Analog input module
Short guide

1. Overview

Analog input module MV110-24.8A is an extension module with 8 universal analog inputs.
The module provides the following functions:

- analog-digital conversion
- sensors / RS485 network status diagnostic
- error and alarm signals

CAUTION
This device should not be used for medical devices which receive, control or otherwise affect human life or physical health.

2. Specification

Table 1 Specifications

Characteristic	Value
Power supply	
Power supply	24 (20 … 28) V DC
Power consumption, max.	6 W
Interfaces	
Data transfer interface	RS485
Connected devices, max.	32
Baud rate	115.2 kbit/s
Protocols	akYtec, ModBus-RTU/ASCII
Inputs	
Number of inputs	8
ADC resolution	16 bits
Sampling time, max.:*	
Resistance thermometer	0.9 s
Thermocouples and current/voltage signals	0.6 s
Accuracy	
Resistance thermometer	± 0.5 %
Thermocouples and current/voltage signals	± 0.25 %
General specifications	
Dimensions	(63 × 110 × 75) ± 1 mm
IP code:	
Faceplate	IP20
Terminal block	IP00
Average service lifetime	10 years
Weight, max.	500 g
Error-free running time, min.	50,000 h
* Because the sampling of inputs is performed sequentially, the total sampling time is equal to the sum of the times of all connected inputs.	

3. Environmental conditions

Table 2 Environmental conditions

Condition	Permissible range
Ambient temperature	–20 … +55 °C
Transportation and storage	–25 … +55 °C
Relative humidity	up to 80% (at +25 °C, non-condensing)
Altitude	up to 2000 m above sea level

CAUTION
The following environmental conditions must be observed:

- low-dust, dry and controlled environment
- closed explosion-proof rooms without aggressive vapors and gases

4. Settings

The module can be configured with the akYtecToolPro software using a RS485-USB interface adapter (not included).

NOTE
The latest version of the configuration software is available for download on www.akytec.de.

Full list of the parameters is given in *User guide* (available on the device page at www.akytec.de).

5. Installation and connection

Before installation make sure there is enough free space for connecting the module and placing the wires.
The module is designed for DIN rail mounting in a control cabinet or for wall mounting.

CAUTION
Improper installation can cause serious or minor injuries and damage the module.
Installation must be performed only by fully qualified personnel.

Installation of external connections is carried out by a wire with a cross section of not more than 0.75 mm².
Powering any devices from the network contacts of the module is prohibited
The device is powered from a local power supply unit of suitable capacity.
The power supply unit should be installed in the same electrical cabinet in which the device is installed.

CAUTION
All electrical connections must be performed by a fully qualified electrician.
Switch on the power supply only after the wiring of the device has been completely performed.

6. Wiring

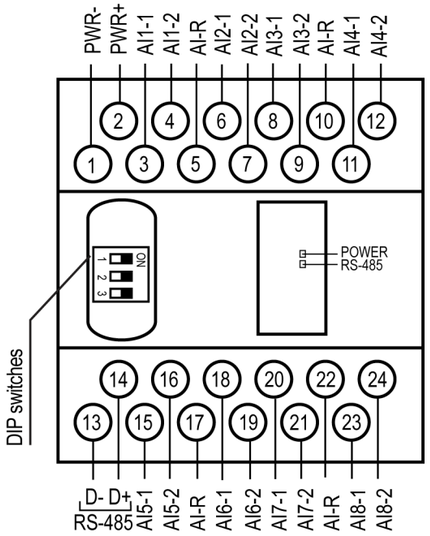


Fig. 1 Electrical connections

Table 3 Terminal assignments

No.	Description	No.	Description
1	Power supply (0 V)	13	RS-485 (D-)
2	Power supply (24 V)	14	RS-485 (D+)
3	Input 1-1 (AI1-1)	15	Input 5-1 (AI5-1)
4	Input 1-2 (AI1-2)	16	Input 5-2 (AI5-2)
5	Input R (AI-R)	17	Input R (AI-R)
6	Input 2-1 (AI2-1)	18	Input 6-1 (AI6-1)
7	Input 2-2 (AI2-2)	19	Input 6-2 (AI6-2)
8	Input 3-1 (AI3-1)	20	Input 7-1 (AI7-1)
9	Input 3-2 (AI3-2)	21	Input 7-2 (AI7-2)
10	Input R (AI-R)	22	Input R (AI-R)
11	Input 4-1 (AI4-1)	23	Input 8-1 (AI8-1)
12	Input 4-2 (AI4-2)	24	Input 8-2 (AI8-2)

NOTICE
All AI-R terminals are internally connected. It is possible to connect sensors to any of them.

To restore default network settings, turn the DIP switch S1 in OFF position.

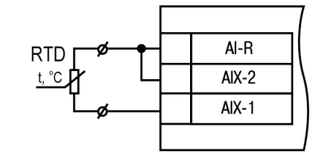


Fig. 2 Resistance thermometer wiring

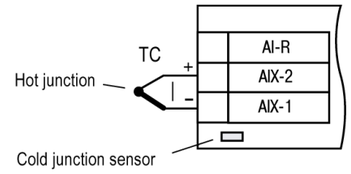


Fig. 3 Thermocouple wiring

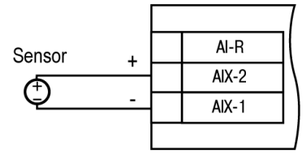


Fig. 4 Voltage signal wiring (–50…+50 mV or 0…1 V)

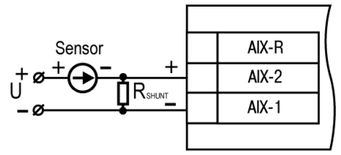


Fig. 5 Current signal wiring (0…5, 0…20 or 4…20 mA, R_{SHUNT} = 49.9 Ω ± 0,1 %)

CAUTION
To measure a current signal a shunt resistance of 49.5 Ω (±1%) should be connected in parallel.

NOTICE
It is recommended to use resistance included in the package or other high-stable resistance.

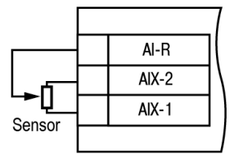


Fig. 6 Resistance sensor wiring

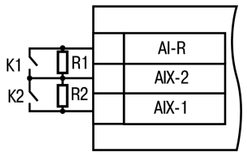


Fig. 7 Digital signal wiring

7. Indication

On the front panel there are indication LEDs. The decoding of the LED indications is given in table below.

Table 4 Indication

LED	LED state	Description
RS485	Flashing	Data exchange via RS485 interface
POWER	ON	Power supply indication

8. Modbus communication

Following Modbus functions are available: **3 (0x03)** or **4 (0x04)** for reading and **16 (0x10)** for writing.

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Table 5 Modbus registers

Parameter	Type	Register	
		hex	dec
Decimal point (**dP**)			
Input 1	int16	0000	0
Input 2	int16	0006	6
Input 3	int16	000C	12
…	…	…	…
Input 8	int16	002A	42
Measured value			
Input 1	int16	0001	1
Input 2	int16	0007	7
Input 3	int16	000D	13
…	…	…	…
Input 8	int16	002B	43
Error code			
Input 1	int16	0002	2
Input 2	int16	0008	8
Input 3	int16	000E	14
…	…	…	…
Input 8	int16	002C	44
Time mark			
Input 1	int16	0003	3
Input 2	int16	0009	9
Input 3	int16	000F	15
…	…	…	…
Input 8	int16	002D	45
Measured value as FLOAT			
Input 1	Float32	0004, 0005	4, 5
Input 2	Float32	000A, 000B	10, 11
Input 3	Float32	0010, 0011	16, 17
…	…	…	…
Input 8	Float32	002E, 002F	46, 47

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