Analog output module
Short guide

1. Overview

MU210-502 is an extension module with 6 analog outputs of unified signals.

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

Each of the 6 outputs can be configured to one of the types:

- 0…20 mA
- 4…20 mA
- 0…10 V

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);
- atmospheric pressure: 84 ... 106.7 kPa;
- closed non-hazardous areas, free of corrosive or flammable gases;
- permissible pollution degree 2 according to IEC 61131-2.

3. Specifications

Table 1 Specifications

Parameter	Value	
Power supply		
Power supply	24 (10…48) V DC	
Power consumption	5 W	
Protection against reverse polarity	Yes	
Analog outputs		
Analog output supply voltage	12…28.8 V	
DAC resolution	12 bits	
DAC warm-up time	10 minutes	
Output update period, min.	200 ms	
Signal	0-20 mA 4-20 mA	0-10 V
Maximum output ripple	25 µA	10 mV
Accuracy	± 0.5 %	± 0.5 %
Temperature influence	0.1 % / 10 °C	0.1 % / 10 °C
Influence of electromagnetic interference	± 0.5 %	± 0.5 %
Output short circuit protection	Yes	
Output state diagnostics	Yes	
Communication interfaces		
Data transfer interface	Dual Port Ethernet 10/100 Mbit	
Configuration interface	USB 2.0 (MicroUSB), Ethernet 10/100 Mbit	
Date transfer protocol	Modbus TCP, MQTT SNMP, NTP	
Protocol version	IPv4	
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		
Accuracy	± 3 s/day at +25 °C ± 10 s/day at -40 °C	
Backup battery	CR2032L	
General specifications		
Dimensions	42 × 124 × 83 mm	
IP code	IP20	
Error-free running time*	60,000 h	
Average service life time	10 years	
Weight	300 g	
* Except real-time clock 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 Network parameters

Parameter	Description	Default value
IP address	IPv4 Internet Protocol address	192.168.1.99
Subnet mask	IP address recognition area in the subnet	255.255.255.0
Gateway	IP address of the gateway	192.168.1.1
DNS server 1	Primary DNS server	77.88.8.8
DNS server 2	Secondary DNS server	8.88.8.8

5. Wiring

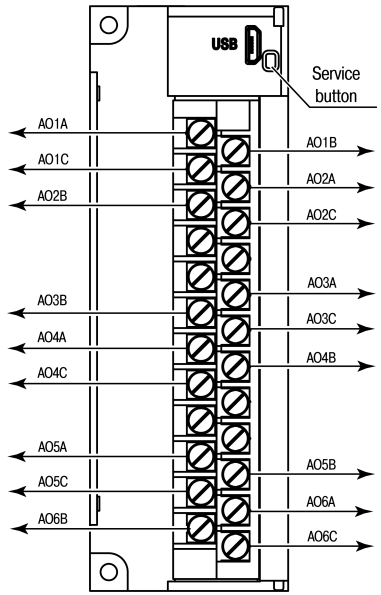


Fig. 1 Terminal block layout

Table 3 Contact assignment

Marking	Description
AOxA	Output power supply (+)
AOxB	Outputs AO1...AO6
AOxC	Common power contacts (-) of the outputs (the length of the power line of the analog outputs is not more than 30 m)

The service button performs the following functions:

- Default settings restoration;
- IP address assignment;
- Firmware update.

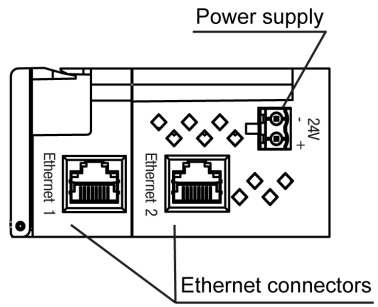


Fig. 2 Device connectors

© All rights reserved. Subject to technical changes and misprints.
akYtec GmbH · Vahrenwalder Str. 269 A · 30179 Hannover · Germany
Tel.: +49 (0) 511 16 59 672-0 · www.akytec.de

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

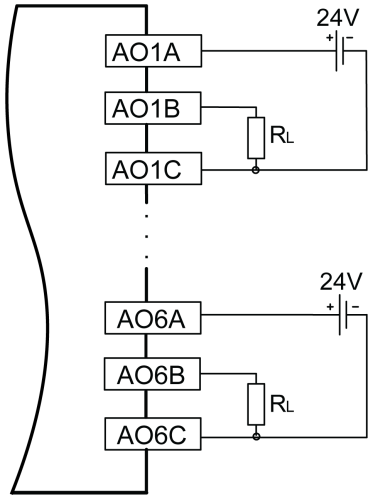


Fig. 3 Output wiring

Table 4 Supply voltage selection

Mode	Resistance	Output supply voltage
4–20 mA, 0–20 mA	400…600 Ω	24 V
0–10 V	min. 1000 Ω	24 V

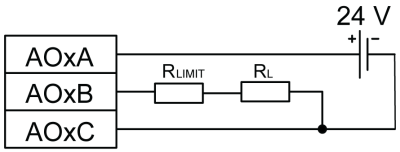


Fig. 4 Limit resistor wiring

The resistance of the resistor R_{LIMIT} must be chosen so that the total resistance in the load circuit is included in the value specified in *table 4* range. The power of the resistor R_{LIMIT} must be at least 1 W.

6. Settings

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

7. Indication

Table 5 LED States

LED	LED Status	Function
Power ⏻ (green)	ON	Power on
Eth 1 (green)	Flashing	Data transfer over Ethernet 1 interface
Eth 2 (green)	Flashing	Data transfer over Ethernet 2 interface
Fault ⚠ (red)*	OFF	No errors
	ON	Program / configuration error
	Flashing (0.1 s / 2 s)	Low battery
	Flashing (0.1 s / 0.5 s)	No requests from master. Safe state activated
	Flashing (0.9 s / 1 s)	Hardware peripherals error (Flash, RTC, Ethernet Switch), overheating**
Output LED (red/green)	Green	Output on
	OFF	Output off
	Red	Output fault

* Alarm LED indication priorities from highest to lowest: hardware failure, overheating, software errors, safe state, battery level.

** When the module overheats to a temperature above 95°C, the device turns off analog outputs ("**Off**" output signal operation mode) and "DAC overheat" is displayed in the output status parameter. When the temperature drops below 85°C, the "Emergency" indicator is reset and the values of the outputs can be set.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

© All rights reserved. Subject to technical changes and misprints.
akYtec GmbH · Vahrenwalder Str. 269 A · 30179 Hannover · Germany
Tel.: +49 (0) 511 16 59 672-0 · www.akytec.de