Digital input module
Short guide

1. Overview

Digital input module MV110-24.16DN is an expansion module with 16 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. Specification

Table 1 Specification

Characteristic	Value
Power supply	
Power supply	24 (20 … 28) V DC
Power consumption, max.	6 W
Inputs	
Number of inputs	16
Galvanic isolation	in groups, 1500 V
Pulse frequency, max.	1 kHz
Pulse width, min.	100 µs
Pause between pulses, min.	450 µs
Current, max.	85 mA (at 27 V power supply)
HIGH level	4,5 mA
LOW level	1,5 mA
Line resistance, max.	none
Signal types	switch contacts (external power supply required), NPN, PNP
Interfaces	
Data transfer interface	RS-485
Baud rate, max.	115.2 kBd
Protocols	akYtec, ModBus RTU/ ASCII
Galvanic isolation	2300 V
Flash memory overwrites, max.*	10,000
General specification	
Dimensions	(63 × 110 × 75) ± 1 mm
IP code: Faceplate Terminal block	 IP20 IP00
Average service lifetime	10 years
Weight, max.	500 g

* Flash memory stores configuration parameters.

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

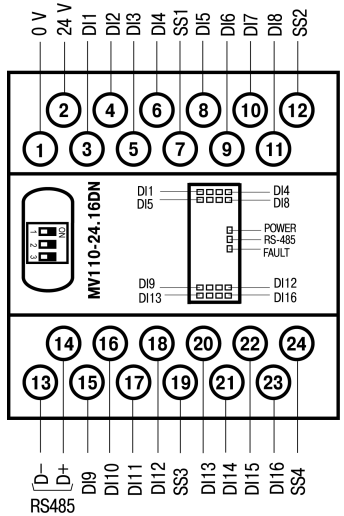


Fig. 1 Electrical connections

Table 3 Terminal assignment

No.	Description	No.	Description
1	Power supply (0 V)	13	RS-485 (D-)
2	Power supply (24 V)	14	RS-485 (D+)
3	Input 1 (DI1)	15	Input 9 (DI9)
4	Input 2 (DI2)	16	Input 10 (DI10)
5	Input 3 (DI3)	17	Input 11 (DI11)
6	Input 4 (DI4)	18	Input 12 (DI12)
7	Input voltage 1–4 (SS1)	19	Input voltage 9–12 (SS3)
8	Input 5 (DI5)	20	Input 13 (DI13)
9	Input 6 (DI6)	21	Input 14 (DI14)
10	Input 7 (DI7)	22	Input 15 (DI15)
11	Input 8 (DI8)	23	Input 16 (DI16)
12	Input voltage 5–8 (SS2)	24	Input voltage 13–16 (SS4)

Under the cover on the front panel of the module three DIP-switches are located:

- **1** – During normal operation, the switch should be set to OFF position
- **2** – Factory settings restoration
- **3** – Firmware–update

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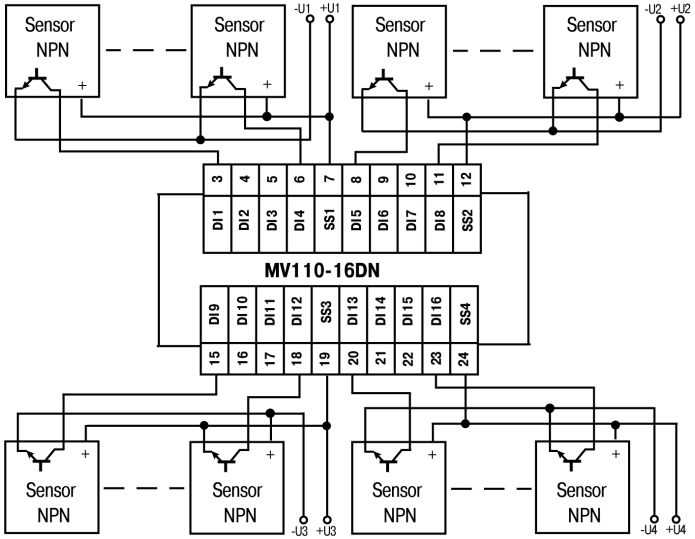


Fig. 2 Input wiring — NPN

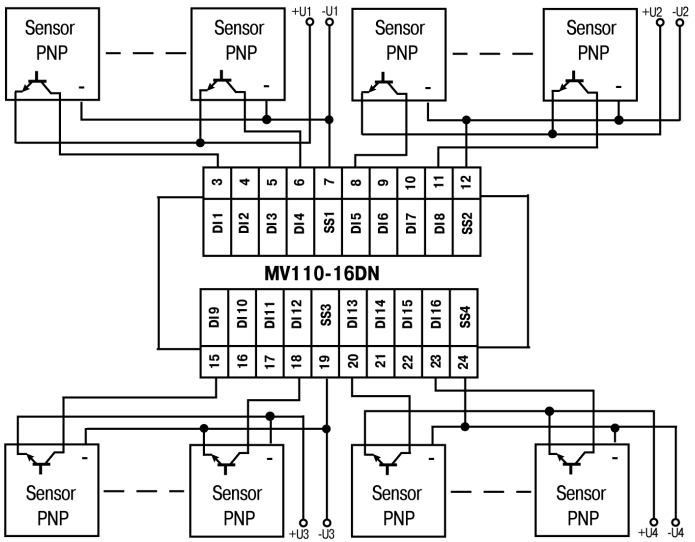


Fig. 3 Input wiring — PNP

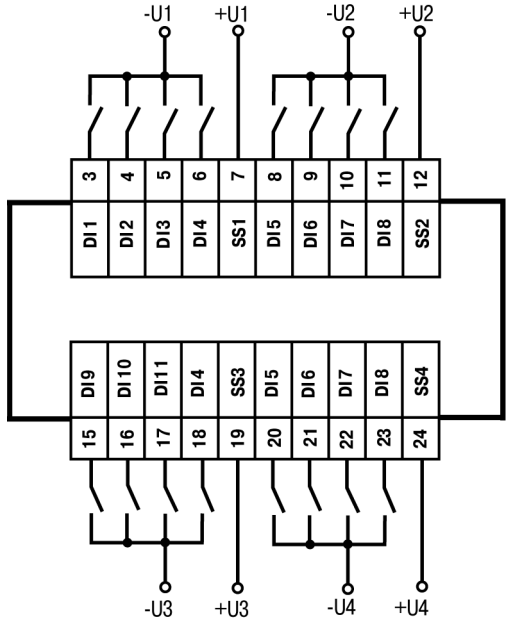


Fig. 4 Input wiring — switch contacts

7. Indication

On the front panel there are indication LEDs.

Table 4 Indication

LED	LED state	Description
INPUT 1...16	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

Table 5 Modbus registers

Parameter	Value (Unit)	Type	Register	
			(Hex)	(Dec)
Bit mask of input status	0…65535	Uint16	0033	0051
Counter DI1–DI6	0…65535	Uint16	0040–004F	0064–0079
Baud rate	0 – 2,4 (kBd); 1 – 4,8 (kBd); 2 – 9,6 (kBd); 3 – 14,4 (kBd); 4 – 19,2 (kBd); 5 – 28,8 (kBd);	Uint16	0209	0521
	6 – 38,4 (kBd); 7 – 57,6 (kBd); 8 – 115,2 (kBd)			
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

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

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