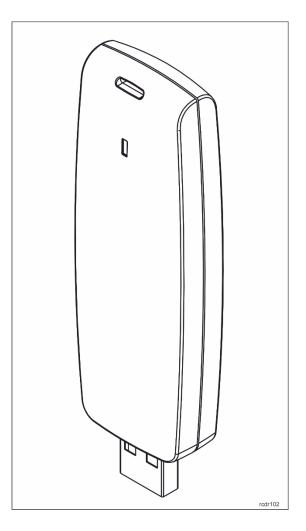
Roger Access Control System

RUD-3-DES

Operating manual

- Firmware version: v2.3
- Hardware version: v2.x
- Document version: Rev. A





PRODUCT DESIGNATION

The RUD-3-DES can be used as card enroll reader for access control system or any other application which requires card reader. Card can be enrolled straight from the RACS 4 (version 4.4.6 or newer is required) and VISO or using dedicated Roger MiniReader application (version 1.2 or newer required). RUD-3-DES can also provide a transponder programmer functionality, but in such cases **RogerVDM** 2.1. The reader supports keyboard emulation mode - the read data can be entered into any application or text field. Roger company offers SDK programming package that enables a programmer to develop customized applications for a specific requirements.

BUILD

RUD-3-DES is a miniature reader and writer for 13.56MHz ISO/IEC 14443A MIFARE® Classic, Plus (S, X) and DESFire (EV1, EV2, EV3). standard proximity cards and is supplied from serial USB port which is also used for communication with the device. A USB connection cable is included.

FEATURES

- MIFARE®: Ultralight(1), Classic, Plus (S, X) and DESFire (EV1, EV2)
- Read number: CSN, SSN, MSN, DESFIRE File
- Write number: SSN, MSN, DESFire File
- Keyboard emulation mode
- Administrator reader for RACS 4 system
- Administrator reader for RACS 5 system
- Configuration from PC (RogerVDM software)
- Configuration from PC (RogerVDM software)
- Led indicator
- For indoor use only
- SDK programming package
- Dimension: 88,0x30,5x14,5 mm
- Weight: ~20g
- CE

PROXIMITY CARDS

RUD-3-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.

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.

R	CN
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	l		F	PCN	
C4	C5	C6	C7	22	33	44

Note: More information about card reading and programming are described in the <u>ANO24 MIFARE cards</u> application note.

USING THE READER WITH ROGER MINIREADER PROGRAM

The **Roger MiniReader** (v1.1.12 or newer) displays the list of available USB readers connected to the PC. In order to read a single card, you need to select the *Read single card* command, and then put a card close to the reader. When the code is read, it automatically appears in the Card codes window. If you use the *Read multiple cards* command, program will read cards in a loop and insert them to the Card codes window. In order to interrupt the reading process, you need to use the *Stop reading* command. The cards read can automatically be copied to the Clipboard (*Tools > Options > Copy card code to clipboard*). By using it, the card codes can be moved to other applications or saved to a text file (*Tools > Options > Append card code to file*).

ອ Roger MiniReader				-	
ile Tools Help					
ist of readers					
Refresh list of readers	🚽 ⋥ Read single card 🛛 🦻 Ré	ead multiple cards 🛛 🔳 Stop rea	ding		
Device	Serial number	Device type		Туре	
Czytnik 1	535000000E0E132D	Mifare Card Reader		RUD-3-DES v2.1	
c					
Card codes (4)					
Clear card window	🛃 Save card codes to file				
Date/time	Format: Full code (DEC)	Format: 24 bit (DEC)	Format: 8,16 bit (DEC)	Format: Full code (HEX)	
29.06.2023 15:40:12	36137454627210756	0002377220	036,17924	8062D2D2244604	
29.06.2023 15:40:14	36137454627675140	0002841604	043,23556	8062D2D22B5C04	
29.06.2023 15:40:16	36137454631798020	0006964484	106,17668	8062D2D26A4504	
29.06.2023 15:40:19	36131181695608068	0004728068	072,09476	805D1E4A482504	
C					>

Fig. 1 Roger MiniReader main window

Options	×
Run MiniReader on Windows startup and Run Copy card code to clipbaord	l start card reading
 Copy card code to active text box Card code format: Full code DEC 24 bit DEC 8,16 bit DEC Full code HEX 	End of line: None TAB CR LF
🛃 🗌 Append card code to file:	
C:\Program Files (x86)\Roger\Roger MiniRe	ader\Codes.csv
🍕 🗹 Acoustic signal upon card reading	
	OK Cancel

Fig. 2 Configuration window

RACS 4 AND RACS 5 SYSTEM SUPPORT

RUD-3-DES is well suited for RACS systems and can be used as an administrator reader for entering new card numbers into access control applications. From the list of available readers for PR Master or VISO control program choose RUD-3-DES and follow application reading steps.

Read card code			×
Select controller or reader where to read a card cod	e:		
Controller or reader name	Network	ID	~
RUD-3	RUD-3 13.56 MHz USB Mifare reade	HID1 (Mifare Card Reader) 535000	_
PR402DR	Podsystem A	1	
PR411DR	Podsystem A	2	
PR312MF	Podsystem A	3	
			<u> </u>
<			>
		Read Cancel H	elp

Fig. 3 PR Master reader section

F	lead number					? X
	Select device					
Car	d Reader: USB RUD	series reader	T		5	Refresh
Γ	Port	Serial Number	Description	Device	Firmwa	re Version
9	RBC	RBC	RBC	RBC	RBC	
►	USB-HID	53500000E0E132D	Mifare Card Reader	RUD-3-DES v2.1	2.3.0.056	
	_	_				
			Number reading: 00	8062214AB21C04		
					🕗 ОК	😢 Cancel

Fig. 4 VISO reader section

THIRD-PARTY SOFTWARE

Support for RUD-3-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-3-DES software SDK has been released. SDK package contains DLL files dedicated for USB HID class RUD-3-DES device, .NET software example and programmer documentation.

The device also has a keyboard emulation function. This option allows to enter data read from RFID cards in the application and works in the same way as a computer keyboard. By default this feature is disabled, to use it changes by means of RogerVDM software have to be applied.

Keyboard emulation			
Keboard emulation	[1]: Yes		
End of line character	[1]: Yes		
Output format	[0]: HEX		

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 <u>www.roger.pl</u>.

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*

Firmware update	
Device	
Device:	RUD-3 v2.x 💌
Firmware version:	v2.3 💌
Communication Channel:	USB ▼
Connection Parameters	
Device:	USB-HID (53500000E0E132D) 🔻
Connection Info	
Communication Channel:	USB
Device:	RUD-3 v2.x fv2.3
	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 <u>AN024 MIFARE Cards</u>.

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.

▲ General settings	
DEV (device) comment	RUD3DES
Serial number length (CSNL) [B]	5
Keyboard emulation	
Keboard emulation	[0]: No
End of line character	
Output format	[0]: HEX
Programmable card number (PCN) setting	gs for Mifare Classic
Sector type	[1]: SSN
Format	[0]: BIN
First byte position (FBP)	1
Last byte position (LBP)	5
Sector ID	7
Application ID (AID)	
Block ID	0
Key type	[1]: B
Key	Unknown
Programmable card number (PCN) setting	gs for Mifare Plus
Sector type	[1]: 55N
	[0]: BIN
Format	
Format	
Sector type	number (PCN). If the option [0]:None is selected then card returned number (RCN) will include only CSN and PCN will be

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.

PCN		Messages
1223334444ABBCCC	Program Mifare Classic	Card number has been successfully saved.
DEC O HEX	Program Mifare Plus	
	Program Mifare Desfire	
Card Format		
	Format card	×

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.

Card number		
RCN: 1223334444ABBCCC	Read card	
Mifare Plus Security Level		
	Read level	

Fig. 9 Card reader window

DEVICE INSTALLATION

RUD-3-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-3-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.

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.

Programs provided by Roger (PR Master, VISO, Roger MiniReader and RogerVDM) automatically detect that the RUD-3-DES reader and present it on the list of available devices.

The RUD-3-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-3-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.

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-3-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.

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.

Configuration Read Status				
	Mifare Card Reader (SN: 535000000E0E132D)			
	RUD-3(DES)\Firmware\RUD-3 v2.1_fv2.3.0.56.bin			
Updating progress				
Programming				
	40%			
	Update Close			

Fig. 10 Firmware update with RogerVDM

TECHNICAL DATA

Technical data		
Power supply	5VDC directly from the USB port	
Average current consumption	80mA	
Cards	13.56MHz ISO/IEC 14443A MIFARE® Classic, Plus and DESFire (EV1, EV2 and EV3)	
Reading distance	Up to 6 cm for the MIFARE® Classic ISO reference card in optimal orientation.	
	Up to 3 cm for MIFARE® Plus (S, X) and DESFire ISO reference card in optimal orientation.	
	Note: The parameters given above apply to the situation when the standard proximity card is in the optimal position relative to the reader.	
Reading time	~ 200msec	
IP Rating	IP30	
Dimensions	88,0x30,5x14,5 mm	
Weight	~ 20g	

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CE; RoHS

ORDERING INFORMATION

Product version	Description
RUD-3-DES v2 The interface together with a cable and a magnetic stand	

PRODUCT HISTORY

Product History				
Product version	Firmware	Date	Description	
RUD-3 v1	Fv 1.0.0.1	29/07/2011	First commercial product version.	
RUD-3 v2	Fv 2.0.4.23	12/10/2015	Second commercial product version	
RUD-3-DES	Fv 2.1.2.50	12/05/2021	05/2021 The version replaces RUD-3 device	
RUD-3-DES	Fv 2.3.0.56	26/01/2024	Second commercial product version	



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Contact: Roger sp. z o.o. sp. k. 82-400 Gościszewo 59 Tel.: +48 55 272 0132 Fax: +48 55 272 0133 Tech. support: +48 55 267 0126 E-mail: <u>biuro@roger.pl</u> Web: <u>www.roger.pl</u>

