

Obr. 1. Wiring diagram for voltage signals and thermocouples.

If the source of analog signal connected to the differential input is not potential-binded to GND (for example thermocouple), it is necessary to connect the AINx- terminal to AGND.

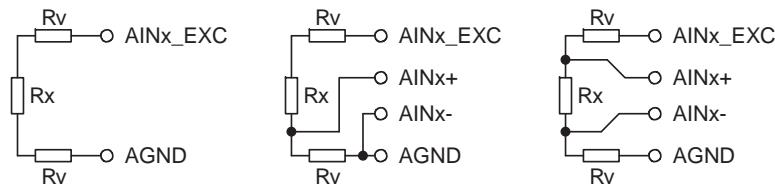


Fig. 2. Wiring diagram for voltage signals, thermocouples and RTD sensors (2/3/4-wire topology; resistors R_v illustrate resistance of wires).

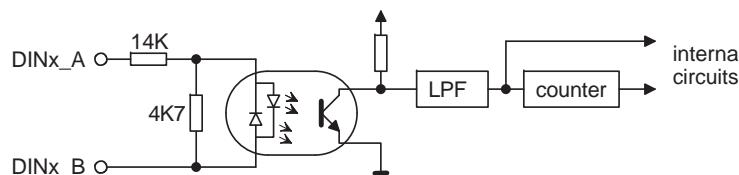


Fig. 3. Simplified diagram of the digital inputs and counters.

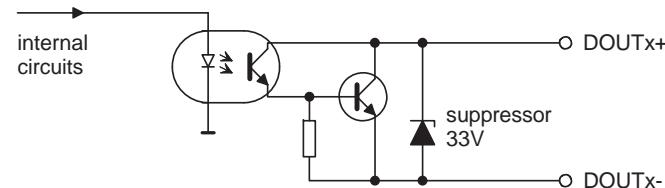


Fig. 4. Simplified diagram of the digital outputs.

MU-415

Installation Guide

(further guides and software available at <https://www.tedia.eu/mu>)

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General description

The MU-415 modules are designed especially for distributed DAQ&C systems and offer the following functions:

- four pairs of S.E./DIF analog inputs for voltage signals with ranges of ± 40 mV to ± 1.2 V, resistance measurement with ranges of 120 Ohm up to 4 kOhms, thermocouples (linearization most used types including cold junction compensation) and RTD sensors (2/3/4-wire connection, linearization most used types); analog inputs are isolated from other circuits, but not each to other
- two digital inputs for signals 24 V (DC or AC signal 50/60 Hz) equipped with counters (up to 10 Hz; DC signal only); inputs are isolated from other circuits and each to other
- two digital outputs for DC signals up to 32V (continuous current 0.3 A); outputs are isolated from other circuits and each to other
- RS-485 communication line (without isolation, i.e. the GND of the RS-485 line is shared with the power source GND)

General instructions for use

The DAQ&C modules of the MicroUnit serie may be used only according to the manufacturer's recommendations and precautions given in manuals and other general standards and terms and may be used only such a way, that its failure caused by any reason will not be dangerous to any person or property.

Installation

The modules are intended for mounting on a 35 mm DIN rail, operating temperature of $-10\text{--}60$ °C with relative humidity up to 90%, noncondensing. The location and meaning of the terminals are described in the figure and in the tables.

When connecting the power supply ($10\text{--}30$ V_{DC}; power consumption 2.2 W max.), it is necessary to pay attention to the correct polarity and voltage tolerance; failure to observe the permitted limits may result in permanent damage. Also, connecting the supply voltage to another terminal of the module can cause permanent damage.

When connecting the communication line, use shielded double line cable meeting RS-485 or RS-232 requirements. The cable shield must be connected to terminal 43.

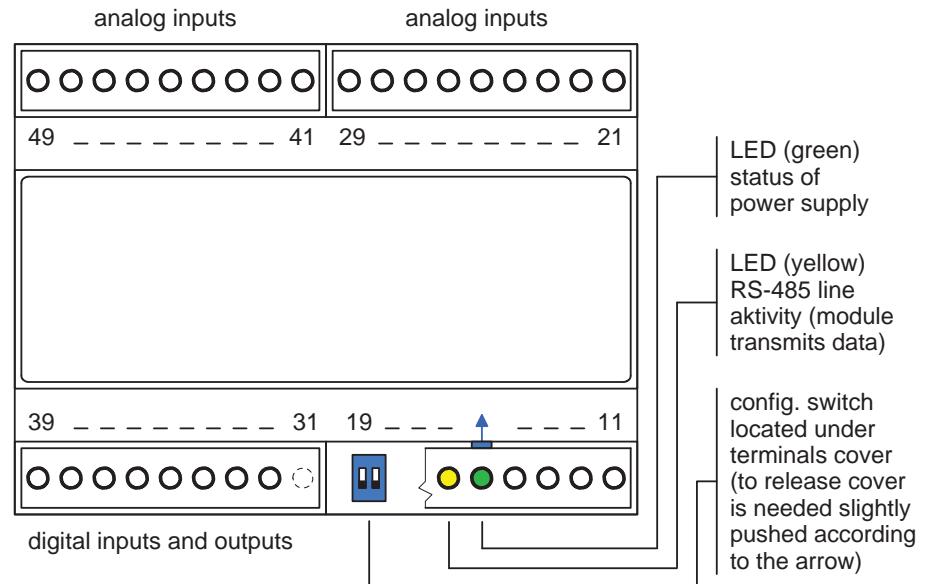
All other signals are connected with appropriate wires to the screw terminals described and explained in the following tables and figures.

The length of the wires (except for the RS-485 line) should not exceed 2 meters.

Configuration

A special software utility (allows to set communication parameters, behavior of digital ports, etc.) is intended for configuring the modules. Pay attention to the correct setting of the double switch located under the transparent cover.

segment 1 the ON position disables writing to the configuration memory
segment 2 the OFF position enables user parameters stored in the configuration memory (address, transfer rate, type of comm. protocol, etc);
 the ON position (or ON-OFF sequence) when power-up or restart sets up default communication parameters instead of user parameters (see the guide of the config software utility or programming guide)



Power supply and RS-485 terminals

| | | | |
|----|--|----|---|
| 11 | PGND (power supply, GND) | 13 | TX/RX- (RS-485 line, signal A) |
| 12 | PWR (power supply, +24 V _{DC}) voltage within the range 10~30 V _{DC} | 14 | TX/RX+ (RS-485 line, signal B) shield must be connect to the terminal 11 |

Digital I/O terminals

| | | | |
|----|--|----|--|
| 32 | DOUT0- (negative signal) | 36 | DIN0_A (input signal DIN0 & CNT0) |
| 33 | DOUT0+ (positive signal) | 37 | DIN0_B (input signal DIN0 & CNT0) |
| 34 | DOUT1- (negative signal) | 38 | DIN1_A (input signal DIN1 & CNT1) |
| 35 | DOUT1+ (positive signal) voltage up to 32 V _{DC} , current up to 0.3 A | 39 | DIN1_B (input signal DIN1 & CNT1) up to ± 35 V _{DC} or V _{AC} (± 60 V max. 1 sec.) |

Analog input terminals

| | | | |
|----|---------------------------------------|----|--|
| 21 | AGND (common ground for all AINx) | 41 | AGND (common ground for all AINx) |
| 22 | AIN0+ (differential input) | 42 | AIN2+ (differential input) |
| 23 | AIN0- (differential input) | 43 | AIN2- (differential input) |
| 24 | AIN0_EXC (input & excitation current) | 44 | AIN2_EXC (input & excitation current) |
| 25 | AGND (common ground for all AINx) | 45 | AGND (common ground for all AINx) |
| 26 | AIN1+ (differential input) | 46 | AIN3+ (differential input) |
| 27 | AIN1- (differential input) | 47 | AIN3- (differential input) |
| 28 | AIN1_EXC (input & excitation current) | 48 | AIN3_EXC (input & excitation current) |
| 29 | AGND (common ground for all AINx) | 49 | AGND (common ground for all AINx) overvoltage protection up to ± 15 V _{DC} (± 20 V max. 1 sec.) |