RCIO Multi I/O compact module

Summary

The RCIO is a microprocessor-controlled, compact, communicative module with the I/O mix optimized for HVAC and home control applications. The module uses a RS485 bus for communication, and can be easily integrated in a variety of supervision and control systems.

Application

- **Compact I/O module data acquisition and HVAC control systems**

Function

The RCIO module is a multiple I/O module (8 AI, 6 AO, 8 DI, 8 DO). The module communicates by means of a RS485 data bus. The Modbus RTU communication protocol ensures smooth and easy integration in a number of control and data acquisition systems.

The communication circuits are protected against overvoltage. If the module is terminating the communication bus, i.e. it is the last in line, a terminating 120 Ω resistor may be switched on by short-circuiting of the BUS END jumpers (right pack, No. 3 and 4). Green LEDs indicate states of the I/Os, red LED communication (TX), yellow LED system module cycle (RUN), and green LED power on.

The module can be mounted on a standard DIN rail.

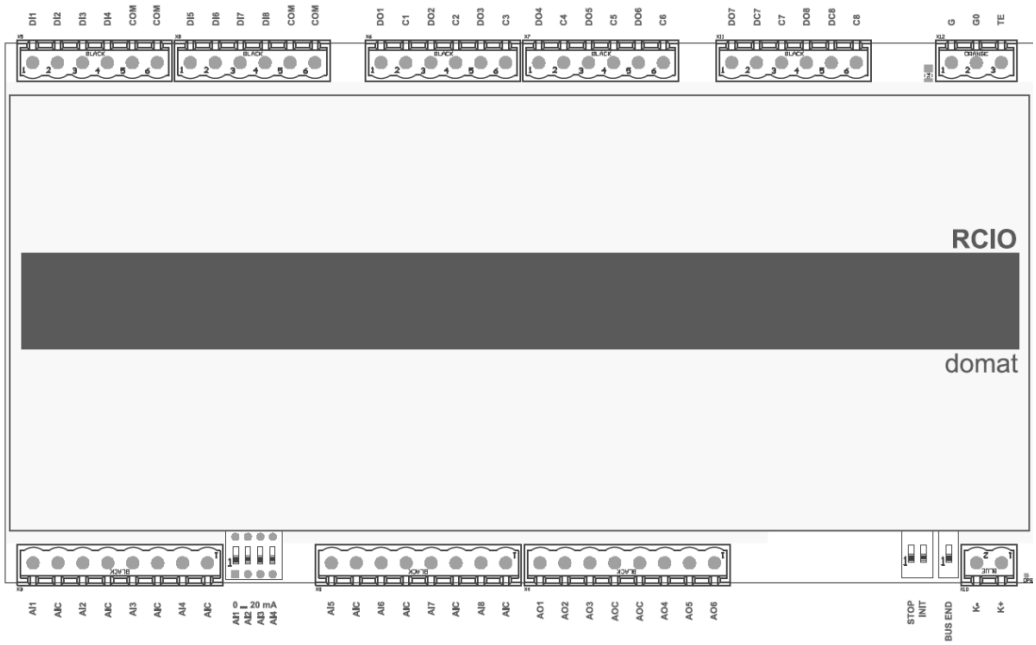
See domat - *Technical application notes* for connection and function examples.

RCIO module is backward compatible with MCIO2 module.

Technical data

Power	24 V AC/DC ±20 %
Consumption	max. 8 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	8 × analogue input 0…10 VDC, Pt1000, 0…1600 Ohms, 0…5000 Ohms; resolution 16 bitu, measurment error 0.25 % 0…20 mA DC (only AI1…AI4) (current range changeble by jumper/sw)
Analogue outputs	6 × analogue output 0…10 VDC (max. 10 mA, short-circuit proof, current 20 mA)
Digital inputs	8 × digital input 24 VDC/VAC, input current 4 mA, galvanic isolation 1.5 kV
Digital outputs	6 × digital output, NO, relay SPST 3 A (AC1, general use, non-inductive load according to EN 60947-4-1 ed. 3), 250 VAC/30 VDC 2 × digital output change-over, rele SPDT 8 A (AC1, general use, non-inductive load according to EN 60947-4-1 ed. 3), 250 VAC/30 VDC
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	steel
Terminals	screw terminals M3, detachable
Dimensions	217 (l) × 115 (w) × 40 (h) mm
Protection degree	IP20 (EN 60529)
Recommended wire	0.35…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 + 2005-09, EN 61000-6-4 ed.2:2007 + A1:2011 (industrial environment) electrical safety EN 60950-1 ed.2:2006 + A11:2009 + A12:2011 + A1:2010 + A2:2013 + Opr.1:2011-10 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
G0	G0 power supply
TE	optional connection for shielding, technical ground
AI1…AI8	analogue input 1…8
AIC	**analogue input ground** (common) Notice: All analogue inputs AI1 to AI8 have common ground AIC. The inputs are optically separated from the other parts of the I/O module. For three-wire connection (active sensors, e.g. pressure, humidity), the analogue input ground AIC must be connected with the peripheral 24 V AC power ground (or 0 V terminal for DC peripheral). As all I/O types are mutually separated in the module, it is possible to use one common transformer to power both the active peripherals and the RCIO module.
AO1…AO6	digital input 1…6
AOC	**analogue output ground** (common) Notice: The ground is optically separated from the other parts of the I/O module. For three-wire connection (active periphery, e.g. valves actuators, frequency changer), the analogue output ground AOC must be connected with the peripheral 24 V AC power ground (or 0 V terminal for DC peripheral). As all I/O types are mutually separated in the module, it is possible to use one common transformer to power both the active peripherals and the RCIO module.
DO1…DO6	digital output 1…6

C1…C6	common terminal for DO1…DO6
NO7, 8	digital output 7, 8
NC7, 8	digital output 7, 8
C7, 8	common terminal for DO7, 8
DI1…DI8	digital input 1…8
AOC	common terminal for digital inputs DI1…DI8

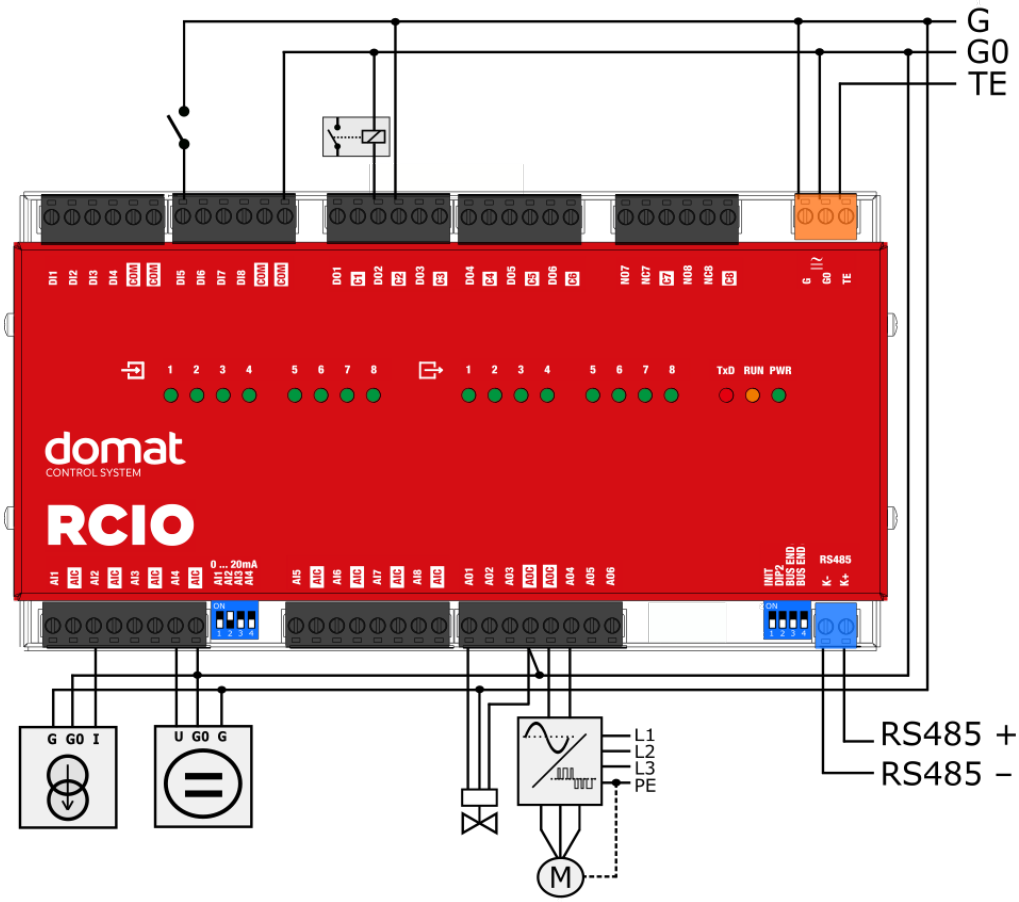
LED indication

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

AI1…4	To use AI1...AI4 as 0(4)...20 mA set the corresponding switch 1...4 to ON. This connects an internal resistor which changes the voltage input to current input. No external resistors are required at these inputs.
INIT	INIT - if are all switches ON at power-up, configuration parameters are set to defaults
BUS END	2 Switches 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



Addressing

The Modbus address can be set:

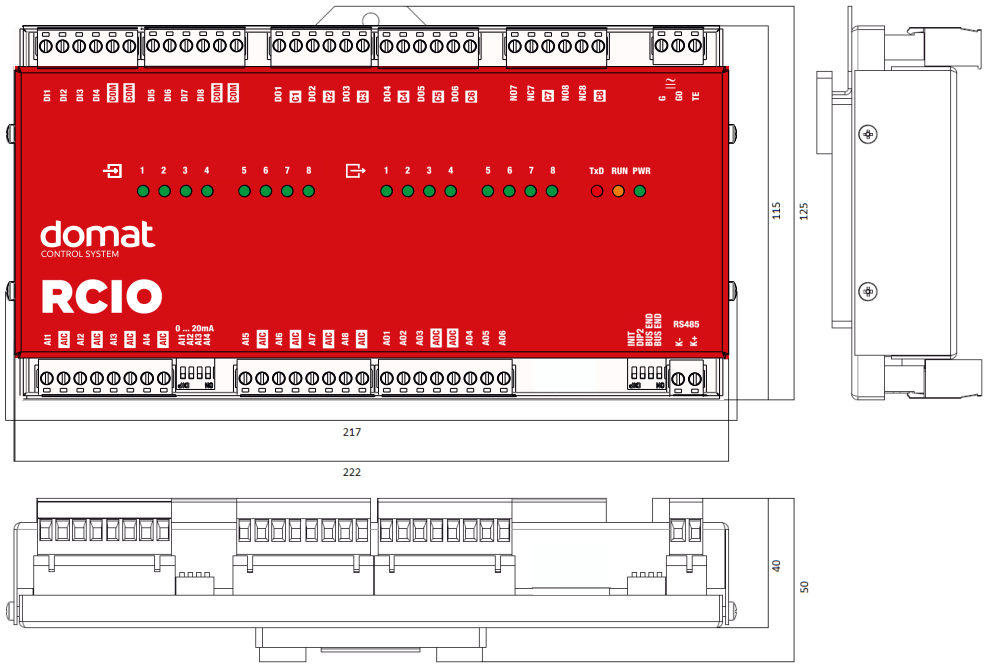
- **softwarewise** using the ModComTool software, available for free at **www.domat.cz**. The default address (factory setting) is 1, default communication parameters are 9600, 8, N, 1. Parity and stopbits can be set in Modbus register 1005 LSB.

All changes apply after the module is switched off and on again.

Installation

The module can be mounted on a standard DIN rail. To remove the modul, pull the plate at the upper part of the module which releases both DIN rail locks at the same time. Move the plate upwards with a screwdriver and remove the module.

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	04/2019 – First datasheet version. 08/2021 – Stylistic adjustments, change of logo. 09/2022 – Addition of information on AOC, AIC. 08/2023 – Analogue inputs (0…20 mA) technical data clarified.