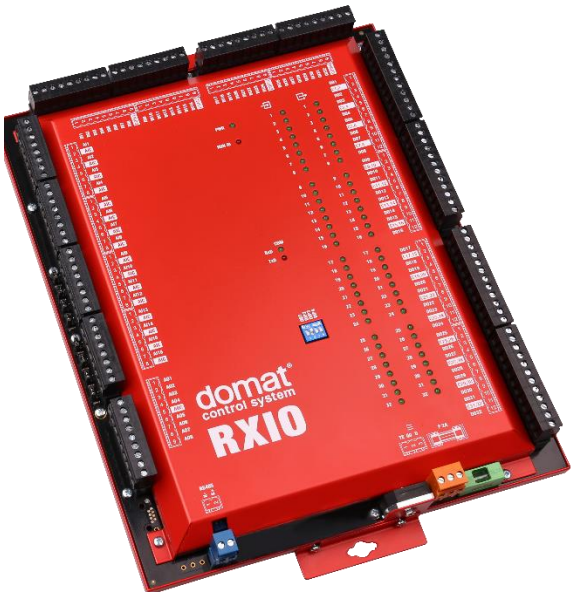
RXIO Compact I/O module



Summary **The RXIO multiple I/O compact module is a microprocessor-controlled, communicative module with the I/O mix optimized for larger HVAC 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 for data acquisition and HVAC control systems**

Function

The RXIO module is a multiple I/O module (16 AI, 8 AO, 32 DI, 32 DO). The module communicates by means of a RS485 data bus. It is fully integrated into the SoftPLC environment, however, the Modbus RTU communication protocol ensures smooth and easy integration in a number of control and data acquisition systems. The Modbus register description is available in a separate document.

The communication circuits are protected against overvoltage. If the module is terminating the communication bus, i.e. it is the last in line, terminating resistors may be switched on by short-circuiting of the BUS END DIP switches (close to the K+, K- terminals). LEDs indicate states of the binary I/Os, red LED flashes for outgoing communication (TX), system module cycle (RUN), and green LED (ON) indicates supply voltage.

The module can be mounted on the base plate of the switchboard, or on another flat and smooth surface by two screws.

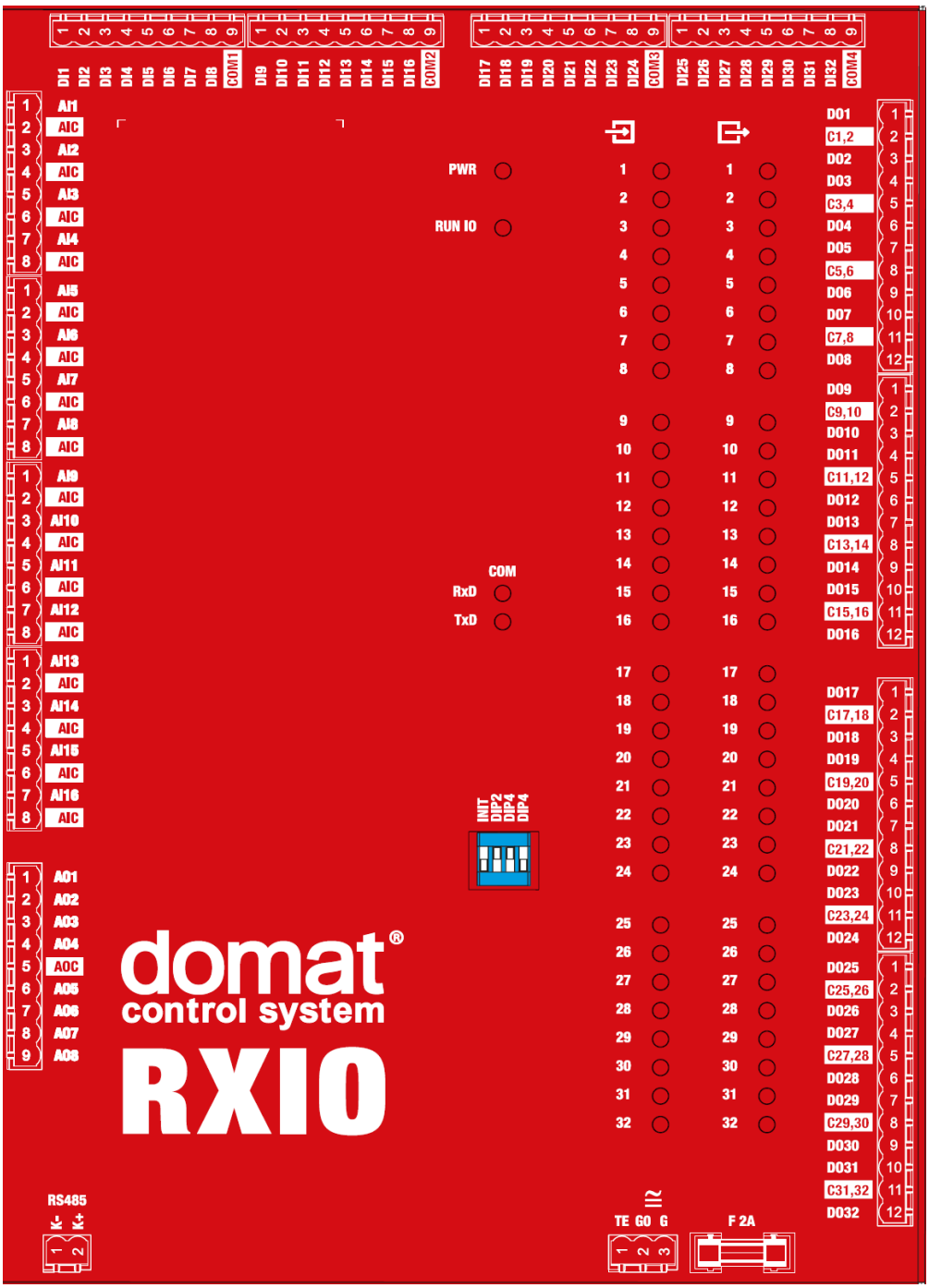
See domat - Technical application notes for connection and function examples.

Technical data

Supply voltage	18…35 V DC, 14…24 V AC
Consumption	19.5 W
Fuse	T2A/250 V
Working temperature of the module	0…70 °C
Communication	RS485, galvanic isolation 1 kV, Modbus RTU, 1200…19200 bps
RS485 - K+, K- terminals	
Max. bus length	1200 m
Max. number of modules on the bus	256 addresses, maximum number of modules depends on requested response time: for common HVAC applications with IPLCx01 or IPCT.1 use about 4 RXIO (about 300...400 data points on the bus)
Analogue inputs	8 × 0…10 V DC, 0…20 mA DC, Pt1000, 0…1600 Ω, 0…5000 Ω; 16 bit resolution, 0.25% accuracy (jumper current range) 8 × Pt1000, 0…1600 Ohm, 0…5000 Ohm; 16-bit resolution, accuracy 0.25% (other ranges, like Pt100, Ni1000, … can be transformed from input by predefined transformation in the PLC software)
Analogue outputs	8 × 0…10 V DC
Analogue outputs load	min. 10 kΩ, max. current 10 mA each output; outputs are short-circuit protected by current limitation to 20 mA
Digital inputs	32 × 24 V AC/DC – voltage must be applied (no dry contacts), input current 4 mA, galvanic isolation 1.5 kV
Input voltage for log. „0“	max. 5 V AC/DC
Input voltage for log. „1“	18...30 V DC, 18...26 V AC
Digital outputs	32 × relay SPST 5 A (AC1, general use, non-inductive load according to ČSN EN 60947-4-1 ed. 3), 250 V AC /30 V DC
Dimensions	293 (h) × 237 (w) × 40 (d) mm (module) 324 (h) × 237 (w) × 40 (d) mm (incl. fixtures)
Housing	sheet metal
Protection	IP20 (ČSN EN 60529)
Recommended wire cross section	0.14…1.5 mm2
SW	ModComTool
Ambient conditions	external conditions: EN 60721-3-3. climatic class 3K5 (-5…45 °C; 5 %...95 % relative humidity, non-condensing gases and chemically non-agressive conditions).

	storage: EN 60721-3-1 climatic class 1K3 (- 5…45 °C; 5…95 % relative humidity, non-condensing gases and chemically non-agressive conditions).
Standards of conformity	EMC EN 61000-6-2 ed.3:2005, EN 61000-6-4 ed.2:2006 + A1:2010 (industrial enviroment) electrical safety EN 60950-1 ed.2:2006 + A11:2009 + A12:2011 + A1:2010 + A2:2014 + Opr.1:2012 + Z1:2016 hazardous substances reduction EN 50581:2012

Terminals



Terminals and connectors

F 2 A	Fuse F2A. Replace only with the same type if fuse broken.
G	power
G0	power
TE	optional connection for shielding
COM1 RS485	port COM1 – serial link RS485, terminals K+, K-

Analogue inputs

AI1…8 **analogue inputs 1…8**

are designed as **passive only**. The range (0...1600 Ω (default), 0...5000 Ω, Pt1000) can be set over Merbon IDE or ModComTool.

AI9…16 **analogue inputs 9…16**

can be set so as to measure

- **resistance** (same as AI1 to AI8),
- **voltage** 0...10V (default) or
- **current** 0...20 mA.

The AI9 to AI16 0...20 mA ranges are set over a jumper **for each input independently**. The jumpers are accessible from outside of the module.

Range	**jumper**
resistance, passive temperature sensors	OFF (default)
voltage 0...10 V	OFF (default)
current 0...20 mA	ON

AIC **analogue inputs ground** (common for all AI)

Notice:

All analogue inputs AI1 to AI16 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. 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 RXIO module.

Analogue outputs

AO1…8 **analogue outputs1…8**

Notice:

The 0…10 V outputs are short-circuit protected (with current limitation to 20 mA) and optically separated from the other circuits in the module, and their ground (AOC) is not connected to the analogue inputs ground.

AOC **analogue outputs ground**

Notice:
The ground is optically separated from the other parts of the I/O module. For three-wire connection (active peripherals, e.g. valve actuators, variable speed drives), the analogue input ground AOC must be connected with the peripheral 24 V AC power ground. 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 RXIO module.

Digital inputs

DI1…32	**digital inputs 1…32** Digital inputs operate with 24 V AC/DC. Each set of eight digital inputs have their own common COM terminals. The inputs are optically separated from the other circuits in the module, and they may be linked to the same transformer or power supply which supplies the RXIO module. The statuses of the inputs are indicated by LEDs at the front panel of the module.
COM1	**digital inputs ground DI1…8** The ground is optically separated from the other parts of the I/O module.
COM2	**digital inputs ground DI9…16** The ground is optically separated from the other parts of the I/O module.
COM3	**digital inputs ground DI17…24** The ground is optically separated from the other parts of the I/O module.
COM4	**digital inputs ground DI25…32** The ground is optically separated from the other parts of the I/O module.

Digital outputs

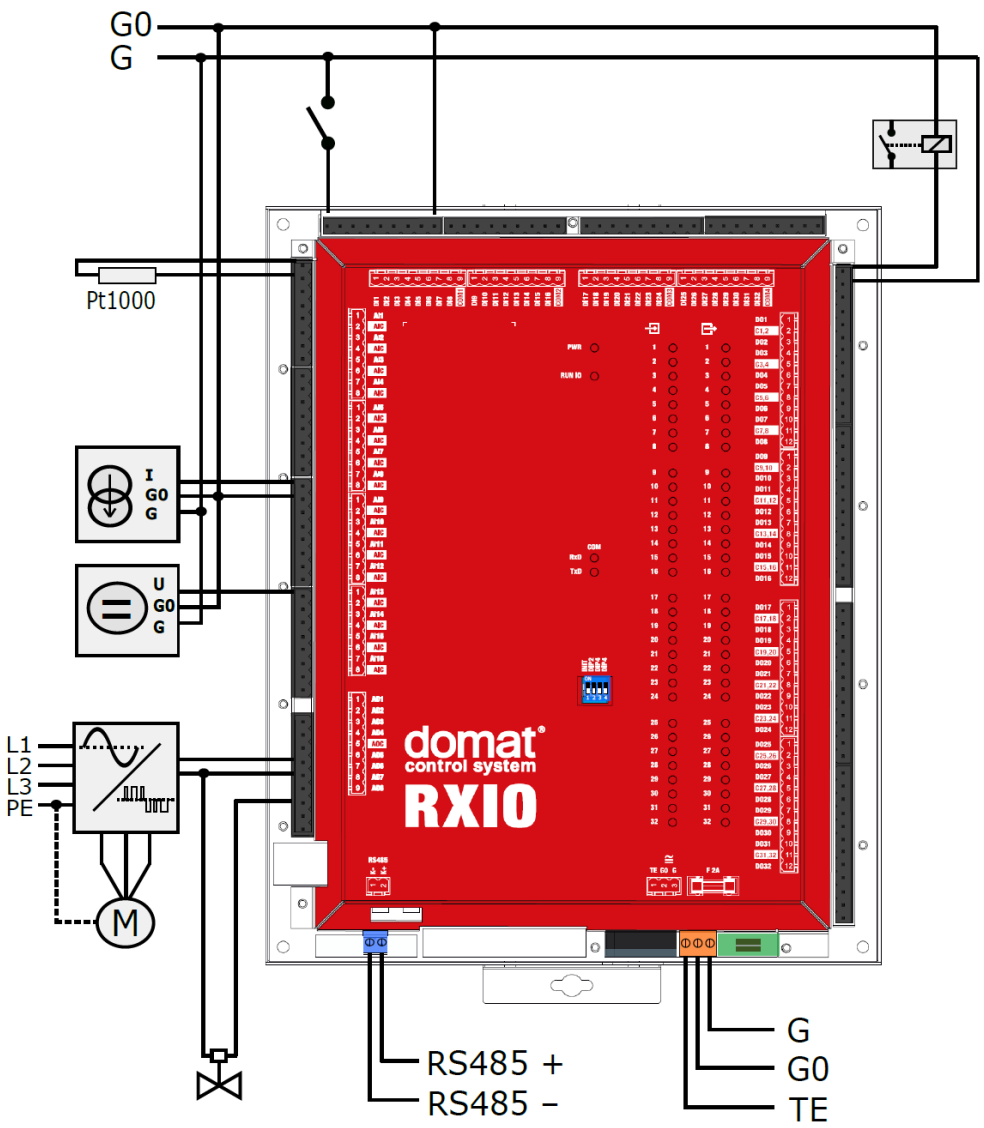
DO1…32	**digital outputs 1…32** Digital outputs are normally open relays with maximum voltage 250 V, 5 A. Each pair of outputs has one common terminal (CX, Y). The statuses of the outputs are indicated by LEDs at the front panel of the module.
CX,Y	Common terminal for two neighbouring digital outputs with number X and Y.

DIP switches	**INIT**	INIT (DIP1): if ON at power-up, configuration parameters are brought to defaults (see Configuration parameters in Merbon IDE). Default parameters are: address 1,baud rate 9600 bps, data bits 8, parity None, number of stop bits 1. Another function of the INIT switch is to bring EEPROM into default factory settings. To init the EEPROM, proceed as follows: - connect the device over RS485 to a PC with **ModComTool** (Modbus Configuration Tool)

- set INIT to ON
- apply power
- find the controller in the tool (Scan)
- set INIT to OFF
- in the **ModComTool**, open the controller window
- click the Initialisation button in the tool
- remove and apply power.

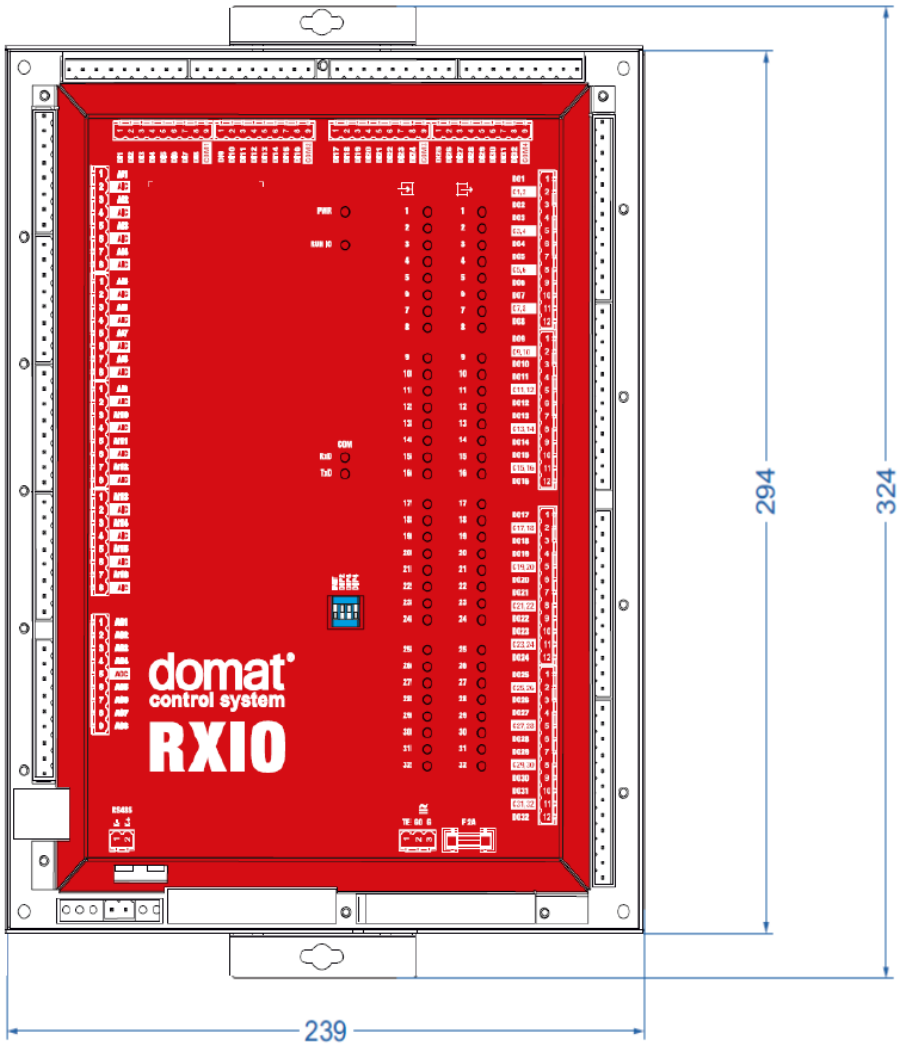
DIP2…4 not used

Connection



Addressing The Modbus address is set with the configuration software, **ModComTool**, which is free to download at http://domat-int.com/en/downloads/software. The default address is 1, default communication parameters are 9600, 8, N, 1.

Dimensions



Dimension 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	12/2017 – First datasheet version. 08/2021 – Stylistic adjustments, change of logo.