

*Roger Access Control System*

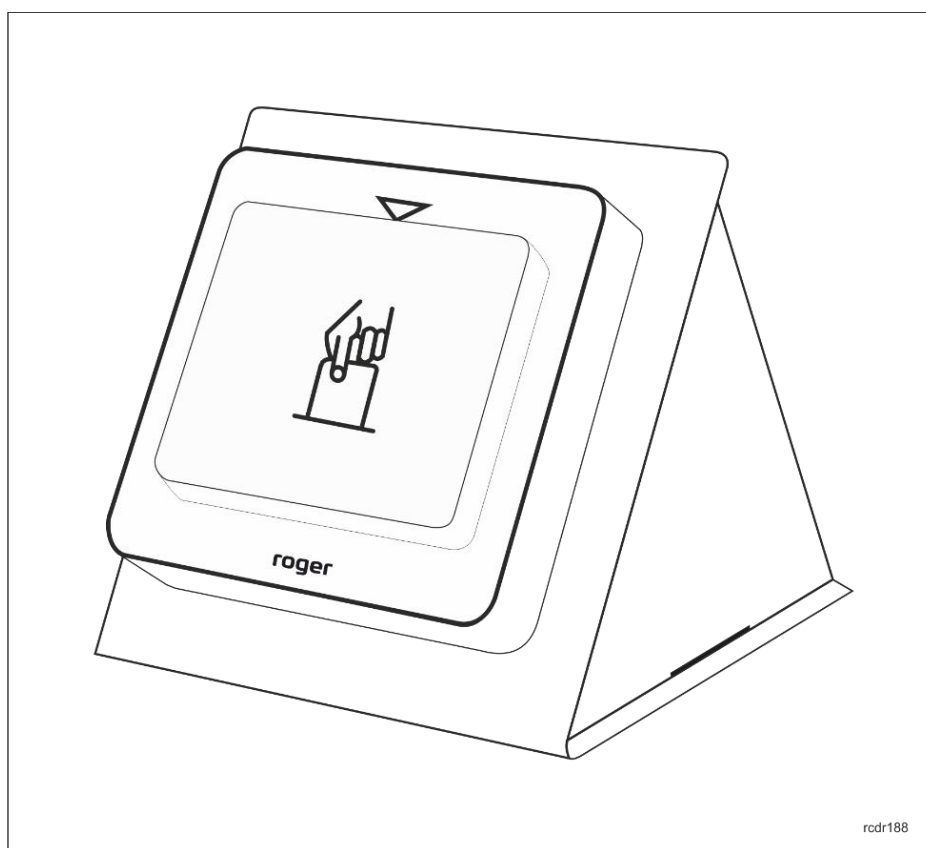
## RUD-4-DES Card Programmer

Operating manual

*Firmware version: v1.2.x*

*Hardware version: v1.0*

*Document version: Rev. E*



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## PRODUCT DESIGNATION

RUD-4-DES is a reader and programmer of ISO/IEC 14443A MIFARE® Classic, Plus (S, X) and DESFire (EV1, EV2, EV3) standard proximity transponders. Additionally, it allows to read EM 125kHz card codes. RUD-4-DES can be used as an administrator reader in RACS 4 systems (PR Master 4.4.6 and higher required) and RACS 5 systems (**VISO**). RUD-4 can also be used as a universal card number reader (e.g. by means from **Roger MiniReader** v1.1 or higher). The function of programming MIFARE® Classic, Plus and DESFire cards is available in the utility program **RogerVDM** 2.0.8. An SDK development package has been prepared for integration purposes in external applications.

## BUILD

The device has a stable, desktop metal housing with a card holder and is powered from a USB serial port, which is also used to communicate with the device.

## FEATURES

- MIFARE®: Ultralight (1), Classic, Plus (S, X) and DESFire (EV1, EV2)
- Read/write number: CSN, SSN Mifare Classic
- Read/write number: CSN, SSN Plus (S, X)
- Read/write number: DESFIRE File (EV1, EV2, EV3)
- EM 125kHz: compatible with EM 4100/4102 standard
- Keyboard emulation mode
- Led indicator
- Configuration from PC (RogerVDM software)
- Metal desktop housing
- USB A-B connection cable
- For indoor use only
- SDK programming package
- CE

## PROXIMITY IDENTIFIERS

RUD-4-DES is factory set for chip serial number (CSN – Chip Serial Number) reading. For higher security level reading rules can be changed to handle programmable secure sector numbers (PCN – Programmable Card Number) in such case a management tool RogerVDM must be used for configuration. The EM 125kHz identifier serial number is read independently and is not subject to configuration.

## CARD NUMBERS

Reader Returned Card Number (RCN) is a combination of a Chip Serial Number (CSN) and Programmable Card Number (PCN) created on the basis of following formula, CSN number of bytes and PCN number length that results from flexible defined PCN first byte position (MSB) and PCN last byte position (LSB) can be adjusted according user requirements.

RCN	
CSN	PCN

Example:

Reader Configuration:

- CSN number of bytes: 4
- PCN MSB: 8
- PCN LSB: 10

Chip Serial Number CSN (HEX) – 7 bytes						
C1	C2	C3	C4	C5	C6	C7

Programmed Card Number PCN (HEX) – 16 bytes (maximum length of card data block)															
AA	BB	CC	DD	EE	FF	00	11	22	33	44	55	66	77	88	99

Returned Card Number (RCN):

RCN						
CSN				PCN		
C4	C5	C6	C7	22	33	44

Note: More information about card reading and programming are described in the [AN024 MIFARE cards](#) application note.

### USING THE READER WITH ROGER MINIREADER PROGRAM

Roger MiniReader 1.1 program displays all detected RUD-4-DES readers on the list. Use *Read single card* and then swipe your card so the card number would be displayed in the program. When *Read multiple card* is selected then the program displays successively added card numbers on the list. This can be terminated by selection of *Stop reading*. Card numbers can be automatically copied to clipboard (*Tools->Options->Copy card code to clipboard*) and then transferred to third party apps or they can be saved in text file (*Tools->Options->Append card code to file*).

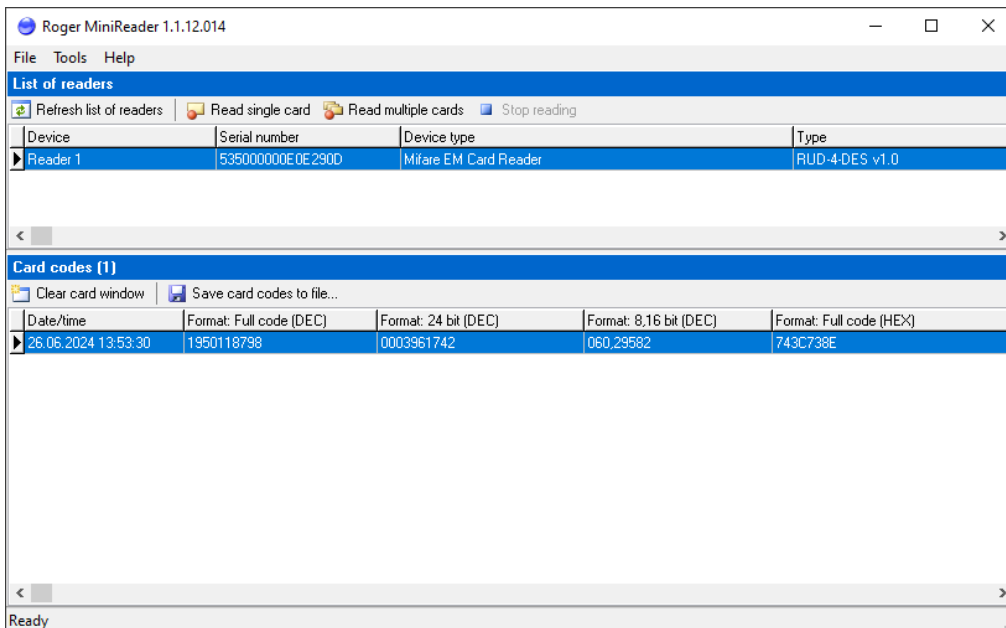


Fig. 1 Roger MiniReader main window

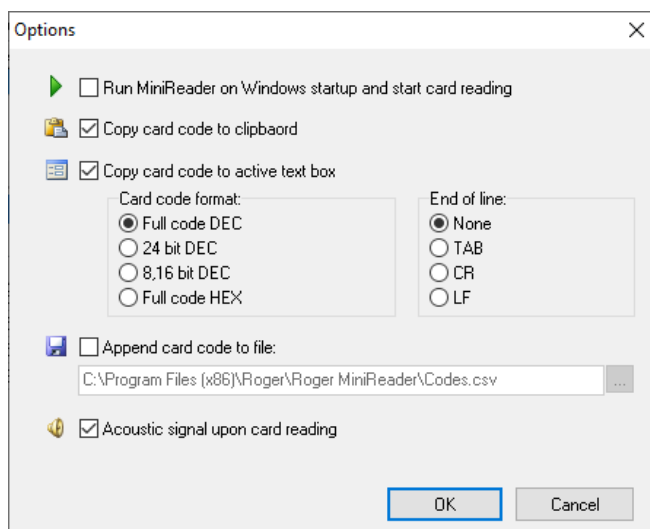


Fig. 2 Configuration window

### RACS 4 AND RACS 5 SYSTEM SUPPORT

RUD-4-DES can be applied as administrator reader in RACS 4 and RACS 5 to enter new identifiers in access control system. The software **PR Master 4.5** (RACS 4) or **VISO** (RACS 5) displays detected readers on the list. To read a new card into the system or change an existing one, you can use any of the devices available on the list - including the RUD-7 reader.

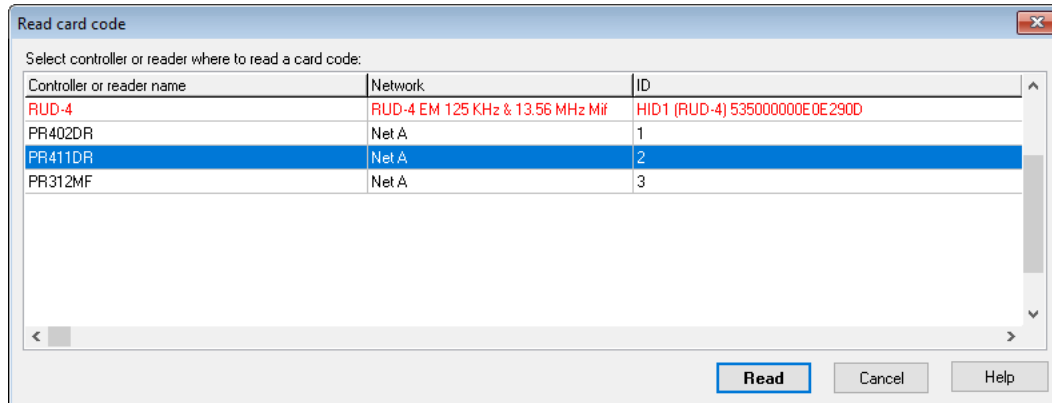


Fig. 3 PR Master reader section

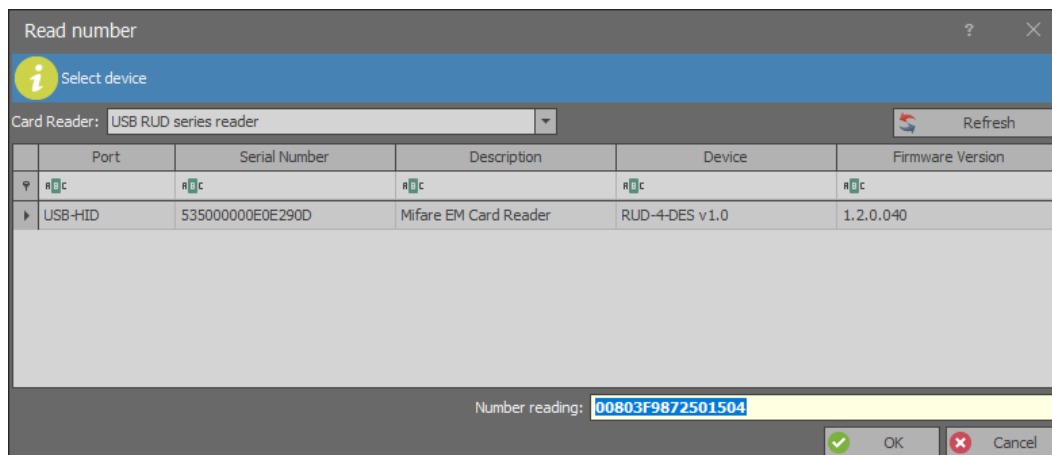


Fig. 4 VISO reader section

### THIRD-PARTY SOFTWARE

Support for RUD-4-DES reader can also be implemented in other programs, in such case, the logic of reader handling depends completely on the program’s author. For integration purposes a RUD-4-DES software SDK has been released. SDK package contains DLL files dedicated for USB HID class RUD-4-DES device, .NET software example and programmer documentation.

Additionally, the reader provides the option of keyboard emulation. Enabling this option causes the code of the read card to go directly to the PC keyboard buffer and then to the active application window. By default, this function is disabled and to enable it, you must change the settings via the RogerVDM application.

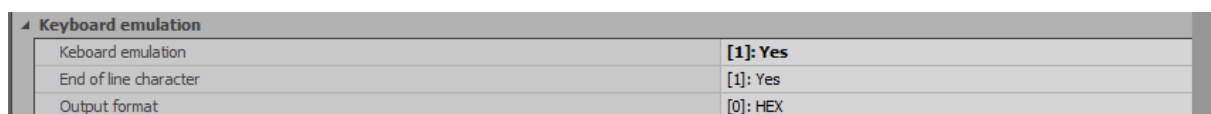


Fig. 5 Keyboard emulation mode settings section

## DEVICE CONFIGURATION

Card number read and write rules are configurable with **RogerVDM** (Windows) management tool that can be downloaded from Roger website [www.roger.pl](http://www.roger.pl).

For device configuration, connect it to PC USB port and run **RogerVDM** software.

From the top menu list select *Device > New* than choose Your reader version and set USB communication channel for USB-HID class device, finally press *Connect*

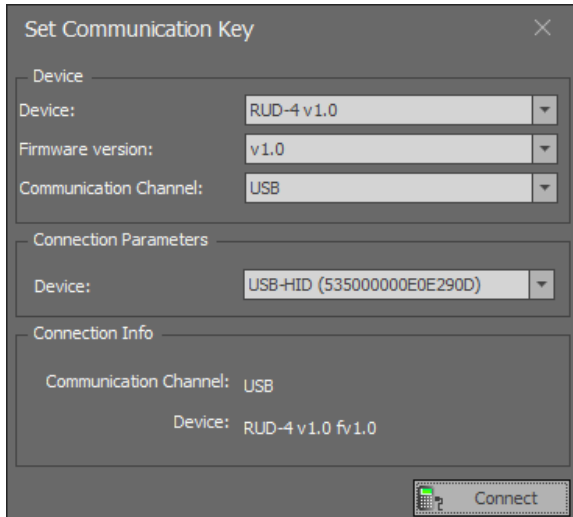


Fig. 6 Device select window

The program will establish a connection with the reader and automatically switch to the Configuration window. The window contains a number of parameters defining both the rules for reading and writing card codes, which are explained in Application Note [AN024 MIFARE Cards](#).

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Note: reader parameter configuration applies to both write and read card number operation. Configuration modifications must be confirmed with *Send to device* button to take effect.

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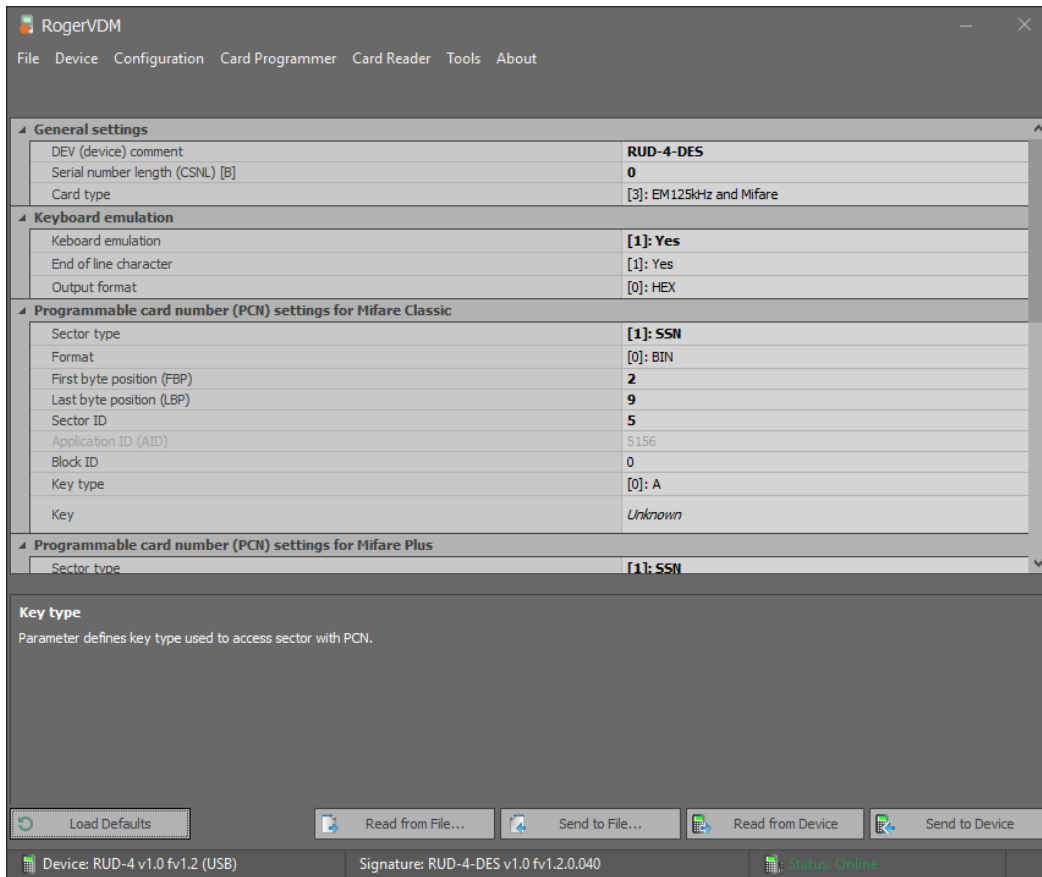


Fig. 7 Device configuration window

## CARD NUMBER WRITE AND READ OPERATIONS

Card programming window is dedicated for PCN number programming operation according rules setup from program Configuration window. Required PCN must be entered in the appropriate data format DEC or HEX in the Card Code window box and confirmed with a proper Program Mifare... button, for Classic, Plus or DESFire type.

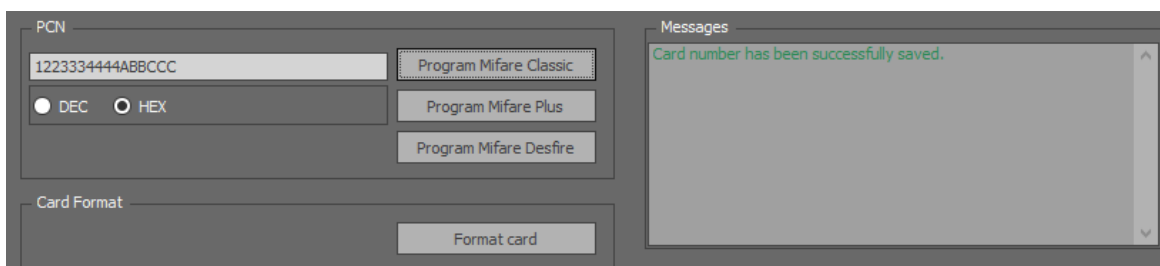


Fig. 8 Card programming window

Write operation result will be confirmed with adequate message in the Messages box. RCN number can be read in Card Reader window.

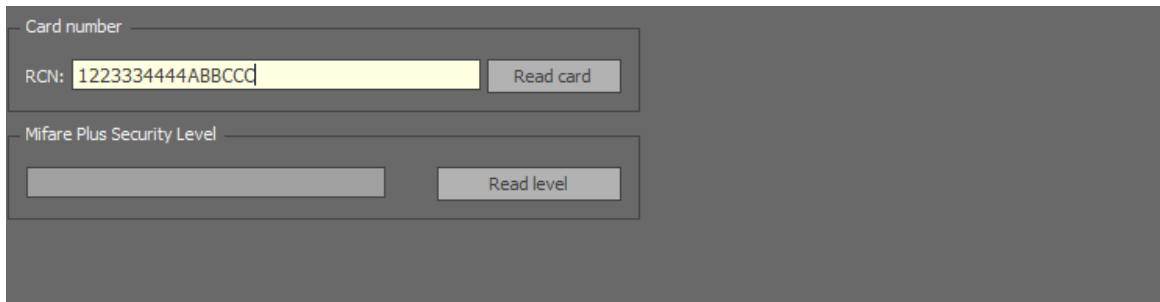


Fig. 9 Card reader window

## DEVICE INSTALLATION

RUD-4-DES is a USB-HID (Human Interface Device Class) device and it's supported by 32bit and 64bit versions of Windows 10, Windows 8, Windows 7. RUD-4-DES doesn't require dedicated drivers, it's handled by OS generic USB HID driver. You may connect the device directly to the PC USB port, driver installation will start automatically.

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Note: You should not disconnect a reader while the software working with it is being run. Violating this rule usually causes that the application controlling the reader may hang up and you will have to terminate it by using Windows Task Manager.

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Programs provided by Roger (**PR Master**, **VISO**, **Roger MiniReader** and **RogerVDM**) automatically detect that the RUD-4-DES reader present it on the list of available devices.

The RUD-4-DES reader can be connected directly to the PCs USB socket or using a cable with magnetic stand provided together with the reader. Using this cable is convenient because when you use a magnetic stand, the reader can be located at computer's case or any other metallic part of a desk or a table.

Optionally, the RUD-4-DES can be connected to computer by other USB cable of a length not exceeding 5 meters. However, any modifications of original USB cables are prohibited. The only acceptable way of prolonging USB cables is by using original factory-made extension cables.

## FIRMWARE UPDATE

The firmware of the reader can be updated by means of the **RogerVDM** v2.08.35278 or newer software. The file with the current firmware is available at [www.roger.pl](http://www.roger.pl).

Before changing the reader firmware, make sure that the firmware downloaded from the manufacturer's website is appropriate for the updated device and that the programs which use the reader are disabled. After starting the RogerVDM program close the device selection window and in Tools menu select the proper device (RUD-4-DES) from the list. Then indicate the access path to the location where the software file (\*.bin type) is saved. After clicking the Update button, the software update begins and must be carried out in accordance with the program instructions displayed during the process.

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Warning: It is strongly recommended to act in accordance with program instructions, waiver of required actions connected with violations of the update rules can damage Your device. Note that firmware update process is done entirely at your own risk.

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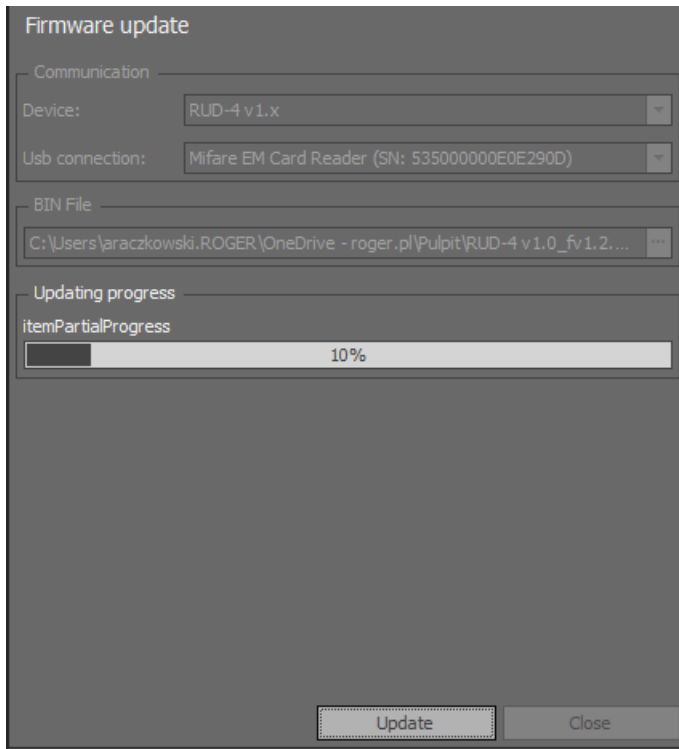


Fig. 10 Firmware update with RogerVDM

## TECHNICAL DATA


Technical Data	
Power supply	5VDC directly from the USB port
Nominal current consumption	80mA
Cards	- 13.56MHz ISO/IEC 14443A MIFARE® Classic, Plus and DESFire - EM 125kHz, EM 4100/4102 compatible
Reading distance	- up to 3 cm for MIFARE® Classic cards - up to 2 cm for MIFARE® DESFire* cards - up to 4 cm for EM 125kHz cards (while in an optimal relative location to the reader)
Reading time	~ 200msec
Environment	Indoor general conditions, temperature: +5°C to +40°C, relative humidity: 10 to 95% (no condensation)
Dimensions	110x105x140 mm
Weight	~ 640g
Compliance	CE, RoHS

## ORDERING INFORMATION

Product version	Description
RUD-4-DES v1	The reader together with a USB cable

## PRODUCT HISTORY

Product History			
Product version	Firmware	Date	Description
RUD-4 v1	Fv 1.0	16/06/2016	First commercial product version.
RUD-4-DES v1	Fv 1.0	20/06/2016	First commercial product version

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