Digital input module
Short guide

1. Overview

MV210-221 is an extension module with 9 AC digital inputs and 6 active digital inputs.

The module operates as a slave in Ethernet network with Modbus TCP protocol.

The device is intended for use in industrial automation for creation of decentralized control systems.

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. Specifications

Table 2 General specifications

Parameter	Value
Electrical	
Power supply	24 (10 ... 48) V DC
Power consumption	6 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 inputs	
Inputs number	6
Input signal	Switch contact (potential free) NPN transistor
Functions	Pulse counter Debounce filter (optional)
Pulse length, min.	1 ms (f ≤ 400 Hz)
Input lines (loop) resistance, min.	100 Ω
AC digital inputs	
Inputs number	9
AC voltage signal — Frequency	47…63 Hz
AC voltage signal — HIGH level	20…264 V
AC voltage signal — LOW level	0…10 V
Functions	Voltage detection Phase reversal fault or power loss detection
Operation time counter Power-on counter Last power-on and power-off time	
HIGH level (current), max.	2 mA
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. 260 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, 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 3 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. Connection diagrams

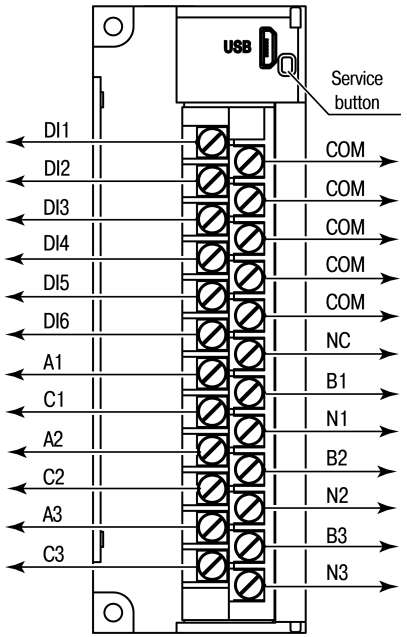


Fig. 1 Terminal block layout

Table 4 Terminal assignments

Marking	Description
DI1…DI6	Input terminals
COM	Common input power supply point
A1…A3, B1…B3, C1…C3	AC inputs terminals
N1…N3	Neutral point of AC inputs
NC	Not connected

The service button performs the following functions:

- Restore default settings
- IP address assignment

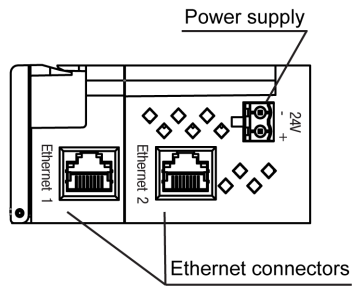


Fig. 2 Device's connectors

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akYtec GmbH · Vahrenwalder Str. 269 A · 30179 Hannover · Germany
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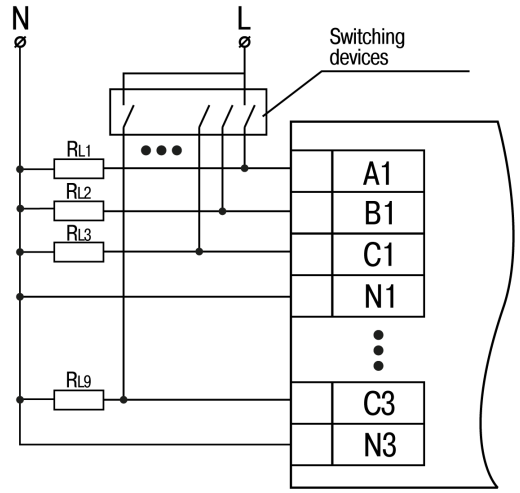


Fig. 3 Single-phase circuits

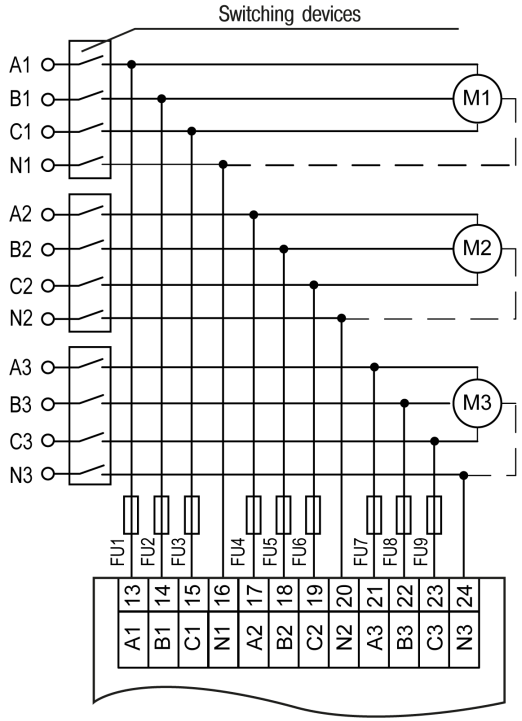


Fig. 4 Three-phase circuits

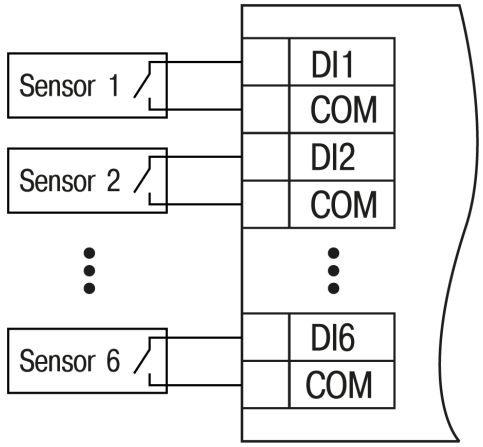


Fig. 5 Switch contact wiring

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 for MV210-221). If the module is connected to the USB port, the main module power supply is not required.

7. 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 (Sect. 4.3, App. C)
		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)
Input LEDs (15)	green	Off	LOW on the input
		On	HIGH on the input
	red	On	Phase loss or incorrect phase rotation in a three-phase network

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