Analog input module
Short guide

1. Overview

The MV110-24.8AS analog input module is an extension module with 8 analog inputs for the following standard signals:

- 4-20 mA
- 0-20 mA
- 0-5 mA
- 0-10 V

The module performs the following functions:

- Connection of peripherals with analog outputs
- Conversion of analog signals to digital values
- Sensor-based status diagnostics
- Diagnostics of RS-485 network status
- Generation of appropriate error signals or alarm signals
- Slave device in ModBus protocol structure

The module has the following galvanically isolated circuits:

- Power supply
- Analog inputs
- RS-485 interface

Separate inputs are not galvanically isolated

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	6 W
Resolution, max.:	
4…20 mA and 0…20 mA	4 µA
0…5 mA	1 µA
1…10 mV	2 mV
Interfaces	
Data transfer interface	RS-485
Connected devices, max.	32
Baud rate	115.2 kbit/s
Protocols	akYtec, ModBus-RTU/ASCII
Outputs	
Number of analog inputs	8
ADC Resolution	10 bits
Input resistance:	
0…20 mA and 4…20 mA	130…250 Ω
0…5 mA	30…500 Ω
0…10 V	200 kΩ
Sampling time for each input	5 ms ± 2 %
General specification	
Dimensions	(63 × 110 × 75) ± 1 mm
IP code:	
front panel	IP20
terminal block	IP00
Average service lifetime	8 years
Weight, max.	500 g

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. Indication

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

Table 3 Indication

LED	LED state	Description
POWER	ON	Power supply indication
RS-485	Flashing	Data transmission via RS-485
FAULT	ON	A built-in monitoring system has detected a device failure

7. Wiring

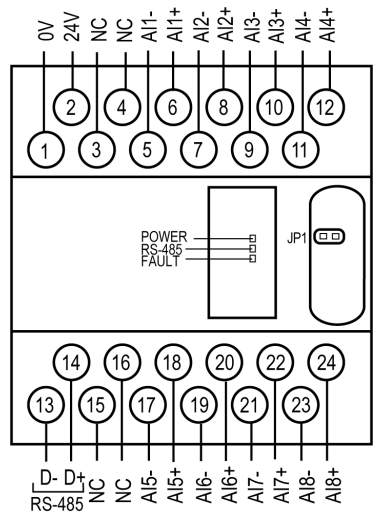


Fig. 1 Electrical connections

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akYtec GmbH · Vahrenwalder Str. 269 A · 30179 Hannover · Germany
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Table 4 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	Not connected (NC)	15	Not connected
4	Not connected (NC)	16	Not connected
5	Input 1 (common negative)	17	Input 5 (common negative)
6	Input 1 (+)	18	Input 5 (+)
7	Input 2 (common negative)	19	Input 6 (common negative)
8	Input 2 (+)	20	Input 6 (+)
9	Input 3 (common negative)	21	Input 7 (common negative)
10	Input 3 (+)	22	Input 7 (+)
11	Input 4 (common negative)	23	Input 8 (common negative)
12	Input 4 (+)	24	Input 8 (+)

Under the cover on the front panel of the module there is a 10-pole pin strip XP1 with the jumper **JP1** for factory settings restoration.

1. All the AIx terminals are internally connected through a resistance of approximately 0.1 Ω and must have the same potential.
2. The total consumption of active current sensors from an integrated 24 V source should not exceed 50 mA.

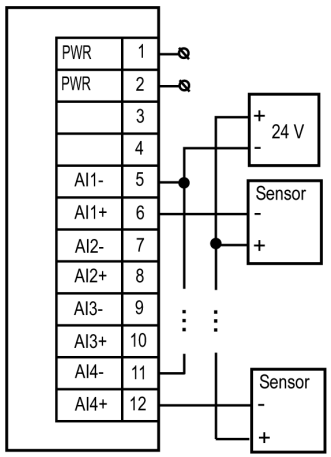


Fig. 2 Connection of 2-wire sensors

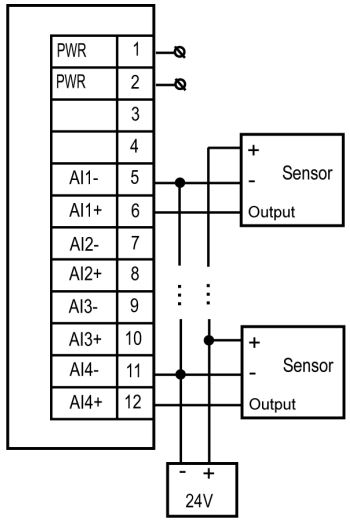


Fig. 3 Connection of 3-wire sensors

8. Modbus communication

For the Modbus protocol, the following functions are implemented: 03, 04 (**read registers**), 06 (**preset single register**), 06 (**preset single register**), 16 (**preset multiple registers**), 17 (**report slave ID**).

Table 5 Modbus register

Parameter	Description	Data type	Input	Register hex
exit	Cause of reset	INT16	—	0x88
n.Err	Last network error	BYTE	—	0x90
bPS	Baud rate	INT16	—	0x30
PrtY	Parity	INT16	—	0x38
Sbit	Stop bits	INT16	—	0x40
Addr	Device address	INT16	—	0x48
Rs.dL	Response delay	INT16	—	0x50
ComF	Common filters	INT16	—	0x28
in-t	Sensor type	INT16	1	0x00
			…	…
			8	0x07
in.Fd	Filter time constant	INT16	1	0x18
			…	…
			8	0x1F
Ain.L	Measuring range / lower limit	FLOAT32	1	0x58, 0x59
			…	…
			8	0x66, 0x67
Ain.H	Measuring range / upper limit	FLOAT32	1	0x68, 0x69
			…	
			8	0x76, 0x77
dP	Decimal point	INT16	1	0x20
			…	…
			8	0x27
Peak	Change rate limit	INT16	1	0x08
			…	…
			8	0x0F
OutF	Channel filter	INT16	1	0x10
			…	…
			8	0x17
ird	Measured value (INT)	INT16	1	0x100
			…	…
			8	0x107
indt	Measured value (INT) with a time mark	INT16+INT16	1	0x108, 0x109
			…	…
			8	0x116, 0x117
srd	Error code	INT16	1	0x118
			…	…
			8	0x11F
read	Measured value (FLOAT) with a time mark	FLOAT32 +INT16	1	0x120 … 0x122
			…	…
			8	0x135 … 0x137

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