

Roger Access Control System

**MCX2D AND MCX4D INSTALLATION MANUAL**

Firmware version: 1.1.30  
 Hardware version: 1.0  
 Document version: Rev. G

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**INTRODUCTION**

The expander is designed for operation with MC16 access controller (RACS 5 system) mainly as a component of MC16-PAC-KIT. Factory new expander is configured with default settings including ID=100 address.

**DEVICE CONFIGURATION**

The expander can be configured in regard of various parameters (including address) in order to adapt it to the requirements of specific installation. Device can be configured from VISO v2 management software or RogerVDM utility software.

Note: Remote configuration of device from VISO v2 software is possible only if jumper is placed on MEM contacts (fig. 3). If the jumper is removed then such configuration is blocked. In case of factory new device, jumper is placed on MEM contacts.

**CONFIGURATION WITH VISO v2 PROGRAM**

In RACS 5 v2 system the expander can be installed at site without previous configuration. According to AN006 application note, its address and other settings can be configured from VISO v2 management software and during such configuration the access to its service contacts (fig. 3) is not required.

**CONFIGURATION WITH ROGERVDM PROGRAM**

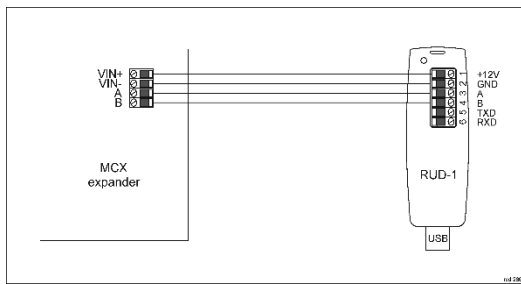


Fig. 1 Connection of the expander to RUD-1 interface (configuration)

Programming procedure with RogerVDM software:

1. Connect the device to RUD-1 interface (fig. 1) and connect the RUD-1 to computer's USB port.
2. Remove jumper from MEM contacts (fig. 3) if it is placed there.
3. Restart the device by pressing RST button and RUN LED indicator will pulsate. Then within 5 seconds place jumper on MEM contacts and RUN LED indicator will pulsate quicker.
4. Start RogerVDM program, select MCX v1.x device, v1.x firmware version, RS485 communication channel and serial port with RUD-1 interface.
5. Click *Connect*, the program will establish connection and will automatically display *Configuration* tab.
6. Enter unoccupied RS485 address in range of 100-115 and other settings according to requirements of specific installation.
7. Click *Send to Device* to update the configuration.
8. Optionally make a backup by clicking *Send to File...* and saving settings to file on disk.
9. Disconnect from RUD-1 interface and leave jumper on MEM contacts to enable further configuration of device from VISO v2 software or remove jumper from MEM contacts to block such remote configuration.

**MEMORY RESET AND MANUAL ADDRESSING**

Memory reset procedure resets all settings to factory default ones and it enables to manually configure the address on RS485 bus.

Memory reset and manual addressing procedure:

1. Remove all connections from LCK1 and DC1 lines.
2. Remove jumper from MEM contacts (fig. 3) if it is placed there.
3. Connect LCK1 and DC1 lines.
4. Restart the device by pressing RST button and RUN LED indicator will pulsate. Then within 5 seconds place jumper on MEM contacts and ACL LED indicator will pulsate.
5. Disconnect LCK1 and DC1 lines and RUN LED indicator will pulsate slowly. The number of consecutive flashes will correspond to expander's address on RS485 bus.

6. Press RST button in a certain moment to define certain address (table 1) or press RST button after 16 flashes when ACL and RUN LED indicators are switched on to define default ID=100 address.
7. Disconnect from RUD-1 interface and leave jumper on MEM contacts to enable further configuration of device from VISO v2 software or remove jumper from MEM contacts to block such remote configuration.

Number of RUN LED flashes	RS485 address	Number of RUN LED flashes	RS485 address
1	101	9	109
2	102	10	110
3	103	11	111
4	104	12	112
5	105	13	113
6	106	14	114
7	107	15	115
8	108	16	100

Example:

In order to select ID=105 address within memory reset procedure, press RST button after 5 flashes of RUN LED indicator.

**BACKUP BATTERY CHARGING**

According to fig. 4 the expander charges backup battery. Table 2 includes current values which ensure 80% battery charging within 24 hours (according to EN-60839 standard). The charging current is selected by means of jumpers on expander board (fig. 3).

Charging current	Contacts	Battery capacity
~0.3A	300	7Ah
~0.6A	300+600	17Ah
~0.9A	300+600+900	24Ah

**FIRMWARE UPDATE**

The firmware of device can be changed to newer or older version. The update requires connection to computer with RUD-1 interface (fig. 2) and starting RogerVDM software. The latest firmware file is available at [www.roger.pl](http://www.roger.pl).

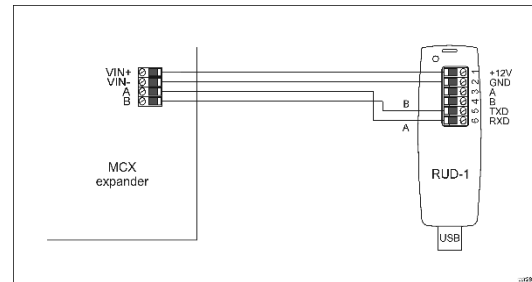


Fig. 2 Connection of the expander to RUD-1 interface (firmware update)

Firmware update procedure:

1. Connect the device to RUD-1 interface (fig. 2) and connect the RUD-1 to computer's USB port.
2. Place jumper on FDM contacts (fig. 3).
3. Restart the device by pressing RST button and TXD LED indicator will switch on.
4. Start RogerVDM program and in the top menu select *Tools* and then *Update firmware*.
5. In the opened window select device type, serial port with RUD-1 interface and path to firmware file (\*.hex).
6. Click *Update* to start firmware upload with progress bar in the bottom.
7. When the update is finished, remove FDM jumper and restart the device. Additionally it is recommended to start memory reset procedure.

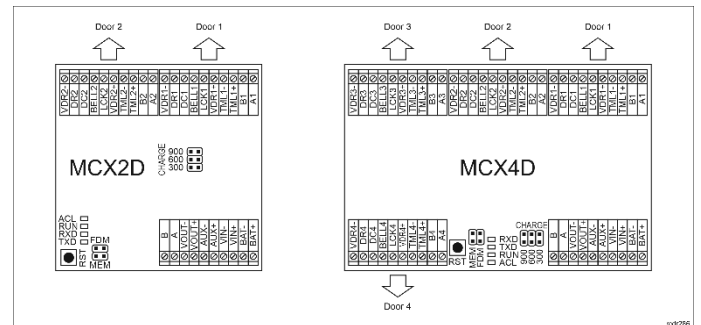


Fig. 3 View of MCX2D and MCX4D expanders

Name	Description
BAT+, BAT-	Backup battery
VIN+, VIN-	13.8VDC input power supply

AUX+, AUX-	13.8VDC/0.2A output power supply (for general purpose)
VOUT+, VOUT-	13.8VDC/0.2A output power supply (to controller)
A, B	RS485 interface (to controller)
Ax, Bx	RS485 interface (to readers)
TMLx+, TMLx-	13.8VDC/0.2A output power supply (to readers)
VDRx+, VDRx-	13.8VDC/1.0A output power supply (to door lock)
LCKx	15VDC/1A transistor output line (door lock)
BELLx	15VDC/1A transistor output line (alarm signalling device)
DCx	Input line (door contact)
DRx	Input line (exit button)

**Table 4. LED indicators**

Indicator	Colour	Integral functions
ACL	Red	In normal mode the LED indicates backup power supply from battery instead of PSU.
RUN	Red	Single pulse every 4 sec : normal mode Quick pulsing: service mode Slow pulsing (0.5s/0.5s): No communication with controller Very slow pulsing (1s/1s): Configuration memory error In case of Memory reset this LED is used for manual addressing.
TXD	Red	LED indicates data transmission to controller
RXD	Green	LED indicates data receiving from controller
VDR, TML, VOUT, AUX	Green	LED indicates voltage at particular output.
LCK	Red	LED is on when corresponding LCK output is switched on.

**Table 5. Specification**

Nominal supply voltage	13.8VDC; +/- 100mV (with battery support) or 12.0VDC (without battery support)	
Nominal current consumption	50mA (expander module) + battery charging current + outputs (VOUT, AUX, TML, VDR)	
Battery charging current	Configurable: ~0.3A/0.6A/0.9A	
Inputs	MCX2D: Four (DCx, DRx) MCX4D: Eight (DCx, DRx)	
Outputs	MCX2D: Four (LCKx, BELLx) outputs, each with 15V/1.0A DC max load MCX4D: Eight (LCKx, BELLx) outputs, each with 15V/1.0A DC max load	
Power supply outputs	MCX2D: VOUT, AUX: 0.2A TML1-2: 0.2A VDR1-2: 1.0A MCX4D: VOUT, AUX: 0.2A TML1-4: 0.2A VDR1-4: 1.0A Note: The voltage level on output is equal to expander supply voltage	
Distances	Up to 1200 m between MC16 controller and MCX expander (RS485). Up to 1200 m between MCX expander and MCT terminals (RS485) The total distance between controller and any device cannot exceed 1200m.	
Environment	Indoor general conditions, temperature: +5°C to +40°C, relative humidity: 10 to 75% (no condensation)	
Dimensions W x S x G	MCX2D:	80 x 80 x 20 mm
	MCX4D:	80 x 115 x 20 mm
Weight	MCX2D:	65g
	MCX4D:	85g
Compliance	CE, RoHS	

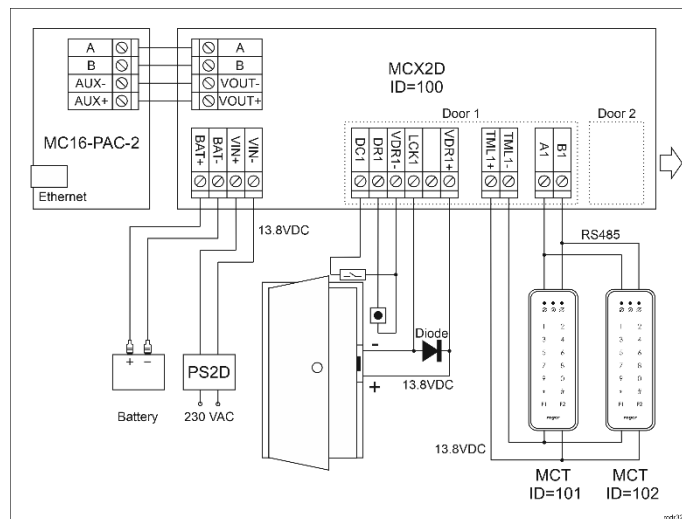


Fig. 4 Connection of readers and expanders to MC16 access controller (sample only)

In case of MCX4D the connection diagram is similar to the one shown in fig. 4 with the exception of MC16-PAC-4 controller, PS4D power supply unit and up to four doors control. All MCT readers connected to the MC16 controller via MCX2D/MCX4D expander must have unique addresses on RS485 bus in range of 101-115 (assuming that expander is operated with default ID=100 address). In case of read-in door, single reader is connected to the controller within particular door. Diagrams include doors with electric strikes. In case of electromagnetic lock, the polarity of LCK output must be changed within low level configuration of MCX2D/MCX4D expander by means of RogerVDM software. Diagrams include exit buttons. In case of read-in/out doors they can be used for emergency door opening.

**INSTALLATION**

*Note: The electronics module is sensitive to electrostatic discharge. Before performing any work on the module, ensure you are free of electrostatic charge by touching a grounded metal object with your bare hand.*

The expander should be installed in a metal enclosure with a door and a power supply. The enclosure must be earthed by means of PE wire. The manufacturer offers a range of enclosures designed for electronic modules and equipped with power supplies. The installation site should be away from heat and moisture sources and protected from unauthorized access. The connection between the power supply and the expander should be made using a cable with a minimum cross-section of 0.5 mm<sup>2</sup> and a length of up to 50 cm. The PSxS series power supply comes with cables with a cross-section of 1 mm<sup>2</sup> and a length of 30 cm, which can be used to power the expander. All electrical lines connected to the expander must run inside the building or in underground cable ducts. All electrical connections should be made with the power off. The network circuit supplying the device must be equipped with an installation switch. After completing installation and start-up, close the enclosure.

**Installation may only be performed by a qualified person with the appropriate permits and authorizations for connecting and intervening in 230VAC and low-voltage networks. It is not permitted to use the enclosure without a properly installed and technically functional electric shock protection circuit (PE).**

	<p>This symbol placed on a product or packaging indicates that the product should not be disposed of with other wastes as this may have a negative impact on the environment and health. The user is obliged to deliver equipment to the designated collection points of electric and electronic waste. For detailed information on recycling, contact your local authorities, waste disposal company or point of purchase. Separate collection and recycling of this type of waste contributes to the protection of the natural resources and is safe to health and the environment. Weight of the equipment is specified in the document.</p>
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