Digital output module
Short guide

1. Overview

MU210-412 is an extension module with 24 digital outputs

The module is equipped with two Ethernet ports for daisy chain connection. If the module fails or the power is turned off, then data will be transferred 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

Table 1 Operating conditions

Condition	Permissible range
Ambient temperature	-40…+55 °C
Transportation and storage	
Relative humidity	up to 95 % (at +35 °C, non-condencing)
Attitude	up to 2000 m ASL
IP code	IP20
Vibration / shock resistance	conforms to IEC 61131-2
EMC emission / immunity	conforms to IEC 61131-2

3. Specification

Table 2 General specifications

Parameter	Value	
Electrical		
Power supply	24 (10 ... 48) V DC	
Power consumption	4 W at 24 V DC	
Polarity protection	Yes	
Appliance class	II	
Interfaces		
Data transfer	Double Ethernet 10/100 Mbps	
Protocols	Modbus TCP, MQTT SNMP, NTP	
Configuration interface	USB 2.0 (MicroUSB) Ethernet 10/100 Mbps	
Digital outputs		
Outputs number	24	
Output type	transistor	
Control	On-Off Low frequency PWM High frequency PWM Pulse generator	
Output switching mode	High-side switch (DO1-DO8)	Push-pull switch (DO9-DO24)
Output power supply	10…36 V	
DC load current, max.	0.15 A	0.4 A
Allowed short-time output current, max.	0.19 A	0.6 A
Output pulse length, max.	5 µs	1 ms
Output frequency (for resistive load), max.	60 kHz	1 Hz
Load capacity, max.	20 µF at <10 Hz	20 µF
Output protection	short circuit protection during power on output overcurrent protection	
Flash-memory (log file storage)		
File size, max.	2 kB	
Number of log files, , max.	1000	
Logging interval, min.	10 s	
Real time clock		
Accuracy	±3 s/day at +25 °C ±10 s/day at -40 °C	
Backup battery	CR2032	
Mechanical		
Dimensions	42 × 124 × 83 mm	
Weight	approx. 600 g	

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, lay the wires in the cable channel of the module housing and close the cover.

If necessary, 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 3 Ethernet parameters

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

5. Terminal assignment and Service button

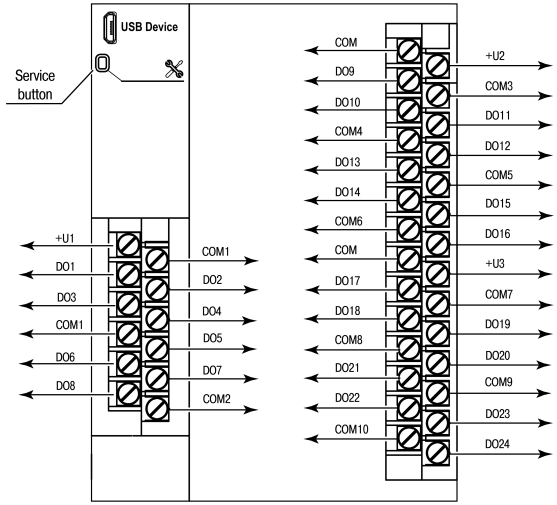


Fig. 1 Terminal assignment

Table 4 Terminal assignments

Marking	Description
DI1…DI24	Input terminals
COM	Common input power supply point
+U1	Supply voltage for outputs DO1–DO8
+U2	Supply voltage for outputs DO9–DO16
+U3	Supply voltage for outputs DO17–DO24

The service button can be used for the following functions:

- IP address assignment
- Factory settings restoration

6. Connection diagrams

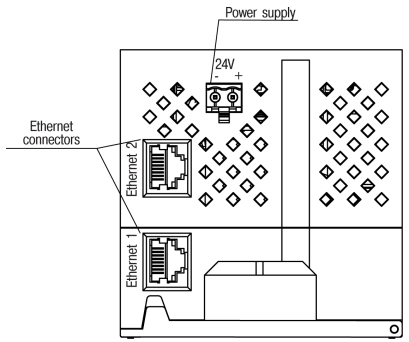


Fig. 2 Device connectors

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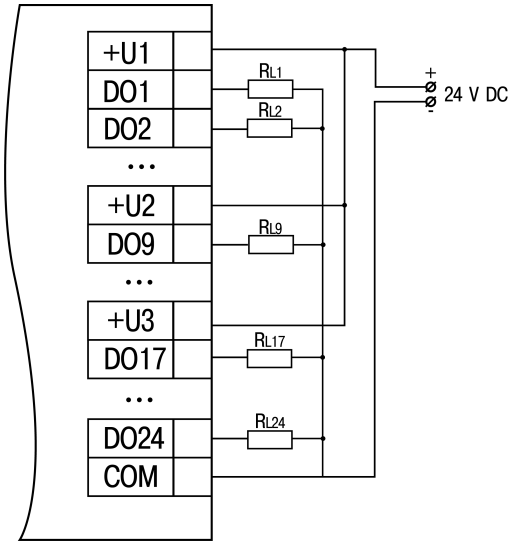


Fig. 3 Output wiring

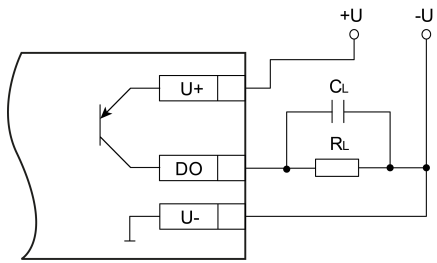


Fig. 4 Output wiring in high-side switching mode

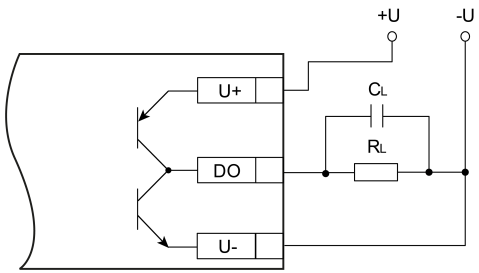


Fig. 5 Output wiring in push-pull switching mode

7. Settings

The module is configured via the Modbus TCP protocol or in 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.

8. Indication

Table 5 LEDs

LED	Color	LED State	Description
⏻	green	Off	Power off
		On	Power on
Eth 1	green	Off	Not connected
		Flashing	Data transfer over Ethernet 1 interface
Eth 2	green	Off	Not connected
		Flashing	Data transfer over Ethernet 2 interface
⚠	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)
Output LEDs (24)	green	Off	Output off / Fault status
		On	Output on
	red	On	No output power supply

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