Analog output module
Short guide

1. Overview

MU110-24.6U is an extension module with 6 analog outputs.

The module provides the following functions:

- module control and parametrization via RS485 network
- RS485 Network diagnostics
- error and alarm signal generation
- Slave in the RS485 network.

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 Specification

Characteristic	Value
Power supply	
Power supply	24 (20 … 28) V DC
Power consumption, max.	6 W
Interfaces	
Data transfer interface	RS-485
Connected devices, max.	32
Baud rate	115.2 kbit/s
Protocols	akYtec, ModBus-RTU/ASCII
Outputs	
Number of outputs	6
Output signal	0–10 V
Accuracy, max.	± 0.5 %
Load resistance, min.	2 kΩ
Auxiliary voltage	12…36 V DC
General specifications	
Dimensions	(63 × 110 × 75) ± 1 mm
IP code: Faceplate Terminal block	 IP20 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. Wiring

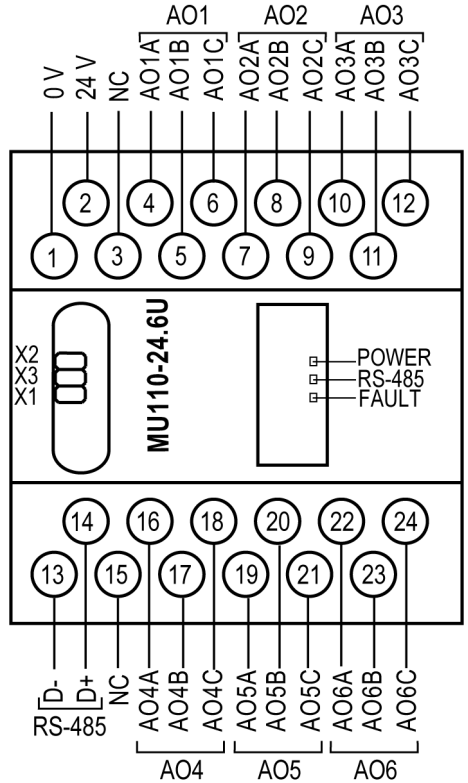


Fig. 1 Electrical connections

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	Not connected (NC)	15	Not connected (NC)
4	Output 1 / 0–10 V (AO1A)	16	Output 4 / 0–10 V (AO4A)
5	Output 1– (AO1B)	17	Output 4– (AO4B)
6	Output 1+ (AO1C)	18	Output 4+ (AO4C)
7	Output 2 / 0–10 V (AO2A)	19	Output 5 / 0–10 V (AO5A)
8	Output 2– (AO2B)	20	Output 5– (AO5B)
9	Output 2+ (AO2C)	21	Output 5+ (AO5C)
10	Output 3 / 0–10 V (AO3A)	22	Output 6 / 0–10 V (AO6A)
11	Output 3– (AO3B)	23	Output 6– (AO6B)
12	Output 3+ (AO3C)	24	Output 6+ (AO6C)

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There are three jumpers under the front cover:

- **JP1** – DRAM write-protection;
- **JP2** – restore factory settings;
- **JP3** – service function.

All jumpers are in OFF position by default.

The voltage of an external auxiliary voltage source may not exceed 36 V.

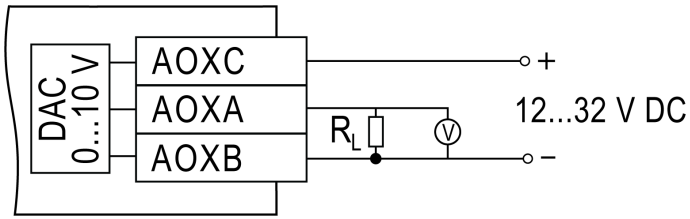


Fig. 2 Output wiring

The output is designed for minimal load resistance of 2 kΩ.

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
RS-485	Flashing	Data transfer via RS485 interface
POWER	ON	Power supply indicator
FAULT	ON	Data transfer via RS485 interface is interrupted

8. ModBus

Using the ModBus protocol, the value transmitted to the analog output (in the range from 0 to 1000) is transmitted to the device.

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

Table 5 ModBus Registers

Parameter	Value [unit]	Type	Register	
			(hex)	(dec)
Output value AO1	0…1000 [0.1 %]	uint16	0000	0000
Output value AO2	0…1000 [0.1 %]	uint16	0001	0001
Output value AO3	0…1000 [0.1 %]	uint16	0002	0002
Output value AO4	0…1000 [0.1 %]	uint16	0003	0003
Output value AO5	0…1000 [0.1 %]	uint16	0004	0004
Output value AO6	0…1000 [0.1 %]	uint16	0005	0005
Safe output status AO1	0…1000 [0.1 %]	uint16	0010	0016
Safe output status AO2	0…1000 [0.1 %]	uint16	0011	0017
Safe output status AO3	0…1000 [0.1 %]	uint16	0012	0018
Safe output status AO4	0…1000 [0.1 %]	uint16	0013	0019
Safe output status AO5	0…1000 [0.1 %]	uint16	0014	0020
Safe output status AO6	0…1000 [0.1 %]	uint16	0015	0021
Time-out	0…600 [s]	uint16	0030	0048

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