

*Roger Access Control System*

## Graphic touch panel MD70 v2.0

### User manual

*Firmware version: 1.x*

*Document version: Rev. B*



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# 1. DESCRIPTION AND SPECIFICATION

MD70 is a graphical touch panel with built-in camera and dual band 125kHz/13,56 MHz proximity reader. Generally, terminal is dedicated for operation in as a user authentication device and system commanding terminal in the RACS 5 access control and building automation system. In particular, MD70 is suitable for operation as a time and attendance registration point. It is possible to install on the panel third party Android applications and thus extend its functionality. Users can be authenticated on the terminal by proximity card, PIN or QR code. MD70 allows definition of Widgets which can be used to trigger any arbitrary selected action in the RACS 5 system or, to present any of its states. The built-in camera can be used to make photos of the system users who login on the terminal and for online picture transmission to the access system management software. MD70 can be connected to RACS 5 system in the wired way (Ethernet, RS485) or wireless one (Wi-Fi). The device is stylistically aligned with QUADRUS device series.

<b>Table 1. Specification</b>	
Parameter	Value
Supply voltage	Nominal 12VDC, min./max. range 10-15VDC
Current consumption	500mA average, 800mA max (current consumption depends on CPU load)
Screen	7" / 800x480px, capacitive touch panel
Camera	2 Mpx / Autofocus
Communication interfaces	Ethernet, WiFi (802.11 a/b/g/n), RS485
Built-in reader	Card reader EM125kHz and ISO/IEC 14443A / MIFARE Ultralight, Classic, DESFire EV1, EV2, EV3, Plus
Environmental class (according to EN 50131-1)	Class I, indoor general conditions, temperature: +5°C to +40°C, relative humidity: 10 to 95% (no condensation)
IP code	IP30
Dimensions (H. x W. x D.)	134 x 218 x 25mm
Weight	approx. 500g
Certificates	CE

## 2. CONFIGURATION

MD70 panel can be operated in two device modes: as Access Point in RACS 5 access control system (*RACSPoint* app in fullscreen or building automation mode) or as undefined mode. The mode can be selected with *Configuration Wizard* app (when started for the first time) or *Settings MD70* app (any time).

### 2.1 Configuration wizard

*Configuration wizard* app is displayed automatically when the panel is started for the first time. Select language version and accept license agreement in order to start selection screen with available device modes (fig. 1). The panel can work as RACS 5 terminal (*RACSPoint* app) or without any startup app (Undefined). The device mode can be selected or changed later using *Settings MD70* app.

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Note: The list of available options depends on installed apps.

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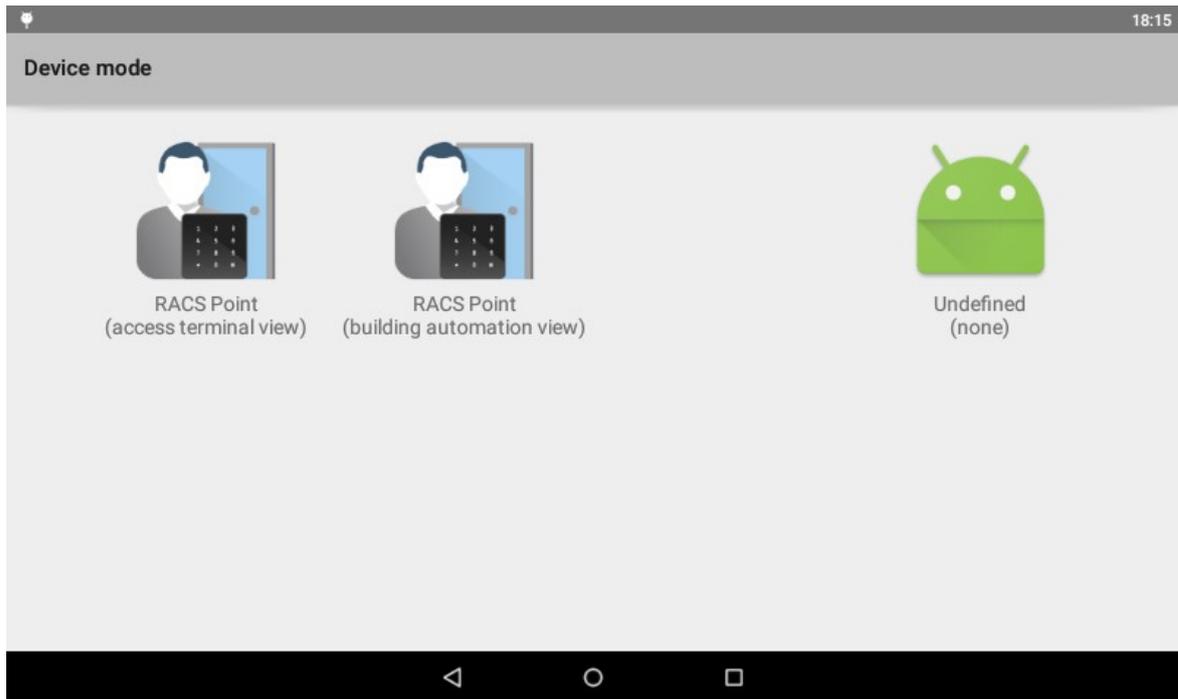


Fig. 1 Device mode selection

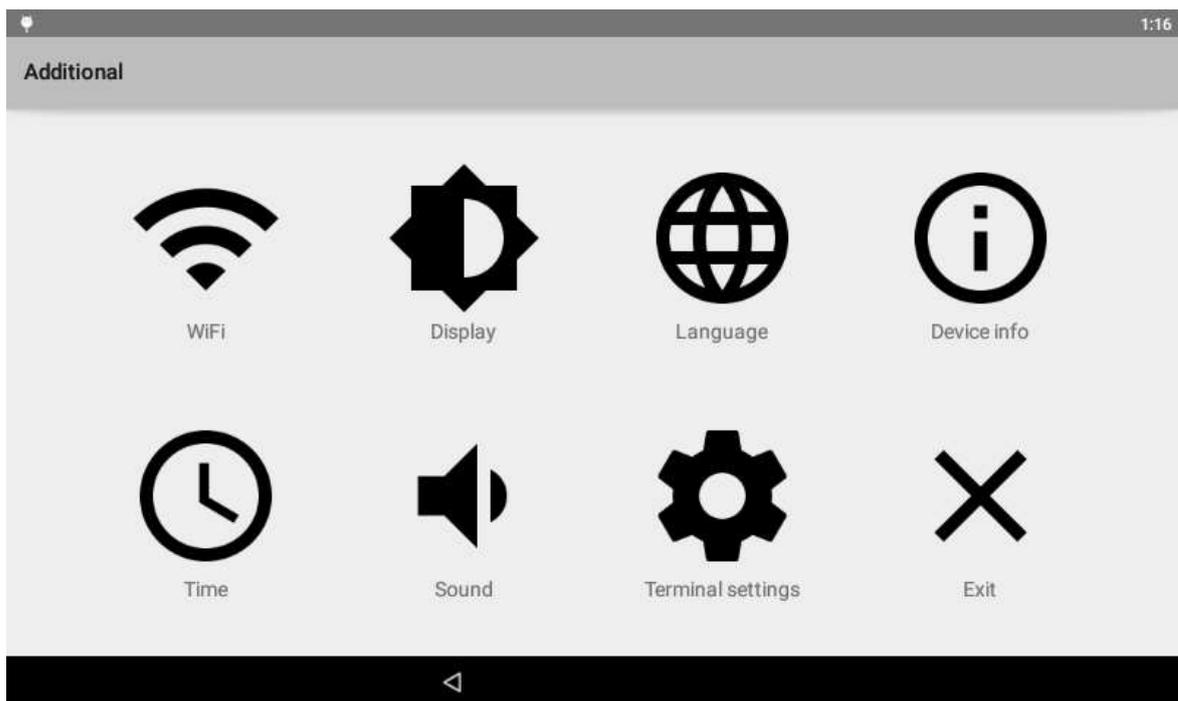


Fig. 2 Additional settings

In the next window it is possible to define additional settings and to display device information. Terminal settings icon is a shortcut to *Settings MD70* app which is used to configure basic parameters for operations with Roger systems. The *Settings MD70* app is described in point 2.2. When *Exit* icon is selected then device is restarted in selected device mode.

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Note: IP address of MD70 terminal is defined with *Ethernet* app, which is mentioned in point 2.5.3.

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## 2.2 Settings MD70 app

Regardless of selected device mode, basic parameters for operations in RACS 5 system are configured with *Setting MD70* app (fig. 3). The app can be started using *Configuration wizard*, *RACS Point* app or in MD70 service menu.

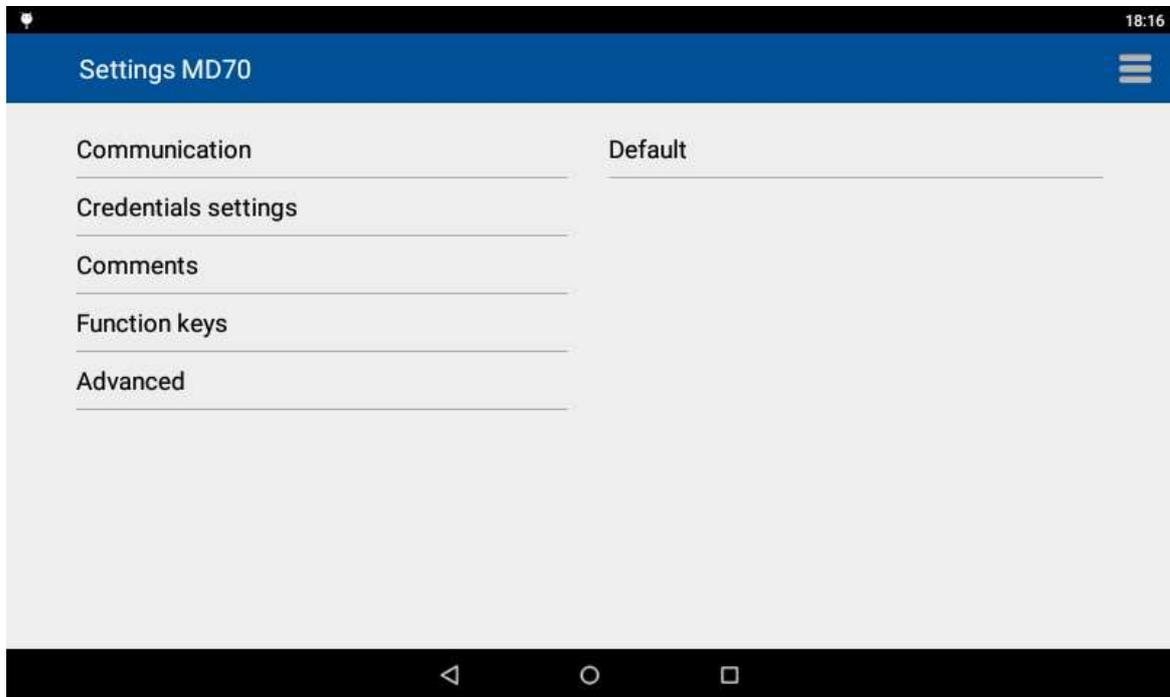


Fig. 3 *Settings MD70* app start screen

### 2.2.1 Communication

#### **General**

**Communication mode** [UDP, RS485]

Selection of MD70 communication method.

**Communication lost signalization delay [s]**

Defines time in seconds after which reader will signal lost of communication with controller.

#### **RS485**

**RS485 address**

Defines MD70 address on RS485 bus. The channel number indicates serial port with connected device e.g. RS485A (addresses in range 100-115), RS485B (addresses in range 200-215).

**Encryption enable** [off, on]

When option is active reader will encrypt data transmitted over RS485 communication bus.

**Communication key**

Encryption key for RS485 bus communication.

#### **UDP settings**

**Host IP address**

Defines IP address of master device (e.g. MCX16-RS) connected to MD70 terminal.

**Device communication port**

Defines port of master device (e.g. MCX16-RS) connected to MD70 terminal.

**Broadcast port**

Defines port for device and service function detection.

**Communication key**

Encryption key for UDP communication.

**VCR settings****Device communication port**

Defines port for VCR communication (video from built-in camera).

**Communication key**

Encryption key for VCR communication.

**RogerVDM Communications settings****Communication key**

Encryption key for communication with RogerVDM software.

**Device communication port**

Defines port for communications with RogerVDM software.

**2.2.2 Mifare settings**

The tab for configuration of cards and QR codes. Detailed information of card reading and CSN/PCN are covered in MCT reader manuals.

**CSN settings****CSNL**

CSNL parameter specifies the number of bytes taken from CSN number and used to create the RCN number.

**Card read mode** [0: MF + EM, 1: MF, 2: EM]

Choice of card technology to be read by the built-in reader. Choosing 'MF + EM' causes simultaneous reading of EM125kHz cards and Mifare cards.

**Mifare Classic settings****Card type** [0: NONE, 1: SSN, 2: MAD]

Specifies the type of sector where PCN number is stored. If value '0' is set then RCN will be formed from CSN number only. If value '1' is chosen then PCN code will be read from file on the card.

**Format** [0: BIN, 1: ASCII HEX]

Format of data in the block.

**First byte position (FBP)** [0-15]

Specifies position of the byte in data block where PCN number begins.

**Last byte position (LBP)** [0-15]

Specifies position of the byte in data block where PCN number ends.

**Sector ID** [0-39]

Key used to encrypt data on card.

**AID** [0000-FFFF]

Specifies AID number (Application Identifier) of the file where PCN code is stored. By default: 5156 (Roger AID).

**Block ID** [0-14]

Block ID in the sector with PCN. For sectors 0-31 blocks 0-2 are available, while for sectors 32-39 blocks 0-14 are available.

**Key type** [0: Key type A, 1: Key type B]

Specifies key type used to encrypt data stored on the card.

**Card key** [000000000000-FFFFFFFFFFFF]

12 bytes key used to encrypt data stored on the card.

#### **Mifare Ultralight settings**

**Card type** [0: NONE, 1: SSN, 2: MSN]

Specifies the type of sector where PCN number is stored. If value '0' is set then RCN will be formed from CSN number only. If value '1' is chosen then PCN code will be read from file on the card.

**Page number** [0-12]

Memory page number with PCN number

#### **Mifare Plus settings**

**Card type** [0: NONE, 1: SSN, 2: MAD]

Specifies the type of sector where PCN number is stored. If value '0' is set then RCN will be formed from CSN number only. If value '1' is chosen then PCN code will be read from file on the card.

**Format** [0: BIN, 1: ASCII HEX]

Format of data in the block.

**First byte position (FBP)** [0-15]

Specifies position of the byte in data block where PCN number begins.

**Last byte position (LBP)** [0-15]

Specifies position of the byte in data block where PCN number ends.

**Sector ID** [0-39]

Key used to encrypt data on card.

**AID** [0000-FFFF]

Specifies AID number (Application Identifier) of the file where PCN code is stored. By default: 5156 (Roger AID).

**Block ID** [0-14]

Block ID in the sector with PCN. For sectors 0-31 blocks 0-2 are available, while for sectors 32-39 blocks 0-14 are available.

**Key type** [0: Key type A, 1: Key type B]

Specifies key type used to encrypt data stored on the card.

**Card key** [000000000000-FFFFFFFFFFFF]

12 bytes key used to encrypt data stored on the card.

#### **Mifare DESFire settings**

**Card type** [0: NONE, 1: SSN, 2: MAD]

Specifies the type of sector where PCN number is stored. If value '0' is set then RCN will be formed from CSN number only. If value '1' is chosen then PCN code will be read from file on the card.

**Format** [0: BIN, 1: ASCII HEX]

Format of data in the block.

**First byte position (FBP)** [0-15]

Specifies position of the byte in data block where PCN number begins.

**Last byte position (LBP)** [0-15]

Specifies position of the byte in data block where PCN number ends.

**Sector ID** [0-39]

Key used to encrypt data on card.

**Application ID** [0000-FFFF]

Specifies AID number (Application Identifier) of the file where PCN code is stored. By default: 5156 (Roger AID).

**File ID** [0-32]

Defines file number in which RCN is placed. For DESFire EV0 cards it is acceptable number from 0 to 16, however in EV1 cards numbers from 0 to 32 can be used.

**Key number** [0-13]

Defines key ID of application which is used to encrypt file.

**Communication protection level** [0:Plain, 1: Data authentication by MAC, 2: Full encryption]

Defines encryption for communication between card and reader.

**General key number** [0-13]

Defines file access key number on card.

**Key type** [0 – TDES Crypto DESFire Native Mode, 1 – TDES Crypto Standard Mode, 2 – 3KTDES Crypto, 3 – AES128 Crypto]

Defines type of access key number on card.

**Key** [0000000000000000-FFFFFFFFFFFFFFFF]

Key used to encrypt data on card. 3KTDES key type contains 24 bytes, TDES and AES keys contain 16 bytes.

**QR code****QR key** [0000000000000000-FFFFFFFFFFFFFFFF]

16-bytes protection key for QR code reading.

**2.2.3 Comments**

Comments are used to enter text information for available objects. Comments are then displayed in management software (e.g. VISO) to allow easier identification of device objects.

**2.2.4 Function keys**

The section enables to configure function keys for their use in *RACS Point* app and define their descriptions.

**2.2.5 Advanced****Advanced**

**Card number data type** [1: None, 2: Number 16 bit, 4: Number 24 bit, 8: Number 32 bit, 16: Number 40 bit, 32: Number 56 bit, 64: Number 64 bit, 128: CID32B, 256: ABA\_TRACK2, 512: F8C16, 1024: F16C32, 2048: GUID, 4096: SAN]

Defines data type returned by reader to controller.

**LED SYSTEM flash after card read** [on, off]

When option is set LED SYSTEM generates single flash whenever card is read.

**Card/PIN buffer timeout [s]** [0-64]

Time in seconds after which Card/PIN buffer will be automatically cleared.

**Keypad settings****Time between keys** [1-64]

Defines max. time in seconds between two consecutive key presses.

**Single key press** [on, off]

When option is active reader will report every single key press to controller. When disabled then full PIN is transmitted.

**Min. length of PIN** [0-16]

Defines minimal number of digits in PIN. When '0' is selected then PIN is disabled.

**Max. length of PIN** [0-16]

Defines maximal number of digits in PIN.

**Allow [\*] key on PIN beginning** [on, off]

When option is active then terminal allows to use asterisk [\*] key on the first position of PIN. The key can be recognized by controller for special functions.

**Device mode****Device mode**

Defines MD70 device mode and allows to specify startup app.

**Advanced****Daily reboot** [on, off]

When option is active then terminal is automatically restarted daily.

**2.2.6 Default**

The section allows to restore default settings (concerns only *Settings MD70* app).

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Note: Settings are saved automatically when the app is exited (Back button on terminal screen). Selected app is started automatically or system apps are restarted when *Settings MD70* app is exited.

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## 2.3 Configuration for access control system (RACS 5)

In order to use MD70 in RACS 5 system it is necessary to select *RACS Point* device mode as well as configure communication mode and address (RS485 or IP). Device mode can be selected with *Configuration Wizard* by selection of startup app or with *Device mode* parameter in *Settings MD70* app (see point 2.2.5). Communication mode is selected with *Communication mode* parameter in *Settings MD70* app (see point 2.2.1). The MD70 IP address is configured with *Ethernet* app from service menu (see point 2.5.3). RACS Point app can be started in two modes:

- Access terminal mode: the app is started automatically showing system login window including camera view, numeric keypad and message display
- Building automation mode: the app operates in background and enables to use widgets to control building automation. This mode allows to use third party widgets.

After exiting *Settings MD70* app, the *RACS Point* app shall be started automatically.

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Note: Specific *RACS Point* settings are configured within the app.

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## 2.4 MD70 service mode

When *Configuration wizard* and *Settings MD70* app is closed then the configuration or modification of settings is possible within service mode which is started by clicking green icon on the right part of screen (fig. 1) and then entering password (by default "admin"). The access is granted for 15 minutes and then it can be automatically disabled. It is also possible to immediately block the access to service menu using *AdminMode* app.

Basically, settings in service menu can be divided into general settings (*Settings* app – see point 2.5.1) such as display or sound parameters and Roger system settings (*Settings MD70* app – see point 2.2).

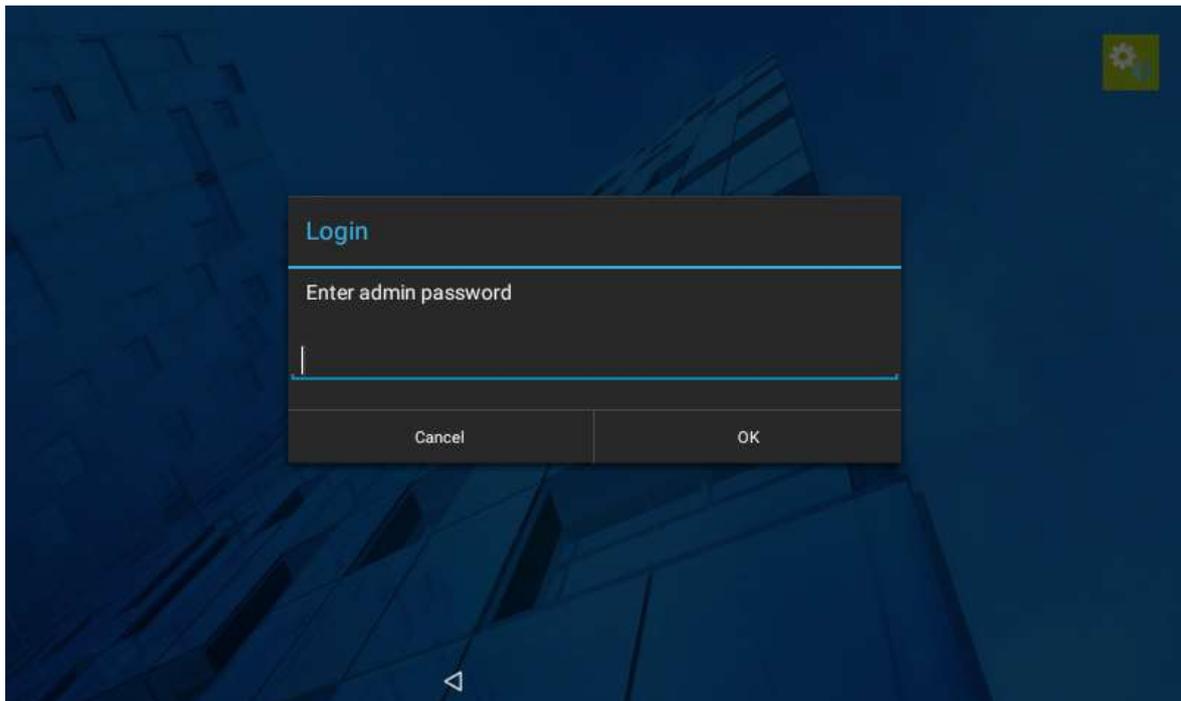


Fig. 4 Login screen for MD70 service menu.

### 2.4.1 Settings app

The app is used to modify general settings of MD70 terminal.

#### **Wireless & networks**

##### **Wi-Fi**

Enables configuration of Wi-Fi connection.

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Note: If MD70 is configured for UDP communication mode then Wi-Fi connection must be disabled.

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#### **Device**

##### **Display**

**Wallpaper:** background for building automation mode

**Sleep:** time for screensaver activation

**Screensaver:** screensaver selection menu and configuration

**Font size:** Font size modification on the display

##### **Sound & notification**

**Sound:** sound settings configuration

**Default notification ringtone:** ringtone configuration

**Other sounds:** screen locking and touch sounds

**Notification:** management of app notifications, access to notifications is blocked when status bars are locked

##### **Storage**

Displays summary information on device memory

##### **Apps**

Displays list of installed apps (including details) and allows to uninstall them. Additionally information on RAM usage is available.

##### **Personal Accounts**

Email configuration.

**Language & input****Language:** app and menu language selection**Spell checker:** spell checker for text entered with screen keyboard**Personal dictionary:** list of own expressions to be used by spell checker**Keyboard & input methods:** keyboard settings (Android keyboard by default)**Speech:** text-to-speech settings**Mouse/trackpad:** pointer speed setting**Backup & reset**

Full factory data reset

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Note: All user settings, additional apps and device settings shall be erased. Device starting after full factory reset may take up to 20 minutes.

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**System****Date & time****Automatic date & time:** automatic date/time synchronization; Internet connection required.**Automatic time zone:** automatic time zone synchronization; Internet connection required**Set date:** manual date configuration**Set time:** manual time configuration**Select time zone:** manual time zone selection**Use 24-hour format:** 24-hour format selection**Choose date format:** regional or manually selected**About tablet****Status :** Network information including IP and MAC addresses, serial number and operation time**Legal information:** information on software component licenses**Model number:** MD70 model**Android version, Kernel version, Build number:** Android OS version and compilation number**2.4.2 AdminMode app**

The app is used to manage access to such MD70 areas as notification bar and service menu (both should be deselected prior to MD70 use in premises). Additionally the context menu of the app (top right corner) includes following commands:

- Password change – admin password configuration
- System settings – shortcut to system settings
- Device info – Basic device information is displayed including network settings
- System log – Basic device information is saved in file log located at storage/sdcard0/LOG/).
- Reboot – device restart

**2.4.3 Other preinstalled apps***File explorer*

MD70 internal memory card is located at /storage/sdcard0, while mass storage device connected to USB port is located at /storage/usbdisk.

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Note: The access to system files is blocked but still it is necessary to remain cautious when file and folder names are deleted/renamed.

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*Ethernet*

The app is used to configure Ethernet connection of MD70 including its IP address

*Clearscreen*

The app locks the touchpanel so the surface could be cleaned without disrupting device operation/settings.

*Browser*

Internet browser.

*Email*

Email app.

*Restart*

Device restart app.

*Clock*

Besides actual time display the app includes alarm clock, timer and stopwatch.

## 2.5 App installation

In order to update selected app or install new app it is necessary to download it from Internet or connect USB drive with the app to MD70 (automatically mounted at storage/usbdisk) and then use *File explorer* app.

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Note: Due to security reasons or device compatibility with Roger systems, the installation and/or proper operations of some apps on the MD70 might be impossible. Each additional app uses MD70 resources and it may interrupt the operation of Roger software. Therefore the risk and responsibility related to installation of third party apps is borne by user.

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Factory new device is equipped with the latest versions of all Roger apps. Some Roger apps may require MD70 operating system update or installation/update of other apps.

## 3. INSTALLATION

### 3.1 Terminals and connection diagram

<b>Table 2. MD70 terminals and ports</b>	
Terminal/ port	Description
12V	12VDC power supply
GND	Ground and RS485 bus reference potential
A	RS485 communication bus, line A
B	RS485 communication bus, line B
ETH0	Ethernet port
USB	USB host port

The installation depends on selected communications method (RS485, Ethernet or Wi-Fi) but regardless of such selection some functionalities still may require connection to computer network (e.g. when MD70 is connected to controller via RS485 bus, photos can be transferred only through Ethernet or Wi-Fi). USB port is used for connection of mass storage device (pendrive) which can for example be used to update MD70 apps.

#### 3.1.1 R485 bus

Connect power supply and both A and B lines of RS485 bus according to fig. 5.

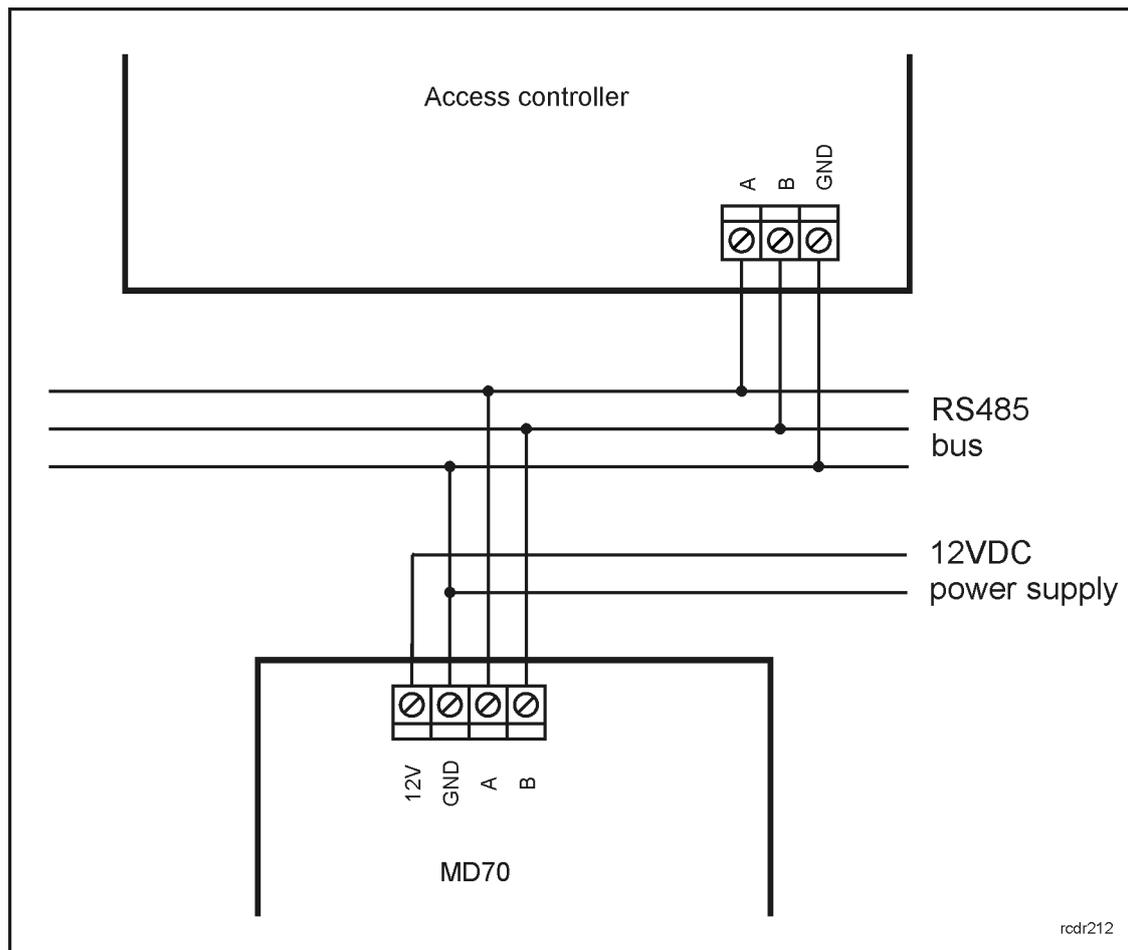


Fig. 5 MD70 connection to RS485 bus

#### Installation guidelines:

- the maximal distance between controller and terminal cannot exceed 1200m
- each device connected to RS485 bus must have unique address in range of 100-115
- all devices connected to the same RS485 communication bus should be connected to the same negative potential (GND)
- any RS485 bus topology can be used except for loop

#### 3.1.2 Ethernet connection

Connect power supply and Ethernet cable with RJ45 connector to the MD70..

Note: The device may not work properly on 1Gb / s networks.

#### 3.1.3 Wi-Fi connection

Connect power supply and then turn on and configure Wi-Fi connection.

### 3.2 Power supply

The terminal requires 12VDC nominal power supply. The power should be connected to the +12V line and GND line. Additionally, the GND line can be used as reference potential for the RS485 bus (if used). All devices connected to RS485 bus should have the same supply minus (GND).

Note: Due to relatively high current consumption (up to 800mA), the MD70 requires efficient power supply unit and supply wires with adequate cross sections in order to prevent significant voltage drop. Unstable PSU may cause random restarting or even make MD70 starting impossible.

### 3.3 LED indicators

The MD70 terminal is equipped with three LED indicators. Their function depends on started app. In case of *RACS Point* app, indicators are compatible with MCT series readers.

Symbol	Name	Colour	Description
	STATUS	Red/Green	Armed/disarmed mode of Alarm Zone
	OPEN	Green	Door unlocked
	SYSTEM	Orange	This indicator is used mainly for signalling following system errors: <ul style="list-style-type: none"> <li>• microcontroller memory failure (steady light). In such case restore default settings of the app</li> <li>• configuration error (2 Hz flashing light). In such case restore default settings of <i>Settings MD70</i> app</li> </ul>

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Note: No communication with master device (controller) is signalled with all LEDs flashing.

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### 3.4 Installation and use guidelines

- The terminal consists of front panel and base which are factory assembled and they must be disassembled prior to terminal installation using standard flat head screwdriver. Insert flat ending successively into all four holes on both sides in order to release internal latches (fig. 5)
- The terminal should be installed on vertical structure (wall) far from heat and moisture.
- Ensure power supply wires with adequate cross section and PSU with proper output power as to prevent voltage drop below 11V at maximal current consumption.
- It is recommended to install the terminal on double flush mounting box.
- Install terminal base with included screws according to the orientation indicated on the enclosure and in such way as to ensure tamper contact pressed against the surface.
- Connection wires should be led through hole in the base to MD70 screw terminals.
- All electric cables must be connected to devices with disconnected power supply.
- If terminal and controller are supplied not from the same PSU then GND terminals of both devices should be shorted.
- Do not short 12VDC power supply terminals.
- Clean front panel regularly by means of wet cloth and mild detergent. Do not clean by means of abrasive materials and strong cleaners like alcohols, solvents, etc. Damages to screen surface are beyond the scope of warranty. Prior to cleaning it is recommended to start *ScreenCleaner* app to lock the touch panel.

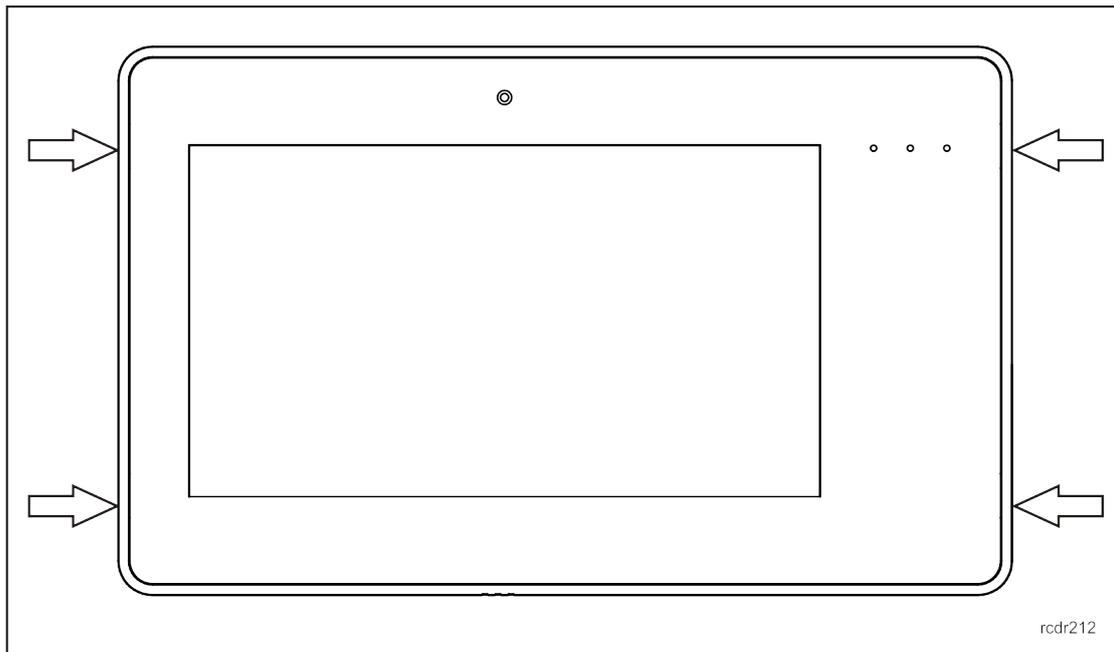


Fig. 6 MD70 enclosure opening

### 3.3 Software update

MD70 system software is stored on memory card inside the device.

In order to update the software:

- Download all events and secure other MD70 data if necessary
- Disconnect MD70 power supply
- Remove internal Flash memory card
- Select system image (\*.img extension) and copy to memory card
- Connect memory card and switch MD70 power supply on

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Note: Start configuration procedure after the update.

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## 4. ORDERING INFORMATION

Table 4. Ordering information	
Product	Description
MD70	Graphic touch panel with Mifare Classic/DESFire reader

## 5. PRODUCT HISTORY

Table 5. Product history		
Product version	Released	Description
1.0.4	I 2017r.	The first commercial version of the product
2.0	III 2023r.	The second commercial version of the product

	<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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