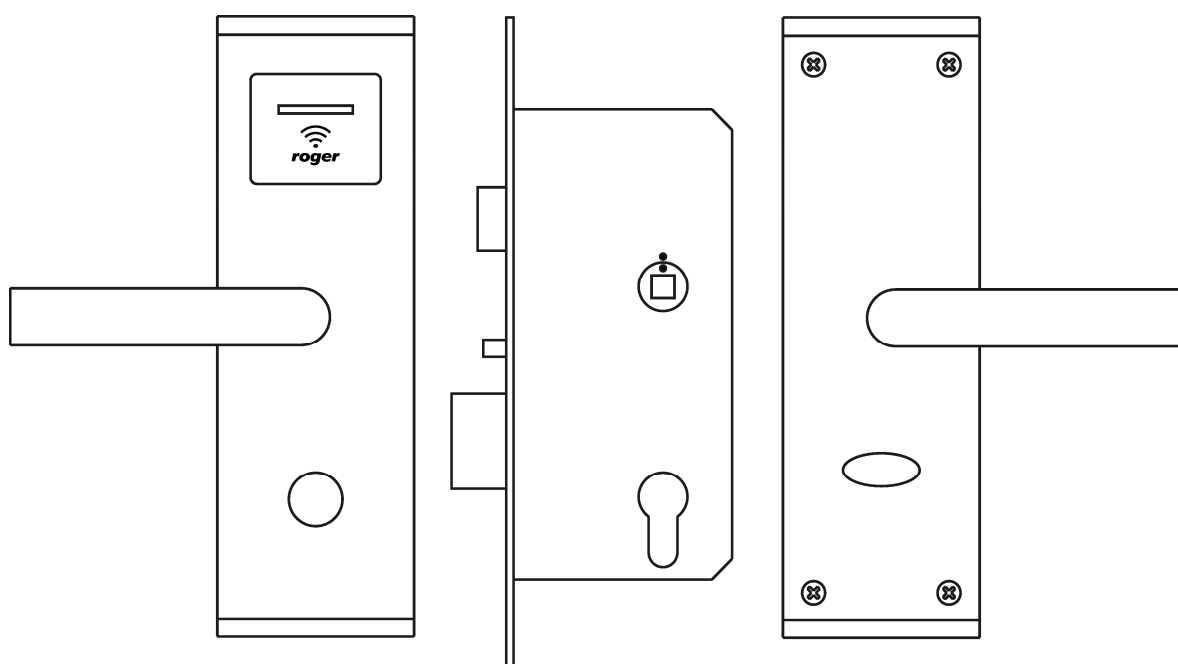*Roger Access Control System*

RWL-1-SL Standalone Door Lock

Operating Manual

Firmware version: 1.1

Document version: Rev. A

CE

DESIGN AND APPLICATION

RWL-1-SL lock enables read-in access control based on MIFARE proximity cards - based on the card numbers stored in its memory, the lock decides autonomously if the access can be granted.

The RWL-1-SL lock consists of two escutcheons with handles and mortise lock. Card reader is installed in the external escutcheon while the battery pack is installed in the internal escutcheon. The internal handle is permanently coupled with deadbolt thus the door can be always opened from the inside regardless of proximity card and batteries charge level. The external handle is separated from the deadbolt and moves freely. When the access is granted the electronic module couples the external handle with deadbolt and latch to enable door opening. When the door is closed then the deadbolt is relocked automatically in order to protect door against unauthorized opening. The RWL-1-SL lock can be optionally equipped with door cylinder and then be opened from the outside with traditional metal key. The RWL-1-SL is equipped with knob switch position detector. The lock is supplied with 4 pcs of AA batteries. Low battery level can be signalled locally. The batteries enable two year operation for average 10 card readings per day.

Depending on door opening direction and handle location on the door leaf the adequate type of RWL-1-SL lock must be applied.

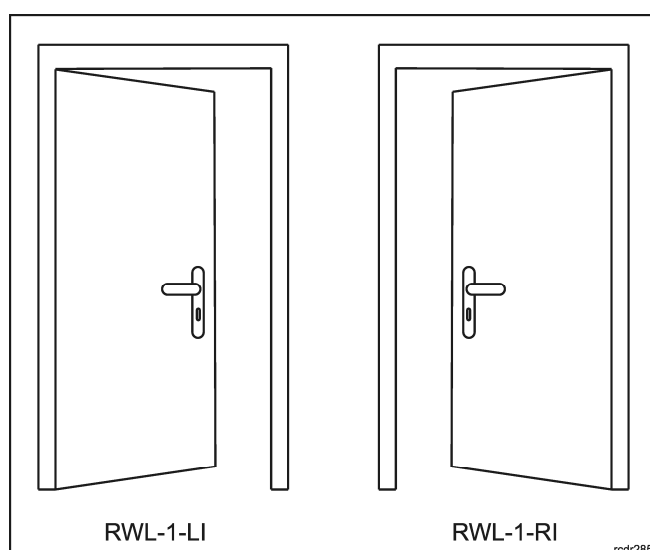| Version	Description
RWL-1-SL-LI	Left hand door
RWL-1-SL-RI	Right hand door
RWL-1-SL-LO	Left hand reverse door
RWL-1-SL-RO	Right hand reverse door

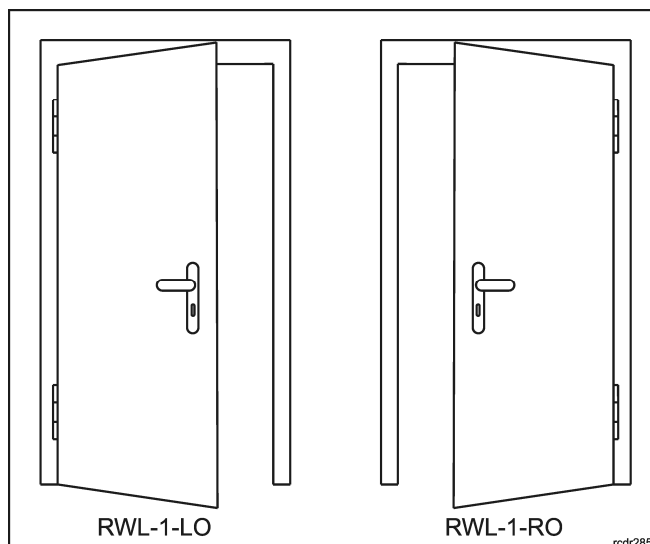Fig 1. RWL-1-SL lock in inward opening doors while standing outside

Fig. 2. RWL-1-SL lock in outward opening doors while standing outside

Mechanical construction

External part of RWL-1-SL

The external part of RWL-1-SL consists of escutcheon with handle and it is dedicated to installation at the entry to controlled room. The escutcheon includes card reader (A) and hole for door cylinder (G) which can be used for emergency door opening with mechanical key. The electronic module which is located inside the escutcheon includes service pins (B) and programming pins (C). Wires with larger plug (D) are used to connect the electronic module with mortise lock and wires with smaller plug (E) are used to connect the module with battery pack. Two isolated wires (F) are not used in RWL-1-SL.
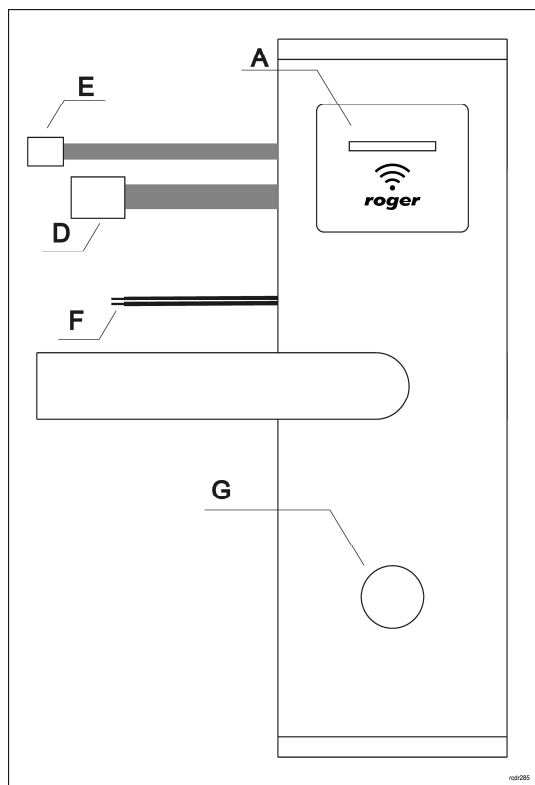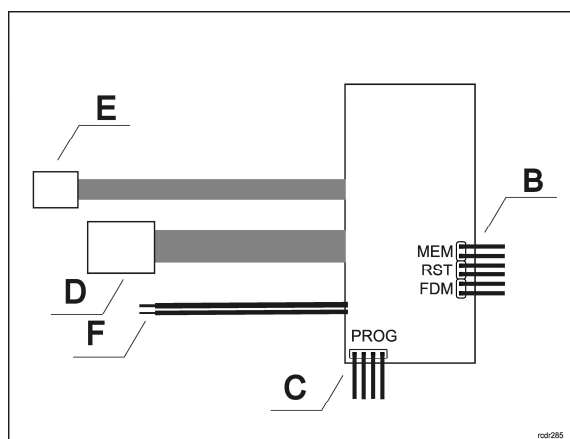

Fig. 3. External part of RWL-1-SL

Fig. 4. Electronic module inside external escutcheon

Internal part of RWL-1-SL

The internal part of RWL-1-SL consists of escutcheon with handle and it is dedicated to installation at the exit from controlled room. The escutcheon is equipped with knob switch (H) and detector to monitor its status using cable with connector (I). The connector can be plugged into socket (K) at the mortise lock. The door can be locked with the knob switch and then it cannot be opened from the outside using proximity card. When the handle is twisted then the knob reverts to normal position. The internal escutcheon includes also battery pack (J). In order to replace batteries unscrew two top bolts and pull the pack off. Wires with plug (M) are connected to socket (E) at external escutcheon in order to supply it.
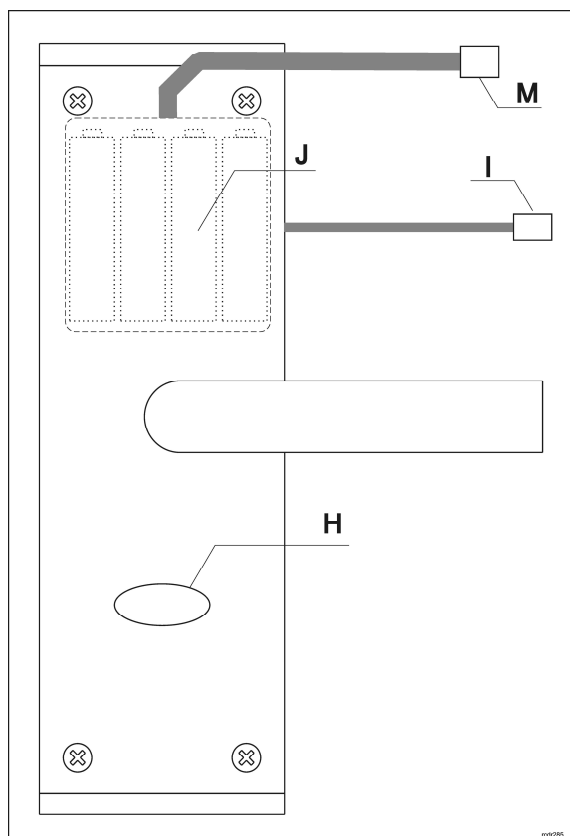

Fig. 5. Internal part of RWL-1-SL

Mortise lock

The mortise lock includes servomechanism which can be controlled by electronic module located inside external escutcheon. Two groups of wires with plugs come out of the mortise lock. The larger plug (L) is used for connection with internal part of RWL-1-SL while the smaller plug (K) for connection with external part of RWL-1-SL.

The lock is equipped with latch (M), deadbolt (N) and release bolt (O). Once the door is closed, the deadbolt is released automatically. The door can be opened by internal handle, external handle or metal key. The deadbolt can be controlled by external handle only if it is coupled by servomechanism controlled by electronic module. External handle is coupled momentary whenever access is granted. When the RWL-1-SL is operated in *Office mode* then external handle is coupled permanently. Handle spacing i.e. distance from handle to cylinder in the mortise lock equals to 72mm.

Fig. 6. Mortise lock

Door cylinder

RWL-1-SL lock is adapted to door cylinder installation. Such cylinder enables emergency door opening from the outside using metal key. The size of cylinder depends on door thickness and it must be selected in such way that it would not protrude by more than 12mm over door surface. The door cylinder 26/10 is included with RWL-1-SL lock and it can be used in door with 38mm to 55mm thickness.

FUNCTIONAL DESCRIPTION

The RWL-1-SL can be used as autonomous access control point, where the access is granted based on the data stored in the lock's memory. The lock requires configuration which can be done from the

programming computer with the RogerVDM application and connected to the lock through RUD-1 communication interface. If the lock is designated to operate with list of 50 users, each equipped with *Main card* and *Backup card*, it can be programmed manually without computer. In this scenario, two programming cards, called ADD card and DEL card, are used to program the unit.

Note: Due to the small size of the proximity keyfobs, they may be incorrectly detected by the built-in proximity sensor. In the RWL series locks, it is recommended to use full-size ISO proximity cards.

Proximity cards

The lock is equipped with a card reader which supports MIFARE® cards. Factory configured device reads card serial number (CSN - *Chip Serial Number*), but using RogerVDM software it can be configured to use programmable card number (PCN – *Programmable Card Number*) stored in the encrypted memory of the MIFARE card.

Card number

The card number which RWL-1-SL lock reads from the card and returns to the access controller is called RCN (*Returned Card Number*). In general, the RCN can be composed of two sections:

- CSN section
- PCN section

The CSN section is a part of the RCN card number taken from the card serial number (CSN). The serial number is programmed by card manufacturer.

The PCN section is a part of the RCN card number taken from the card's programmable memory. The programmable number can be encrypted with own key in order to enable protection against card copying.

Due to relatively easy copying of the card serial numbers (CSN), it is recommended to configure the lock for operation with programmable card numbers (PCN).

Standalone Access Control

The lock grants access for cards stored in its memory. Up to 100 cards can be defined and stored in lock's memory. Each card can be authorised for momentary door opening (option: *Normal access*) and/or to open the door for unlimited time (option: *Office access*). If the card is authorized for *Normal access* then it opens the lock for the time specified by the parameter *Lock pulse*. If the card is authorized for *Office mode* then it can open the lock for unlimited time. When lock is switched to *Office mode* door can be open without use of a card. If the card is authorised for *Normal access* and *Office mode* then in order to get normal access it must be used once while in order to activate *Office mode* it must be used twice.

The access to a room from the outside can be blocked with knob switch located at the internal escutcheon. The functioning of knob can be disabled with the parameter *Don't disturb knob switch.*

Backup cards

Up to 100 cards can be defined and stored in lock's memory. Each card can belong to individual user. Optionally the lock can operate with 50 users only. In such a case each user can have two cards: *Main card* and *Backup card*. Both cards have the same authorizations and the enrolment of *Backup card* is optional. Factory new lock is configured to operate with 50 users. This mode is also used when lock's default settings are restored. Switching to 100 users mode can be done only by means of RogerVDM software. The main benefit of *Backup cards* is to enable selective removing of *Main cards* from the lock's memory even if such *Main cards* are not physically available (e.g. lost or damaged). Therefore it is recommended to mark and store *Backup cards* in designated place for future use.

Note: *Backup card* is assigned with same authorizations as accompanying *Main card* and can be used in the same way as the *Main card*.

LED indicators

RWL-1-SL lock is equipped with 3 LED indicators which functions are described in the table below.

LED indicators		
Name	Colour	Description
LED RED	Red	Indicator is blinking when lock waits for the optional second card reading. If it occurs, lock switches to *Office mode*.
LED BLUE	Blue	Indicator: • 2 sec pulse when access is granted and external handle is coupled • two 2 sec pulses when access is denied • lights steadily when operates in *Office mode*
LED SYSTEM	Orange	• lights steadily in case of lock's configuration error • pulses slowly in case of low battery level (batteries must be replaced)

Power supply

RWL-1-SL lock is supplied from 4 pcs of AA batteries. In case of average 10 operations daily the alkaline batteries enable 2 year functioning. Low battery level is signalled locally by orange LED SYSTEM pulsing and acoustic signal generated prior to entering standby mode.

CONFIGURATION

RWL-1 lock can be programmed manually or from PC computer. All configuration settings can be setup and edited using RogerVDM program. Connection to PC requires RUD-1 interface.

Factory new lock is configured with 2 programming cards (ADD card and DEL card). *Lock pulse* by default is set to 2 sec while built-in RFID reader is configured to read card serial numbers (CSN).

Factory cards		
Label	Name	Authorization
ADD	ADD programming card	New card adding to the lock
DEL	DEL programming card	Card deleting from the lock

Configuration recovery from the lock

In some circumstances it might be required to recover the configuration settings from the lock. Such operation can be done by means of RogerVDM software. Regardless of the operating mode it is not possible to recover communication password and card encryption keys. Recovery of the user cards programmed in the lock's memory, can be disabled by means of *Card codes protection* option, which by default is set off so the card codes can be read from the lock's memory.

Note: Once the *Card code protection* option is set, the only way to clear it is to execute memory reset which erases entire lock's memory.

Manual programming of the users

The lock can be configured manually without computer. Using manual programming it is possible to add and delete user cards. Factory new lock is configured with *Backup cards* and delivered with 2 programming cards (ADD card and DEL card). The manual programming of the users can be used either when lock operates with *Backup cards* (50 users limit) or without *Backup cards* (100 users

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limit). When lock operates with 100 user limit, programming steps related to the *Backup cards* shall be skipped.

Note: It is possible to program new ADD and DEL programming cards during memory reset procedure.

User adding

    A.   Read ADD programming card.

    B.   Read first card to program user's *Main card*.

    C.   Read second card to program user's *Backup card*.

Notes:

- New user shall be granted *Office access* if step A is repeated twice.

- New user shall be granted *Normal access* and *Office access* if step A is repeated thrice.

- If *Backup card* is not needed then read ADD programming card again in step C.

- If already programmed card is used in step B or C then the lock shall generate 2 sec acoustic warning and shall finish programming procedure.

Example: Programming of user with *Normal access*

- Read ADD programming card once.

- Read first card to program user's *Main card*.

- Read second card to program user's *Backup card*.

- Wait till 3 acoustic beeps are *generated* by lock and then you can continue with more cards programming.

Example: Programming of user with *Office access*

- Read ADD programming card twice.

- Read first card to program user's *Main card*.

- Read second card to program user's *Backup card*.

- Wait till 3 acoustic beeps are *generated* by lock and then you can continue with more cards programming.

Example: Programming of user with *Normal access* and *Office access*

- Read ADD programming card thrice.

- Read first card to program user's *Main card*.

- Read second card to program user's *Backup card*.

- Wait till 3 acoustic beeps are *generated* by lock and then you can continue with more cards programming.

User deleting

    A.   Read DEL programming card.

    B.   Read *Main card* or *Backup card* to remove both cards from the lock's memory.

Note: All cards can be removed from memory using memory reset procedure.

Example: User deleting

- Read DEL programming card.

- Read *Main card* or *Backup card* to remove both cards from the lock's memory.

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- Wait till 3 acoustic beeps are generated by lock and then you can continue with more cards programming.

Programming with RogerVDM software

RogerVDM software enables full configuration of the lock, it is also possible to configure list of 100 users with *Main cards* instead of default list of 50 users with *Main cards* and *Backup cards*. The selection of user limit is done with the parameter *Backup cards*. When the option is set to *[1]: Yes* then lock operates with 50 users limit.

Note: It is recommended to backup RWL-1-SL settings, save them to file and protect against loss and access of unauthorized persons.

The procedure below includes steps required to configure the lock using computer and RogerVDM software.

1. Place jumper on MEM pins.

2. Connect the lock to RUD-1 interface using dedicated cable (fig. 6).

3. Short RST pins for a moment preferably by placing and removing jumper – Orange LED SYSTEM shall pulsate.

4. In RogerVDM select *Device/New* and then select type of device (RWL-1-SL) and serial COM port with RUD-1 interface.

5. Select required settings.

6. Make backup by saving settings to file (button: *Send to File...*).

7. Upload settings to the lock (button: *Send to device*).

8. In RogerVDM select *Device/Disconnect*.

9. Remove jumper from MEM pins.

10. Short RST pins for a moment preferably by placing and removing jumper.

11. The lock is ready for operation.
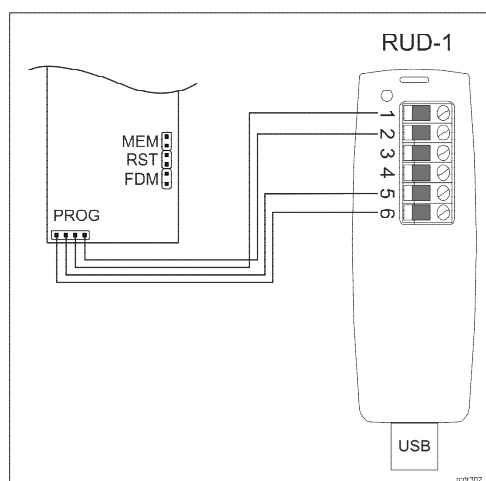

Fig. 7. Connection of lock to the RUD-1 interface

RogerVDM commands

The table below includes commands which are available in RogerVDM software for RWL-1-SL lock.

Command/button	Description
Tab: Configuration	

Load defaults	Restore default settings
Read from File...	Load backup configuration
Send to File...	Save backup configuration
Read from Device	Reads configuration from device
Send to Device	Upload configuration to device
Tab: Credentials	
Add	Adds new user
Edit	Edit existing user
Delete	Delete existing user
Delete all	Delete all users
Read from file	Read users list from file
Write to file	Save users list to file
Read from device	Read users list from device
Send to device	Save users list to device

RWL-1-SL configuration parameters in RogerVDM

The table below includes RWL-1-SL configuration parameters which can be modified using RogerVDM software within low level configuration of device (tab: *Configuration*).

Parameter	Function
General settings	
LED SYSTEM flash after card read	When option is set then card reading is confirmed with flash on LED SYSTEM. Default value: Yes.
Short sound after card read	When option is set then card reading is confirmed with short acoustic beep. Default value: Yes.
LED SYSTEM pulsing when card close to the reader	When option is set then orange LED SYSTEM pulses whenever card is detected near the reader. Default value: No.
Battery low level signalisation	When option is set then lock signals low battery level by orange LED SYSTEM indicator pulsing and series of 5 acoustic beeps after card reading. Default value: Yes.
Buzzer loudness level	The parameter defines loudness level of the built-in buzzer. When set to zero then buzzer is disabled. Default value: 100%
Standalone mode	
Lock pulse [s]	The parameter defines lock opening time when access is granted. Default value: 2s.
ADD programming card	The card code of the ADD programming card.
DEL programming card	The card code of the DEL programming card.
Backup cards	When option is on, then each user programmed in the lock can have both *Main card* and *Backup card*. When the option is off then each user can have the *Main card* only. Default value: Yes.
Card codes protection	When option is set then it is not possible to read user card codes from the lock's memory. Once option is set it can be cleared by memory reset procedure only. The purpose of the option is to

	prevent unauthorized person to read card numbers from the lock's memory. Default value: No.
Don't disturb knob switch	When option is set (Yes), rotating the knob switch located on the internal escutcheon will disable access to the room by means of cards. Each time door is opened using handle, knob switch returns to off position. Default value: No (option off).
Advanced card read settings	
CSN length	The parameter defines number of bytes taken from the card serial number (CSN) and applied in the returned card number (RCN). Default value: 8.
Mifare Classic settings	
Sector type	When the parameter is enabled then returned card number (RCN) is composed of two parts: the programmable card number (PCN) and the card serial number (CSN).
	When the option is disabled then the returned card number (RCN) is composed of the card serial number (CSN) only.
	Default value: None.
Format	The format of the programmable card number (PCN) stored in the card's memory. Default value: BIN.
First byte position (FBP)	The parameter specifies the position of the most significant byte (MSB) of programmable card number (PCN). Default value: 0.
Last byte position (LBP)	The parameter specifies the position of the least significant byte (LSB) of programmable card number (PCN). Default value: 7.
Sector ID	The parameter specifies sector number in card's memory where programmable card number (PCN) is stored. Default value: 0.
Application ID	The parameter Application ID (AID) is located in card's MAD sector and it specifies the sector where programmable card number (PCN) is stored if the *Sector type* (see above) is configured as MAD. Default value: 5156 (Roger AID).
Block ID	The parameter specifies the block number where programmable card number (PCN) is stored in a particular sector of card's memory. For sectors 0-31, blocks 0-2 are available while for sectors 32-39, blocks 0-14 are available. Default value: 0.
Key type	The parameter specifies key type used for encryption of data in card's memory. Default value: A.
Key	The parameter specifies 6-byte key used to encrypt data in card's memory. Default value: FF...FF.

Users

Credentials tab in RogerVDM top menu enables management of the cards programmed in the lock's memory. As explained earlier, lock can operate with 50 users with *Main card* and *Backup card* or 100 users with *Main card* only. Each user can be granted with *Normal access* and/or *Office mode* authorisation. If programmed, the *Backup card* have the same authorisations as a *Main card* it accompanies. When user is granted with the *Normal access* authorisation it can open a door for the time defined by *Lock pulse* parameter. When user is granted with *Office mode* it can open the door for unlimited time and then, when required using the same card it can terminate *Office mode*. Both options can be granted to the same user.

When card has both authorisations, with the first card usage lock opens for *Lock pulse* time and waits for optional second card usage what is signalled by LED SYSTEM blinking. If the card is used second

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time lock switches into *Office mode*. If the lock is in the *Office mode* then with the single use of a card with *Office mode* authorisation lock terminates *Office mode*.

Memory reset

Memory reset erases all programmed card and restores factory configuration settings. After reset the locks operates with 50 users list and reads card serial number (CSN). In order to perform memory reset procedure proceed with following steps:

- Remove jumper from the MEM pins (if applicable).

- Short RST pins for a moment preferably by placing and removing jumper.

- When acoustic signalization is started place jumper on MEM pins and the devices shall confirm memory reset with 2 acoustics beeps.

- Read any proximity card and it shall be new ADD programming card.

- Read any proximity card and it shall be new DEL programming card.

- Wait for 3 acoustic beeps. The lock shall restore default factory settings and shall switch to normal operation.

INSTALLATION

The lock is designed for installation in door with 38 to 55mm thickness and with 72mm handle spacing. Prior to installation make sure that door cylinder is long enough.

Lock installation

- Make holes in door using drilling template In case of non-rebated door it might be necessary to use metal plate. Both, drilling template and metal plate are included in the factory new set.

- Install mortise lock in such a way that marks which specify proper location of handle pin will be aligned (fig. 6). Lead K and L groups of wires through top hole to external escutcheon.

- Install handle pin (2 parts) in mortise lock (with carvings towards lock).

- Optionally install external door contact (e.g. reed relay) and connect it to F group of wires (fig. 3).

- Lead battery wires and knob switch detector (fig. 5 pos. I and M) through bottom hole and then connect the groups of wires.

- Install batteries (4xAA) in the pack and then insert into internal escutcheon.

- Mount escutcheons and verify if the internal handle controls the cylinder and metal key can open the door.

Note: Ensure access to metal key to enable emergency opening of the door.

Specification

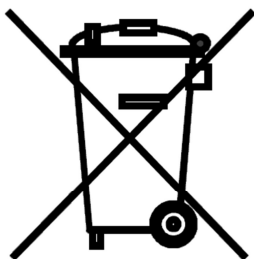| Parameter	Value
Power supply	4 x AA (LR06) alkaline batteries
Battery life	Approx. 2 years with 10 entries per day
Door thickness	38 – 55 mm
Handle spacing	72 mm
Built-in card reader	ISO/IEC 14443A MIFARE®
Environmental class	Class I, indoor general conditions, temperature: +5°C to +40°C,

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(acc. to EN 50131-1)	relative humidity: 10 to 95% (no condensation)
IP code	IP40
Dimensions	78 x 242mm
Weight	Approx. 2200g
Certificates	CE

Ordering information

Product	Description
RWL-1-SL-LI	Standalone door lock with escutcheons; left hand
RWL-1-SL-RI	Standalone door lock with escutcheons; right hand
RWL-1-SL-LO	Standalone door lock with escutcheons; left hand reverse bevel
RWL-1-SL-RO	Standalone door lock with escutcheons; right hand reverse bevel

Product history

Product version	Released	Description
1.1	XII 2021	The first commercial version of the product

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.

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