Analog input module
Short guide

1. Overview

Analog input module MV210-101 is an extension module with 8 universal analog inputs.

The module has two Ethernet ports for connection within the daisy chain scheme. If the module fails or the power is turned off, the data transmission will be fed directly from port 1 to port 2 without disconnecting.

The full User Guide is available on the device page at *www.akytec.de*.

2. Environmental conditions

- ambient temperature: –40 … +55 °C;
- relative humidity: up to 95% (at +35 °C, non-condensing);
- closed non-hazardous areas, free of corrosive or flammable gases;
- permissible pollution degree 1 according to IEC 61131-2.

3. Specifications

Table 1 Specifications

Characteristic		Value
Power supply		
Power supply		24 (10 ... 48) V DC
Power consumption		4 W
Protection against reverse polarity of supply voltage		Yes
Interfaces		
Data transfer interface		Dual-Port Ethernet 10/100 Mbps
Configuration interface		USB 2.0 (MicroUSB), Ethernet10/100 Mbps
Date transfer protocol		Modbus TCP
Network protocol version		IPv4
Inputs		
Number of analog inputs		8
ADC resolution		16 bits
Sampling time	TC	max. 0.6 s
	RT	max. 0.9 s
	I/U signals	max. 0.6 s
Accuracy	TC	±0.5 %
	RT	±0.25 %
	I/U signals	±0.25 %
Electromagnetic influence		max. 0.3%
Temperature influence		20 % / 10 °C
Shunt resistance		51 Ω
Flash-memory (log-file)		
Maximum log file size		2 KB
Maximum number of log files		1000
Minimum log writing interval		10 s
Real time clock		
Inaccuracy	at +25 °C	max. 1 s per day
	at -40 °C	max. 3 s per day
Battery type		CR2032
Lifetime of one battery		6 years
General specifications		
Dimensions		42 × 124 × 83 mm
Ingress protection rating		IP20
Average lifetime**		10 years
Weight		approx. 0.4 kg
Lifetime of one battery		6 years

* Because the sampling of inputs is performed sequentially, the total sampling time is equal to the sum of the times of all connected inputs.

** Expect RTC battery

4. Installation and connection

Before installation make sure there is enough free space for connecting the module and placing the wires. The module is mounted on a DIN rail or on a vertical surface using screws.

Installation of external connections is carried out by a wire with a cross section of not more than 0.75 mm².

For stranded wires, use end sleeves.

After installation, put the wires into the cable channel of the module housing and close the cover.

If necessary, in order to remove the terminal blocks of the module, loosen the two screws at the corners of the terminal blocks.

CAUTION
Connection and maintenance is performed only when the module power and the power to all devices connected to it is turned off.

Table 2 Default network settings

Parameter	Note
MAC-address	Set at the factory and is unchanged.
IP address	Can be static or dynamic. The default setting is **192.168.1.99**
Subnet mask	Specifies the subnet of the IP addresses of other devices visible by the Module. The default setting is **255.255.255.0**
Gateway IP Address	Specifies the gateway address to access the Internet. The factory default setting is **192.168.1.1**

5. Connection diagrams

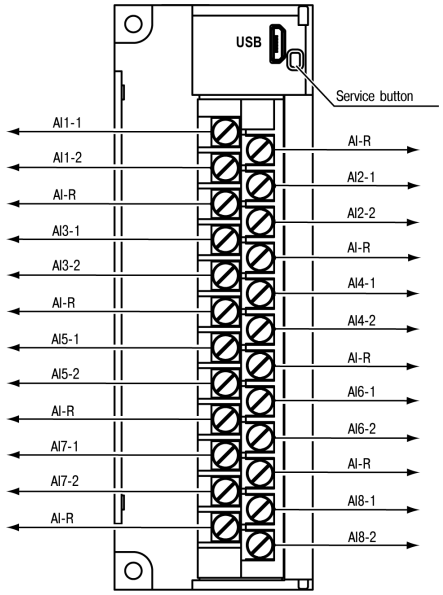


Fig. 1 Terminal block layout

Denomination	Function
AI1-1, AI1-2–AI8-1, AI8-2	Analog inputs AI1–AI8
AI-R	Common points of analog inputs

The service button performs the following functions:

- Restore default settings;
- IP address assignment;
- Firmware update.

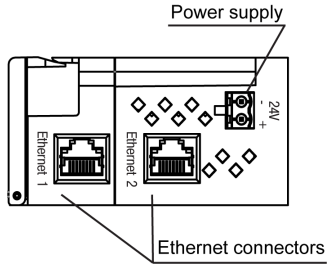


Fig. 2 Power and Ethernet connectors

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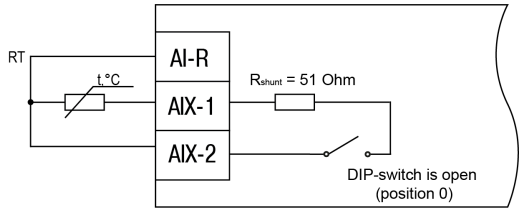


Fig. 3 Resistance thermometer wiring

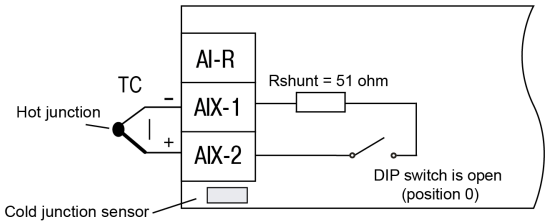


Fig. 4 Thermocouple wiring

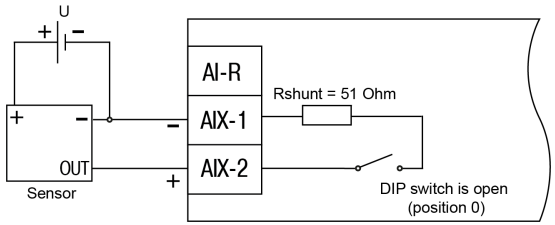


Fig. 5 Voltage signal wiring

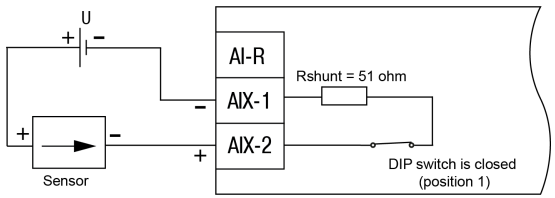


Fig. 6 Current signal wiring (two-wire)

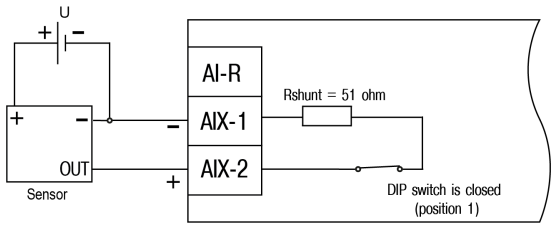


Fig. 7 Current signal wiring (three-wire)

NOTICE
When using active sensors, it should be borne in mind that the "minus" pins of their output signals in the device are interconnected.

CAUTION
When connecting an active current sensor, it is necessary to connect a built-in 51 ohm resistor. To do this, set the DIP switch of the corresponding channel, which is on the side of the module, to position **1**.

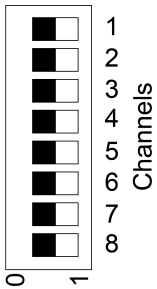


Fig. 8 DIP-switches on device housing

NOTICE
If the DIP switches are in position **1** while using other sensors, the values will not be displayed correctly.

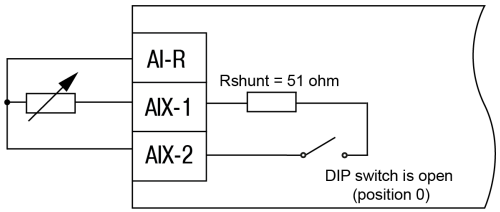


Fig. 9 Resistance sensor wiring

6. Settings

The module is configured via the Modbus TCP protocol or in the akYtec ToolPro program via the USB interface (see User Guide for MV210-101). If the module is connected to the USB port, the main module power supply is not required.

7. Indication

Table 3 Indication

LED	LED Status	Function
Power ⏻ (green)	ON	Device operating voltage is applied
Eth 1 (green)	Flashing	Data transfer via Ethernet port 1
Eth 2 (green)	Flashing	Data transfer via Ethernet port 2
Failure ⚠ (red)	OFF	Normal operation
	ON	Main application and / or configuration failure
	Lights 200 ms every 3 seconds	It is necessary to replace the battery of RTC
	Lights 100 ms twice a second (after a pause of 400 ms)	The module is in a safe status
	900 ms on, 100 ms off	Hardware peripheral failure (Flash, RTC, Ethernet Switch)
Input status indicators (see table below)	Green	Input is ON
	Off	Input is OFF
	Off for a short time	Measurement at the input
	Orange	Non-critical input error
	Red	Critical input error

Table 4 Error indication

Error	Indication
Measurement correct	Green
Measured value error	Orange
Measurement not ready. Wait for the results of the first measurement after switching on the device	Orange
Sensor is disconnected	Off
Cold junction temperature too high	Orange
Cold junction temperature too low	Orange
Measured value too high	Orange
Measured value too low	Orange
Short circuit	Red
Sensor break	Red
No connection with ADC	Red
Incorrect calibration coefficient	Orange

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