This device is designed for DIN rail mounting in a control cabinet and can implement basic control systems for various applications such as lighting, pump, ventilation and heating control and others. A user program is written in function block diagram language in the akYtec ALP programming software, which is available free of charge. The control algorithm is loaded into the device memory via a micro USB cable connection.



Functions and features:

- Built-in 6DI + 8DO + 4Fast DI + 6AI + 2AO + 1xEthernet + 2xRS485 in one device
- 6 analog inputs, each capable of connecting:
  - RTD sensors (Pt500/1000, Ni500/1000, etc.)
  - NTC/PTC sensors
  - 4-20 mA / 0-10 V signals
  - Digital signals
- 10 digital inputs, 4 of which support pulse counting (up to 100 kHz)
- 2 analog outputs configurable for 4-20 mA or 0-10 V
- Ethernet interface with support for Modbus TCP client (master) / server (slave)
- 2xRS485 interfaces with support for Modbus RTU / ASCII | Master/Slave
- PRM-expandable: up to 32 additional I/O points over an internal bus with no loss in performance
- Real-time clock
- USB-powered in the programming mode

6 digital inputs, 8 digital outputs	6 DI AND 8 DO
6 analog inputs, 2 analog outputs	6 AI AND 2 AO
4 fast digital inputs	4 DI FAST
Modbus TCP | Ethernet	
USB interface	
Modbus RTU / ASCII | RS485	Modbus RS485
Built-in real-time clock	
DIN rail mounting	DIN
Free software	
Ambient temperature	+55°C -40°C

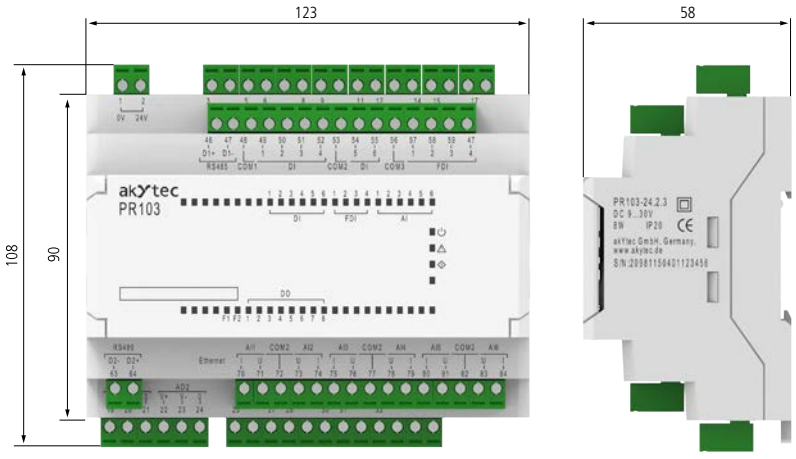
Technical data:

Digital inputs	
Quantity	6
Type	Switch contact
Logical states	
1	8.5...30 V DC (2...5 mA)
0	-3...+5 V DC (0...15 mA)
Galvanic isolation	in groups of 2 and 4
Fast digital inputs	
Quantity	4
Logical states	
1	8.5...30 V DC (2...5 mA)
0	-3...+5 V DC (0...15 mA)
Pulse width, min	5 mks
Pulse frequency, max	100kHz
Galvanic isolation	in group of 4
Universal inputs	
Quantity	6
Input signal	Analog / Digital
Galvanic isolation	none
Analog input	4-20 mA, 0-10 V, 0-300 kOhm Pt1000, PTC, NTC...
ADC resolution	12 bit
Digital outputs	
Quantity	8
Type	relay, NO
Galvanic isolation	individual
Switching capacity	
AC	5 A, 250 V (resistive load)
DC	3 A, 30 V
Minimum load current	10 mA (at 5 V DC)
Analog outputs	
Quantity	2
Analog outputs	4-20 mA, 0-10 V
Permissible load	15...30 V
DAC resolution	12 bit
Galvanic isolation	individual
Environment	
Ambient temperature	-40...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80 % (at +25 °C, non-condencing)
IP Code	IP20
Enclosure	
Dimensions	123 × 108 × 58 mm
Weight	approx. 350 g
Material	plastic

Supported sensors:

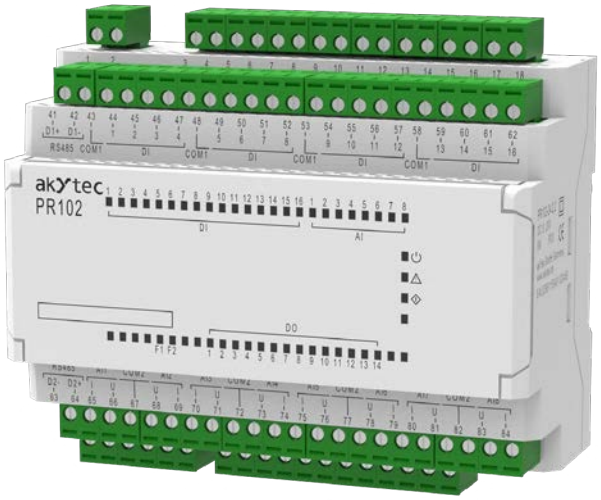
Sensor	Measuring range
RTD according to IEC 60751:2008	
Pt500, Pt1000	-200…+850°C
Cu500, Cu1000	-50…+200°C
Ni500, Ni1000	-60…+180°C
RTD according to GOST 6651	
500P, 1000P	-200…+850°C
500M, 1000M	-50…+200°C
Standart signals	
0-10 V 4-20 mA	0...100%
Resistive signal	
0-300 kohm	0...100%
Thermistors / NTC	
B57861S series, 2 kΩ, B25/100 = 3560	-55…+100°C
B57861S series, 3 kΩ, B25/100 = 3988	-55…+145°C
B57861S series, 5 kΩ, B25/100 = 3988	-35…+145°C
B57861S series, 10 kΩ, B25/100 = 3988	-35…+155°C
B57861S series, 30 kΩ, B25/100 = 3964	-20…+155°C
B57861S series, 50 kΩ, B25/100 = 3760	-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	

Dimensions:



PR102

PR102 is a Mini-PLC designed to implement basic control systems for various applications such as lighting control, pumping control, ventilation and heating control, and others.
The key advantages of PR102 are its extensive functionality and high density of I/O points. Occupying only 126 mm of a DIN-rail length in a control cabinet, this Mini-PLC offers a total of 40 built-in digital and analog inputs and outputs, and two RS485 ports for communication with Modbus-RTU/ASCII-enabled devices. Furthermore, the built-in I/Os may be directly expanded with up to two extension modules of the PRM series.
An application program is written in function block format in the akYtec ALP programming software available free of charge. The control algorithm is uploaded to the device memory via a micro-USB-cable connection.



Functions and features:

- Built-in 16DI + 14DO + 8AI + 2AO + 2xRS485 in one device
- A total of 40 I/Os
- 8 analog inputs, each capable of connecting:
  - RTD sensors (Pt500/1000, Ni500/1000, etc.)
  - NTC/PTC sensors
  - 4-20 mA / 0-10 V signals
  - Digital signals
- 2 analog outputs configurable for 4-20 mA or 0-10 V
- 2xRS485 interfaces with Modbus RTU / ASCII | Master/Slave
- PRM-expandable: up to 32 additional I/O points over an internal bus with no loss in performance
- Real-time clock
- USB-powered in the programming mode

16 digital inputs	16 DI
14 digital outputs	14 DO
8 analog inputs	8 AI
2 analog outputs	2 AO
Modbus RTU/ASCII | RS485	Modbus RS485
USB interface	
Built-in real-time clock	
DIN rail mounting	DIN
Software at no charge	
Ambient temperature	+55°C -40°C

Technical Data:

General	
Power supply	24 (9...30) V DC
Power consumption, max.	8 W
Real Time Clock	Backup 5 years (CR2032)
Real Time Clock accuracy	± 3 s/day
Extension modules	up to 2 PRMs
Programming	
Programming environment	akYtec ALP
Programming language	FBD
Programming interface	Mini-USB
Memory	
ROM	128 kB
RAM	32 kB
Retain memory	1016 Byte
Communication	
Interface	2x RS485
Protocols	Modbus RTU / ASCII (Master / Slave)
Baud rate	9.6...115.2 kBit/s
Digital inputs	
Quantity	16
Type	Switch contact
Logical states	
1	8.5...30 V DC (2...5 mA)
0	-3...+5 V DC (0...15 mA)
Galvanic isolation	none
Universal inputs	
Quantity	8
Mode	Analog / Digital
Galvanic isolation	none
Analog input	4-20 mA, 0-10 V, 0-300 kohm Pt1000, PTC, NTC...
ADC resolution	12 bit
Digital outputs	
Quantity	14
Type	relay, NO
Galvanic isolation	individual
Switching capacity	
AC	5 A, 250 V (resistive load)
DC	3 A, 30 V
Minimum load current	10 mA (at 5 V DC)
Analog outputs	
Quantity	2
Analog outputs	4-20 mA, 0-10 V
Permissible load	12...30 V
DAC resolution	12 bit
Galvanic isolation	individual
Environment	
Ambient temperature	-40...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80 % (at +25 °C, non-condencing)
IP Code	IP20
Enclosure	
Dimensions	123 × 108 × 58 mm
Weight	approx. 250 g
Material	plastic

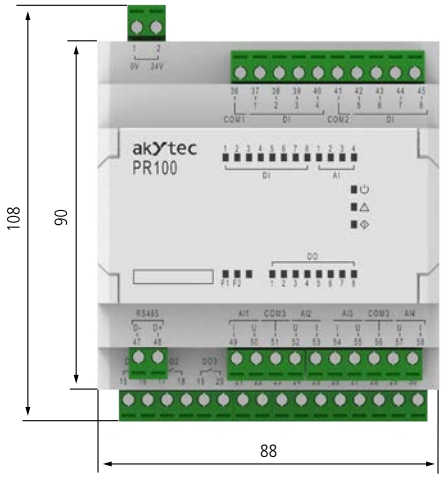
PR100

PR100 is a compact Mini-PLC designed to solve basic automation tasks in, for example, lighting control, pumping control, ventilation and heating control, and other simple control systems.
With its minimum width, which measures as narrow as five standard MCBs placed inline, and dedicated enclosure form, the PR100 Mini-PLC allows for space-saving installation even in smaller consumer units , not to mention control cabinets. This device can operate in non-heated environments down to -40°C as well as in heated ones in temperatures up to +55°C.
An application program is written in function block format in the akYtec ALP programming software available free of charge. The control algorithm is uploaded to the device memory through a micro USB cable.

Functions and features:

- Built-in 8DI + 8DO + 4AI + 1xRS485 in one device
- A total of 20 I/Os
- Configurable inputs for 4-20mA, 0-10V
- RS485 interface with Modbus RTU / ASCII | Master/Slave
- USB-powered in the programming mode
- Real-time clock
- Software-based features include: retain variables, day timer, week timer, PID control, etc.

Dimensions:



8 digital inputs	8 DI
8 digital outputs	8 DO
4 analog inputs	4 AI
Protocol Modbus RTU/ASCII	Modbus
RS485 interface	RS485
USB interface	
Built-in real-time clock	
DIN rail mounting	DIN
Software at no charge	
Ambient temperature	+55°C -40°C

Technical Data:

General	
Power supply	24 (9...30) V DC
Power consumption, max.	4 W
Real Time Clock	Backup 5 years (CR2032)
Real Time Clock accuracy	± 3 s/day
Extension modules	none
Programming	
Programming environment	akYtec ALP
Programming language	FBD
Programming interface	Mini-USB
Memory	
ROM	128 kB
RAM	16 kB
Retain memory	1 kB
Network variables	128 Byte
Communication	
Interface	RS485
Protocols	Modbus RTU / ASCII (Master / Slave)
Baud rate	9.6...115.2 kBit/s
Digital inputs	
Quantity	8
Type	Switch contact
Logical states	
1	8.5...30 V DC (2...5 mA)
0	-3...+5 V DC (0...15 mA)
Galvanic isolation	in groups of 4
Universal inputs	
Quantity	4
Mode	Analog / Digital
Galvanic isolation	none
Analog input	4-20 mA, 0-10 V
ADC resolution	12 bit
Digital outputs	
Quantity	8
Type	relay, NO
Galvanic isolation	individual
Switching capacity	
AC	5 A, 250 V (resistive load)
DC	3 A, 30 V
Minimum load current	10 mA (at 5 V DC)
Environment	
Ambient temperature	-40...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80 % (at +25 °C, non-condencing)
IP Code	IP20
Enclosure	
Dimensions	88 × 108 × 58 mm
Weight	approx. 250 g
Material	plastic

The Mini-PLC PR100 cannot be expanded with PRM extension modules.

PRM

PRM provides the quickest and the most convenient, as regards installation and configuration, digital or analog I/O extension for the PR200 Programmable Relay from akYtec.
This module connects to the PR200 base unit directly over the internal bus, which ensures much faster and reliable communication as compared to RS485/Modbus. Moreover, the communication over the internal bus requires no additional I/O configuration as it is with Modbus registers.

Functions and features:

- Independent power supply (24V DC or 230V AC on option)
- The same high-speed performance as that of the PR200 base unit
- Easy connection, removal and replacement
- Galvanic isolation between power supply and I/O groups

Standard variants	Description	Enclosure
PRM-230.1	230 V AC voltage, 8 DI and 8 DO relay	DIN rail / wall 80 x 108 x 58 mm
PRM-24.1	24 V DC voltage, 8 DI and 8 DO relay	
PRM-230.3	230 V AC voltage, 4 AI and 2 AO	
PRM-24.3	24 V DCvoltage, 4 AI and 2 AO	

The PRM expansion modules are compatible with all akYtec programmable relays except the PR100.

8 digital inputs or 8 digital outputs	8 DI OR 8 DO
4 analog inputs or 2 analog outputs	4 AI OR 2 AO
Galvanic isolation	PS In Out
Cost effective	
DIN rail mounting	DIN
IP code	IP20
Ambient temperature	+50°C -20°C

Technical data:

	PRM-230.1	PRM-24.1
General		
Power supply	230 (90...264) V AC; 50 (47…63) Hz	24 (19...30) V DC
Power consumption, max.	8 VA	4 W
Mounting	DIN rail (switchboard / distribution box)	
Ambient temperature	-20...+55 °C	
IP code	IP20	
Dimensions	80 x 108 x 58 mm	
Weight	approx. 250 g	
Digital inputs		
Quantity	8	
Type	Switch contact	Switch contact, PNP with open collector
Logical states		
1	159...264 V AC (0.75...1.5 mA)	15...30 V DC (5 mA)
0	0...40 V AC (0...0.5 mA)	-3...+5 V DC (0...1 mA)
Galvanic isolation	in groups of 4	
Digital outputs		
Quantity	8	
Type	relay (NO)	
Galvanic isolation	in groups of 2	
Switching capacity		
AC	5 A, 250 V (resistive load)	
DC	3 A, 30 V	
Minimum load current	10 mA (at 5 V DC)	

	PRM-230.3	PRM-24.3
General		
Power supply	230 (90...264) V AC; 50 (47…63) Hz	24 (19...30) V DC
Power consumption, max.	8 VA	4 W
Mounting	DIN rail (switchboard / distribution box)	
Ambient temperature	-20...+55 °C	
IP code	IP20	
Dimensions	80 x 108 x 58 mm	
Weight	approx. 250 g	
Analog inputs		
Quantity	4	
Type	TC, RTD, (0)4-20 mA, 0-1 V, -50-50 mV, 0 … 3950 Ω	
ADC resolution	16 bit	
Sampling time for one input, max.	0.6-0.8 s	
Accuracy		
TC	0.5 %	
RTD	0.25 %	
I/U	0.25 %	
Analog input resistance, min.	10 kΩ	
Analog outputs		
Quantity	2	
Type	0-24 mA, 0-20 mA, 4-20 mA, 0-5 V, 0-10	
DAC resolution	12 bit	
Accuracy	± 0.5 %	
Temperature influence	± 0.25 %	
Galvanic isolation between outputs	2830 V	
Voltage supply (external, each output)	15-30 V DC	
Accuracy	± 0.5 %	
Output load (max.)	1000 Ω (0-24 mA, 0-20 mA, 4-20 mA) 300 Ω (0-5 V, 0-10 V)	

SMI200

SMI200 Programmable Compact Controller is, in essence, an operator interface terminal featured with 128kB programming capacity and an RS485 interface to connect I/O modules. This device has a compact enclosure that fits into any standard Ø22.5 mm mounting cutout and provides effortless installation on a control panel or at a control cabinet door.
If you need the programming possibility of a PLC on the one hand, while that never-fulfilled potential of often overpriced PLCs makes no sense for your modest application on the other hand – the SMI200 Programmable Compact Controller is an ideal compromise for you in terms of both common sense and money.

Functions and features:

- Freely programmable device
- 2-line 32-character LCD display
- Master / Slave in a Modbus network over RS485
- Quick and easy installation in a Ø22.5 mm mounting cutout
- Programming software akYtec ALP (available at no charge)
- Real-time clock

Functions and features:

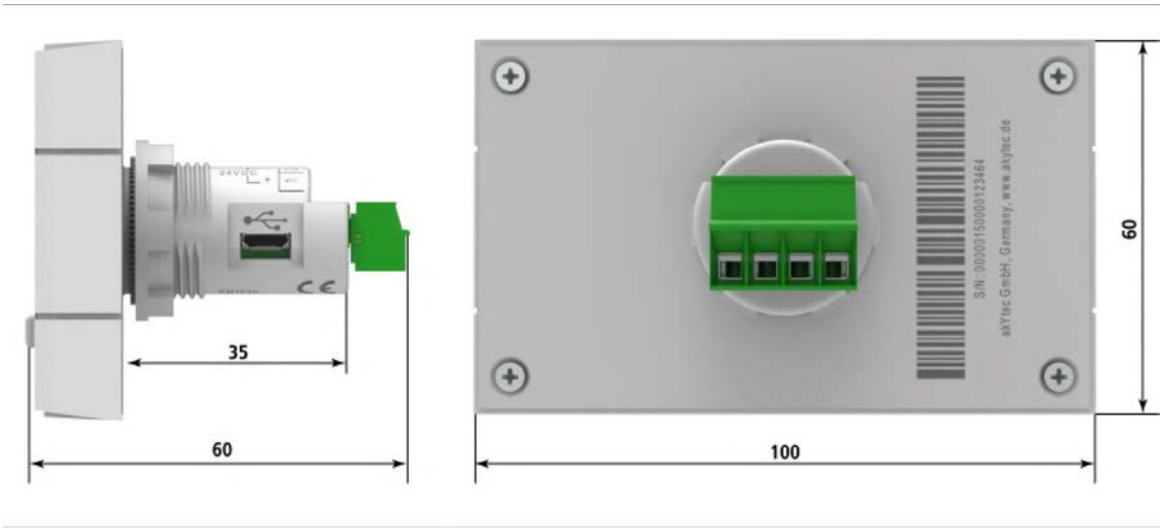
- Indoor and outdoor lighting systems
- HVAC applications
- Engine control
- Oven / furnace / kiln control
- Lifting systems
- Access control

LCD display	LCD
Protocoll Modbus RTU/ASCII	Modbus
RS485 interface	RS485
USB interface	
Real-Time Clock	
Effortless installation	
IP Code	IP54
Ambient temperature	+50°C -20°C

Technical data:

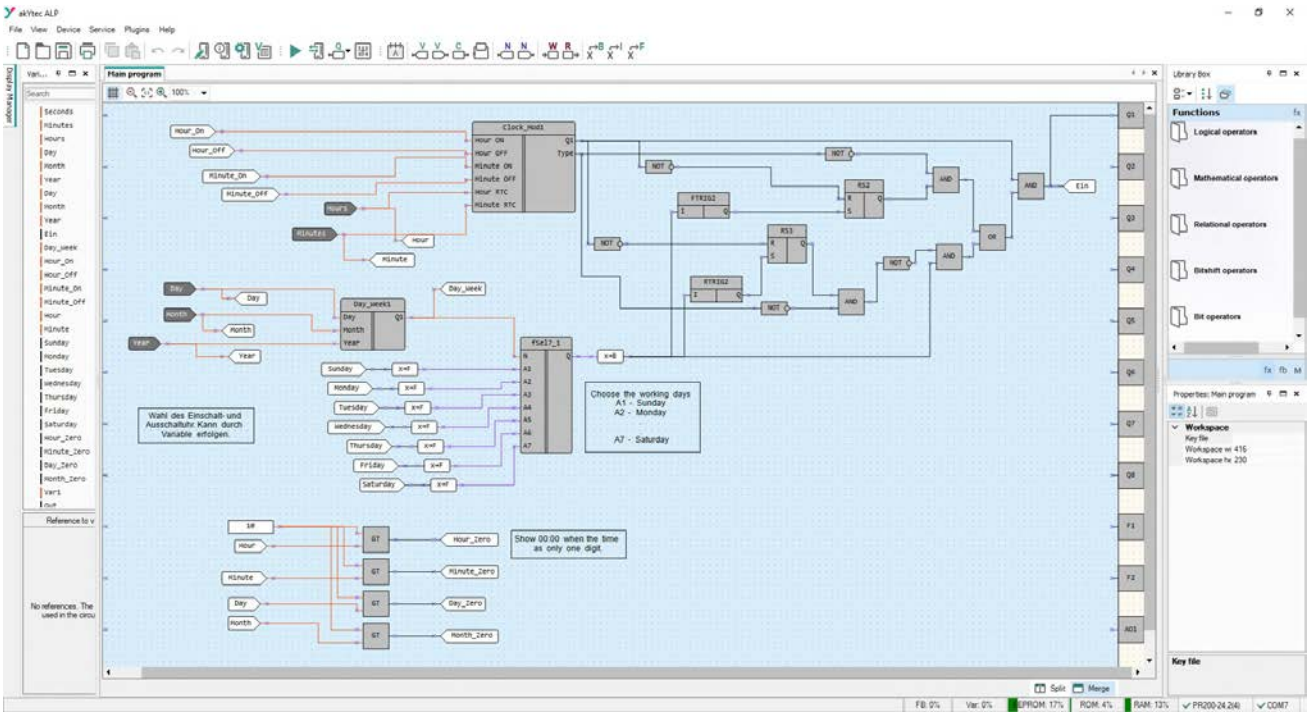
General	
Power supply	24 (9...32) V DC
Power consumption, max.	2.5 W
Display	LCD with backlight, 2-line, 2x16-characters
Function keys	6
Real Time Clock	yes
Mounting	ø 22.5 mm borehole
Ambient temperature	-20...+55 °C
IP code	front IP54, rear IP20
Dimensions	100 x 60 x 60 mm
Weight	approx. 150 g
Programming	
Programming environment	akYtec ALP
Programming language	FBD
RAM	32 kB
ROM	128 kB
Network variable memory	512 Byte
Interfaces	
RS485	2-pole connector
Protocols	Modbus RTU / ASCII (Master / Slave)
Baud rate	9.6...115.2 kbit/s
Programming interface	Micro-USB

Dimensions:



Programming software akYtec ALP

akYtec ALP software tool is a programming environment for akYtec's Mini-PLCs and the SMI200 Programmable Compact Controller. Projects for these devices are written in the programming language FBD (Function Block Diagram) according to IEC 61131-3. akYtec ALP is available free of charge and included in delivery.



Properties:

- Creating your own function blocks / macros
- Simulation mode
- Real-time I/O status monitoring
- Use of internal variables for a simplified project creation
- Firmware update function
- Templates for network variables
- Complete overview of resource use and their availability in the project
- Integrated Display Manager
- Access to Online Macro Database

Free of charge software

Programming language FBD (Function Block Diagram)

FBD

Programming language ST for creating users macros (Structured text)

ST

Overview of the functions, function blocks and macros:

Functions:

- Logical operators
- Mathematical operators
- Relational operators
- Bit operators

Function blocks:

- Triggers
- Timers
- Generators
- Counters
- PID controller

Macros:

- HVAC
- Analog conversions
- Signal converters (Pt1000, NTC, PTC)
- Control (On-Off, Range monitor)

MX110 Series

The I/O-Modules of the MX110 Series offer a cost effective and flexible solution in distributed automation systems. Unlike many centralized I/O systems, the operation of these modules requires no need for involving any bus couplers nor supply modules because each MX110 unit has its own power supply and communication terminals on board. With the proven RS485 interface and intelligent functions, such as pulse counting or sensor state diagnostics, the MX110 modules can be used in different fields, e.g., building technology, process industry, etc. These robust digital and analog modules are used for decentralized data acquisition and process control as well as they can serve as a proper supplement to existing systems or new automation systems to be deployed.

The use of I/O-Modules provides:

- Significant reduction of cabling resulting in the lower susceptibility to interferences
- Reduced setup time due to direct connection of sensors and actuators
- Higher flexibility of the entire system due to free placement and easy replaceable elements
- Better system adaptability and extensibility

Applications:

- I/O signal transmission to a SCADA system or HMI (e.g. operator terminal)
- Increasing the number of I/O points of a PLC
- Any RS485-capable fieldbus network with communication via Modbus RTU/ASCII

Functions:

- PWM
- Pulse counter function
- Sensor-based status diagnostics
- Diagnostics of RS485 network status
- Additional logic functions at digital inputs and outputs
- Transmission protocol autodetection
- Generation of appropriate error signals or alarm signals
- DIN rail or wall mounting

Modbus protocol	Modbus
RS485 interface	RS485
Galvanic isolation	PS In Out RS485
DIN rail mounting	DIN
Wall mounting	WALL
Ambient temperature	+50°C -20°C

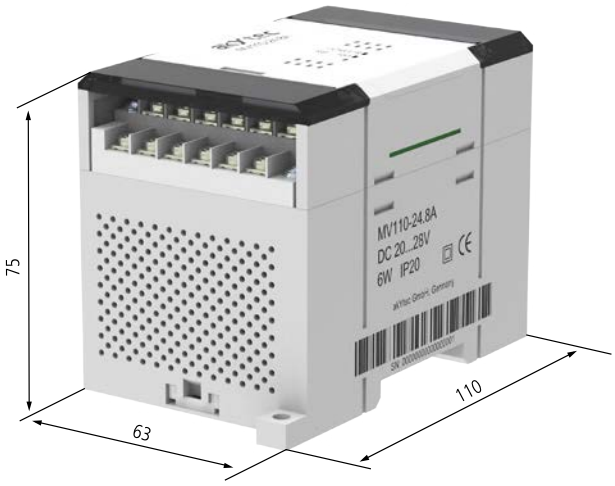
Configuration

The configuration software is available free of charge. A simple and convenient interface enables fast and uncomplicated configuration of I/O-Modules. The configuration mask can be saved as a file.

Overview table:

Module	Digital inputs	Digital outputs	Analog inputs	Analog outputs	Properties
Input modules					
MV110-24.8A			8		Inputs: RTD, TC, 0-5 mA, 0(4)-20 mA, 0-1 V, 25...900(2000) ohm, switch contacts
MV110-24.8AS			8		"Fast" inputs: 0(4)-20 mA, 0-5 mA, 0-10 V, measuring frequency up to 200 Hz
MV110-24.16D	16				Inputs: switch contacts (no external power supply required), NPN sensors, pulse counters (24 V DC external power supply, measuring frequency up to1kHz)
MV110-24.16DN	16				Inputs: switch contacts, NPN sensors, pulse counters (24 V DC external power supply, measuring frequency up to 1kHz)
Combined I/O-Modules					
MK110-24.8D.4R	8	4			Inputs: Switching contacts, NPN sensors Outputs: relays 4 A, 24 V DC
Output modules					
MU110-24.8I				8	Outputs: 4-20 mA, accuracy 0.5 %
MU110-24.6U				6	Outputs: 0-10 V, accuracy 0.5 %
MU110-24.8R		8			Outputs: relays (NO), 4 A, 250 V AC or 24 V DC
MU110-24.8K		8			Outputs: NPN transistors, 400 mA, 60 V DC
MU110-24.16R		16			Outputs: relays (NO) 3 A at 250 V AC or 30 V DC
MU110-24.16K		16			Outputs: NPN transistors, 400 mA, 60 V DC

Mx110 Dimensions:



Plug-in screw terminals:

Analog input module MV110-24.8A

8 AI

4-20 mA

TC

RTD

Analog inputs	8
ADC resolution	16 bit
Input signals	
Resistance thermometer	Pt50, Pt100, Pt500, Pt1000 Ni100, Ni500, Ni1000
Thermocouple	A, J, N, K, S, R, B, T
Position encoder	25...900ohm, 25...2000 ohm, 0(4)-20 mA, 0-5 mA
Standard signal	0-1 V, 0-5 mA, 0-20 mA, 4-20 mA
Usable as digital input	yes, 8x
Accuracy, max.	
Resistance thermometer	±0.25%
Thermocouple	±0.5%
Position encoder	±0.25%
Standard signal	±0.25%
Sampling rate per input, max.	
Resistance thermometer	0.9 s
Thermocouple	0.6 s
Position encoder	0.6 s
Standard signal	0.6 s

Analog input module MV110-24.8AS

8 AI

4-20 mA

0-10V

FAST

Analog inputs	8
ADC resolution	10 bit
Input signals	
Standard signal	0-10 V, 0-5 mA, 0-20 mA, 4-20 mA
Usable as digital input	no
Accuracy, msx.	±0.25 %
Input resistance	
0-10 V	min. 200 ohm
0-5 mA	130...500 ohm
0-20 mA	130...250 ohm
4-20 mA	130...250 ohm
Sampling rate per input, max.	5 ms ± 2%

Supply	
Power supply	24 (21...35) V DC
Power consumption, max.	6 W
Communication	
Interface	RS485
Protocol	Modbus RTU / ASCII
Baud rate	2.4...115.2 kbit/s
IP Code	IP20
Environment	
Ambient temperature	-20...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80%, non-condensing
Enclosure	
Dimensions	63 x 110 x 75 mm
Weight	approx. 240 g
Material	Plastic

Digital input module
MV110-24.16D(DN)

16 DI

PNP

NPN

Digital I/O module
MK110-24.8D.4R

8 DI

NPN

4 DO

RELAY

Digital inputs	16
MV110-24.16D	
Input signal	switch contact, NPN
Galvanic isolation	–
Pulse frequency, max.	1 kHz
Pulse length, min.	0.5 ms
Current, max.	7 mA
Lead resistance, max.	100 ohm
MV110-24.16DN	
Input signal	switch contact, NPN/PNP
Galvanic isolation	1500 V, in groups of 4
Pulse frequency, max.	1 kHz
Pulse length, min.	0.5 ms
Integrated voltage source	24±3 V
Current, max.	8.5 mA (with 27 V)
Logical „1“, min.	4.5 mA
Logical „0“, max.	1.5 mA

Digital inputs	8
Input signal	switch contact, NPN
Galvanic isolation	–
Insulation strength	1500 V
Pulse frequency, max.	1 kHz
Pulse width, min.	0.5 ms
Current, max.	7 mA
Lead resistance, max.	100 ohm
Digital outputs	4
Type	relays
Permissible load	4 A, 24 V DC

Supply	
Power supply	24 (21...35) V DC
Power consumption, max.	6 W
Communication	
Interface	RS485
Protocol	Modbus RTU / ASCII
Baud rate	2.4...115.2 kbit/s
IP Code	IP20
Environment	
Ambient temperature	-20...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80%, non-condensing
Enclosure	
Dimensions	63 x 110 x 75 mm
Weight	approx. 240 g
Material	Plastic

Analog output module MU110-24.8I

8 AO

4-20 mA

Analog outputs	8
Output signal	4-20 mA
DAC resolution	10 bit
Power supply	10...36 V DC
Accuracy, max.	±0.5 %
Load resistance	0...1300 ohm

Analog output module MU110-24.6U

6 AO

0-10V

Analog outputs	6
Output signal	0-10 V
DAC resolution	10 bit
Power supply	12...36 V DC
Accuracy, max.	±0.5 %
Load resistance	min. 2000 ohm

Supply	
Power supply	24 (20...28) V DC
Power consumption, max.	6 W
Communication	
Interface	RS485
Protocol	Modbus RTU / ASCII
Baud rate	2.4...115.2 kbit/s
IP Code	IP20
Environment	
Ambient temperature	-20...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80%, non-condensing
Enclosure	
Dimensions	63 x 110 x 75 mm
Weight	approx. 240 g
Material	Plastic

Digital output module

MU110-24.8R

8 DO RELAY

MU110-24.8K

8 DO NPN

MU110-24.16R

16DO RELAY

MU110-24.16K

16DO NPN

Digital outputs	8
MU110-24.8R	
Type	relay (NO)
Current, max.	4 A at 250 V AC or 24 V DC
MU110-24.8K	
Type	NPN
Current, max.	400 mA at 60 V DC

Digital outputs	16
MU110-24.16R	
Type	relay (NO)
Current, max.	3 A at 250 V AC or 30 V DC
MU110-24.16K	
Type	NPN
Current, max.	400 mA at 60 V DC
Galvanic isolation	in groups of 4

Supply	
Power supply	24 (21...35) V DC
Power consumption, max.	6 W (8R, 8K), 12 W (16R, 16K)
Communication	
Interface	RS485
Protocol	Modbus RTU / ASCII
Baud rate	2.4...115.2 kbit/s
IP Code	IP20
Environment	
Ambient temperature	-20...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80%, non-condensing
Enclosure	
Dimensions	63 x 110 x 75 mm
Weight	approx. 240 g
Material	Plastic

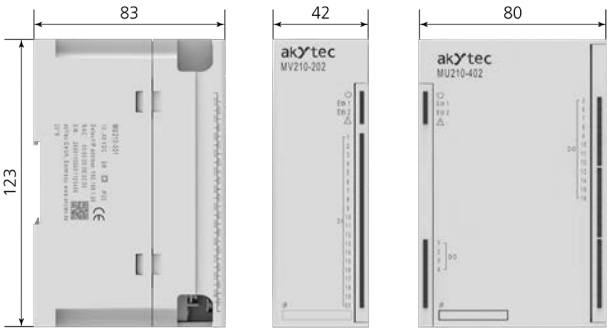
MX210 Series

The Ethernet I/O-Modules of the MX210 series are available in different variants depending on the combination of the number, type, and properties of their inputs and outputs. The MX210 series includes modules featuring high-frequency inputs of up to 100 kHz for high-speed counting.
Each module of this series has two built-in Ethernet ports. This allows interconnection of these devices according to the daisy chain connection, which stands out by simplicity and scalability. The two Ethernet ports are bypass-capable, meaning that the data transfer is not interrupted even if one of the modules fails.
Any MX210 extension module can simultaneously communicate with up to 4 TCP clients, which facilitates cabling and configuring of the control system.

Functions and features:

- Up to 32 DI / 16 DO | up to 8 AI / 8 AO
- A wide range of various digital and analog inputs and outputs
- Network status diagnostics
- Supported protocols: Modbus TCP, MQTT, SNMP, SNTP
- 2-port Ethernet Switch (LAN bypass)
- Daisy-Chain Wiring
- Alarm signals
- Real-time clock
- Data logging
- Group configuration of multiple modules
- Easy mounting and connection
- Free of charge configuration tool

Dimensions:



Modbus TCP	Modbus TCP
2 Ethernet ports	
Daisy-Chain Wiring with LAN bypass	BYPASS
USB interface	
Galvanic isolation	PS In Out Eth1 Eth2
Data logging	CSV
DIN rail mounting	DIN
Wall mounting	WALL
Ambient temperature	+55°C -40°C
Free software included	

Overview table:

Module	Digital inputs	Digital outputs	Analog inputs	Analog outputs	Properties
Input modules					
MV210-101			8		Inputs: RTD, TC, 0-5 mA, 0(4)-20 mA, 0-1 V, 0...(2)5 kohm
MV210-202	20				Inputs: switch contacts, NPN/PNP sensors, pulse counters (24 V DC external power supply, measuring frequency up to 100 kHz)
MV210-204	20				Inputs: switch contacts (no external power supply required), NPN sensors, pulse counters (24 V DC external power supply, measuring frequency up to 400 Hz)
MV210-212	32				Inputs: switch contacts, NPN/PNP sensors, pulse counters (24 V DC external power supply, measuring frequency up to 100 kHz)
MV210-214	32				Inputs: switch contacts (no external power supply required), NPN sensors, pulse counters (24 V DC external power supply, measuring frequency up to 400 Hz)
MV210-221	15				6 inputs: switch contacts (no external power supply required), NPN sensors, pulse counters (24 V DC external power supply, measuring frequency up to 400 Hz). 9 inputs: AC 230V
Combined I/O-Modules					
MK210-311	6	8			Inputs: switch contacts (no external power supply required), NPN sensors; Outputs: relays (NO), 5 A at 250 VAC, cos > 0.4 or 3 A at 30 VDC
MK210-312	12	4			Inputs: switch contacts (24 V DC external power supply), NPN/PNP sensors; Outputs: relays (NO), 5 A at 250 VAC, cos > 0.4 or 3 A at 30 VDC
Output modules					
MU210-401		8			Outputs: relays (NO) 5 A at 250 VAC, cos > 0.4 or 3 A at 30 VDC
MU210-402		16			Outputs: relays (NO) 5 A at 250 VAC, cos > 0.4 or 3 A at 30 VDC
MU210-410		16			Outputs: transistors (PWM up to 60 kHz) High-side switch - 0.8A High- or low-side switch - 0.1A
MU210-501				8	Outputs: 0(4)...20 mA, 0...(1)10 V, accuracy 0.25 %

Technical data:

Supply	
Power supply	24 (10…48) V DC
Communication	
Interface	Ethernet 10/100 Mbps
Protocol	Modbus TCP, MQTT, SNMP, SNTP
Configuration	USB 2.0 (USB micro), Ethernet 10/100 Mbps
Environment	
Ambient temperature	-40...+55 °C
Storage temperature	-25...+55 °C
Humidity	up to 80%, non-condensing
IP Code	IP20
Appliance class	II

Analog input module MV210-101

8 AI

4-20 mA

TC

RTD

Analog inputs	8
ADC resolution	16 bit
Input signals	
Resistance thermometer	Pt50, Pt100, Pt500, Pt1000 Ni100, Ni500, Ni1000
Thermocouple	A, J, N, K, S, R, B, T
Position encoder	0-2(5) kohm
Standard signal	-1...1 V, -50...+50 mV, 0-5 mA, 0-20 mA, 4-20 mA

Digital input module MV210-202

20 DI

NPN

PNP

FAST

Digital inputs	20
Input signals	Switch contact, NPN/PNP
Power consumption, max.	5 W
Pulse frequency, max.	100 kHz
Pulse length, min.	5 µs (1-8 DI) 1 ms (9-20 DI)
Integrated voltage source	24±3 V
Logical „1“, min	5.5 mA (8.8...30.0 V)
Logical „0“, max	1.2 mA (0.0...6.1 V)

Digital input module MV210-204

20 DI

NPN

Digital inputs	20
Input signals	Switch contact, NPN
Power consumption, max.	5 W
Pulse frequency, max.	400 Hz
Pulse length, min.	1 ms
Integrated voltage source	no external power supply required 24±3 V (only for NPN inputs)
Lead resistance, max.	100 ohm

Digital input module MV210-212

32 DI

NPN

PNP

FAST

Digital inputs	32
Input signals	Switch contact, NPN/PNP
Power consumption, max.	9 W
Pulse frequency, max.	100 kHz
Pulse length, min.	5 µs (1-8 DI) 1 ms (9-32 DI)
Integrated voltage source	24±3 V
Logical „1“, min	5.5 mA (8.8...30.0 V)
Logical „0“, max	1.2 mA (0.0...6.1 V)

Digital input module MV210-214

32 DI

NPN

Digital inputs	32
Input signals	Switch contact, NPN
Pulse frequency, max.	400 Hz
Pulse length, min.	1 ms
Integrated voltage source	no external power supply required 24±3 V (only for NPN inputs)
Lead resistance, max.	100 ohm

Digital input module MV210-221

15 DI

NPN

Digital inputs	9+6
Input signals	230 V AC signals + dry contact NPN
Pulse frequency, max.	400 Hz
Pulse length, min.	1 ms
Integrated voltage source	no external power supply required 24±3 V (only for NPN inputs)
Lead resistance, max.	100 ohm

Digital I/O module MK210-311

6 DI

8 DO

NPN

Digital inputs	6
Input signal	Switch contact, NPN
Pulse length, min.	1 ms
Integrated voltage source	24±3 V (only for NPN inputs)
Lead resistance, max.	100 ohm
Digital outputs	8
Type	Relay output (NO)
Permissible load	5 A, 250 V AC; 3 A, 30 V DC

Digital I/O module MK210-312

12 DI

NPN

PNP

4 DO

Digital inputs	12
Input signal	Switch contact, NPN/PNP
Pulse frequency, max.	100 kHz
Pulse length, min.	5 µs (1-8 DI) 1 ms (9-12 DI)
Logical „1", min	5.5 mA (8.8...30.0 V)
Logical „0", max	1.2 mA (0.0...6.1 V)
Digital outputs	4
Type	Relay output (NO)
Permissible load	5 A, 250 V AC; 3 A, 30 V DC

Digital output module MU210-401

8 DO

RELAY

Digital outputs	8
Output signal	Relay output (NO)
Power consumption, max.	6 W
Permissible load	5 A, 250 V A; 3 A, 30 V DC;
Pulse frequency, max.	1 Hz
Pulse length, min.	50 ms

Digital output module MU210-402

16DO

RELAY

Digital outputs	16
Output signal	Relay output (NO)
Power consumption, max.	9 W
Permissible load	5 A, 250 V A; 3 A, 30 V DC;
Pulse frequency, max.	1 Hz
Pulse length, min.	50 ms

Digital output module MU210-410

16DO

FAST

Digital outputs	16
Output signal	Transistor output
Power consumption, max.	5 W
Permissible load	100 mA / 800 mA, 10...36 V DC
Pulse frequency, max.	60 kHz / 10kHz
Pulse length, min.	10 µs / 1 µs

Analog output module MU210-501

8 AO

4-20 mA

0-10V

Analog outputs	8
Type	0(4)-20 mA, 0-1(10) V
Accuracy	± 0.25 %
Power consumption, max.	5 W
DAC resolution	12 bits

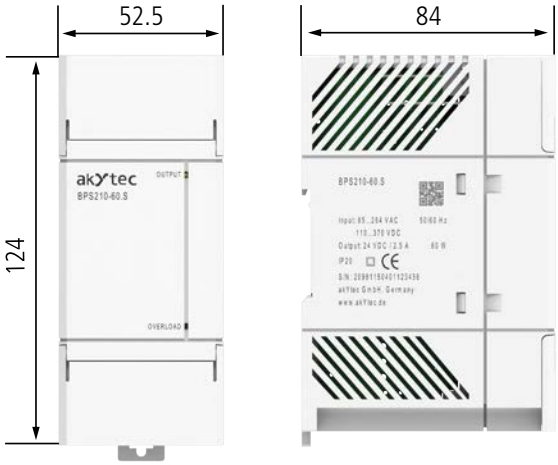
BPS210-60.S

The BPS210-60.S is a two phase power supply unit with an integrated output-relay fit for the demanding solutions. It offers maximum functionality for applications in complex systems and machines. The power supply steps down the voltage from 230V AC to 24V DC. Output voltage can be adjusted with a trimmer (+-8%). Thanks to the extremely space-saving narrow design, they are particularly suitable for industrial applications in switch boxes or in small control cabinets. To increase the output power, several power supply units of the same type can be connected in parallel. Warning! Improper use can lead to hazards such as short circuit, fire, electric shock, etc.

Functions and features:

- Relay output for alarm
- Parallel connection (for power redundancy).
- Adjusting output voltage (± 8%)
- High stability of output voltage (permissible variation less than 2 %)
- Minimum ripple (0.5%)
- Voltage and current output limit
- Overvoltage and surge protection
- Overload, short circuit and overheat protection
- Universal AC/DC input voltage range

Dimensions:

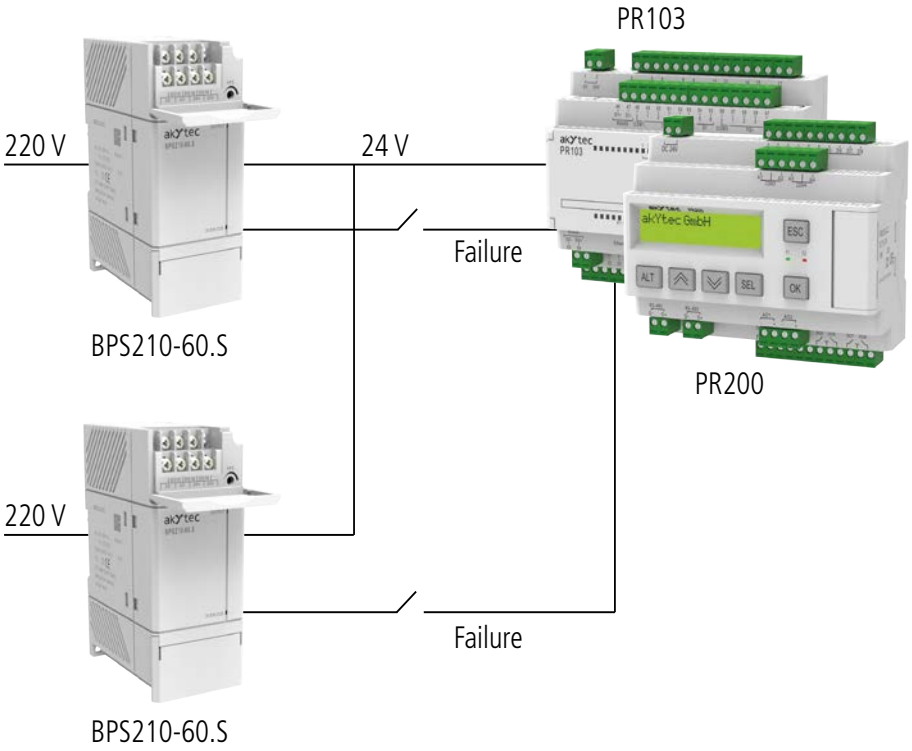


Input signal	85...264 VAC 110...370 VDC
Output signal	24 V⎓DC 2.5A
1 Relay output	1DO
Power backup	
Adjusting output voltage	±8%
Output current limitation	
Galvanic isolation	
DIN rail mounting	DIN
Wall mounting	WALL
Ambient temperature	+70°C -40°C

Technical data:

Output	
Rated output voltage	24 V DC
Rated output current	2.5 A
Rated output power consumption	60 W
Output voltage adjustment	±8 %
Pulse voltage alteration, max.	120 mV
Input	
Output voltage limits	
AC	85...264 V, 45...65 Hz 85...264 V, 45...65 Hz
DC	110...370 V
Current consumption	1.25 A
Inrush current	36 A
Efficiency	85%
ADC resolution	12 bit
Protection	
Output current limit	104 … 116% of rated current
Output voltage limit	150% of rated voltage
IP Code	IP20
Environmental conditions	
Ambient temperature	-40…+70 °C
Transportation and storage	-40…+50 °C
Enclosure	
Weight	max. 0.5 kg

Backup:



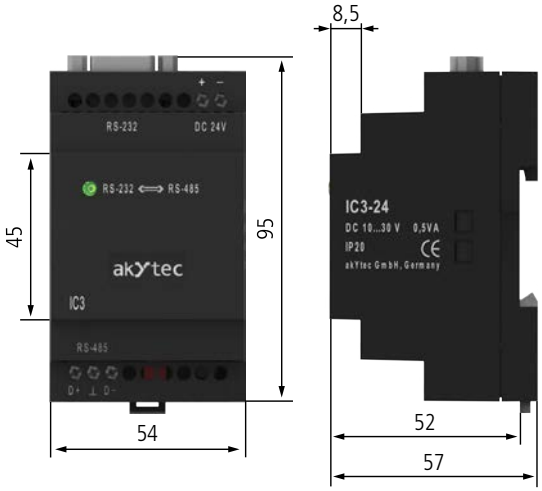
IC3

IC3 is a bidirectional RS232-to-RS485 converter. With this device, you can connect any RS485 device directly to the serial RS232 COM port of your PC or another device. This converter supports automatic direction control of data transmission, so no software drivers are required. All standard protocols for the RS232 and RS485 interfaces are supported.

Functions and features:

- Bidirectional (RS232<->RS485) data exchange
- ADDC (Automatic Data Direction Control) - no flow control is required
- Galvanic isolation
- Supply voltage 24 V DC or 230 V AC
- Built-in termination resistors

Dimensions:



Conversion of RS485 and RS232 signals	RS232 IC3 RS485
RS485 interface	RS485
RS232 interface	RS232
Galvanic isolation	PS RS485 RS232
DIN rail mounting	DIN
IP20	IP20

Ordering code:

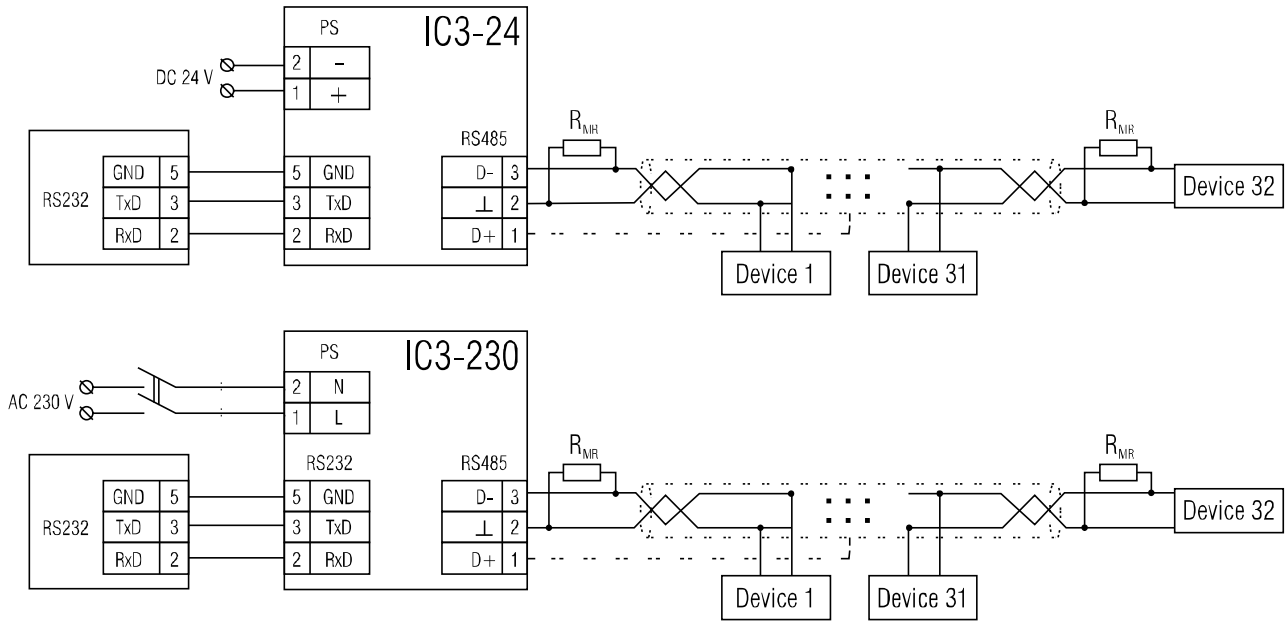
IC3 - X

Power supply	
230 (85...245) V AC	230
24 (10...30) V DC	24

Technical data:

Power supply	
IC3-230	230 (85...245) V AC, 50 (47...60) Hz
IC3-24	24 (10...30) V DC
Power consumption, max.	0.5 VA
Galvanic isolation	1500 V
RS232 Interface	
Cable length, max.	3 m
Baud rate	up to 115.2 kbit/s
Signals	TxD, RxD, GND
RS485 interface	
Cable length, max.	1200 m
Number of devices in the network, max.	32
Terminals	D+, D-
Dimensions	54 x 95 x 57 mm
Mounting	DIN rail (35 mm)
Weight	approx. 100 g

Wiring:



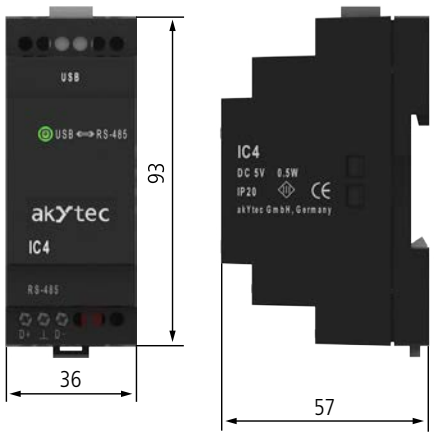
IC4

With the USB-RS485 bidirectional converter IC4, you can create an extra serial port on a notebook or PC and connect a serial device to a vacant USB port. It provides reliable galvanic isolation between the interfaces. The device is powered directly from the USB port.

Functions and features:

- Bidirectional (USB<->RS485) data exchange
- ADDC (Automatic Data Direction Control) - no flow control is required
- Galvanic isolation between interfaces
- Port-powered from PC's USB – no power supply unit is needed
- Power/Transmit LED indicator
- Operating systems:
  - Windows XP / Server 2003 / Vista / 7 / 8 / 8.1 / 10
  - Mac OS X
  - Linux 2.6. x/3.x.x l

Dimensions:

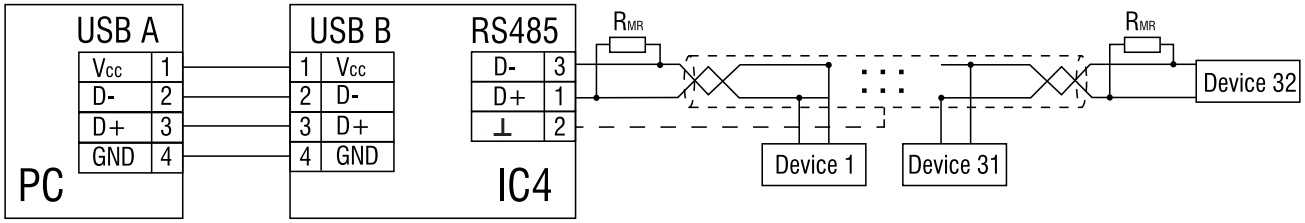


Bidirectional (USB<->RS485) data exchange	RS485 IC4 PC
RS485 interface	RS485
USB interface	
Galvanic isolation	RS485 USB
DIN rail mounting	DIN
IP20	IP20

Technical data:

Power supply	over USB (5 V)
Power consumption, max.	0.5 W
Galvanic isolation	1500 V
USB interface	
Specification	USB 2.0
Terminals	D+, D-
Baud rate	up to 115.2 kbit/s
Cable length, max.	3 m
RS485 interface	
Specification	TIA/EIA-485
Terminals	D+, D-
Number of devices in the network, max.	32
Cable length, max.	1200 m
Dimensions	36 x 93 x 57 mm
Weight	approx. 65 g

Wiring:



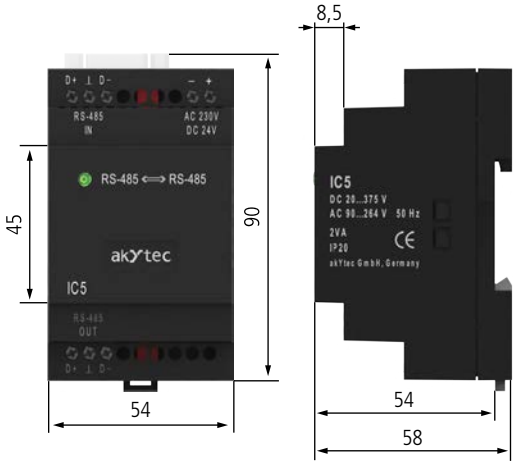
IC5

RS485 repeater IC5 is used to connect two segments of the RS485 network in purpose to increase the bus length and extend the network by additional devices (up to 32). The repeater provides galvanic isolation between network nodes.

Functions and features:

- Networking more than 1200 m
- Up to 32 nodes in the network
- Galvanic isolation between network nodes
- Universal (24 V DC / 230 V AC) power supply

Dimensions:

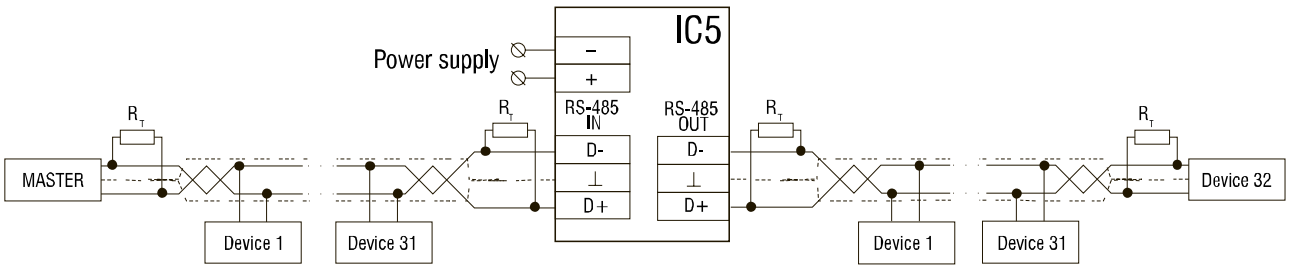


RS485 repeater	RS485 IC5 RS485
RS485 interface	RS485
Galvanic isolation	PS RS485 RS485
DIN rail mounting	DIN
IP20	IP20

Technical data:

Power supply	230 (85...245) V AC, 50 (47...60) Hz
	24 (10...30) V DC
Power consumption, max.	2 VA
Galvanic isolation	1500 V
RS485 interface	
Cable length, max.	1200 m
Number of devices in the network, max.	32
Terminals	D+, D
Dimensions	54 x 90 x 58 mm
Mounting	DIN rail (35 mm)
Weight	approx. 100 g

Wiring:



TRM138

TRM138 is an 8-channel on-off controller designed in a plastic enclosure for panel mounting. This device is intended for measuring, displaying and controlling different physical variables such as temperature, pressure, humidity, etc.

Functions and features:

- Reception and transmission
- Displaying the measured values and configuration parameters on 4-digit LED displays
- Digital filtering of the input signal (EMI-interference protection)
- Signal correction
- Creating an alarm signal in case of sensor failure using the outputs for alarm signals and displaying the failure ause
- Creating control signals for actuating devices according to confi guration parameters
- Manual control, creating control signals using the function keys
- Full control over PC using RS485 interface
- Operating with akYtec, Modbus RTU and Modbus ASCII protocols in a Slave mode
- Saving the set programmable parameters to non-volatile memory in case of power outage
- Configuration via PC or using the function keys.

8 control loops	8 CHANNELS
8 universal analog inputs	8 AI
Thermocouple Resistance temperature detector Analog input 4-20 mA Analog input 0-1 V	
Output type on request	OUTPUT TYPE
Relay output Analog output 4-20 mA	
On-off control	ON OFF
Modbus RTU/ASCII | RS485	Modbus RS485
Ambient temperature	+50°C +1°C

Areas of application:

The TRM138 is used in various fields of industry as e.g. multi-zone oven temperature control, protective and monitoring systems.

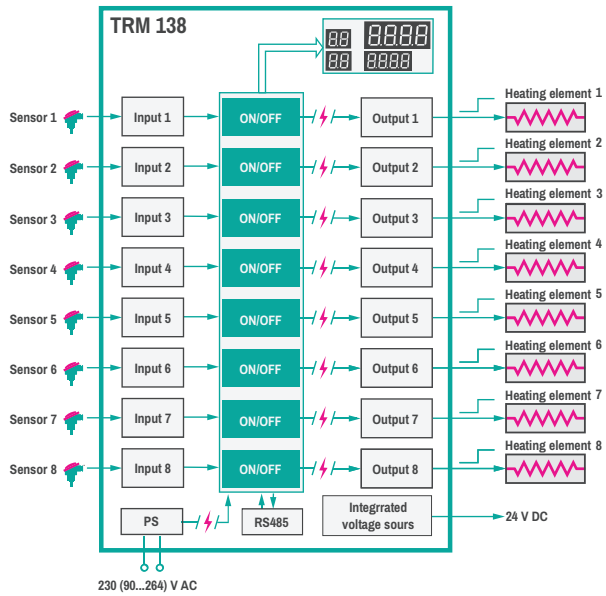
Technical data:

Power supply	230 (90...264) V AC; 50 (47...63) Hz
Power consumption, max.	18 VA
Inputs	8 analog (Resolution ADC 16 bit)
Optional outputs	8
Sampling rate (per input), max.	0.6 s
Integrated voltage source	24 ± 3 V DC , 150 mA
Interface	RS485
Protocols	Modbus RTU / ASCII, akYtec
Baud rate	2.4...115.2 kbit/s
IP Code	front IP54, enclosure IP20
Ambient temperature	+1...+55 °C
Dimensions	169 x 138 x 50 mm
Weight	approx. 450 g
Input signal	
RTD	Pt50, Pt100, 50P, 100P, 50M, 100M, Cu50, Cu100
TC	J, N, K, S, R, A, L
Standard signals	0-5 mA, 0-20 mA, 4-20 mA, -50...+50 mV, 0-1 V
Outputs	
R (Relay)	4 A, 250 V AC / 30 V DC
I (4-20 mA)	10…30 V, max. 1.3 kohm (DAC Resolution 10 bit)

Ordering code:

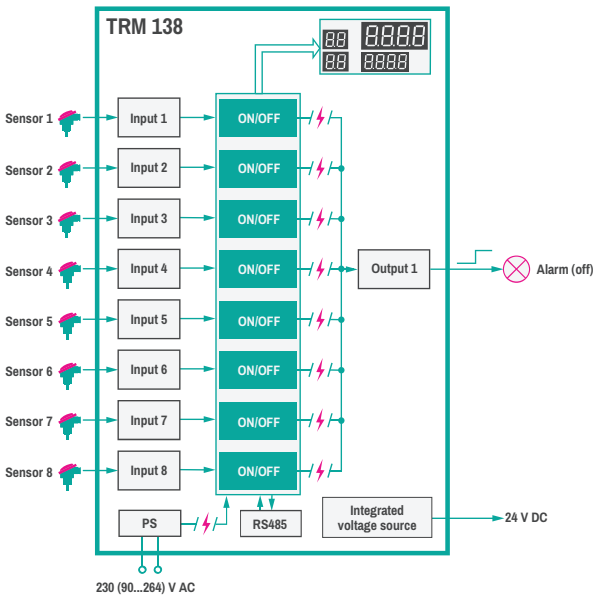
Standard variants	Description	Enclosure
TRM138.H7.R	8DO (Relay)	144 x 169 x50.5 mm panel mounting
TRM138.H7.I	8AO (4-20 mA)	
TRM138.H7.IIIIRRRR	4AO (4-20 mA)+4DO (Relay)	

Typical application cases:



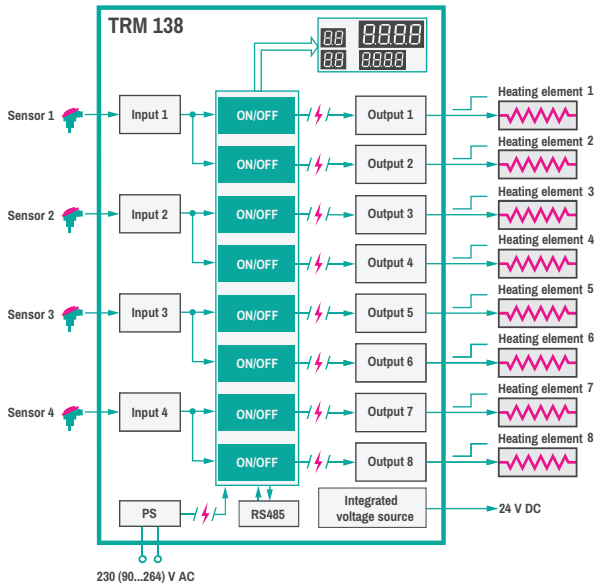
8-channel 2-position control

8-channel temperature controller can be used for bread production, in multiband tunnel type furnaces, and other process equipment.



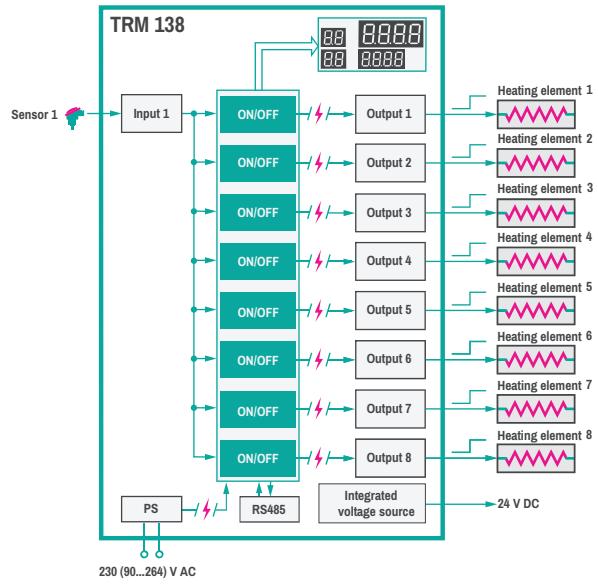
Alarm switch (8 inputs)

Alarm switch can be used in multi-zone ovens for food, metallurgical and other industries.



4-channel 3-position control

Temperature control and two-stage heating control in technological equipment with up to four heating areas and rapid heat-up: baking ovens, injection molding machines, extruders, etc.



1-channel 2 position-control

Temperature on/off control with one sensor and eight independent settings.

TRM202

TRM202 is a 2-channel process controller available in a panel- or wall-mount enclosure on option. This device is intended to measure, display, and control temperature, pressure, humidity, flow, or any other physical variables. Confi gurable analog inputs and optional outputs provide particular flexibility when choosing this controller to create automatic control and regulation systems of various technological processes in different areas of industry, agriculture, or utilities.

Functions and features:

- Reception and transmission of the input signal according to the sensor type
- Displaying the process values and configuration parameters on two 4-digit LED displays
- Scaling and filtering the input signal
- Signal correction, square root function
- Calculation of the difference between two signals
- On-Off control of two independent processes or three-step control of one process variable
- Modbus RTU/ASCII communication in slave mode over the RS485 interface
- Signal retransmission using analog output 4-20 mA
- Alarm output
- Sensor / input error detection
- Error indication
- Configuration via the functional keys

Areas of application:

The TRM202 process controller is especially recommended to be used for temperature measurement and control of mediums in refrigeration equipment, drying cabinets, various ovens, pasteurizers and in other process equipment.

2 independent control loops — 2 CHANNELS

2 universal analog inputs — 2 AI

- Thermocouple
- Resistance temperature detector
- Analog input 4-20 mA
- Analog input 0-1 V

Output type on request — OUTPUT TYPE

- Relay output
- Analog output 4-20 mA

On-off control — ON OFF

Modbus RTU/ASCII | RS485 — Modbus RS485

Ambient temperature — +50°C +1°C

Technical data:

Power supply	230 (90...264) V AC; 50 (47...63) Hz		
Power consumption,max.	6 VA		
Analog inputs	2 (ADC resolution 16 bit)		
Optional outputs	2		
Sampling rate, max.	1 s		
Interface	RS485		
Protocols	Modbus RTU / ASCII, akYtec		
Baud rate	2.4...115.2 kbit/s		
Ambient temperature	+1...+50 °C		
Enclosure			
Type	H1	H2	H3
Dimensions	96 x 96 x 70 mm	96 x 48 x 100 mm	105 x 130 x 65 mm
IP Code	front IP54	front IP54	IP44
Input signal			
RTD	Pt50, Pt100, 50P, 100P, 50M, 100M, Cu50, Cu100		
TC	B,J, N, K, S, R, A, T, L, A-2, A-3		
Standard signals	0-5 mA, 0-20 mA, 4-20 mA, -50...+50 mV, 0-1 V		
Outputs			
R (Relay)	8 A, 230 V AC / 30 V DC		
I (4-20 mA)	10…30 V, max. 1 kohm (DAC resolution 10 bit)		

Ordering code:

TRM202. X . X

Enclosure	
96 x 96 x 70 mm, panel mount	H1
96 x 48 x 100 mm, panel mount	H2
105 x 130 x 65 mm, wall mount	H3
Output type	
Relay output*	R
Analog output 4-20 mA	I

* For three-step control the device should be equipped with two digital outputs.

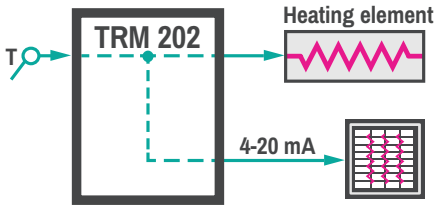
Standard variants	Description	Enclosure
TRM202-H1.RR	2DO (Relay)	96 x 96 x 70 mm, panel mount
TRM202-H2.RR		96 x 48 x 100 mm, panel mount
TRM202-H3.RR		105 x 130 x 65 mm, wall mount
TRM202-H1.RI	1DO (Relay)+1AO (4-20 mA)	96 x 96 x 70 mm, panel mount
TRM202-H2.RI		96 x 48 x 100 mm, panel mount
TRM202-H3.RI		105 x 130 x 65 mm, wall mount

Types of enclosure:

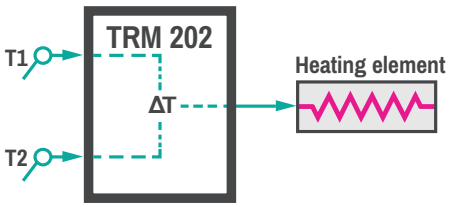
TRM202-H3.RR
for wall mounting

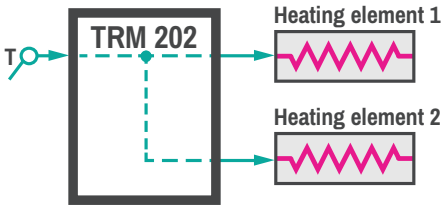
TRM202-H1.RR
for panel mounting

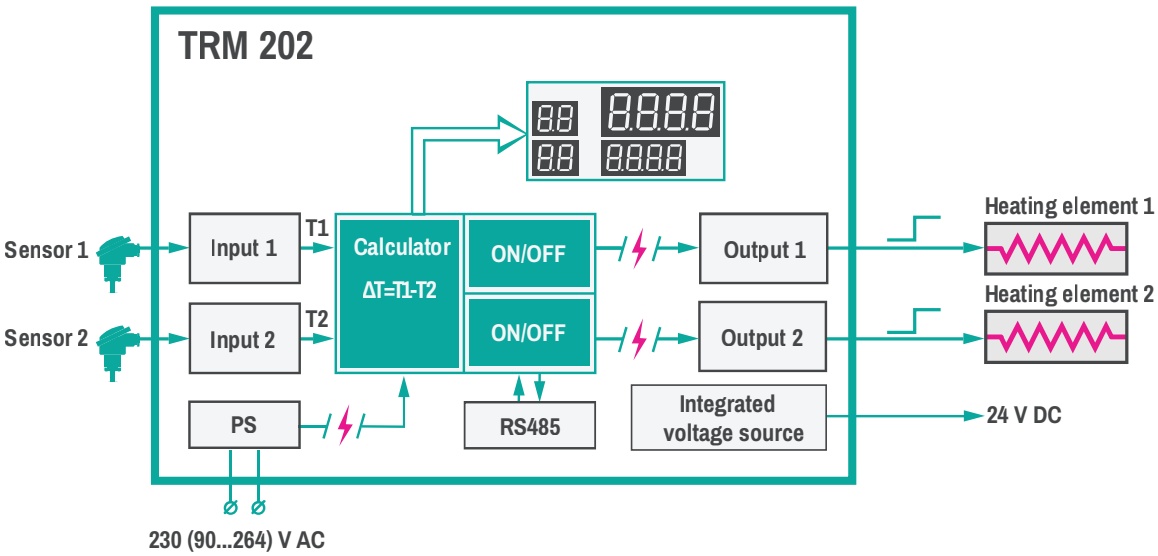
Typical application cases:

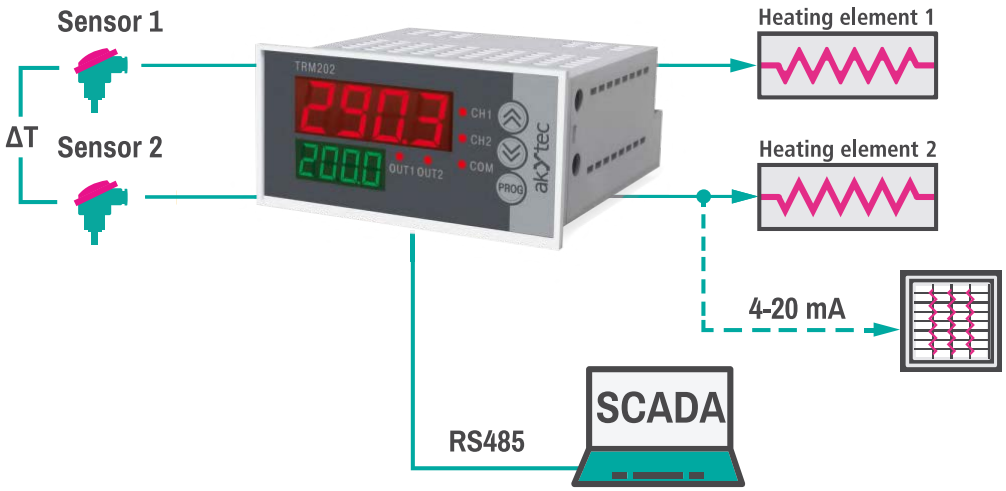


1. Regulation with signal retransmission over the analog output 4-20 mA.
2. Regulation of the difference between two measured values.
3. One-channel three-step control (with two different setpoints).









TRM210

TRM210 is a PID controller available in different enclosure variants: a panel- or wall-mount enclosure on option. This device is intended to measure, display, and control temperature, pressure, humidity, flow, or any other physical variables. One configurable analog input and one optional output provide particular flexibility when choosing this controller to create automatic control and regulation systems of various technological processes in different areas of industry, agriculture, or utilities. A digital input is available to enable remote start stop of the control process.

Functions and features:

- Reception and transmission of the input signal according to the sensor type
- Displaying the process values and configuration parameters on two 4-digit LED displays
- Scaling and fi ltering the input signal
- Signal correction
- PID control (pulse or analog) or on-off control
- Autotuning function
- Stand-alone control
- Manual control
- Modbus RTU/ASCII communication in slave mode over the RS485 interface
- Signal retransmission using analog output 4-20 mA or 0-10 V
- Alarm output
- Sensor / input error and Loop Break Alarm detection
- Error indication
- Remote start / stop with the digital input
- Configuration via the functional keys

Areas of application:

The PID controller TRM210 is designed for creating automatic control and regulation systems of various technological processes in different areas of industry, agriculture and utilities.

1 digital input	1 DI
1 universal analog input	1 AI
Thermocouple Resistance temperature detector Analog input 4-20 mA Analog input 0-1 V	
Output type on request	OUTPUT TYPE
Relay output Solid state relay Analog output 4-20 mA Analog output 0-10 V	
PID control	PID CONTROL
On-off control	ON OFF
Modbus RTU/ASCII | RS485	Modbus RS485
Ambient temperature	+50°C +1°C

Technical data:

Power supply	230 (90...264) V AC; 50 (47...63) Hz		
Power consumption,max.	6 VA		
Analog input	1 (ADC resolution 16 bit)		
Digital input	1		
Optional outputs	2		
Sampling rate, max.	1 s		
Interface	RS485		
Protocols	Modbus RTU / ASCII, akYtec		
Baud rate	2.4...115.2 kbit/s		
Ambient temperature	+1...+50 °C		
Enclosure			
Type	H1	H2	H3
Enclosure	96 x 96 x 70 mm	96 x 48 x 100 mm	105 x 130 x 65 mm
IP Code	front IP54	front IP54	IP44
Input signal			
RTD	Pt50, Pt100, 50P, 100P, 50M, 100M, Cu50, Cu100		
TC	B,J, N, K, S, R, A, T, L, A-2, A-3		
Standard signals	0-5 mA, 0-20 mA, 4-20 mA, -50...+50 mV, 0-1 V		
Outputs			
R (Relay)	1 A (PID control) / 8 A (alarm), 30 V DC / 230 V AC		
S (SSR)	100 mA, 4…6 V DC		
I (4-20 mA)	10…36 V, max. 1 kohm (DAC resolution 10 bit)		
U (0-10 V)	15…36 V, min. 2 kohm (DAC resolution 10 bit)		

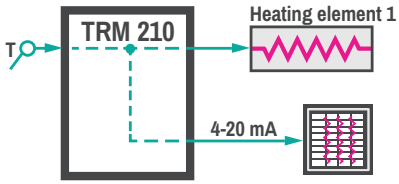
Types of enclosure:

TRM210-H1.RR
for panel mounting

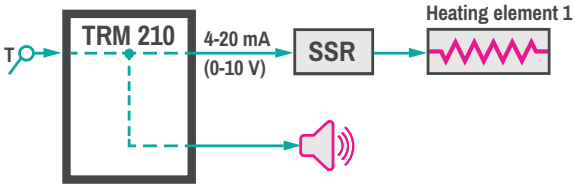
TRM210-H3.RR
for wall mounting

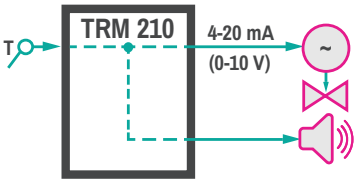
Standard variants	Description	Enclosure
TRM210-H1.RR	2DO (Relay)	96 x 96 x 70 mm, panel mount
TRM210-H2.RR		96 x 48 x 100 mm, panel mount
TRM210-H3.RR		105 x 130 x 65 mm, wall mount
TRM210-H1.SR	1DO (SSR) + 1DO (Relay)	96 x 96 x 70 mm, panel mount
TRM210-H2.SR		96 x 48 x 100 mm, panel mount
TRM210-H3.SR		105 x 130 x 65 mm, wall mount
TRM210-H1.UR	1AO (0-10 V) + 1DO (Relay)	96 x 96 x 70 mm, panel mount
TRM210-H2.UR		96 x 48 x 100 mm, panel mount
TRM210-H3.UR		105 x 130 x 65 mm, wall mount
TRM210-H1.IR	AO (4-20mA)+1DO (Relay)	96 x 96 x 70 mm, panel mount
TRM210-H2.IR		96 x 48 x 100 mm, panel mount
TRM210-H3.IR		105 x 130 x 65 mm, wall mount

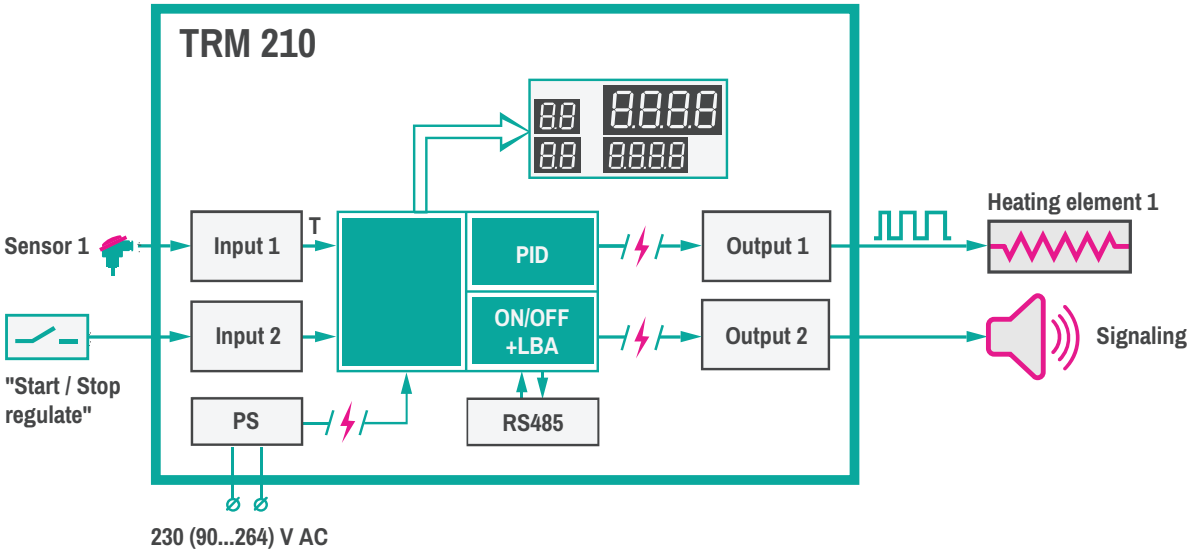
Typical application cases:



1. Regulation with signal retransmission over the analog output 4-20 mA or 0-10 V.
2. Regulation of the difference between two measured values.
3. One-channel three-step control (with two different setpoints).







TRM212

TRM 212 is a weather-compensated PID controller. This device has been specifically designed with dedicated internal logic to implement PID control of analog or 3-step control valves. The TRM212 requires 230 V AC power supply and can be operated as Slave in a Modbus network (RTU or ASCII) over the RS485 interface.

Functions and features:

- Reception and transmission of the input signal according to the sensor type
- Displaying process values and configuration parameters on two 4-digit LED displays
- Scaling and filtering the input signal
- Signal correction, square root function
- Calculation of the sum, difference, ratio, or root of the measured signal values
- PID control of analog or three-step control valves
- Remote setpoint adjustment in accordance with an external parameter
- Autotuning function
- Stand-alone control
- Manual control
- Modbus RTU/ASCII communication in slave mode over the RS485 interface
- Alarm output
- Sensor / input error and Loop Break Alarm detection
- Error indication
- Remote start / stop with the digital input
- Configuration via the functional keys

1 channel for controlling

2 universal analog inputs

- Thermocouple
- Resistance temperature detector
- Analog input 4-20 mA
- Analog input 0-1 V

Output type on request

- Relay output
- Analog output 4-20 mA
- Analog output 0-10 V

PID control

Modbus RTU/ASCII | RS485

Ambient temperature +50°C +1°C

Areas of application:

The process controller TRM212 is designed to measure and control temperature or other physical variables in different areas of industry, agriculture and utilities. It is especially recommended to use this device to control analog or three-step control valves.

Technical data:

Power supply	230 (90...264) V AC; 50 (47...63) Hz		
Power consumption,max.	6 VA		
Inputs	2 (ADC resolution 16 bit)		
Optional outputs	2		
Sampling rate, max.	1 s		
Interface	RS485		
Protocols	Modbus RTU / ASCII, akYtec		
Baud rate	2.4...115.2 kbit/s		
Ambient temperature	+1...+50 °C		
Enclosure			
Type	H1	H2	H3
Enclosure	96 x 96 x 70 mm	96 x 48 x 100 mm	105 x 130 x 65 mm
IP Code	front IP54	front IP54	IP44
Input signal			
RTD	Pt50, Pt100, 50P, 100P, 50M, 100M, Cu50, Cu100		
TC	B,J, N, K, S, R, A, T, L, A-2, A-3		
Standard signals	0-5 mA, 0-20 mA, 4-20 mA, -50...+50 mV, 0-1 V		
Outputs			
R (Relay)	1 A (PID control) / 8 A (alarm), 30 V DC / 230 V AC		
I (4-20 mA)	10…36 V, max. 1 kohm (DAC resolution 10 bit)		
U (0-10 V)	15…36 V, min. 2 kohm (DAC resolution 10 bit)		

Types of enclosure:

TRM212-H1.RR

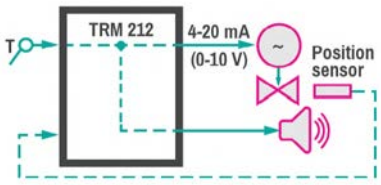
for panel mounting

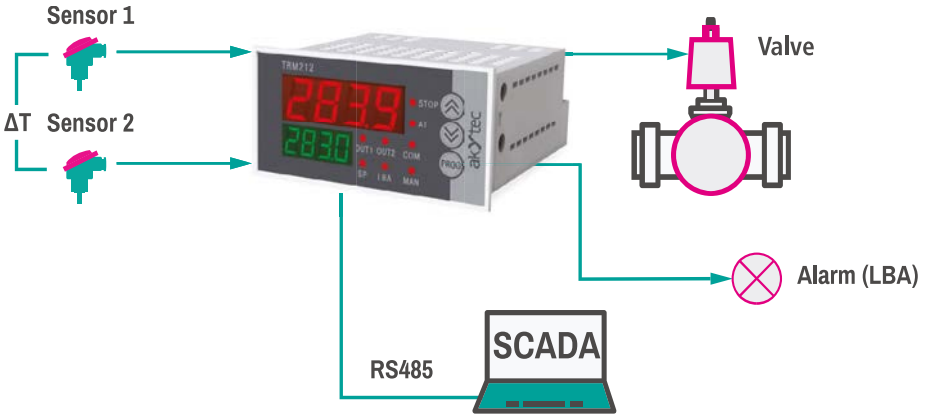
TRM212-H3.RR

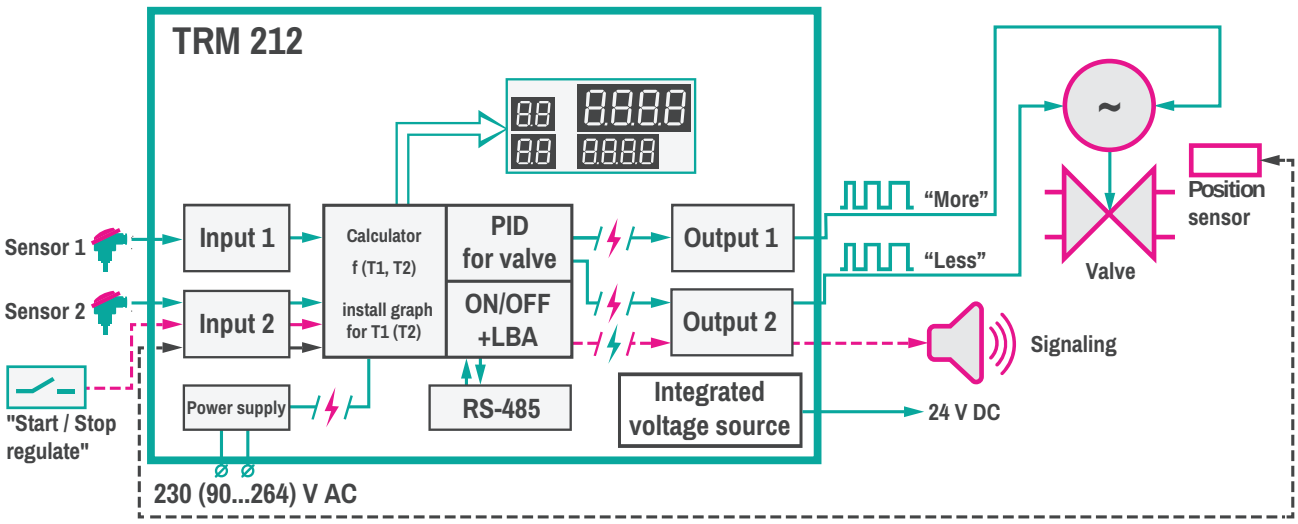
for wall mounting

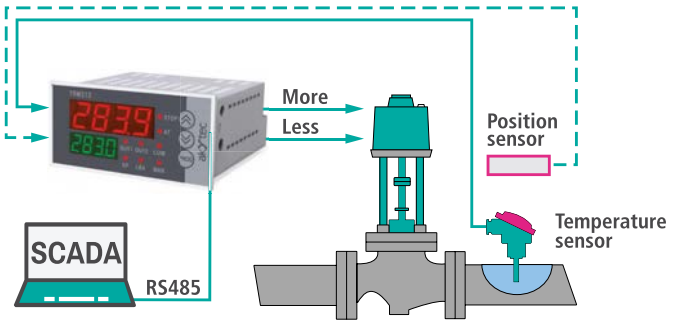
Standard variants	Description	Enclosure
TRM212-H1.RR	2DO (Relay)	96 x 96 x 70 mm, panel mount
TRM212-H2.RR		96 x 48 x 100 mm, panel mount
TRM212-H3.RR		105 x 130 x 65 mm, wall mount
TRM212-H1.IR	1AO (4-20 mA)+1DO (Relay)	96 x 96 x 70 mm, panel mount
TRM212-H2.IR		96 x 48 x 100 mm, panel mount
TRM212-H3.IR		105 x 130 x 65 mm, wall mount
TRM212-H1.UR	1AO (0-10 V)+1DO (Relay)	96 x 96 x 70 mm, panel mount
TRM212-H2.UR		96 x 48 x 100 mm, panel mount
TRM212-H3.UR		105 x 130 x 65 mm, wall mount

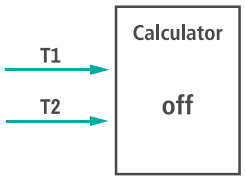
Typical application cases:



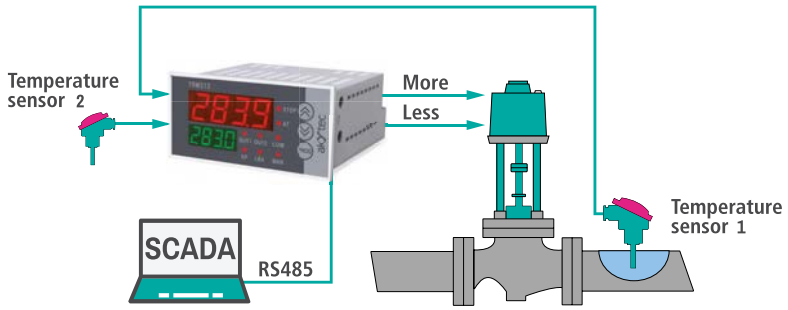


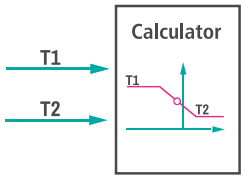




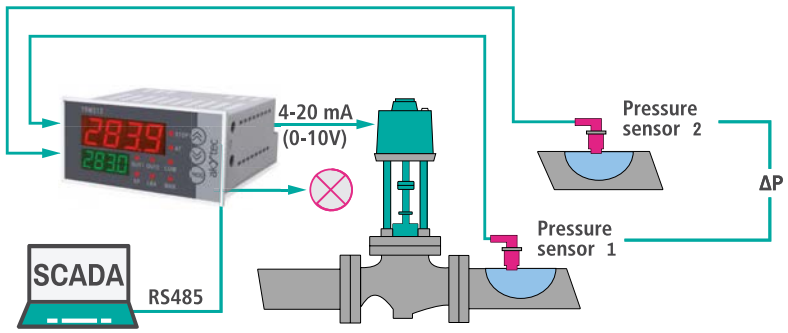


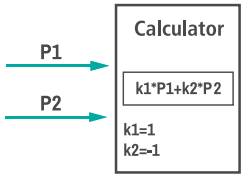
Temperature control using a three-step control valve with / without a position sensor.



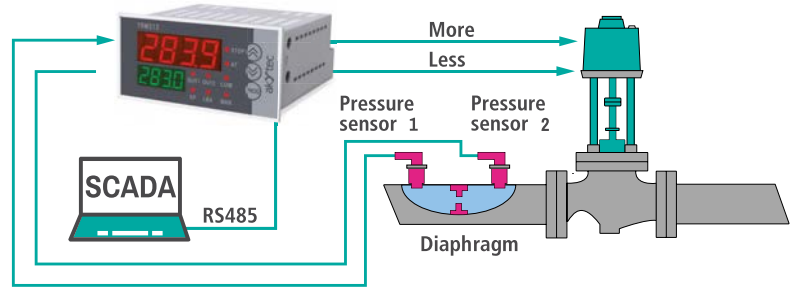


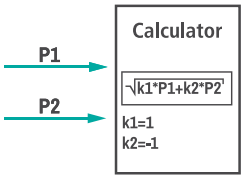
Weather-compensated control: temperature regulation in a heating system depending on the outdoor temperature.



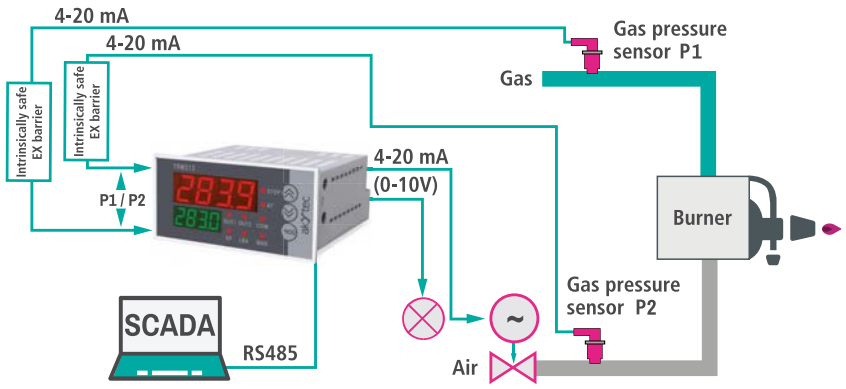


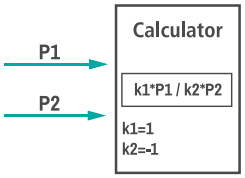
Pressure difference regulation in pipes using a three-step control valve without any position sensor.





Pressure-based flow measurement and regulation in standard orifice plates or Venturi tubes without using differential manometers.





Regulation of gas/air ratio using valves with an analog input. The second output may be used for alarm.

TRM500

The 1-channel temperature controller TRM500 is a universally applied and easily operated stand-alone device. This controller features one configurable analog input for a wide range of resistance thermometers and thermocouples as well as one digital input. A relay output, an alarm output and a DC logic output are also available.

Functions and features:

- On-Off or PID control
- Manual control
- 20 mm, 4 digit display, 2nd display optional
- Digital input filter with an adjustable time constant
- Custom 2-point linearization
- Digital input (remote start/stop or setpoint change)
- Temperature range alarm
- Auxiliary alarm output
- Additional logic output (SSR)
- Configurable outputs
- Autotuning function
- Cold junction compensation
- Input calibration
- 9 status LEDs
- Digital input filter with an adjustable time constant:
  - Custom linearization
  - Limit value monitoring
  - 9 status LEDs Configuration via the functional keys

Inputs:

- Universal input for resistance thermometers and thermocouples:
  - Resistance thermometers: Pt50, Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000
  - Resistance thermometers in 2-,3- or 4-wire circuit
  - Thermocouples: B, J, K, L (GOST), N, R, S, T
  - Cold junction compensation
- Digital input: potential free-contact

1 channel for controlling — 1 CHANNEL

1 universal analog input — 1 AI

Thermocouple

Resistance temperature detector

Powerful relay output 30 A — 30 A OUTPUT

On-off control — ON OFF

PID controll — PID CONTROL

Cost effective

Ambient temperature — +50°C -20°C

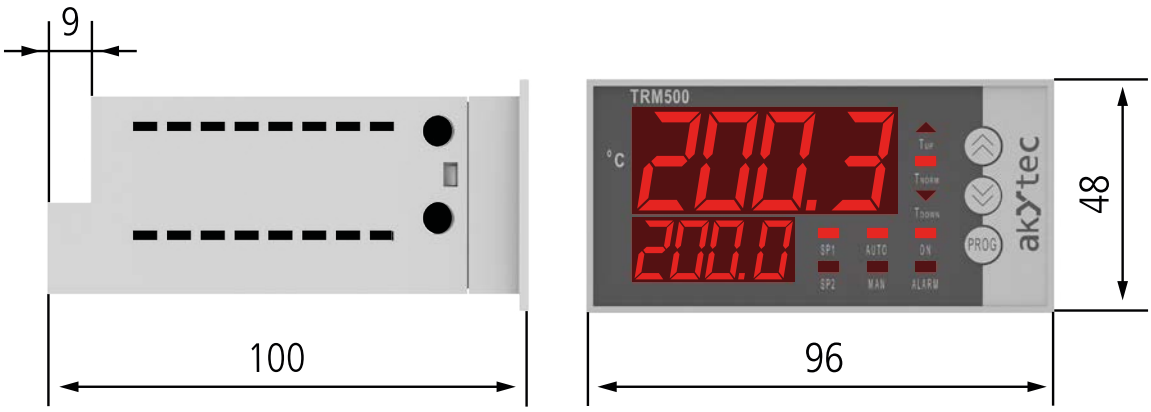
Areas of application:

The TRM500 can be applied in furnaces, injection moulding machines, extruders, PET bottle manufacturing, shrink wrappers, dryers, etc.

Technical data:

Power supply	230 (96...264) V AC; 50 (47...63) Hz
Power consumption, max.	5 VA
Resistance thermometer	Pt50, Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000
Accuracy	0.25 %
Connection circuit	2-, 3-, 4-wire
Sampling rate for 3-wire	0.3 s
Sampling rate for 2-, 4-wire	0.2 s
Lead resistance, max.	15 ohm
Reference junction	internal
Thermocouple	B, J, K, L (GOST), N, R, S, T
Accuracy	0.50%
Sampling rate, max.	0.2 s
Lead resistance, max.	100 ohm
Digital input	potential free contact
ON, resistance, max.	70 ohm
OFF, resistance, min.	1000 ohm
Digital outputs	
OUT1 (Relay)	30A / 250 V AC (resistive), 20A / 30 V DC
OUT2 (Relay)	5A / 250 V AC (resistive), 3A / 30 V DC
OUT3 (Solid State Relay)	0 / 5 V, 40 mA
Dimensions	96 x 48 x 100 mm
IP Code	front IP54, enclosure IP20
Ambient temperature	-20...+50 °C
Humidity	up to 80% (non-condensing)
Weight	approx. 160 g

Dimensions:



NPT3

The NPT3 transmitter is designed to be mounted on a measuring insert in a DIN connection head of Form B. The device converts the sensor signal of a TC or RTD to a 4-20 mA standard signal. The configuration is performed via the USB interface. No programming adapter is required. The configuration software is in delivery included.

Functions and features:

- Suitable for a wide variety of RTDs and TCs
- Support for 2-, 3-, or 4-wire RTD connection
- Operating temperature -40...85°C
- High accuracy and resolution
- High reliability
- Configuring over the USB interface
- Free configuration software included

Areas of application:

- Any DIN Form B sensor head.

Technical data:

Power supply	24 (12...36) V DC
Analog input	1
Analog output	1
RTD	Pt50, Pt100, Pt500, Pt1000, Ni100
TC	B, J, K, N, R, S, T
Accuracy	
TC	0.5 %
RTD	0.25 %
Linearity error, max.	0.2 %
Analog output	4-20 mA
Permissible load	$R_B \leq (U_V\text{-}11\ V) / 0.02\ A$
Ambient temperature	-40...+85 °C
IP code	IP30
Dimensions	Ø 44 x 18 mm
Weight	approx. 25 g

1 universal analog input — **1 AI**

Thermocouple
Resistance temperature detector

Analog output 4-20 mA — **4-20 mA**

USB interface

DIN Form B sensor head installation

Ambient temperature — +85°C / -40°C

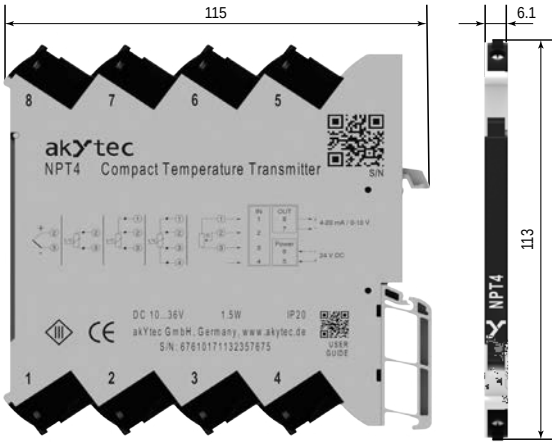
NPT4

The NPT4 is a universal temperature transmitter housed in a 6-mm slim enclosure for DIN rail mounting. This device is intended to convert any input signal from a TC or RTD (2-, 3-, 4-wire) sensor into a 0(4)-20 mA or 0(2)-10 V standard signal. The input is protected against sensor break and short circuit. The power supply circuit is protected against reverse polarity. A wide variety of RTD and TC sensors are accepted. The device configuring is performed via the USB interface.

Functions and features:

- Support for a wide variety of RTD and TC
- 2-, 3- or 4-wire connection
- Analog output 0-5 mA, 0(4)-20 mA, 0(2)-10 V
- Operating temperature -40...70 °C
- High reliability
- High accuracy and resolution
- Configuring over the built-in USB port

Dimensions:



1 universal analog input — 1 AI

- Thermocouple
- Resistance temperature detector

1 universal analog output — 1 AO

- Analog output 4-20 mA
- Analog output 0-10 V

microUSB interface

DIN rail mount — DIN

Ambient temperature — +70°C / -40°C

General specification:

Power supply	24 (10…36) V DC
Power consumption, max.	1.5 W
Galvanic isolation	1500 V
PC interface	microUSB (USB2.0 Full Speed)
Protection class	III
IP code	IP20
Ambient temperature	-40...+70 °C
Humidity	up to 95% (non-condensing)
Dimensions	6,1 x 113 x 115 mm
Weight	approx. 200 g

Input

Analog input	1
Accuracy	
TC	0.5%
RTD	0.25%
Resolution ADC	
TC	15 bit
RTD	15 bit
Galvanic isolation	1500 V

Output:

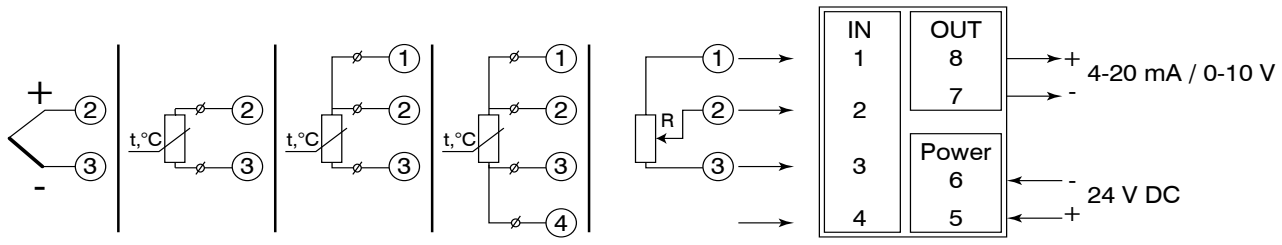
Analog output	1
Galvanic isolation	1500 V
Measuring range	0…23 mA, 0…11 V
Input signal	0-5 mA, 0(4)-20 mA, 0-5 V, 0(2)-10 V
Input resistance	
0-5 mA, 0(4)-20 mA	≤ 480 ohm
0-5 V, 0(2)-10 V	≥ 1000 ohm
Resolution DAC	12 bit
Output ripple	0.12 mA

Sensor types:

Sensor	Measuring range, °C	Temperature coefficient, °C^{-1}	Conversion range, min., °C
RTD according to IEC 60751:2008			
Pt50	-200…+850	0.00385	100
Pt100	-200…+850		100
RTD according to GOST 6651			
50P	–200…+850	0.00391	100
50M	–180…+200	0.00428	50
Cu50	–50…+200	0.00426	50
100P	–200…+850	0.00391	100
100M	–180…+200	0.00428	50
Cu100	–50…+200	0.00426	50
Ni100	–60…+180	0.00617	50
Position encoders			
Potentiometer (3-wire)	0…100 %	-	10 %
Resistance sensor (2-wire)	0…1000 Ohm	-	100 Ohm

Sensor	Measuring range, °C	Conversion range, min., °C
TC according to IEC 60584-1:2013		
J	-200…+1200	400
N	-200…+1300	500
K	-200…+1300	500
S	0…+1750	600
R	0…+1750	600
B	+200…+1800	1200
A	0…+2500	600
T	-200…+400	600
TC according to DIN 43710		
L	-200…+900	400
TC according to GOST 8.585		
L	-200…+800	400
A-2	0…+1800	600
A-3	0…+1800	600

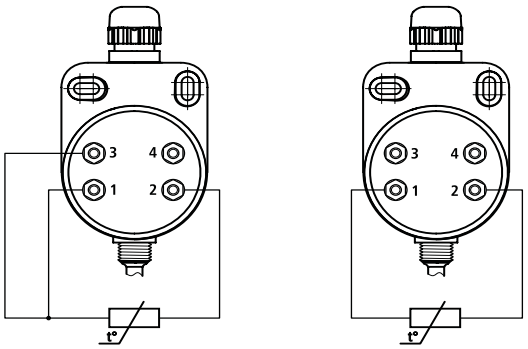
Electrical connections:



DTS125L

The DTS125L is a temperature sensor for measuring air temperature in outdoor or indoor environments. The wallmount IP65-rated enclosure enables this sensor to be utilized in warehouses manufacturing facilities with high installation demands to dust and water protection.

Electrical connection:



Technical data:

Sensor type	Pt100, Pt1000
Wiring	2-wire, 3-wire
Measuring range	-50...+100 °C
Accuracy class	B
Response time, max.	10 s
Insulation resistance, min.	20 Mohm
IP code	IP65
Protective tube	AISI 321
Probe length	60 mm

PT100/PT1000 sensor type — PT100 PT1000

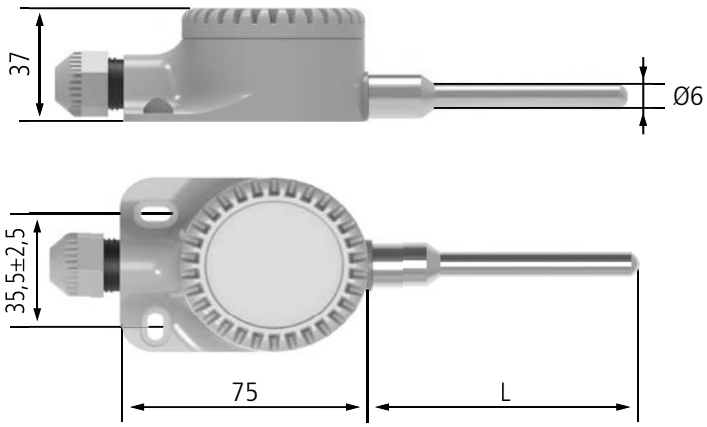
Ambient temperature — +100°C -50°C

Wall mount — WALL

IP code — IP65

For HVAC systems

Dimensions:



PD111

The PD111 is a pressure transmitter designed to convert vacuum or gauge pressure in an electrical signal of 4-20 mA. This transmitter is made of stainless steel AISI316L, equipped with a silicon measuring cell, and a laser-welded membrane that requires no sealing. The internal electronics are well-isolated with a potting compound, which provides additional protection against internal condensation allowing the PD111 to be installed in environments with extreme humidity levels (up to 90%).

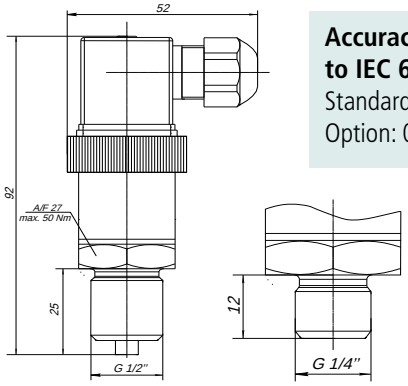
Functions and features:

- Wide variety of measuring ranges
- Laser-welded diaphragm (no sealing required)
- Silicon sensor
- Low temperature influence (≤ 0.1% / 10 °C)
- Long-term stability (<0.2% / year)
- Compact design
- Overload limit: 200 % FS

Areas of application:

- Pneumatics
- Hydraulics
- Machinery and plant engineering
- Energy
- Building technology
- Chemistry and petrochemistry
- Environmental industry

Dimensions:

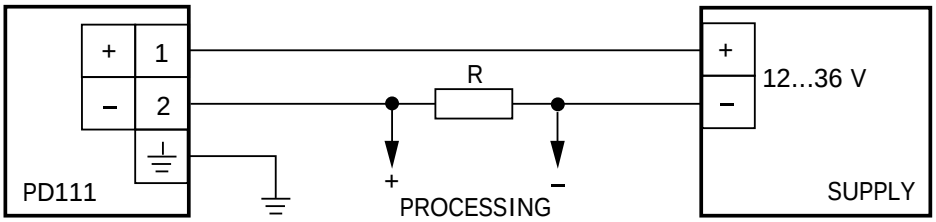


Accuracy according to IEC 60770
Standard: 0.5 % FSO
Option: 0.25 % FSO

Output signal 4-20 mA	4-20 mA
Laser-welded diaphragm	
Protection against internal condensation	
Additional polynomial digital temperature compensation	
Cost effective	
IP code	IP65
Ambient temperature	+100°C / -40°C
For general industrial applications	GENERAL APPLICATION

Technical data:

Supply / Output signal	
Power supply	12...36 V DC
Output signal	4...20 mA
Performance	
Accuracy	standart: ± 0.5 % FSO option: ± 0.25 % FSO
Permissible load	0...1200 ohm
Influence effects	supply: 0.01 % FSO / 10 V; load: 0.05 % FSO / kohm
Temperature stability	≤ ± 0.1 % FSO / 10 °C
Response time	≤ 100 ms
Permissible temperatures	
Permissible temperatures	medium: -40...100 °C environment: -40...80 °C storage: -40...80 °C
Electrical protection	
Short-circuit protection	yes
Reverse polarity protection	yes
Electromagnetic compatibility	emission and immunity according to EN 61326
Mechanical stability	
Vibration	9 g RMS (25...2000 Hz) according to DIN EN 60068-2-6
Shock	480 g / 1 ms according to DIN EN 60068-2-27
Materials	
Pressure connection	stainless steel 304 L
Enclosure	stainless steel 304 L
Diaphragm	stainless steel 316 L
Media wetted parts	pressure connection, diaphragm
Miscellaneous	
Current consumption	max. 70 mA
Weight	approx. 400 g
Installation position	any
Operational life	> 500 000 hours
CE-conformity	EMC Directive: 2004/108/EC
Wiring diagram	



Pin configuration	
Supply +	1
Supply -	2
Shield	ground pin

Ordering code:

PD111 [X] – [X][X][X][X] – [X] – [X]

Input	[bar]							
	0...-1	V	1	P	0	B		
	0...0.4	G	4	0	0	M		
	0...0.6	G	6	0	0	M		
	0...1	G	1	P	0	B		
	0...1.6	G	1	P	6	B		
	0...2.5	G	2	P	5	B		
	0...4	G	4	P	0	B		
	0...6	G	6	P	0	B		
	0...10	G	0	1	0	B		
	0...16	G	0	1	6	B		
	0...25	G	0	2	5	B		
	0...40	G	0	4	0	B		
	0...60	G	0	6	0	B		
	0...100	G	1	0	0	B		
	-0.5...0.5*	C	5	0	0	M		
	-0.8...0.8*	C	8	0	0	M		
	-1...1*	C	1	P	0	B		
	-1...3*	C	3	P	0	B		
	-1...5	C	5	P	0	B		
	-1...9*	C	9	P	0	B		
	-1...15*	C	0	1	5	B		
	-1...24*	C	0	2	4	B		
Accuracy								
	0.5 %						5	
	0.25%						2	
Pressure connection								
	G 1/2“							7
	G 1/4“							8

V – vacuum, G – gauge, C – combined
* Avaliable only with accuracy 0.5% and process connection G1/2"

PD121

The PD121 Pressure Transmitter features a flush diaphragm made of stainless steel AISI 316L and a silicon measuring cell; it converts pressure into an electrical signal of 4-20 mA. The flush diaphragm enables easy cleaning, which is essential for the use of sensors in the food and beverage industries. Depending on the device variant, we offer transmitters for gauge or vacuum pressure, as well as universal devices capable of measuring both negative and positive pressure. The PD121 transmitters are applied for pressure measurement in liquid, viscous, pasty, adhesive, crystallizing, and polluted media compatible with stainless steel AISI 316L / 1.4435 (AISI 304L / 1.4307).

Functions and features:

- Flush diaphragm
- Wide variety of measuring ranges
- Laser-welded diaphragm (no sealing)
- Silicon sensor
- Low temperature influence: ≤ 0.1% / 10 °C
- Good long term stability: < 0.2 % / year
- Compact design
- Overload limit: 200 % FS
- Easy to clean
- Level measurement

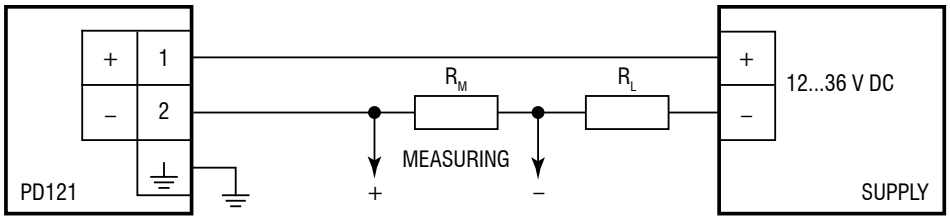
Areas of application:

- Suitable for hygienic application
- General industrial applications
- Food and beverage industry
- Environmental industry
- Paints and varnishes

Output signal 4-20 mA	4-20 mA
Flush diaphragm	
Level measurement in open containers	
Protection against internal condensation	
Additional polynomial digital temperature compensation	
Cost effective	
IP code	IP65
Ambient temperature	+100°C -40°C
For viscous and particle-laden media	

Technical Data:

Supply / Output signal	
Power supply	12...36 V DC
Output signal	4...20 mA
Performance	
Accuracy	standard: ± 0.25 % FSO ± 0.5 % FSO (0...0.16 bar, 0...0.25 bar)
Permissible load	0...1000 ohm
Influence effects	supply: 0.01 % FSO / 10 V; load: 0.05 % FSO / kohm
Temperature stability	≤ ± 0.1 % FSO / 10 °C
Response time	≤ 100 ms
Permissible temperatures	
Permissible temperatures	medium: -40...100 °C environment: -40...80 °C storage: -40...80 °C
Electrical protection	
Short-circuit protection	yes
Reverse polarity protection	yes
Electromagnetic compatibility	emission and immunity according to EN 61326
Mechanical stability	
Vibration	9 g RMS (25...2000 Hz) according to DIN EN 60068-2-6
Shock	480 g / 1 ms according to DIN EN 60068-2-27
Materials	
Pressure connection	stainless steel 304 L
Enclosure	stainless steel 304 L
Diaphragm	stainless steel 316 L
Media wetted parts	pressure connection, diaphragm
Miscellaneous	
Current consumption	max. 70 mA
Weight	approx. 400 g
Installation position	any
Operational life	> 500 000 hours
CE-conformity	EMC Directive: 2004/108/EC
Wiring diagram	



Pin configuration	
Supply +	1
Supply -	2
Shield	ground pin

Ordering code:

PD121 [X] – [X][X][X][X] – [X] – [X]

Input	[bar]							
	0...0.4	G	4	0	0	M		
	0...0.6	G	6	0	0	M		
	0...1	G	1	P	0	B		
	0...10	G	0	1	0	B		
Accuracy								
	0.25%						2	
Pressure connection								
	G 1/2“							7

V – vacuum, G – gauge, C – combined

Dimensions:

Accuracy according to IEC 60770
Standard: ±0.5 % FSO

PVT10

The humidity and temperature transmitter PVT10 designed for indoor installation is intended to measure relative humidity, temperature, or dew point while ensuring high accuracy and stability. Compact wall-mount plastic enclosure with pass-through openings provides natural ventilation of the internal electronics.
The PVT10 features two independent configurable analog outputs (4-20mA or 0-10V) and an RS485 interface for Modbus communication.

Areas of application:

The transmitter PVT10 is applicable at home and office, HVAC and building automation systems, e.g. in hotels, museums or data center.

Technical Data:

Sensors	combined RH and T sensors
Measurement ranges	0...95 % RH /-20...+70 °C
Resolution	0.1 % RH / 0.1 °C
Accuracy	
RH = 20...80%	±3%
RH = 5...20% or 80...95%	±4%
T = 20...+70 °C	±0.5 °C
Response time	approx.15 s
Self-diagnostics	full functionality check at start-up
Warm-up time, max	1 s
Power supply	12 / 24 (11.5...30) V DC
Power consumption, max.	1.5 W
Interface / Protocol	RS485 / Modbus RTU
Analog outputs	2× 4-20 mA / 0-10 V, configurable
Enclosure	white ABS, wall mount, IP20
Cable connections	screwless terminal blocks
Dimensions	71 × 71 × 27 mm
Operating environment	residential, business and industrial indoor spaces

2 transmitters in 1 — 2 IN 1

Humidity transmitter — 0% 95%

Temperature transmitter — +70°C -20°C

4-20 mA output signal — 4-20 mA

0-10 V output signal — 0-10V

Modbus protocol — Modbus

RS485 interface — RS485

IP code — IP20

PVT100

The humidity and temperature transmitter PVT100 is intended to measure relative humidity, temperature, or dew point while ensuring high accuracy and stability. The dust-tight and water-resistant IP65-rated enclosure is available in duct-mount version as well as with a remote probe. The PVT100 features two independent configurable analog outputs (4-20mA or 0-10V) and an RS485 interface for Modbus communication.

Functions and features:

- Dustproof and waterproof enclosure for harsh environment
- Three types of enclosure
- Wide measurement ranges, high accuracy and long-term stability
- Remote temperature probe with fluoroplastic cable for temperatures of up to +120 °C
- Two independent user-configurable analog outputs 0-10 V / 4-20 mA
- RS485 Modbus RTU interface for Fieldbus networking

Areas of application:

- HVAC / building automation
- Energy management systems (EMS)
- Indoor Air Quality (IAQ)
- Hospitals / labs / clean rooms
- Museums / archives, supermarkets
- Swimming pools
- Refrigeration systems
- Paint spray booths
- Pharmaceutical
- Food processing
- Food storage
- Greenhouses, mushroom plants
- Animal rooms
- Textile production
- Paper production
- Drying (ceramic, timber, etc)

2 transmitters in 1	2 IN 1
Humidity transmitter	0% 100%
Temperature transmitter	+80°C -40°C
4-20 mA output signal	4-20 mA
0-10 V output signal	0-10V
Modbus protocol	Modbus
RS485 interface	RS485
IP code	IP65

Technical Data:

Sensors	combined RH and T sensors
Measurement ranges	0...100% RH / -40...+80(120) °C
Resolution	0.1 % RH / 0.1 °C
Accuracy	±2.5(3.5)% RH / ±0.5(0.7)°C
Response time	approx. 15 s
Self-diagnostics	full functionality check at start-up
Warm-up time	≤ 1 s
Power supply	12 / 24 (11...30) V DC
Power consumption, max.	1.5 W
Interface / Protocol	RS485 / Modbus RTU
Analog outputs	2× 4-20 mA / 0-10 V, configurable
Cable connections	screwless terminal blocks
Probe connector	M12, IP68
Enclosure	grey ABS, wall mount, IP65
Dimensions	80 × 82 × 55 mm
Operating environment	industrial indoor and outdoor places

PVT100-RP
Humidity & Temperature Transmitter with remote probe and 2.5 m or 5 m cable

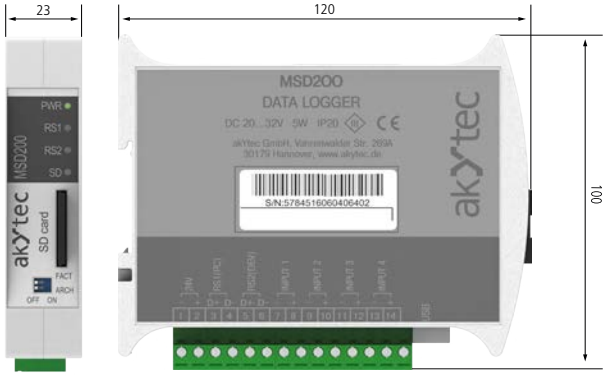
MSD200

MSD200 is a DIN rail device capable of logging data over up to 64 channels and storing them on an SD card (max. 32 GB). This logger has four (0) 4-20 mA analog inputs and two RS485 interfaces (Modbus RTU/ASCII). The MSD200 is configured over the built-in USB port with a free-of-charge software tool (included).

Functions and features:

- 4 analog inputs for standard electrical signals 0-5 mA, 0-20 mA or 4-20 mA
- Scaling function to convert the measured value to any unit
- Monitoring of data received from other devices via Modbus over RS485 interface
- Logging the received data and store it as a hard-copy to a memory card as a CSV file
- Modbus RTU/ASCII communication in master or slave mode over the RS485 interface
- User-friendly software tool MSD200 Configurator

Dimensions:



64 data measuring points	64 CHANNELS
SD card (up to 32 GB)	SD
4 analog inputs	4 AI
4-20 mA input signal	4-20 mA
Modbus protocol	Modbus
RS485 interface	RS485
Master or Slave in a Modbus network	MASTER SLAVE
USB interface	
DIN rail mounting	DIN
Ambient temperature	+55°C -10°C

Areas of application:

The MSD200 can be used for data archiving in various processes in the food, chemical, gas and packaging industry as well as in the construction materials and wood processing industries. It can be also applied in many other areas of industrial and building automation.

Technical Data:

General	
Power supply	24 (20...32) V DC
Power consumption, max.	5 W
Number of channels, max.	64
Logging cycle	1…65535 s
Dataset size (per 1 channel)	20 byte
Storage media	MMC, SD, SDHC, microSD
Storage capacity	≤32 GB
Storage medium file system	FAT32
Analog inputs	
Quantity	4
Input signals	0-5 mA, 0(4)-20 mA
Sampling rate for analog inputs, max.	100 ms
Accuracy	±1.0%
Input resistance	133 ohm
Galvanic isolation	none
Resolution ADC	12 bit
Communication	
Interfaces	2 x RS485 (RS1, RS2), USB-Device 2.0
Protocol	Modbus RTU / ASCII, akYtec
RS485	
RS1 operation mode	Slave (PC interface)
RS2 operation mode	Master (Device interface)
RS1 protocol	Modbus RTU
RS2 protocol	Modbus RTU / ASCII, akYtec
Baud rate	1.2...115.2 kbit/s
Galvanic isolation	individual
Environment	
Ambient temperature	-10...+55 °C
Humidity	up to 80%, non-condensing
IP Code	IP20
Enclosure	
Dimensions	22.5 x 102 x 120 mm
Weight	approx. 150 g
Material	plastic

CONTENTS

akYtec GmbH from Hanover, Germany develops and distributes innovative automation technology and industrial electronic products.
These include various digital displays, control panels, programmable relays,
and many other devices.

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