



domat
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RMIO

Compact I/O module



Summary

The RMIO is a universal, compact, microprocessor controlled, communicative module with its I/O mix optimized for control of small HVAC units, fancoils, and floor heating. It communicates over a RS485 bus with Modbus RTU (slave) and thus can be easily integrated in a range of control systems.

Application

- Compact I/O module for small heat exchange stations, fancoils and IRC applications, add-on module for larger systems, data acquisition.

Function

The RMIO contains inputs and outputs (4× analogue input, 2× analogue output, 4× digital input, 7× digital output). The inputs and outputs are controlled over RS485 with Modbus RTU. Find the Modbus register table in a separate document. The universal compact module RMIO is replacement of the older MMIO module.

The communication circuits are protected against overvoltage and galvanically isolated from other parts of the module. If the module is installed as the first or the last on the bus, set the BUS END DIP switches to ON to terminate the bus. The module is installed on a standard DIN rail. Two LEDs located inside of the housing enable fast diagnostics – power and communication.

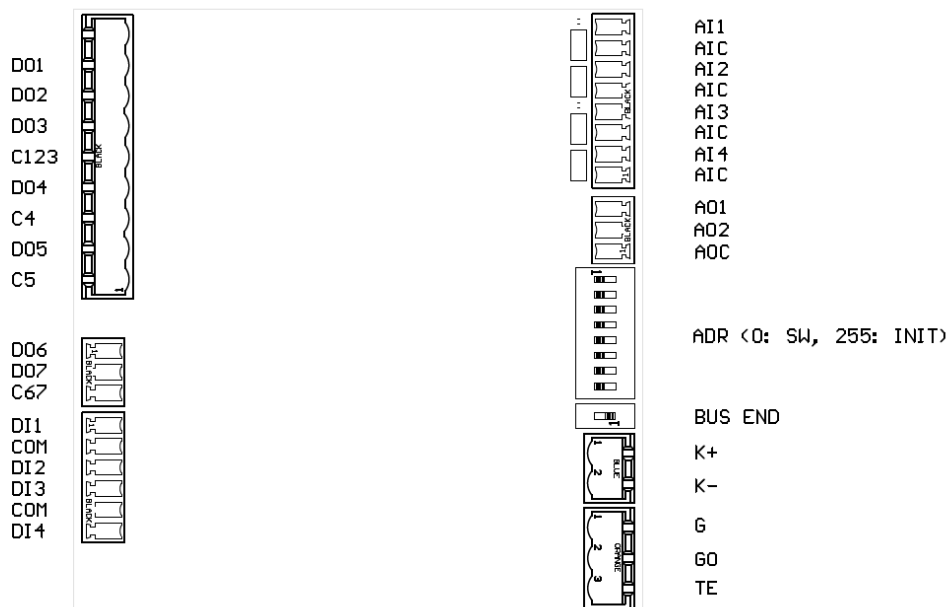
The RMIO module is fixed on standard DIN rail (by snapping).

All module settings are backed up in an EEPROM chip.

See *domat - Technical application notes* for connection examples.

Technical data	Power	24 V AC/DC ±20 %
	Consumption	7 W
	Communication	Modbus RTU RS485, 1200...115200 bit/s
	Galvanic isolation	1 kV
	Max. bus length	1200 m
	Max. amount of modules on the bus	256
	Analogue inputs	2× analogue inputs (AI1, AI2): 0...10 V DC, 0...20 mA DC, Pt1000, 0...1600 Ω, 0...5000 Ω; resolution 16 bit, measurement error 0.25 % For current measurement, external resistor 125 Ω must be connected! 2× analogue inputs (AI3, AI4): Pt1000, 0...1600 Ω, 0...5000 Ω; resolution 16 bit, measurement error 0.25 %
	Analogue outputs	2× analogue outputs 0...10 VDC (max. 10 mA, short-circuit proof, short-circuit current 50 mA, 8 bit A/D converter)
	Digital inputs	4× digital inputs 24 VDC/VAC, Input current 4 mA, galvanic isolation 1.5 kV Max. switching frequency 10 Hz
	Digital outputs	(DO1...DO5) 5× digital output, relay SPST 5 A (AC1, general use, non-inductive load according to EN 60947-4-1 ed. 3), 250 VAC/30 VDC (DO6...DO7) 2× solid state relay with zero switching for AC or DC load, 24 V DC / AC, max. Switching current 0.4 A
	Software for configuration and control	ModComTool 4.2.4.6 or higher for parameters setting Merbon IDE, SoftPLC IDE – predefined Modbus devices any Modbus RTU master PLC
	Housing	polycarbonate box (certification UL94V0) elbox 6U
	Terminals	power supply, bus and DO1 - DO5 screw terminals M3, for AI, AO, DI and DO6,7 screw terminals M2
	Dimensions	105 (l) x 98.5 (w) x 64 (h) mm
	Protection degree	IP20 (EN 60529)
	Recommended wire	0.14...1.5 mm ²
	Ambient temperature	external conditions: -5...45 °C; 5...95 % relative humidity; non-condensing gases and chemically non-aggressive conditions (according to EN 60721-3-3 climatic class 3K5) storage: -5...45 °C; 5...95 % relative humidity; non-condensing gases and chemically non-aggressive conditions (according to EN 60721-3-1 climatic class 1K3)
	Standards conformity	EMC EN 61000-6-2 ed.3:2005, EN 61000-6-4 ed.2:2006 + A1:2010 (industrial environment) Electrical safety EN 60950-1 ed.2:2006 + A11:2009 + A12:2011 + A1:2010 + A2:2014 + cor.1:2012 + Z1:2016 Hazardous substances reduction EN 50581:2012

Terminals



Terminals and connectors

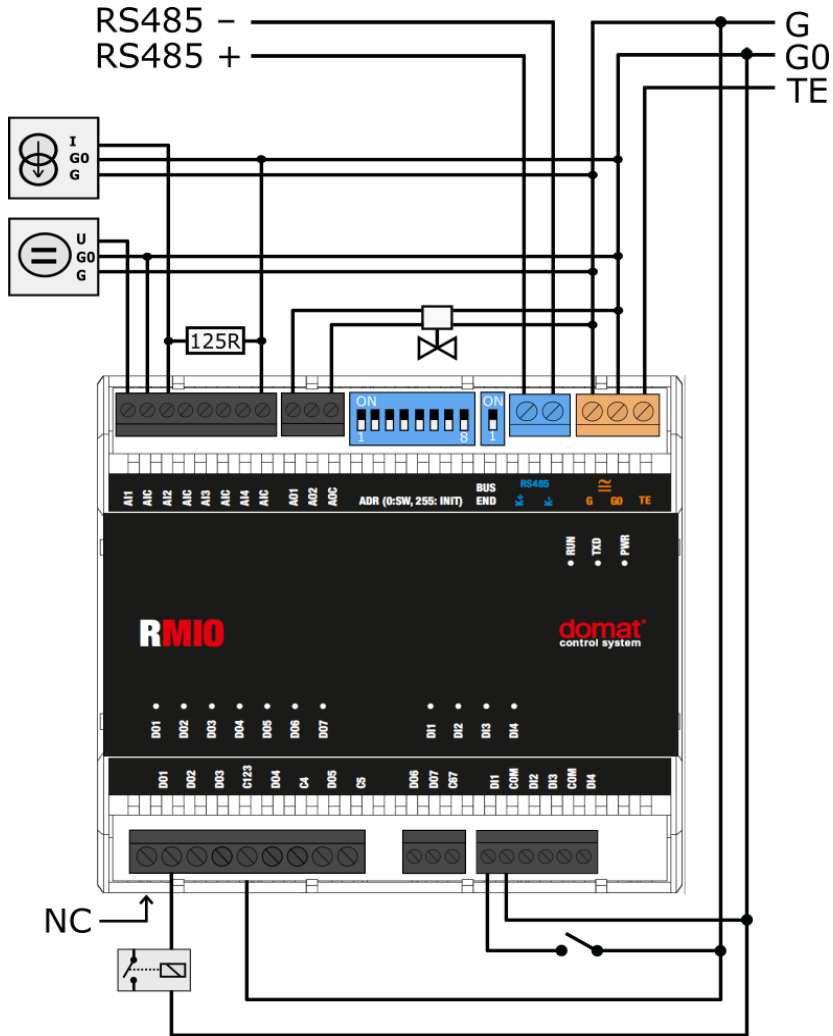
RS485 K+	port COM1 - serial link RS485, terminals K+
RS485 K-	port COM1 - serial link RS485, terminals K-
G	G power supply
GO	GO power supply
TE	optional connection for shielding, technical ground
AI1...AI4	analogue input 1...4
AIC	common terminal for inputs AI1...AI4
DI1...DI4	digital input 1...4
COM	common terminals for inputs DI1...DI4
DO1...DO7	digital output 1...7
C123	common terminal for DO1...DO3
C4, C5	terminals for DO4 and DO5
C67	common terminal for DO6 and DO7
AO1, AO2	analogue output 1 and 2
AOC	common terminal for AO1 and AO2
LED indication	
RUN	orange LED – system cycle (OK: LED flashes periodically 1 s ON, 1 s OFF; ERROR: LED flashes in other pattern, LED is still ON or OFF)
TxD	red LED – RS485 transmitting data at COM1 (flashing: transmitting data; OFF: no data traffic)
PWR	green LED – power supply (ON: power OK; OFF: no power applied, weak or damaged power supply, ...)
DIP switches	
ADR	AUTO – if all switches are OFF, the address is used according to Modbus register 4 LSB USER – address is set by DIP switches configuration INIT - if are all switches ON at power-up, configuration parameters are set to defaults

DIP 8 = bit 0; switches increase their bit weight from right to left, see below

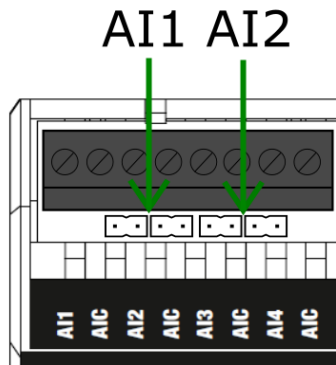
BUS END

Switch for bus RS485 termination (located at the RS485 connector); ON = bus end; the first and last devices on bus should have bus end ON

Connection



Analog inputs AI1 and AI2 have adjustable measuring ranges by jumpers facing the inner side of analog input terminals. AI3 and AI4 inputs have a fixed range (R, temp):



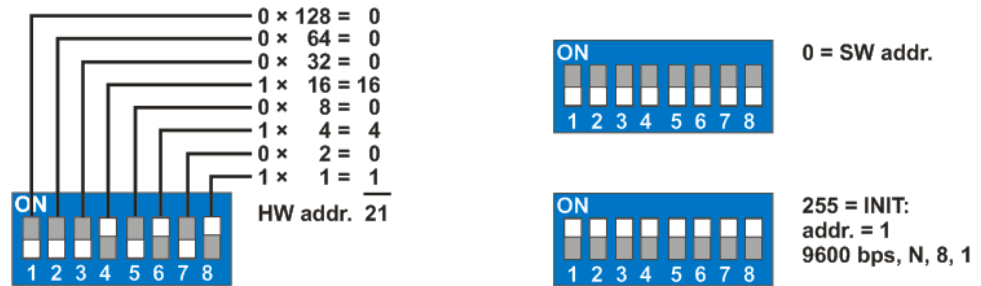
Setting of analogue inputs AI1 and AI2 is as follows:

Range	AI1		AI2	
R, temp				
0...10 V				
0...20 mA				

Addressing

The Modbus address can be set as follows:

- **hardwarewise:** using DIP switches. The switches increase their bit weight from right to left, see image with example where address of 21 is set by activation of switches 4, 6, and 8 with bit weight of 16, 4, and 1 respectively. Valid settable range is 1 to 254. Address 0 (all switches OFF) means that the address is set as entered in the Modbus table. Address 255 (all switches ON) brings the module to INIT mode, where Modbus address is 1 and communication parameters are set to N, 8, 1, see image below. All changes apply after the module is switched off and on again.

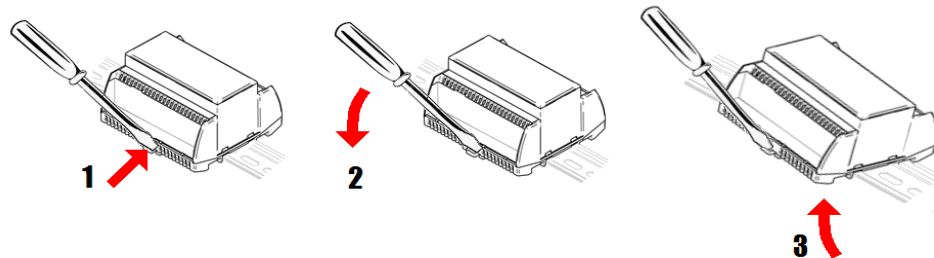


- **softwarewise** using the ModComTool software, available for free at www.domat.cz. The default address (factory setting) is 1, default communication parameters are 9600, 8, N, 1. Parity and stopbits can be set in Modbus register 1005 LSB. **The software address is only active if the hardware addressing switch is set to 0.** All changes apply after the module is switched off and on again.

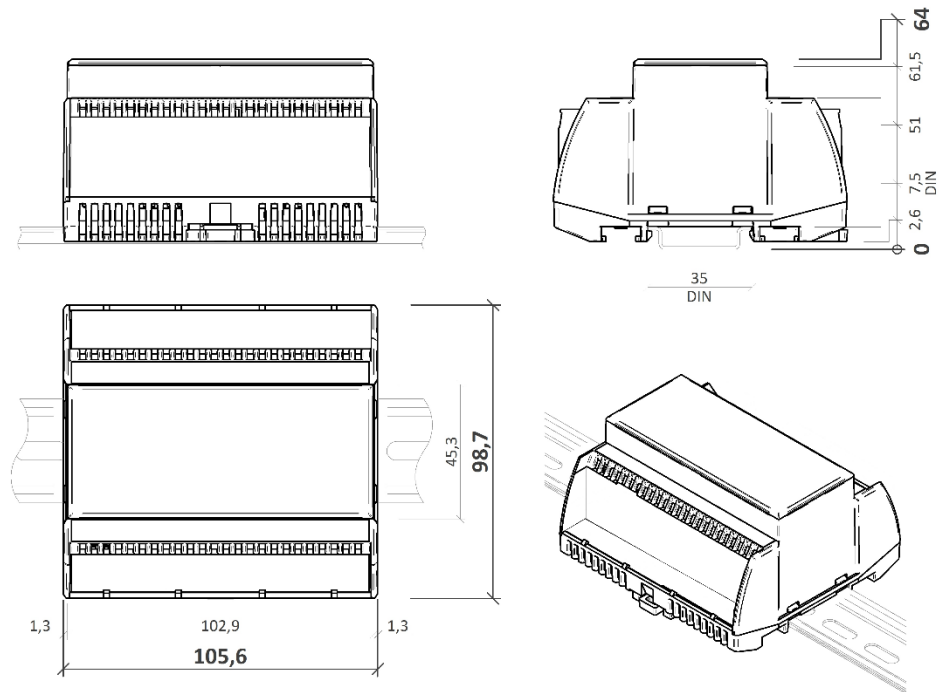
Installation

The RMIO module is fixed on standard DIN rail (by snapping).

When removing the module from the DIN rail proceed as follows: Place a screwdriver in the plastic slot which is in the middle of bottom part of the module (1). Then push the screwdriver upwards (2). After that, the module can be removed by tilting it upwards (3).



Dimensions



Dimensions are in *mm*.

Safety note

The device is designed for monitoring and control of heating, ventilation, and air conditioning systems. It must not be used for protection of persons against health risks or death, as a safety element, or in applications where its failure could lead to physical or property damage or environmental damage. All risks related to device operation must be considered together with design, installation, and operation of the entire control system which the device is part of.

**Changes in
versions**

04/2018 – First datasheet version.

05/2018 – AI ranges setting added in section *Connection*.

10/2018 – Connection scheme and terminals description corrected.

10/2020 – Added max. switching frequency, new logo.

07/2021 – Stylistic adjustments, logo change, added digital outputs description.