Digital input module
Short guide

1. Overview

Digital input module MV110-24.32DN is an expansion module with 32 digital inputs.

The module has the following functions:

- Connecting peripheral devices with digital outputs
- Interpretation of digital signals
- Pulse counter
- RS485 network state diagnostics
- Generating corresponding fault and alarm signals
- Slave in ModBus network

CAUTION
This device must not be used for medical devices which receive, control or otherwise affect human life or physical health.

2. Environmental conditions

Table 1 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

3. Specifications

Table 2 Specifications

Characteristic	Value
Power supply	
Power supply	24 (20…28) V DC
Power consumption, max.	25 W
Interfaces	
Data transfer interface	RS-485
Connected devices, max.	32
Baud rate	115.2 kbit/s
Protocols	akYtec, ModBus-RTU/ASCII
Inputs	
Number of inputs	32
Galvanic isolation of discrete inputs	in groups of 4
Electrical strength of galvanic isolation	1500 V
Pulse frequency, max.	1 kHz
Pulse length, min.	0,5 ms
Integrated voltage source	24 ± 3 V
Current, max.	8.5 mA (with 27 V)
Logical “1”, min.	4.5 mA
Logical “0”, max.	1.5 mA
Lead resistance, max.	—
Signal types	switch contact, NPN/PNP
General specifications	
Dimensions	(63 × 110 × 75) ± 1 mm
IP code: front panel terminal block	 IP20 IP00
Average service lifetime	10 years
Weight, max.	800 g

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

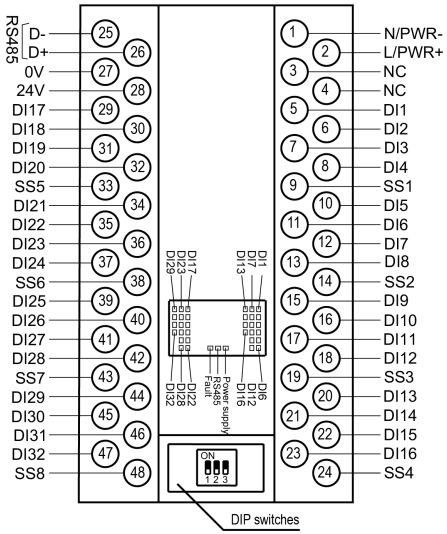


Fig. 1 Terminal block layout

Table 3 Terminal assignment

No.	Description	No.	Description
1	Power supply (0 V)	25	RS485 (D-)
2	Power supply (24 V)	26	RS485 (D+)
3	Not connected	27	Built-in power supply (0 V)
4	Not connected	28	Built-in power supply (24 V)
5	Input 1	29	Input 17
6	Input 2	30	Input 18
7	Input 3	31	Input 19
8	Input 4	32	Input 20
9	Input power supply 1–4	33	Input power supply 17–20
10	Input 5	34	Input 21
11	Input 6	35	Input 22
12	Input 7	36	Input 23
13	Input 8	37	Input 24
14	Input power supply 5–8	38	Input power supply 21–24
15	Input 9	39	Input 25
16	Input 10	40	Input 26
17	Input 11	41	Input 27
18	Input 12	42	Input 28
19	Input power supply 9–12	43	Input power supply 25–28

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No.	Description	No.	Description
20	Input 13	44	Input 29
21	Input 14	45	Input 30
22	Input 15	46	Input 31
23	Input 16	47	Input 32
24	Input power supply 13–16	48	Input power supply 29–32

Functions of DIP-switches:

- **1** – Restoring factory network settings. The factory switch position is **OFF** (factory network settings are disabled);
- **2** – service function, the switch must be in the **OFF** position
- **3** – hardware write protection of the device's non-volatile memory. Factory switch position is **OFF** (hardware protection disabled)

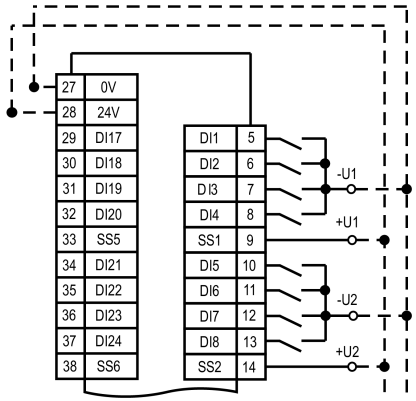


Fig. 2 Contact sensor wiring

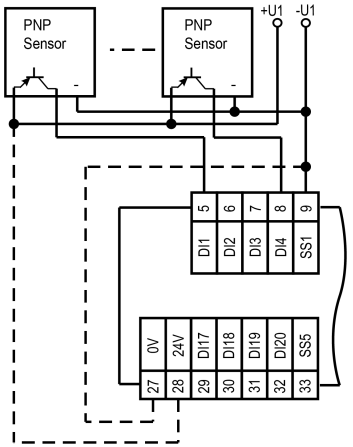


Fig. 3 PNP sensor wiring

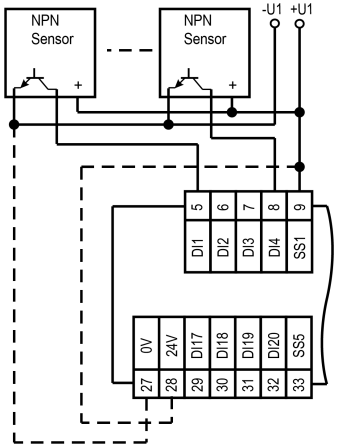


Fig. 4 NPN sensor wiring

The built-in 24 ± 3 V power supply (terminals 0V and 24V) can be connected to the inputs, as shown in the diagram with a dotted line.

7. Indication

On the front panel there are indication LEDs.

Table 4 Indication

LED	LED state	Description
INPUT 1…32	ON	HIGH on input
RS-485	Flashing	Data exchange at serial port
POWER	ON	Power on
FAULT	ON	Data exchange at serial port is interrupted

8. Modbus registers

Writing to the registers is performed with function 16 (0x10), reading — with functions 03 or 04 (the device supports both commands).

Table 5 Modbus registers

Parameter	Value (Unit)	Type	Register	
			(Hex)	(Dec)
Bit mask of input status	0…65535	Uint16	0063, 0064	0099, 0100
Counter DI1–D32	0…65535	Uint16	0065–0084	0101–0132
Baud rate	0 – 2,4 (kbit/s); 1 – 4,8 (kbit/s); 2 – 9,6 (kbit/s); 3 – 14,4 (kbit/s); 4 – 19,2 (kbit/s); 5 – 28,8 (kbit/s); 6 – 38,4 (kbit/s); 7 – 57,6 (kbit/s);	Uint16	0209	0521
	8 – 115,2 (kbit/s)			
Data bits	0 – 7 1 – 8	Uint16	020A	0522
Stop bits	0 – 1 stop bit 1 – 2 stop bits	Uint16	020B	0523
Parity	0 – none 1 – even 2 – odd	Uint16	020C	0524
Response time-out	0…45 (ms)	Uint16	020D	0525
Device address	1…255	Uint16	020F	0527
Network address length	0 – 7 1 – 8	Uint16	0211	0529
Time-out	0…600 s	Uint16	0030	0048
Device name	—	String	F000	61440
Device version	—	String	F010	61456

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