

Configuration Utility User Manual WAVE ID® Readers

Trust begins here.™

99009011



# Legacy Product Conversion Chart

#### Welcome to the New rf IDEAS

Legacy Product Conversion Chart

Since our founding, we've always been known for meeting identity access management challenges with bold ideas. Now, at our 25th anniversary, we look forward to an even bolder future. That's why we're introducing a new company logo and product branding to embody our values of expertise, responsiveness and collaboration.

As an rf IDEAS ENGAGE partner, we'll help you achieve a smooth transition to our new branding. In addition to these product names, we'll be providing more information about the changes you will need to implement, including our new logo.

For new customers, please begin using our new product names immediately. For existing customers, we'll continue to support products that are in service as outlined in our sales and warranty policies. The newly branded products will start shipping as current inventory becomes depleted. Products with the new branding will continue to provide the same functionality and quality.

LEGACY BRANDING	NEW BRANDING
RF IDeas	rf IDEAS
	New company logo and text style expand beyond our RFID heritage to emphasize continuous innovation
pcProx®	WAVE ID® Solo
	Single-frequency 125 kHz or 13.56 MHz reader
pcProx <sup>®</sup> Nano	WAVE ID® Nano
	Ultra-compact, USB-format single-frequency reader
pcProx <sup>®</sup> Playback	WAVE ID <sup>®</sup> Playback
	Reads user data from NXP MIFARE® badges for use in existing applications
pcProx <sup>®</sup> Writer	WAVE ID® Writer
	Reader/writer for NXP MIFARE® smart cards
pcProx <sup>®</sup> Plus	WAVE ID® Plus
	Dual-frequency reader for 125 kHz proximity and 13.56 MHz smart cards
pcProx <sup>®</sup> SP	WAVE ID® SP
	Ultra-slim single-frequency 13.56 MHz reader
pcProx <sup>®</sup> Plus SP	WAVE ID® SP Plus
	Ultra slim, dual-frequency reader for 125 kHz proximity and 13.56 MHz smart cards
Embedded Reader	WAVE ID® Plus Embedded OEM
	New: Single- or dual-frequency reader for direct integration into OEM devices
pcProx <sup>®</sup> BLE	WAVE ID <sup>®</sup> Mobile
	Dual-frequency readers with Bluetooth® low energy technology for reading both cards and mobile credentials
pcSwipe <sup>™</sup> Enroll	pcSwipe <sup>™</sup> Magnetic Stripe Reader
	Magnetic stripe reader
pcProx <sup>®</sup> Sonar	WAVE ID® Sonar
	Presence sensor to protect unattended devices with no additional software or user action required
Wave ID® Analyze	WAVE ID® Analyze
	Card analyzer for identification of proximity and contactless smart card technologies
pcProx <sup>®</sup> Configuration	rf IDEAS <sup>®</sup> Configuration Utility
Utility	Reader configuration for desired credential data and cardholder access privileges

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# **Glossary of Terms**

TERMS	DEFINITIONS
ASCII	The American Standard Code for Information Interchange codes represent text in computers, communications equipment, and other readers that use text.
Contactless	The high frequency 13.56 MHz smart card technology.
FAC	Facility Access Code.
OEM	The card and badge reader without case. Available in self-contained modules for easy system integration.
WAVE ID	The rf IDEAS brand name given to all 125 kHz proximity and 13.56 MHz contactless smart card readers.
SDK	Software Developer's Kit. Software Developer's Kits from rf IDEAS provide the high level command capabilities to integrate software applications with our readers.
CSN	Also known as the Card Serial Number, is part of the ISO 15693 standard for vicinity cards operating at the 13.56 MHz frequency.
UID	The User ID, User Identification, or Unique ID is a number based on all bits of the card data.

# Information Symbols

SYMBOL	MEANING	DEFINITION
Ø	Note	Notes are useful information related to the text.
<b>?</b>	Тір	Tips can provide hints and pointers in addition to the text.
	Important	Important information can include prerequisites, limitations, and caution.

#### Chapter 1

# **Reader Basics**

## **1.1 Difference between Single Configuration and Multi Configuration** Reader

The WAVE ID Plus is a dual frequency programmable reader that combines 125 kHz and 13.56 MHz technologies into the same reader. It's the only reader in the industry that reads multiple cards of your choice among many different card types, delivering flexibility to any customer struggling with different card technologies. In contrast to the WAVE ID Plus reader, our standard WAVE ID Solo proximity and contactless readers function on a single frequency and single card type, which is either 125 kHz proximity or 13.56 MHz contactless.

## 1.2 Reader Setup

To setup the reader:

- 1. Connect the reader to the workstation using RS-232, USB, or Ethernet (must be in the same Subnet as the workstation).
- 2. The workstation should detect new hardware for USB connections. Verify the workstation recognizes this connection using Device Manager.

Chapter 2

## Software 2.1 rf IDEAS Configuration Utility

The rf IDEAS Configuration Utility provides users with the ability to configure their WAVE ID Solo and WAVE ID Plus readers.

The Utility allows WAVE ID Plus to be configured for 2 or 4 (depending on model) card types. rf IDEAS WAVE ID Plus readers with extended functionality can operate in one of two modes, "Data Format" mode ID processing or the "Extended" mode ID processing for output generation. The default mode of processing is Data Format mode.

The utility can be downloaded from the website and while opening the application after installation for the first time, user will need to accept the 'End User License Agreement (EULA)' as shown in image below:

	License Agreement for rf IDEAS <sup>TM</sup> software and hardware, including, but not limited to pcProx <sup>®</sup> , pcProxPlus <sup>®</sup> , pcSwipe <sup>®</sup> , WAVE
	figuration Utility, Proximity Activated Readers, Software Developer's Kit ("SDK"), and Proximity Reader DLLs, Remote Reader
lanage	nent (RRM) Tools, Mobile Application Source Code and associated SDKs, and Protocol(s) (each referenced herein as a "Product").
IPORT	ANT-READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or
	tity, hereinafter "You") and RF IDeas, Inc. ("rf IDEAS") with which you acquired the rf IDEAS Product. The Product includes, but is
ot limit	ed to computer software, firmware, the associated media, any printed materials, any support tools, and any "online" or electronic
ocume	ntation.
y (i) clic	king accept or acknowledging this EULA or (ii) installing, copying, downloading, or otherwise using the Product, you agree to be
ound to	the terms of this EULA. If you do not agree to the terms of this EULA, rf IDEAS is unwilling to license the Product to you. In such
ent, yo	u may not use or copy the Product, and you should promptly contact the vendor you obtained this Product from for instructions
n the re	turn of the unused Product.
OFTW	RE PRODUCT LICENSE: The Product is protected by copyright laws and international copyright treaties, as well as other
ntellectu	al property laws and treaties. Any software included with the Product is licensed, not sold.
1. GR	ANT OF LICENSE.
Thi	EULA grants you the following rights:
1	1. General License Grant. Subject to and conditioned upon your strict compliance with all terms and conditions set forth in this
	EULA, rf IDEAS grants to you as an individual or single entity, a nonexclusive license to make and use copies of the Product for
	the sole purposes of designing, developing, and testing the software application products developed by you using the Product
	("Licensed Product(s)"). Notwithstanding anything in the foregoing, you may install copies of the Product on an unlimited
	number of computers provided only you or authorized individuals within your entity use the Product. Any Product licensed to a

Image 1: End User License Agreement (EULA)

# 2.2 Utility Overview

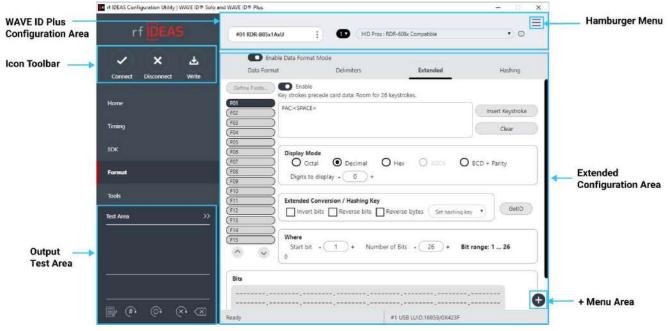


Image 2: Utility Overview

Please note that any unsupported functions will be greyed out.

## 2.3 Hamburger Menu

rf IDEAS	DEVICE LIST	CONFI	GURATION(s)	Ξ
		Not Available	Auto Connect	
▲ × ∓	Select a device 🔻	2         Not Available           3         Not Available	Device	
Connect Disconnect Write		(4) ( Not Available	View	0
lome	Connection Type		Help	
	USB (Universal Serial Bus) ports		Check for update	



The Hamburger Menu contains all the basic configuration options for the utility.

## Auto Connect Menu

rf IDEAS Configuration Utility   WAVE ID® Solo a	and WAVE ID® Plus		1977	□ >
rf IDEAS	DEVICE LIST	_	CONFIGURATION(s)	Ξ
	#01 RDR-805x1AxU USB Firmware: 16.9.0	✓ USB	Auto Connect	>
<ul> <li>★</li> <li>★</li> <li>★</li> </ul>	LUID: 0/0x0000 0C27:3BFA RF IDeas	Serial	Device	>
Connect Disconnect Write		Ethernet	View	>
Home	Connection Type		Help	$\rangle$
Timing	USB (Universal Serial Bus) p	ports	Check for update	

Image 4: Auto Connect Menu

The Auto Connect menu provides options for reader to utility connections.

**USB**: The utility searches for all USB connected readers at start-up.

Serial: The utility searches for all serial connected readers at start-up.

**Ethernet**: The utility searches for the Ethernet connected reader to the IP Address and Port provided by user.

### **Device Menu**

If IDEAS Configuration Utility   WAVE ID Sol	o and WAVE ID® Plus			-	×
rf IDEAS	DEVICE LIST	CONFIGURA	TION(s)		Ξ
	#01 RDR-805x1AxU	HID Prox : RDR-608x Compatible	Auto Connect		 5
<ul> <li>★</li> <li>★</li> <li>★</li> </ul>	USB Firmware: 16.9.0 LUID: 0/0x0000	(2) RDR-758x Equivalent Reset to factory defaults	Device		
Connect Disconnect Write	0C27:3BFA RF IDeas	Reset stored settings	View		>
	Connection Type		19		 _
Home	( ), p	Write stored settings	Help		 <u> </u>
Timing	USB (Universal Serial Bus) p	ports	Check for update		 
Timing					 

Image 5: Device Menu

The Device menu lists the options for resetting the reader to factory defaults and resetting the stored settings.

Reset to factory defaults: Resets all configuration parameters to defaults.

**Reset to Stored Settings:** This selection allows users to reset the reader to their own personally defined stored settings.

Write Stored Settings: Writes the current configuration settings to stored settings.

The last two options from the Device menu will not be available for single configuration readers.

### View Menu

🚛 rf IDEAS Config	guration Utility   V	VAVE ID ® Solo i	and WAVE ID <sup>®</sup> Plus					- 0	×
rf	DEAS		DEVICE LIST			CONFIGURAT	'ION(s)		
2005			#01 RDR-805x1AxU			HID Prox : RDR-608x Compatible	Auto Connect		
	×	L.	USB Firmware: 16.9.0	:	2	RDR-758x Equivalent	Auto Connect		
			LUID: 0/0x0000 0C27:3BFA RF IDeas		3	OFF	Device		>
Connect	Disconnect	Write			✓ Show to	oltip balloon help	View		
Home			Connection Type				Help		>
			USB (Universal Serial B	Bus) po	orts		Check for update		
Timing			Ľ						

Image 6: View Menu

The view menu provides options for altering the appearance of certain functions of the utility. All the options in this menu are set to appear by default.

**Show Tooltip Balloon help**: Menu option for displaying or not displaying the tooltip pop-up balloon. The application default is set to Show tooltips.

#### Help Menu

🐠 rf IDEAS Configuration Utility   WAVE ID® Solo a	nd WAVE ID ® Plus		- 🗆 X
rf IDEAS	DEVICE LIST	CONFIGURA	
	#01 RDR-805x1AxU	HID Prox : RDR-608x Compatible	Auto Connect
<ul> <li>✓</li> <li>X</li> <li>₹</li> </ul>	USB Firmware: 16.9.0	2 RDR-758x Equivalent	Auto Connect /
	LUID: 0/0x0000 0C27:3BFA RF IDeas	3 ( OFF	Device >
Connect Disconnect Write		(4) ( OFF	View >
Home	Connection Type	Read user manual	Help >
	USB (Universal Serial Bus) p	Read End-User License Agreement	Check for update
Timing		(EULA)	
SDK	O Serial: RS-232 and virtual C	www.rfideas.com	
	Use COM ports 1	About	Baudrate 9600 •

Image 7: Help Menu

The Help menu provides information for which users can seek out additional assistance using the utility and/or reader.

**Read User Manual:** Opens the user manual that is provided in the download with the rf IDEAS Configuration Utility.

Read End-User License Agreement (EULA): Opens the end user license agreement which user has

accepted while launching the application for the first time after installation. www.rfideas.com:

This operation will open a new window to the rf IDEAS website.

**About:** This menu options differ when a reader is connected to the utility vs. when there is no reader connected. Without a connected reader, the "About" informational content simply displays the utility version. When a reader is connected, the firmware information is also provided. The rf IDEAS website address is displayed in both modes.

#### Check for Update Menu

The Check for update selection will allow user to download latest Card list, Reader List, and VidPid list.

rf IDEAS Configuration Utility   WAVE ID® Solo a	and WAVE ID ® Plus			□ X
rf IDEAS	DEVICE LIST	CONFIGURA	rion(s)	
		HID Prox : RDR-608x Compatible		-
✓ × ∓	#01 RDR-805x1AxU USB Firmware: 16.9.0	RDR-758x Equivalent	Auto Connect	
	LUID: 0/0x0000 3 0C27:3BFA RF IDeas	) ( OFF	Device	>
Connect Disconnect Write	4	) (OFF	View	>
Home	Connection Type		Help	>
Timing	USB (Universal Serial Bus) ports		Check for update	



# User must be connected to the internet to update the Card List, Reader List, and VidPid List.

Please follow the below steps to download latest Card List, Reader List, and VidPid List.

- 1. Click on Hamburger Menu in the utility and click **Check for update**.
- 2. The latest updates will be shown in the below screenshot.

rf IDEAS Configuration Utility   WAVE ID <sup>®</sup> Solo a	nd WAVE ID® Plus	- 🗆 X
rf DEAS	Three Updates available!	
		Auto Connect
Connect Disconnect Write	rf IDEAS orfiguration Utility Copyright 2020, rf IDEAS, Inc.	Device
	L 9752755	View )
Home	Please select the checkbox and click on Update	Help
	Update for Card List	Check for update
Timing	Update for Reader List	
SDK	Update for VidPid List	
Format	Update	Baudrate 9600 •
Toals	O Ethernet (Local IP 192.168.56.1)	
Test Area >>>		
	IP Address $0$ , $0$ , $0$ , $0$	
	Port 10001 Find Next IP	
		G
	Disconn	ected

Image 9: Updates Available

- 3. User must select the desired checkboxes and click the **Update** button.
- 4. After the latest updates are downloaded, the Download Successful pop-up message will be shown, and the application will restart once user clicks on **OK**

rf IDEAS Configuration Utility   WAVE ID® Solo	and WAVE ID® Plus	- X
rf DEAS	Download Successful × rf DEAS rf IDEAS Configuration Utility ⊜ Copyright 2020, rf IDEAS, Inc.	= • 0 • 0 • 0
Home	Connection Type OUSB (Universal Serial Bus) ports	
Timing SDK	RFIDeas X The app will restart now.	
Format		udrate 9600 •
Test Area >>>	O Ethernet (Local IP 192.168.56.1) IP Address 0 . 0 . 0 . 0	
	Port 10001 Find Next IP	
		¢
	Disconnected	

Image 10: Download Successful and App restarts

5. After the app is restarted, click on the **Check for update** to show you are up to date.

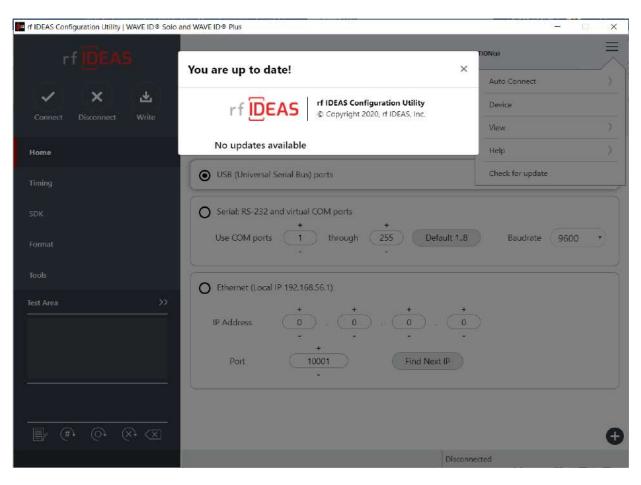


Image 11: No Updates are Available

# 2.4 Plus (+) Menu

🚾 rf IDEAS Configuration Utility   WAVE ID 🖲 Solo	o and WAVE ID ◎ Plus		- 🗆 🗙
rf IDEAS	DEVICE LIST	CONFIGURATION(s)	
	#01 RDR-805x1AxU	HID Prox : RDR-608x Competible	• 0
🖌 🗙 🛃	USB Firmware: 16.9.0	2 RDR-758x Equivalent 3 OFF	*) ©
Connect Disconnect Write	0C27:3BFA RF IDeas	(4) (OFF	• •
Home	Connection Type		
Timing	USB (Universal Serial Bus) ports		
SDK	O Serial: RS-232 and virtual COM	ports	
Format	Use COM ports 1 th	rrough (8) Default 18 Baudrate	9600 •)
roma	-		
Tools	O Ethernet (Local IP 172.16.1.163)		
Test Area >>>	t	+ + +	
	IP Address 0	$\begin{pmatrix} \mathbf{t} \\ 0 \\ \mathbf{\cdot} $	
	Port (10001	Find Next IP	
- <del>1)</del>			
			0
	Ready	#1 USB LUID: 0/0x0000	+ Menu /
	<b>100000000</b>		
rf IDEAS Configuration Utility   WAVE ID® Solo and	d WAVE ID ♥ Plus	-	× □
rf DEAS	DEVICE LIST	CONFIGURATION(e)	
	#01 RDR-805x1AxU US8 Firmware: 16.9.0		0
✓ × ∓	LUID: 0/0X0 3 0C27:38FA.RF IDeas		0
Connect Disconnect Write		(OF	0
Home	Connection Type		
Timing	USB (Universal Senal Bus) ports		
SDK	O Serial: RS-232 and virtual COM ports	Open hwg+ file	0
Format	Use COM ports 1 through	+	0
N-99010	×		
Tools	O Ethernet (Local IP 192,168,43,227)	Save device data to hwg+ file	1 A
Test Area >>		Save device data to Secure hwg+ file	*
	IP Andress (	- Install libusb for NTWCC reader	4 ju
	Port 10007	Find Next IP Save USB device hex raw data to (SDK) file	.*.
	4 · · ·	save usp bence new ram usta to (SDN) the	
			🛛 🖛 + Menu Area
	Ready	#1 USB LUID:0/0X0	

Image 12: Plus (+) Menu Overview

The Plus (+) menu lists the following options:

**Open hwg+ file**: Opens a ".hwg+" or ".hwg+" file. These files contains the standard configuration settings for the reader.

**Open Secure hwg+ file:** Opens secured ".hwg+" file into the reader. A secured hwg+ file contains all the configuration settings for the reader and an iEndOfHwgFile token which will be unique for that file. The token will validate if the hwg+ file has been compromised while opening the file.

Save device data to hwg+ file: Saves the configuration settings of the reader.

**Save device data to Secure hwg+ file:** Saves the configuration settings of the reader in a secured configuration file utilizing a unique iEndOfHwgFile token.

Install libusb for NTWCC reader: It will install the driver needed to operate a NTWCC type reader.

Please note that any unsupported functions will be greyed out.

Save USB device hex raw data to (SDK) file: Report configuration block trace for USB connection.

## 2.5 Icon Toolbar

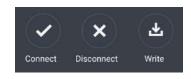


Image 13: Icon Toolbar

The Icon Tool Bar contains the three most general configuration controls for the utility.

### Connect



Image 14: Connect Button

Clicking the Connect icon button commands the utility to search for all the readers on the selected ports.

Once the utility detects a reader, the Device List pull-down menu in the Standard Configuration Area displays the interface connection, firmware, and LUID information for the

connected reader. Below images show how the device list is updated once reader(s) get connected to utility.

📠 if IDEAS Configuration Utility   WAVE ID ® Solo and	I WAVE ID® Plus			-		×
rf IDEAS	DEVICE LIST		CONFIGURATION(s)			$\equiv$
Connect Disconnect Write	#01 RDR-805x1AxU USB Firmware: 16:9.0 LUID: 31267/0r7A23 0C27/3BFA RF IDeas	2 3 4	HID Prox : RDR-508x Compatible           RDR-758x Equivalent           OFF           OFF			
Home	#01 RDR-805x1AxU USB Firmware: 16.9.0 LUID: 31267/0x7A23 0C27:3BFA RF IDeas					_
Timing	UL27/30PA Nº ID'eas	rts				
SDK Format	#02 RDR-xx81AKU USB Firmware: 9.0.0 LUID: 4099/0x1003 0C27:38FA RF IDeas	M ports through		Baudrate 9600	<u></u>	
Tools	#03 RDR-80081AKU USB Firmware: 14.3.0 LUID: 4096/0x1000 0C27:38FA RF IDeas	.227)				
Test Area >>	IP Address 0	. <u>•</u>	· • • • •			
	Port 100	01	Find Next IP			
<b>₽ (#) (0) (X) (X</b>	Ready		#1 USB LUID: 31267/0x7A23	1		Ð

Image 15: Multiple Device Connection

f IDEAS Configuration Utility   WAVE II	$\mathbb{P}^{\otimes}$ Solo and WAVE $\mathbb{P}^{\otimes}$ Plus			a <del>-1</del>		×
rf IDEAS	DEVICE LIST			CONFIGURATION(s)		Ξ
	#03 RDR-80081AKU	1	HID Prox : RDR-608x Cor	mpatible	•	•
~ × Ŧ	USB Firmware: 14.3.0 LUID: 4096/0x1000	2	HID ICLASS ID (IClass SE	Ξ)	٣)	) 0
	0C27:3BFA RF Ideas	3	-Not Available-		۳.	) 0
Connect Disconnect Write		4	-Not Available-		٣	) 0
Home	Connection Type					
Timing	Use USB (Universal Set)	rial Bu	us) ports			
SDK	O Serial: RS-232 and virtu	ual CC	)M ports			
Format	+	+				
	Use COM ports 0 through	0	Default 18	Baudrate 9600	•	
Tools	-	-				
Test Area >>	C Ethernet (Local IP 192.	.168.5	56.1)			
	IP Address 0	0	0.00			
		-	~~~~~	1		
	+					
	Port 0		Find Next IP			
	-					
						+
				#01 USB LUID: 4096/0X100	0	



### Disconnect



Image 17: Disconnect Button

Pressing the disconnect button, commands the utility to disconnect from all readers connected through the available ports.

After the utility disconnects from all the readers, the device list pull-down menu will clear. The status bar will display a Disconnected message, as shown in Image 14:

rf IDEAS Configuration Utility   WAV	E ID <sup>®</sup> Solo and WAVE ID <sup>®</sup> Plus	- 0	×
rf IDEAS	DEVICE LIST	CONFIGURATION(s)	$\equiv$
<ul> <li>★</li> <li>★</li> <li>★</li> </ul>	Select a device 🛛 🔻	1 (-Not/Available	
Connect Disconnect Write		4 C – Not Available – 💌	
Home	Connection Type		
Timing	O Use USB (Universal	Serial Bus) ports	
SDK	• Serial: RS-232 and v	virtual COM ports	
Format	Use COM ports 0 thro	+ Default 18 Baudrate 9600 •	
	O Ethernet (Local IP 1	92.168.56.1)	
Tëst Area >>	IP Address	· • • • • • •	
	Port 0	Find Next IP	
			🕈 st
		Disconnected	

Image 18: Disconnected Message

### Write

Pressing the Write button, writes the configuration settings to the reader.



Image 19: Write Button

# 2.6 WAVE ID Plus Configuration

Configuration	
IID Prox : RDR-608x Compatible	
RDR-758x Equivalent	
ndala ASP 26 bit (Motorola) : RDR-638x Compatible	
(eri NXT UID	

Image 20: WAVE ID Plus Configuration Area

### **Device List**

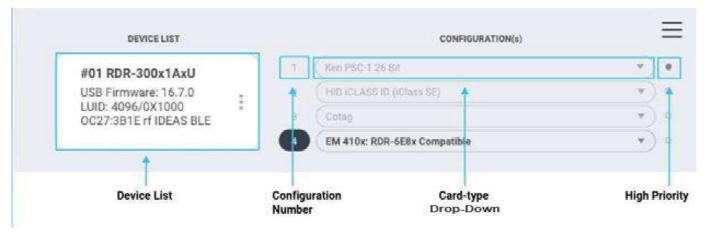


Image 21: WAVE ID Plus Configuration Header

Device List Pull-down: Contains a list of readers found by the utility.

### Configuration(s)

**Configuration Number**: This option provides the ability to switch between configurations. Users can set and edit settings for two or four separate configurations quickly and easily. The active configuration on utility at any particular moment will be highlighted.

**Card Type Drop-Down Menu**: This drop-down menu allows users to select the required card type for their own configuration settings. Each configuration has the ability to have separate card types.

**High Priority**: Provides a WAVE ID Plus user the ability to give a certain configuration a higher priority than another. This is useful when the user has a population of multi-technology card consisting of a combination of 13.56 MHz/125kHz cards.

If multiple configurations have High Priority selected, only the first one (by configuration order) is considered High Priority.

## 2.7 Home Tab

### **Connection Types**

rf IDEAS Configuration Utility   WAVE ID ® Solo a	nd WAVE ID ® Plus			, FFI.	×	
rf IDEAS	DEVICE LIST		CONFIGURATION(s)		=	
The second s	#01 RDR-805x1AxU	0	HID Prox : RDR-608x Compatible	• 0		
✓ × ±	USB Firmware: 16.9.0	2		0		
Connect Disconnect Write	LUID: 0/0X0 0C27:38FA RF IDeas	â		.0		
Comed Obcomed Wile		4	( Gr	0.0	8	
Home	Connection Type					
Timing	USB (Universal Serial Bus) po	irts				USB
SOK	O Serial: R5-232 and virtual CO		+ 255 Default 1.8 Baudrate 960	_		Serial RS-232
Format	Use COM ports	through	255 Default 1.8 Baudrate 960	U	2	
Tools	C Ethernet (Local IP 192.168.43	1.227)				
Test Area >>		-				
	IP Address	. 🜔				Ethernet
	Port	л	Find Next IP			
<b>₽</b> @ @ ∞ ∞					Ð	
	Ready		#1 US8 LUID:0/0X0			

Image 22: Home Tab

The Home tab offers various ways, a reader can connect to the rf IDEAS Configuration Utility. The different selections allow the user to choose the connection type for the specific logical protocol of their reader.

**USB**: Make this selection if the connected reader has a USB logical protocol. The utility will search the USB bus for connected readers.

**RS232 COM Ports and USB Virtual COM Ports:** The utility will search for readers connected to RS232 COM Ports or Virtual COM Ports

Default 1.8: Pressing this button will reset the COM port search range (COM1 through COM8).

Ethernet: Connects to an Ethernet reader at the given IP address and creates a TCP/IP path to the reader. The first, second, third, and fourth byte of the TCP/IP address and the port number must be entered.

Port Option: Allows for changing the Internet socket port numbers.

Find Next IP Button: Looks for other readers on the same Ethernet connection.

### **Output Test Area**

Test Area	— Expand Area
00:000000 00:000000 00:000000 00:000000 00:000000	
00:000000	
Test Button Auto Focus Clear	
Auto GetID Auto Clear	

Image 23: Output Test Area

This is the test area for the keystrokes entered by the reader. On serial readers, this displays the unsolicited serial port data.

The **Auto GetID** icon can be selected for the utility to poll the reader for raw data and displays the results in the lower section of the test area.



Image 24: Auto GetID

The **Auto Focus** icon (when selected) keeps the cursor in the test area box to capture the keystrokes output. If you need to make any configuration changes you will need to turn off Auto Focus.

The Auto Clear box clears all text in the Output Test Area after each card scan.

The **Clear** button erases all text in the Output Test Area each time the user manually presses the clear button.

The **Test** button will open a text editor. This will allow a user to see the card data output from a keystroking reader.

#### Status Bar

•	
USB #01 LUID: 23/0x0017	← Status Ba

Image 25: Status Bar

The status bar reports status on the state of the reader, connected or disconnected. If a reader is connected it will display the connection type and the LUID value. If the reader is disconnected the status bar will read 'Disconnected or No Devices Found'. It also shows many other status in utility of different activities like 'Write', 'Reset to Stored', 'Cloning' etc.

## 2.8 Timing Tab

Use this tab to configure the reader's card hold time (ID) and USB keystroke timing. The timing is presented in milliseconds.

**Card Data Hold Time**: This option determines how long the ID is held after the card is removed from the reader. The LED will remain green until the card hold time expires, then turn red indicating a new card can be presented.

The timing options can range from 50ms to 9950ms min/max (increments of 50 milliseconds). The default is set to 1000ms.

**Continuous Read, Sends Data upon Read:** The reader will continuously read and send the ID from the presented card.

**Lock-Out Time for Repetitive Reads:** The time it takes the reader to read another card must be equal to or greater than the hold time and is only done in 50 milliseconds increments.

Lock-out time will be enabled only for single configuration readers.

Card read timing		
Card data hold time	- (1000) + msec.	
Continuous read, send data upon read		
Lock-out time for repetitive reads	- (1200) + msec.	

Image 26: Card Read Timing

**Key Press Time:** The length of time the key is held down. The minimum value is 0. The maximum is 640. The default is 20.

**Key Release Time**: Enter the time delay between keystrokes. If set to 0, the reader will output as fast as possible. The minimum value is 0. The maximum is 640. The default is 20.

Setting the key press and key release time too high may result in digits in the card data to be sent more than once; Setting the key press and key release time too low may result in missed digits in card data.

USB keystroke tim	19	
Key press time	- 20 + msec.	
Key release	- 20 + msec.	
Key release	- 20 + msec.	

Image 27: USB Keyboard Emulation Timing

## 2.9 SDK Tab

Use this tab to configure the Software Developer's Kit (SDK) Get ID functions, enable and disable keystroking, control BEEPER and LED behavior, and define device Logical Unit ID.

rf IDEAS Configuration Utility   WAVE ID ® Solo and	WAVE ID ® Plus	D
rf DEAS	#01 RDR-805x1AxU	(HID Prox: RDR-608x Compatible • O
✓ × ₽	Disable Keystrokes for SDK Of	f
Connect Disconnect Write	Beeper Beep now	Long beep(s) Number of beeps - 1 +
Home	Beep on card read	folume O Off O Low O Medium 🖲 High
SDK	LED  Auto (controlled by reader)	O Off O Green O Amber O Red
Format	Card ID	Data bytes
Tools	GetID GetID32	Queued ID : 0 Bits 00 00 00 00 00 00 00 00 00 00 00 00 00
Test Area >>	GetQueuedID	
1182797422	Clear lock-out	Age : 00:00:00 (0x48ms) Over runs : 0 Lockout timer : 0
32 Bits : 00 00 00 00 46 80 0E 6E	Logical Unit ID (LUID)	0 065535 or 0x00000xffff
<b>₽ (%)</b> (%) (%) (%)	Ready	#1 USB LUID:0/0X0

Image 28: SDK Tab

### Disable Keystrokes for SDK

Disable Keystrokes for SDK allows a user to turn keystroking on or off. It is always enabled for SDK type readers and cannot be disabled so this option is applicable only for keystroking type readers.

#### LED

The desktop, surface mount, NANO, and non-housed model readers can be equipped with a LED.

**Auto**- Reader automatically sets the LED color: Red = Standby, Green = Credential Read, Amber = Device Enumerating or Firmware Updating.

Off- LED is OFF.

**Red**- LED is set to always be red.

Green- LED is set to always be green.

Amber- LED is set to always be amber.

#### Logical Unit ID

A user defined 16-bit number used to identify one reader from another.

Logical Unit ID (LUID)	(0x100	065535 or 0x00000xffff
		G
	#1 USB LUID	256/0X0100

Image 29: Logical Unit ID

#### Beeper

If equipped, the reader can be configured to produce a beep when a credential is detected by the reader.

**Enable Beep on Card Read**- Enable this to set the reader to beep when a card is read. Default is set to ON.

**Beep Now**- Simulates BEEPNOW SDK Command to BEEP the reader according to "Long Beep" and "Number of Beeps." It is reader configuration independent.

**Long Beep(s)** - By default, the beep is set to a short beep. 2 long beeps or 5 short beeps are allowed.

**Number of beeps**- The minimum is 1 beep and the maximum are 5 beeps. Default is set to 1 beep.

#### Volume

Applicable only for readers equipped with Volume Control.

**OFF**- Turns volume off

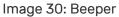
Low- Sets beeper volume to minimum level

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Medium - Sets beeper volume to mid-range level

High (Default) - Sets beeper volume to maximum level

( Barris and )				nber of beeps -	
Beep now	Long b	ieep(s)	Nur	nber of beeps -	<u> </u>
Beep on card read	Volume	O Off	O Low	O Medium	• High



#### Card ID

**GetID**- Press while presenting a card. The ID will be displayed in the "Data bytes" window, 64 bits maximum.

Card ID		Data bytes	
	GetID	ID: 62 Bits	
	GetID32	2A AA AA AA AA AA AA AA	
C	GetQueuedID		
Cle	ar lock-out		
Cle	ar UID		

Image 31: GetID Data Display

**GetID(32)**- Press while presenting a card. The ID will be displayed in the "Data bytes" window, 255 bits maximum.

Card ID	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Data bytes		
C	GetID	ID: 62 Bits		
6	GetID32	00 00 00 00 00 00 00 00		
	Genose	00 00 00 00 00 00 00 00		
(	GetQueuedID	00 00 00 00 00 00 00 00		
	ar lock-out	2A AA AA AA AA AA AA AA		
in the second se	ar UID			
	100			

Image 32: GetID (32) Data Display

**GetQueuedID**- Pressing this button will return the data bytes for the last card read, 255 bits maximum.

Card ID		Data bytes		
$\sim$	GetID	Queued ID : 62 Bits		
	GetID32	00 00 00 00 00 00 00 00		
	GEIID32	00 00 00 00 00 00 00 00		
	GetQueuedID	00 00 00 00 00 00 00 00		
		2A AA AA AA AA AA AA AA		
Clear lock-out		Age : 00:00:55 (1164x48ms)		
		Over runs : 0		
		Lockout timer : 0		

Image 33: GETQueuedID Data Display

**Clear Lockout-** Check to clear the time remaining to allow the reader to read the next card immediately.

**Clear UID-** If Clear UID is checked, the card and the overrun counters will be cleared for the next read. If Clear lock-out is checked, the reader can read another card.

Age Format = HH:MM:SS displays - 00:00:55 Time since the last card read.

# 2.10 Format Tab

## Data Format Tab

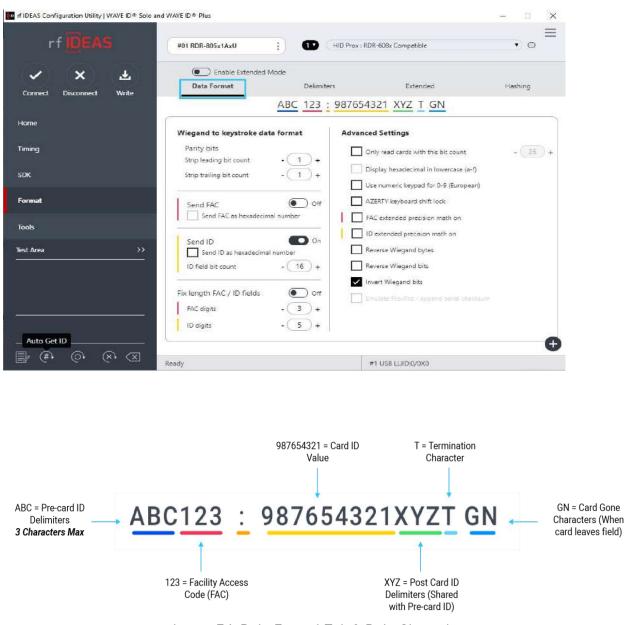


Image 34: Data Format Tab & Data Character

Above image illustrates the various positions delimiter characters can be added to the card data. The numbered portions of the diagram are values FAC/ID from the presented card. The letter portions of the character diagram are created by the user by modifying the pre and post data delimiters in the utility and are keystroked with the FAC/ID.

#### Wiegand to Keystroke Data Format:-

Strip Leading and Trailing Bit Count: By altering the numbers in the leading and trailing bit count, users have the option to strip and discard bits from the card data. The leading and

trailing bit counts can be set to range from 0 to 15 for single configuration readers and 0 to 142 for dual/four configuration readers.

Send FAC (Facility Access Code): Enables FAC out when the card is presented.

Send FAC as Hexadecimal Number: Sends FAC as a hex number, the default is decimal.

**Send ID**: Enables the reader to send the ID portion of the card data.

Send ID as Hexadecimal Number: Sends ID in hex format.

**ID Field Bit Count**: Sets the number of bits used for the ID, range is 8 to 80.

Fix length FAC/ ID Fields: Enables the FAC and ID to be set to a fixed length.

**FAC Digits**: The FAC output is set to a length of digits between 1 and 32. Zeros are added to the front (of the FAC portion) of the data to create a specific length.

**ID Digits**: The ID output is set to a length of digits between 1 and 32. Zeros are added to the front (of the ID portion) of the data to create a specific length.

#### Advanced Settings:-

**Only Read Cards With This Bit Count:** Only reads cards with the specified BIT Count, range adjustable 26 to 255.

**Display Hex in Lowercase:** Displays the FAC/ID in lowercase Hex format.

Use Numeric Keypad: Defines which keypad the reader will use.

**AZERTY Keyboard Shift Lock:** Displays the output as if it were being output from an AZERTY keyboard.

FAC Extended Precision Math On: Enables TRUE 64 bit math.

ID Extended Precision Math On: Enables TRUE 64 bit math.

**Reverse Wiegand Bytes:** Reverses data in byte chunks (8 bits = 1 byte). Example using 26bit card output in Hexadecimal:

Non-Reverse Wiegand Bytes: 37C3E80- Reverse Wiegand Bytes: 803E7C03

**Reverse Wiegand Bits:** Reverses each bit. Example is shown below:

 Non-Reverse Wiegand Bits: 37C3E80 = 11011111000011111010000000

 Reverse Wiegand Bits: 05F0FB =
 00000001011111000011111011

**Invert Wiegand Bits:** Inverts each bit. When looking at the binary string, it will change the 1's to zeroes and 0's to ones.

**Emulate ProxPro-Append Serial Checksum:** This option is only for serial readers. It adds a digit to the end of the serial data. It emulates the serial data format to match HID Corp. Prox Pro reader by sending a 2-byte checksum after the card data.

#### **Delimiters Tab**

The delimiter tab provides a way for users to add pre or post keystrokes to the card data. Click the appropriate keyboard icon to select the appropriate corresponding delimiters.

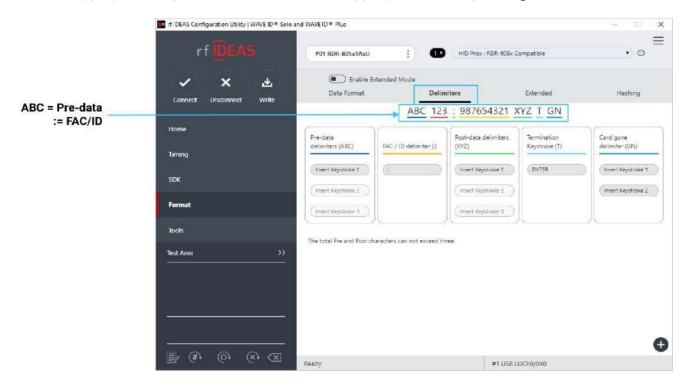


Image 35: Delimiters Tab

**Pre-data Delimiters (ABC):** Select from 0 to 3 characters to display at the beginning of the card data. These characters are shared with the post string of characters.

FAC/ID Delimiter (:): Select a character to display between and separate the FAC and ID data.

ABC123 : 987654321XYZT GN

Image 36: FAC/ID Delimiter

**Post-data Delimiters (XYZ):** Select from 0 to 3 characters to keystroke to the end of the card data. These characters are shared with the pre string of characters.

**Termination Keystroke (T):** Adds a keystroke to the end of the card data to signify the end of the card data.

**Card gone delimiters (GN):** Adds a keystroke to the end of the card data when the card is removed.

#### Delimiter Keyboard:

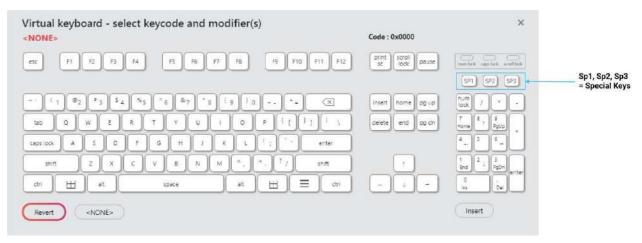


Image 37: Delimiter Keyboard

The Delimiter Keyboard is used to select user defined delimiters (keys). Once opened users can:

Left Click: Selects desired delimiter (key).

**Revert:** Takes user back to previously inserted delimiter choice.

**<None>:** Deletes any selected/inserted delimiter.

**Insert:** Applies selected delimiter to be used.

Special Keys - Sp1, Sp2, and Sp3

There are some additional measures that can be taken to make it more difficult for unauthorized users to reproduce passwords, such as, by adding additional keystroke characters to the card information that is difficult to reproduce, while configuring the data. These additional characters are labelled **Sp1**, **Sp2**, and **Sp3** on the delimiters Virtual Keyboard. The Sp1, Sp2, and Sp3 keys are used only for keystroking environments to send unprintable characters to a specified application.

#### Extended Tab

The Extended feature gives the user the ability to break the raw card data into multiple fields, create pre and post delimiters for each field, and perform data conversion on the raw data in each field. The user can create up to 31 delimiters depending on the number of enabled fields

and the number of delimiters per field. Please note that only one mode can be enabled at a time of Data Format & Extended.

f IDEAS Configuration Utility   WAVE ID® Solo and	I WAVE ID® Plus			- 🗆 X
rf DEAS	#01 RDR-805x1AxU	HID Prox: R	DR-608x Compatible	••
Connect Disconnect Write	Enable Data For Data Format	mat Mode Delimiters ble Key strokes precede card dat	Extended	Hashing
Home	F01 F02		a. NOTITIOT 20 Keystickes.	Insert Keystroke
Timing	F03 (F04			Clear
SDK Format	F05         Display           (F06         O           (F07         O           (F08         Digit		Hex O ASCII O	BCD + Parity
Tools	G	ed Conversion / Hashing Key ert bits Reverse bits R	Reverse bytes Set hashing ke	ey 🔻 GetiD
Test Area >>	F13 F14 Where	bit - 38 + Number	of Bits - 8 + Bit	range: 38 45
	Bits			
	Ready		#1 USB LUID:1200/0X4B0	

Image 38: Extended Tab

**Enable**- Press the button to enable or disable the selected field. This allows the delimiters to be created and sent when the selected bits are processed.

- The settings made on different field(s) will persist only when 'Write' button is clicked to save them.
  - When any of the field(s) is disabled and 'Write' operation is not performed, settings of that particular field will not recover on enabling it again so it is best advised to always save the settings via 'Write' button present in Icon Toolbar.

However, in case of above scenario, you may re-connect the reader. It will bring the reader to its last saved settings from where you will need to do the settings all over again.

- If you would like to do extend settings from scratch follow the steps mentioned below:-
  - A. Bring the WaveID reader to its defaults from (Hamburger Menu > Device Menu > Reset to Factory Defaults).Move to desired configuration #.
  - B. Enable the extend mode on that configuration#. Click on 'Write' to save extend mode in the reader.

- C. Open the Get ID and present the card. The GetID box will close automatically in few seconds.
- D. Start making changes in extended settings afterward and click on 'Write' in the end to save those.

**GetID** – Press the button and present the new card to the reader, this must happen each time a new card is used. The information is used to set the max number of bits on the card and the bits displayed in bit window of the utility.

**Define Fields-** It is only available for the FIPS 201 RDR-7P71AKU and OEM chuid board reader types. Pressing this button will let the user select from the list of predefined card formats.

**Start Bit-** Enter a number to define the left most significant starting bit for the field.

**Number of Bits-** Enter the number of bits used for the field data. This value is added to the Start Bit to define the range of bits used in the field.

**Insert Keystroke-** Enter the delimiters in the delimiter text box (USB readers). Delimiters for serial readers are entered using the virtual keyboards.

**Clear-** Pressing the clear button will clear the delimiters in the delimiter text box.

**Decimal-** Enables the reader to output the card field in decimal format.

**Hex-** Enables the reader to output the card field as a base 16 number in uppercase hex.

**ASCII-** Displays Card Data in ASCII Character Mode, where every byte represents a printable ASCII Character. The ASCII data bit field shall be in multiples of 8 bits and each field bit pattern must define a printable ASCII character (0x20 thru 0x7F); otherwise, warnings (?...) will be displayed in the lower left portion of the "Where" box on the rf IDEAS Configuration Utility Extended TAB screen.

NOTE:-

- ASCII Extended Mode is available only for Secure Type Readers that are compatible with MIFARE DESFire EV1/EV2 Cards, LEAF Smart Cards, and similar technologies. For readers supporting ASCII Character Mode, contact <u>Sales@rfideas.com</u>. See ASCII Extended Procedure in the Appendix to configure reader for ASCII Extended Mode Configuration.
- Before the reader can be configured in the ASCII Display mode, the reader must be preconfigured in advance using the Smartcard Manager Utility. Contact techsupport@rfideas.com for more information.

**BCD/Parity-** Enables the reader to output the card data in binary coded decimal, where each 5 bits represent 1, 2, 4, 8, and parity.

**Octal-** Enables the reader to output the card data in Octal.

Invert Bits- Inverts the bits from the card.

**Reverse Bits –** Reverses the bits from the card.

**Reverse Bytes-** Reverses the bytes from the card.

**Hashing Key-** The Hashing Key selection box allows the user to select the key they created to use for encrypting the selected field. The options are "Off, "A" or "B".

**Digits-** Used to set the number of digits the reader will output for the selected field.

**Up arrow-** Click to move the highlighted field up one position.

**Down arrow-** Click to move the highlighted field down one position.

#### Example Configuring WAVE ID Plus Reader using Extend:

1. Enable extended mode. Select the card type from list and save it using Write button. Click GET ID and present the badge.

nf IDEAS Configuration Utility   WAVE ID @ Solo a	and WAVE ID® Plus	- 🗆 X
rf <mark>IDEAS</mark>	Get Active ID	x <sup>ble</sup> O
Connect Disconnect Write	Waiting for card data from device. Scan card to get Extend values for fields.	nded Hashing Clear
Home Timing	FAC: 170 ID: 43690	ASCII O BCD + Parity
SDK		
Format	Step 2 Clos	e Step 1
Tools	F14 wwere Start bit + (40) + Number of Bits	- (8) + Bit range: 40 47
Test Area >>>	^ ~ 170	
64bits 555555555555555555555555555555555555	Bits	
	64bits 555555555555555	A
	#1 US6 L	U/D:0/0X0

Image 39: Taking output on GetID box

2. Click Close. You will then see your card data in Binary in the grey field.

n IDEAS Configuration Utility   WAVE ID ® Solo and WAVE	ID® Plus		- 🗆 🗙
rf DEAS	01 RDR-805×1AxU	HID Prox : RDR-608x Cor	npatible • O
Connect Disconnect Write	Enable Data Format Mode Data Format	Delimiters	Extended Hashing Clear
Home (F04 F05 Timing (F07 F06	Display Mode O Octal Digits to display		O ASCII O BCD + Parity
SDK (F09 (F10 F11 (F12 (F12) (	Extended Conversion	on / Hashing Key Reverse bits 🔲 Reverse byte	es Set hashing key  GetID
Tools (F13) (F14) (F15)	Where Start bit - 4	0 + Number of Bits -	8 + Bit range: 40 47
	s 		
		#1 USB LUI	D:0/0X0

Image 40: Bits area after taking output on GetID box

- 3. Choose your start bit and number of bits for each field that is enabled.
- 4. Add keystrokes to the field as needed by clicking on the virtual keyboard. These keystrokes will precede the card data for the selected field.

In IDEAS Configuration Utility   WAVE ID® Solo and WAVE ID® Plus		– 🗆 X
rfideas #01 RDR-805x1AxU : 1 HID Prox : RDI	R-608x Compatible	• •
Connect Disconnect Write	Extended	Hashing
Home Fol Fol Factors Precede card data:	Room for 26 keystrokes.	Step 1 insert Keystroke Clear
Virtual keyboard - select keycode and modifier(s) Enter	ASCII:	×
esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12	print sc lock pause	rumlick capt lack scrill lack
$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \end{array} \\ \end{array} \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \begin{array}{c} \end{array} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	insert home pg up delete end pg dn	num / * . 7 8 9 +
caps lock       A       S       D       F       G       H       J       K       L       1       :       ·       enter         shift       Z       X       C       V       N       M       <, ?       ?       ?       shift         ctri       Ш       ait       space       ait       Ш       ctri		4 5 6 1 2 5 0 .
Revert (NONE> Step 2: choose keystrokes	Keep Shifts	Close Step 3: Insert

Image 41: Virtual Keyboard in Extended mode

HINT: If you need an ENTER key after the card data, enable the next field and set number of bits to ZERO. Add an enter in the keystrokes box. See example below:

n IDEAS Configuration Utility   WAVE ID ® Sole and WA	/E ID® Plus	x
rf DEAS	#01 RDR-805x1AxU HID Prox : RDR-608x Compatible	≡
Connect Discornect Write	Enable Data Format Mode     Data Format     Delimiters     Extended  Define Fields	Hashing
Home (F0		Insert Keystroke
Timing (F0	3	Clear
SDK (FO	O Octal      Decimal O Hex O ASCI C	) BCD + Parity
Tools	Extended Conversion / Hashing Key     Invert bits Reverse bits Reverse bytes	ey 🔹 GetID
Test Area         >>           64bits 5555555555         FI	3 Where	t range: NONE
	its 	
	#1 USE LUID:0/0X0	

Image 42: Inserting ENTER at end of data in last enabled field

## Example configuring FIPS201 Reader using Extend:

1. Click "GetID" and present the card to the reader.

师 rf IDEAS Configuration Utility   WAVE ID ® Solo	and WAVE ID ® Plus			- 🗆 X
	Get Active ID		×	
Connect Disconnect Write	Waiting for card dat	a from device. end values for fields.	nded	Hashing
Home Timing	3201 3733 334893 1		1	Insert Keystroke Clear
SDK. Format	3 1152472674		ASCI (	BCD + Parity
	216 - Sec	c	lose	
Tools Test Area >>	(F11 (F12 (F13	Extended Conversion / Hashing Key	e bytes Set hashing (	key + GetID
245bits 1ACA03086799CDB3920A79842D984 215413886F090CA03085901C8608CC3 FC	(F14 (F15	Where Start bit - 6 + Number of Bit 3201	is • 20 + B	it range: 6 25
		11010. <mark>11091010.90090011.0000</mark> 1011.		
	10110011.1 Ready	0010010.00001010.01111001.10110100. #1 U	00101101.1001101: SB LUID: 0/0x0000	

Image 43: Get Active ID Pop

2. Define the fields to match the specific output. There are 5 predefined configurations for FIPS201 cards.

Define Fields	×
Select the number of source bits to define the fields. The bit the card must match the fields definition such as StartBit, Bits BCD+ /W Partiy	
Define the fields using one of the fallowing field definitions:	
PIV 54 Bit OEM BOARD	
PIV 64 Bit/LSB Reverse Nybble OEM BOARD	
PIV 75 Bit OEM BOARD	
PIV 200 Bit WaveID	
PIV 245 Bit WaveID [default]	



3. Configure any additional fields as appropriate.

nf IDEAS Configuration Utility   WAVE ID ® Solo and WAV	EID® Plus			- 🗆 X
rf DEAS	01 :	Over Available		
Connect Disconnect Write	Enable Data Format Moo Data Format efine Fields Defined	le Delimiters	Extended	Hashing
	ncy	e card data: Room for 2 keystrokes ACE>Output <enter></enter>		Insert Keystroke
SDK (VCr	dential Series edential Issue onal ID Display Mode	0 0		Clear
Format Org	anizational ID on/Org. ID ration Date	O Decimal O Hex lay • 0 +	O ASCH 🖲 BCD +	• Parity
Tools F11 F12 F12 F12 F12 F13		rsion / Hashing Key	ytes Set hashing key 🔻	GetID
245bits 1ACA030B6799CDB3920A79B42D9B421 5413886F090CA03085901C8608CC3FC	Where Start bit •	245 + Number of Bits	- 0 + Bit range	: NONE
Bit				
			LUID: 0/0x0000	

Image 45: Configuration of Additional Fields

4. Save the configuration to memory.

🚛 if IDEAS Configuration Utility   WAVE ID 🖲 Solo a	nd WAVEID® Plus			- 🗆 X
rf DEAS	#01	i D Not Available		
Connect Disconnect Write	Data Format	ormat Mode Delimiters	Extended	Hashing
Home	(Agency	able es precede card data: Room for 2 keystr :>Card <space>Output<enter></enter></space>	rokes	Insert Keystroke
Timing SDK	Credential Series (I/Credential Issue) Personal ID Displa	<b>y Mode</b> Octal O Decimal O He	ex () ASCII ()	Clear
Format	Organizational ID Person/Org. ID	its to display - 0 +		bCD + Panty
Tools		ded Conversion / Hashing Key	rse bytes Set hashing ke	GettD
Test Area >>	F13		Set hashing te	

Image 46: Saving Configuration to Memory

# Hashing Tab

Hashing tab is used to store two configurable 16-character Hash Keys to the readers memory. The Hashing Keys can be selected using the Hashing Key drop down box available on the Format tab to enable hashing for the selected field data. The keys are used to encrypt the selected field data and protect the reader from unauthorized changes.

m rf IDEAS Configuration Utility   WAVE	$ID^{\circledast}$ Solo and WAVE $ID^{\circledast}$ Plus	– 🗆 X
rf IDEAS	RDR-800x1AxU I HID Prox : RDR-608x Compatible	·). =
<ul><li>★</li><li>★</li><li>★</li></ul>	Enable Data Format Mode Data Format Delimiters Extend	led Hashing
Connect Disconnect Write		
Home		
Timing		
SDK	Enter string for hashing code values Write to save.	
Format		
Tools	Hashing Keys Key A	
Test Area >>	Key B	
00:0000000 00:0000000		
	Enhance Security	
		Đ
	US	SB #01 LUID: 0/0x0000



Only the WAVE ID Plus with extended feature supports the hashing feature.

FUNCTION	DEFINITION
Кеу А	Sixteen-character hashing key A.
Кеу В	Sixteen-character hashing key B.

#### **Enhance Security**

Erase the security keys if the user does a reset to defaults or tries to write new keys

nf IDEAS Configuration Utility   WAVE	$ID^{\textcircled{R}}$ Solo and WAVE $ID^{\textcircled{R}}$ Plus				×
rf DEAS	RDR-800x1AxU	HID Prox : RDR-608x C	Compatible	• •	Ξ
Connect Disconnect Write	Enable Data Format Mode Data Format	Delimiters	Extended	Hashing	_
Home					
Timing					
SDK		r string for hashing o e to save.	code values.		
Format					
Tools	Hashing Key: Key A	s 123456789ABCDEF			
Test Area >>	Key B 12	3456			
00:0000000 00:0000000					
		Enhance Security	6.		
					+
			USB #01 LUID	0: 0/0x0000	

Image 48: Hashing Code Values

The user can enter a maximum 16 characters string in one or both fields to create the new hashing key or keys. If a user enters less than 16 characters, the string will be padded with null values. After successful write operation, the application will clear the hashing text boxes.

nf IDEAS Configuration Utility   WAVE	ID <sup>®</sup> Solo and WAVE ID <sup>®</sup> Plus	– 🗆 X
rf IDEAS	RDR-800x1AxU I HID Prox : RDR-608x Compatible	. ≡
~ × т	Enable Data Format Mode Data Format Delimiters Ex	ttended Hashing
Connect Disconnect Write	Data Format	
Home		
Timing		
SDK	Enter string for hashing code va Write to save.	lues.
Format		
Tools	Hashing Keys	
Test Area >>	Key A 0123456789ABCDEF	
00:000000000000000000000000000000000000		
	Enhance Security	
		•
		USB #01 LUID: 0/0x0000

Image 49: Enhance Security Enable Box

Entering the Hashing Key or Keys, checking the Enhance Security box, and pressing the Write button enables the Enhance Security feature.

The user can enter the keys or enable the security function separately.

nf IDEAS Configuration Utility   WAVE ID ® So	lo and WAVE ID® Plus		- 🗆 X
	Hashing Key A/E or both will be erased or rep	placed.	• •
Connect Disconnect Write	Define Fields	ok ended	Hashing
Home Timing		rd data: Room for 23 keystrokes.	nsert Keystroke Clear
SDK Format	F05 F06 Display Mode		+ Parity
Tools	F10 F11 Extended Conversio	n / Hashing Key Reverse bits Reverse bytes Set hashing key	GetiD
Test Area >>>	F13 F14 Where Start bit - 8 0 Bits	+ Number of Bits - 8 + Bit range:	: 8 15 +
	Write operation fail	#1 USB LUID:5500/0X157C	

Image 50: Write Warning

The Enhance security feature removes the Hashing Keys if the user tries to reconfigure the reader after the security feature is enabled. Pressing the "Write" button after the security flag is set, will cause the application to reset the Hashing keys and write the new configuration. A warning popup window will appear (as shown above).

The user can change the extended fields without resetting the Hashing Keys, when the reader is in extended mode and the security feature disabled.

The "Reset to default" operation will clear the both Hashing Keys and the Enhance Security flag.

А

# 2.11 Tools Tab

# Cloning

The Cloning feature clones the current reader configuration settings to other readers.

- 1. Plug in only source reader to system and click the "connect" button to connect the reader to utility.
- 2. Under the "Tool" tab, select Cloning and click on "Start" button.

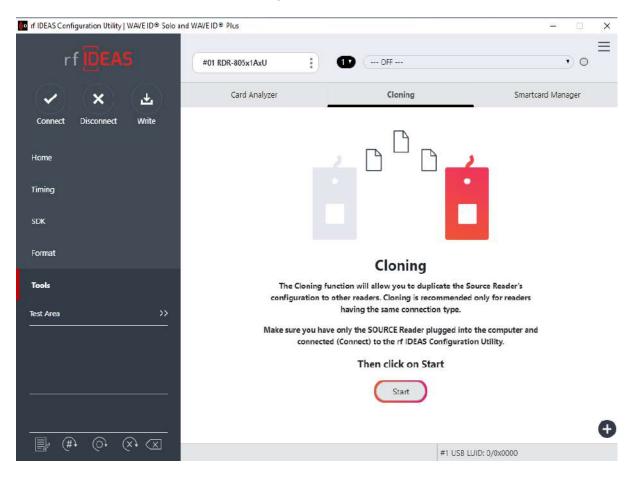


Image 51: Starting the Cloning Process

3. The cloning window will appear as shown below:

n fIDEAS Configuration Utility   WAVE ID® Solo and	WAVEID® Plus	- 🗆 🗙
rf DEAS	#01 RDR-805x1AxU : OFF	• 0
✓ × ∓	Card Analyzer Cloning	Smartcard Manager
Connect Disconnect Write	Clone Current Device Configuration Settings to Other I	Devices
Home	Clone Settings	
Timing	Only update readers with LUID range.	OxFFFF
SDK	Write LUID	0x0001
Format		Default
Tools	Logs	
Test Area >>		
		Clear Log
(#) (0) (×) (X)	Clone Now Please unplug source reader.	Close
	#1 USB LUID: 0/	0x0000

Image 52: Clone Configuration Reader Dialogue Box

D to enter LUID value in hex use 'OX' prefix.

The range displayed in the Minimum LUID and Maximum LUID fields will only come in effect when the "Only update readers within the LUID range" option is selected. Starting LUID and Increment by fields will be written in the new readers only when the "Write LUID" field is checked.

4. Disconnect the source reader.

FUNCTIONS	DESCRIPTIONS
Only update readers within the LUID range	Check to filter which readers will be cloned. Uncheck to clone all readers.
Minimum LUID	Minimum LUID value to filter a range of readers to be cloned. Default is 0x0000.
Maximum LUID	Maximum LUID value to filter which readers will be cloned. Default is 0xFFFF.
Write LUID	Check to write a new LUID to the reader after cloning.
Starting LUID	The next LUID value to be written. Default is 0x1000.
Increment by	Adds Increment by value to the LUID after writing to the reader. Default is 0x0001.
Default	Reset the fields to their default value.
Log	Logs of cloning process.
Clear Log	Clears all log info from Log area.

🔎 rf IDEAS Configuration Utility   WAVE ID ® Solo and	WAVE ID® Plus	- 🗆 🗙
rf DEAS	#01 RDR-805x1AxU OFF	• •
<ul> <li>× ∓</li> </ul>	Card Analyzer Cloning	Smartcard Manager
Connect Disconnect Write	Clone Current Device Configuration Settings to Other De	evices
Home	Clone Settings Minimum LUID Only update readers with LUID range. Ox0000 through	Maximum LUID
Timing	Only update readers with LUID range.     Ox0000     through     Starting LUID	OxFFFF Increment By
SDK	Write LUID	0x0001
Format		Default
Tools	Logs	
Test Area >>		
		Clear Log
	Clone Now Please plug the destination reader(s). Reader(s) detected: 0.	Close
	#1 USB LUID: 0/0:	k0000

Image 53: Reader Disconnected

If there are multiple readers to be cloned, it is recommended a HUB be utilized.

D In case of serial readers the cloning process will be a little slower.

5. Connect the destination reader(s) that will be undergoing the cloning process and click on 'Clone Now' button in the end.

of IDEAS Configuration Utility   WAVE ID® Solo and	WAVE ID ® Plus	- 🗆 X
rf IDEAS	#01 RDR-805x1AxU	• •
<ul> <li>× ∓</li> </ul>	Card Analyzer Cloning	Smartcard Manager
Connect Disconnect Write	Clone Current Device Configuration	a Settings to Other Devices
Home	Clone Settings	um LUID Maximum LUID
Timing		0000 through OxFFFF
SDK		ng LUID Increment By
Format		Default
Tools	Logs	
Test Area >>		
		Clear Log
	Clone Now Please plug the dest Reader(s) de	close
(#) (⊕) (×) (⊠)		#1 USB LUID: 0/0x0000

Image 54: Connecting Other Readers

More than one reader can be configured. Cloning will be done in reader(s) one by one and can be seen in Logs section.

rf IDEAS Configuration Utility   WAVE ID® Solo a	nd WAVE ID ® Plus	– 🗆 🗙
rf <mark>IDEAS</mark>	401 RDR-805x1AxU	. o =
✓ × Ł	Card Analyzer Cloning	
Connect Disconnect Write	Clone Current Device Configuration Settings to Other D	evices
	Clone Settings	
Home	Minimum LUID	Maximum LUID
Timling	Only update readers with LUID range. 0x0000 through	OxFFFF
	Starting LUID	Increment By
SDK	Write LUID (0x1002	0x0001
Format	÷	Default
Tools	Logs	
	4/28/2023, 4:22:33 PM Start	
Test Area >>		
		Clear Log
	Configuring Clone Now Reader(s) detected: 2.	Close
		Đ
B @ @ @ @	+1 USB LUID: 0/0	x0000

Image 55: Configuring Reader(s)

Once the configuration process has finished, the below message will be displayed.

nf IDEAS Configuration Utility   WAVE ID® Sclo an	d WAVE ID® Plus		- 🗆 X
rf DEA5	#01 RDR-805x1AxU	OFF	• 0
<ul> <li>×&lt; ₹</li> </ul>	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write	Clone Curr	ent Device Configuration Settings to Oth	her Devices
Home	Clone Settings		
Timing	Only update readers wi	Minimum LUID th LUID range.	Maximum LUID ough OxFFFF
SDK	Vrite LUID	Ox1005	0x0001
Format			Default
Tools Test Area >>	Logs 4/28/2023, 4:48:16 PM Start 4/28/2023, 4:48:17 PM Conf 4/28/2023, 4:48:17 PM Conf 4/28/2023, 4:48:19 PM Conf 4/28/2023, 4:48:19 PM Finisl	iguring 1 Reader(s) iguring reader 1 of 1 igure #1 FW:16.9.3 LUID 4099/0x1003 -> 4	100/0x1004
			Clear Log
	Pleas Clone Now	se unplug the current set and plug set of destination reader(s). Reader(s) detected: 1.	g the next
		#1 USB LUI	D: 0/0x0000

Image 56: Configuration Finished

- 6. Click the 'Close' button to close the "Cloning" dialogue box. Click the "Connect" button in the 'rf IDEAS Configuration Utility' to check the new cloned configuration of the connected readers. OR
- 7. Unplug the current set of destination reader(s) and plug in next set of readers(s) to be cloned and repeat the process by clicking 'Clone now' button.

# Card Analyzer

The Card Analyzer makes it easy to learn and analyze a card in order to configure it into a reader. The Card Analyzer will learn the card and allow the reader to be configured based on the analysis of the card.

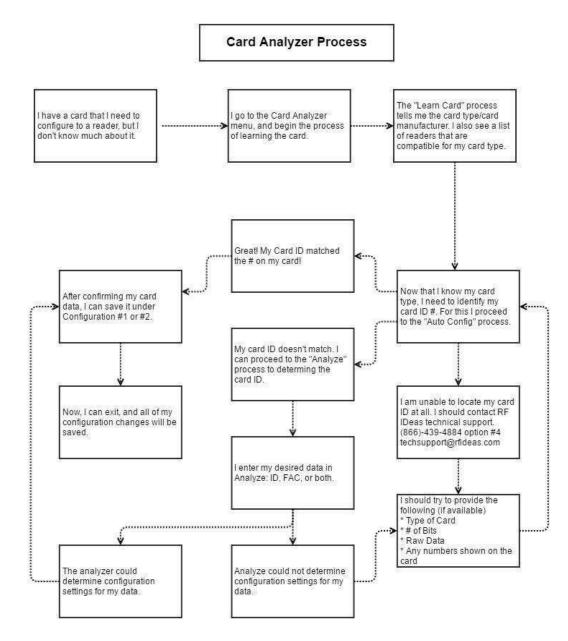


Image 57: Card Analyzer Process

To begin, navigate to Card Analyzer from the Tool menu on the utility.

📭 rf IDEAS Configuration Utility   WAVE ID ® Solo an	d WAVE ID ® Plus		– 🗆 X
rf IDEAS	Select a device	C Not Available	• •
<ul> <li>✓</li> <li>×</li> <li>▼</li> </ul>	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write			
Home			
Timing			
SDK			
Format			
Tools		Card Analyzer	
Test Area >>	The Card	Analyzer will search for cards available to t	he WavelD
		Plus reader. To begin, click start	
		Start	
			Ð
		Disconne	ected

Image 58: Card Analyzer Start Screen

The Card Analyzer feature will not work correctly if multiple devices are connected on rfIDEAS Configuration Utility.

#### **Detecting the Reader**

The Welcome screen provides a brief introduction and provides the reader connection status.

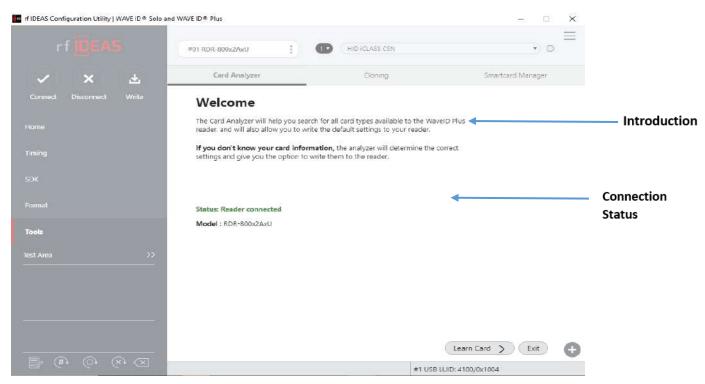


Image 59: Detecting the Reader

FUNCTION	DESCRIPTION
Status	The status may display the following:
	• "Reader not connected". Ensure the reader is connected properly.
	<ul> <li>"Incorrect reader connected." The Card Analyzer feature is only compatible with following WAVE ID® Plus Readers (RDR-80081AKU, RDR-80082AKU, RDR-80581AKU, RDR-80582AKU, RDR-800x1AxU, RDR-800x2AxU, RDR-805x1AxU, RDR-805x2AxU, RDR-800x1AxU-NT, RDR-805x1AxU-NT, RDR-305x1AxU, RDR-305x2AxU, RDR-300x1AxU, RDR-300x2AxU, RDR-305x1AxU, RDR-305x2BxU, RDR-300x1BxU, RDR-300x2BxU, 0EM-805x2BxU-LNV, RDR-80581AKU-RA, RDR-805x1AxU-RA, RDR-300x1CxU, RDR-30Mx1CxU-MXS, RDR-8XMx1AxU, RDR-800x1BxU, RDR-800x6AxU.</li> <li>"Reader connected".</li> </ul>
Learn Card	Press to transition to the Learn Card screen. This button becomes active only when connected to the correct reader.
Exit	Returns the user back to main Card Analyzer window.

#### Learning Card

After the reader is detected, proceed to Learn Card process. This is where the Card Analyzer will attempt to learn the type of card by scanning for matches. Each screen of the Card Analyzer also gives a general overview of the process, and the steps being performed in each phase.

The first part is the scanning phase, where the application will scan the card for matches.

🚾 rf IDEAS Configuration Utility   WAVE ID 🛽 Solo a	nd WAVE ID © Plus	- 🗆 🗙
rf DEAS	#01 RDR-805x1AxU	OFF • 0
<ul> <li>× ∓</li> </ul>	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Learn Card	Card Type
Home	Prepare for auto configuration by learning the card scanned to the reader.	
Timing	<ol> <li>Press the Start Scan button to learn the card.</li> </ol>	
SDK	<ol> <li>Follow the card placement instructions displayed in the popup and status boxes.</li> </ol>	Supporting Readers
Format	<ol> <li>Press the Auto Config to set up the reader to read your card(s) / employee badges</li> </ol>	
Test Area >>	<ol> <li>Pressing the "Hait Scan" button will stop the card search scan. Note: If you "Halt Scan," the search will need to be restarted.</li> </ol>	Halt Scan Start Scan Press the Start Scan button to learn your card.
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: + <b>1 (866) 439-4884</b> .	
	Ready	Back Auto Config > Exit     H     H     H     USB LUID: 0/0x0000

## Image 60: Learn Card Screen

FIELD/BUTTON	DESCRIPTION
Card Type	Card type matches are displayed here.
Supporting Readers	Displays the supported rf IDEAS readers when a card type is selected.
Start Scan	Start the scan function.
Halt Scan	Stop the scan. This button becomes active after the "Start Scan" button is pressed, and the scanning starts.
Auto Config	Takes the user to the "Auto Config" screen. This screen allows the user to configure the reader using the default Card Type settings.
Exit	Returns user back to main Card Analyzer window.

Every time the Start Scan button is pressed, the application scans for the Contactless 13.56 MHz and Proximity 125 KHz Card Types.

To learn a card:

**•** 

9

The application saves the current reader settings prior to scanning. They are restored if the user exits without writing the discovered settings.

1. Click the "Start Scan" button. The "Pop-up Window" appears.

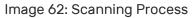
📭 rf IDEAS Configuration Utility   WAVE ID ® Solo	and WAVE ID ® Plus		- 🗆 X
	#01 RDR-805x1AxU :	Carro Offano	, 0
<ul> <li>× ∓</li> </ul>	Card Analyzer	Claning	Smartcard Manager
	Learn Card	Card Type	
	Prepare for auto configuration by learning the card scanned to the reader.		
	<ol> <li>Press the Start Scan button to learn the card.</li> </ol>	j	
	<ol> <li>Follow the card   Please put a ca instructions disp- popup and statu</li> </ol>	ard on the reader.	
	<ol> <li>Press the Auto ( the reader to read your card(s) / employee badges</li> </ol>	Ok	
Test Area >>	<ol> <li>Pressing the "Halt Scan" button will stop the card search scan.</li> </ol>	C	
	Note: If you "Halt Scan," the search will need to be restarted.		Halt Scan Start Scan
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: + <b>1 (866) 439-4884</b> .	Press the Start Sc	an button to learn your card.
		K Back Au	to Config 🗲 Exit
	Ready	#1 USB LUID:	0/0x0000

Image 61: Starting the Scan

The "Back" button is disabled and the "Auto Config" button is unavailable during scanning.

- 2. When prompted, place a card on the reader, click the "OK" button.
- 3. The analyzer will begin scanning the card for potential card type matches. Matches are displayed in the "Card Type" field.

In rf IDEAS Configuration Utility   WAVE ID® Solo a	nd WAVE ID® Plus	- 🗆 🗙	
	#01 RDR-805x1AxU	) OFF O	
	Card Analyzer	Cloning Smartcard Manager	
Connect Disconnect Write	Learn Card	Card Type	Results from scan
	Prepare for auto configuration by learning the card scanned to the reader.		showing possible matches
Timing	1. Press the <b>Start Scan</b> button to learn the card.		
SDK	<ol> <li>Follow the card placement instructions displayed in the popup and status boxes.</li> </ol>	Supporting Readers	
Format Tools	<ol> <li>Press the Auto Config to set up the reader to read your card(s) / employee badges</li> </ol>		
Test Area >>	<ol> <li>Pressing the "Halt Scan" button will stop the card search scan. Note: If you "Halt Scan," the search will need to be restarted.</li> </ol>	Halt Scan Start Scan Scanning in progress	
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: +1 <b>(866) 439-4884</b> .	You will also hear the reader beep during this search.	
(₽, (0, (×) <≍)	Ready	Back Auto Config > Exit     H US8 LUID: 0/0x0000	



"Start Scan" button will be unavailable during the scan process. User can use the "Halt Scan" button to stop the scan process.

After the scan is complete, the following information will be displayed:

rf IDEAS Configuration Utility   WAVE ID® Solo an	d WAVE ID® Plus	- 🗆 ×
rf DEAS	#01 RDR-805x1AxU	( OFF
<ul> <li>× × ∓</li> </ul>	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Learn Card	Card Type
Home	Prepare for auto configuration by learning the card scanned to the reader.	THE FICK
Timing	<ol> <li>Press the Start Scan button to learn the card.</li> </ol>	
SDK	<ol> <li>Follow the card placement instructions displayed in the popup and status boxes.</li> </ol>	Supporting Readers RDR-608x RDR-605xx
Format Tools	<ol> <li>Press the Auto Config to set up the reader to read your card(s) / employee badges</li> </ol>	RDR-800xx RDR-305xx RDR-300xx OEM-805xx
Test Area >> 	<ol> <li>Pressing the "Halt Scan" button will stop the card search scan. Note: If you "Halt Scan," the search will need to be restarted.</li> </ol>	Halt Scan Start Scan Press the Start Scan button to learn a new card or the Auto
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: + <b>1 (866) 439-4884</b> .	Config button to configure the reader 40 Bits : 00 00 00 40 2D E0 B5 08
		Key Back     Auto Config     Exit
	Ready	#1 USB LUID: 0/0x0000

Image 63: Scanning Complete

4. Select any card type to view the list of supporting readers. If no Card Type is detected, the application will display "Card not found: Please contact rf IDEAS for additional support".

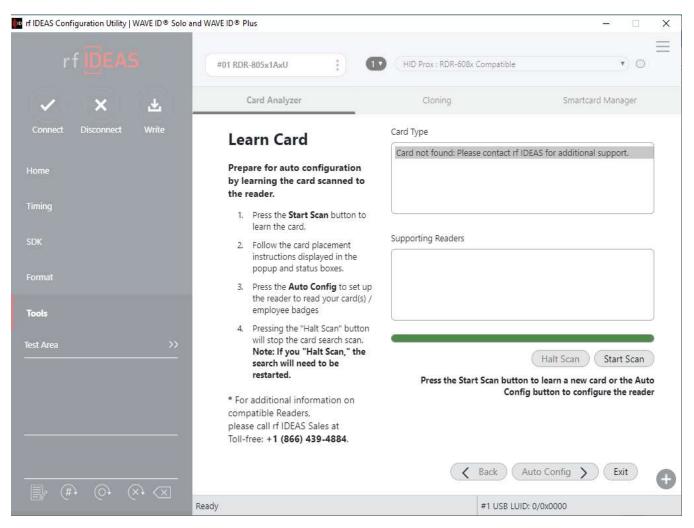


Image 64: Card Not Found Scenario

- 5. To scan a new card, click the "Start Scan" button, and repeat the process.
- 6. To configure the reader, click the "Auto Config" button.

#### Auto Config

After Learn Card has determined the card type from the card scan, the reader can be configured to send the Card ID displayed in the Card ID status window. The utility displays the Card ID found based on the default reader settings. The user can highlight each listed Card Type and validate the Card ID number to the card. It's also possible to double-click the bit string at the bottom and copy it to the clipboard.

🔎 rf IDEAS Configuration Utility   WAVE ID ® Solo an	d WAVE ID® Plus – 🗆 🗙
rf <mark>IDEAS</mark>	#01 RDR-805x1AxU III HID Prox : RDR-608x Compatible • • •
✓ × ∓	Card Analyzer Cloning Smartcard Manager
Connect Disconnect Write	Auto Config
Home	Use the Card ID found during the Learn step to configure your card.
Timing	Select the card listed in the Card     Card Type     Field.     HID Prox
SDK Format	2. Note: If you're unable to find your ID in the Card Type list, either: press Learn Card to try a new card, or press Analyze to have the card analyzer find the
Tools	card setting for you. 3. Once selected, the card's ID number will appear in the <b>Card</b> Configuration # 1 • HID Prox : RDR-608x Comp
Test Area >>	ID field. Verify that the number shown matches the number on your card. 37 Bits : 00 00 00 00 4 AA 9A 60 4E
	4. If the number matches, select the <b>Configuration #</b> you wish to write and press the <b>Write</b> button.
	Learn Card Analyze      Exit     Exit  Exit     Exit
	#1 USB LUID: 0/0x0000

Image: 65 Auto Config Screen

It is not possible to jump directly to the "Auto Config" feature without first performing the "Learn Card" feature.

For some cases 'Auto Config' button may be disabled based on reader type or scanned card type.



FIELD/BUTTON	DESCRIPTION
Card ID	Contains the Card ID based on the default settings for the selected Card Type.
Card Type	When the user selects a "Card Type", the application displays the Card ID based on the most popular default settings for the selected card type.
Configuration#	Write multiple configurations to the reader by selecting the configuration# from the dropdown and clicking the "Write" button.
Write	Writes the configuration to the reader for the selected card type. Writing one of the scanned cards from card type list into reader will enable 'Save Hwg+ File' button.
Learn Card	Go back to the "Learn Card" screen.
Analyze	Move to the "Analyze Card" screen.
Exit	This button has the following functions –
	<ul> <li>If the user has not written any configurations, pressing the "Exit" button will restore the reader to its original settings prior to starting the Card Analyzer. Then returns the user to main Card Analyzer window.</li> <li>If the user has written configurations, pressing the "Exit" button will return user to main Card Analyzer window with the new card settings.</li> </ul>

To auto configure:

1. Select each card type and match the Card ID listed with the ID on the card.

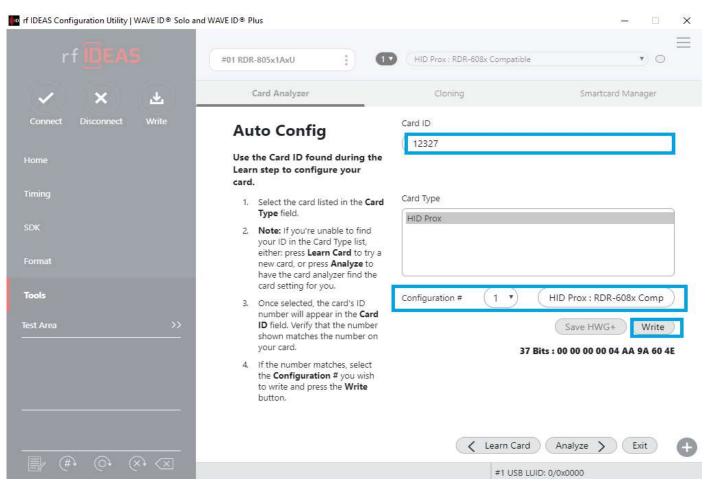


Image 66: Writing Configuration Settings to the Reader

If you're unable to locate the ID listed on the card, you can click the "Learn" button and try a new card, or press the "Analyze" button to find the card settings.

2. Select the Configuration # and click the "Write" button. The "pop-up" window appears.

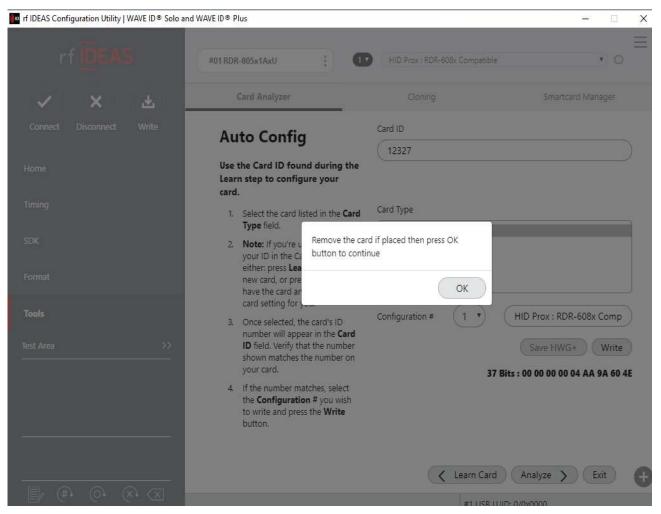


Image: 67 Pop-up Window for Removing the Card

- 3. After the card is removed from the reader, click the "OK" button to continue writing the configuration to the reader.
- 4. The Card Analyzer will then automatically begin writing the chosen configuration to the reader.

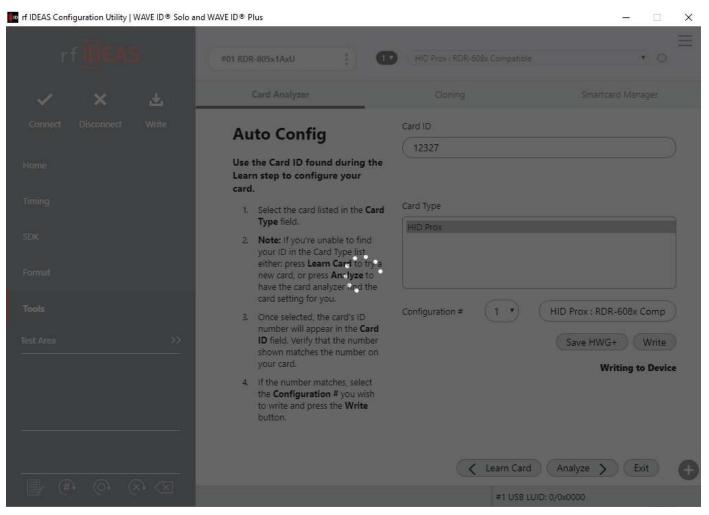


Image 68: Writing the Configuration to Reader

5. After writing the new settings to the reader, the status of the write will appear on the status bar.

rf IDEAS Configuration Utility   WAVE ID® Solo and	WAVE ID® Plus – 🗆 🗙
rf 🔟EAS	#01 RDR-805x1AxU II HID Prox : RDR-508x Compatible • O
<ul> <li>✓ × ∓</li> </ul>	Card Analyzer Cloning Smartcard Manager
Connect Disconnect Write	Auto Config
Home	Use the Card ID found during the Learn step to configure your card.
Timing	1. Select the card listed in the <b>Card</b> Card Type
SDK	Type field. 2. Note: If you're unable to find
Format	your ID in the Card Type list, either: press <b>Learn Card</b> to try a new card, or press <b>Analyze</b> to have the card analyzer find the
Tools	card setting for you. 3. Once selected, the card's ID Configuration # 1 • HID Prox : RDR-608x Comp
Test Area >>	number will appear in the <b>Card</b> ID field. Verify that the number shown matches the number on Save HWG+ Write
	your card. 37 Bits : 00 00 00 04 AA 9A 60 4E 4. If the number matches, select the Configuration # you wish to write and press the Write button.
	✓ Learn Card Analyze > Exit
	#1 USB LUID: 0/0x0000

Image 69: Writing Process Complete

# Analyze Card

The Analyze Card section should be used when the user knows the FAC/ID and there is a concern about the range of one or both. The user must enter the ID number printed on the card and the FAC if they know it. The feature will attempt to calculate the "ID field bit count", then the TP and LP.

🔎 rf IDEAS Configuration Utility   WAVE ID® Solo and	I WAVE ID ® Plus	- 🗆 X
rf DEAS	#01 RDR-805x1AxU	HID Prox : RDR-608x Compatible
<ul> <li>× × ∓</li> </ul>	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Analyze Card	User Input Fields
Home	Learn reader settings for selected card.	ID Analyze
Timing	<ol> <li>Enter the Card ID and FAC numbers in the User Input</li> </ol>	Card Type
SDK	Fields. The FAC may be omitted if unknown. 2. Press <b>Analyze</b> to begin the	HID Prox
Format	search. The results will be displayed in the <b>Analyzed Card</b> ID field.	
Tools	<ol> <li>Select the Configuration # and press Write to write the settings to the reader.</li> </ol>	Analyzed Card ID
Test Area >>	to the reader.	
		Configuration # 1 • HID Prox
		Save HWG+ Write
· · · · · · · · · · · · · · · · · · ·		
		< Auto Config Exit
		#1 USB LUID: 0/0x0000

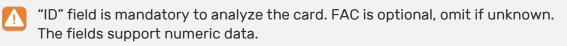
# Image 70: Analyze Card Screen

FIELD/BUTTON	DESCRIPTION
FAC	Field to enter a Facility Access Code (FAC).
ID	Field to enter a card ID.
Analyze	Starts the card analyze function. The application will attempt to learn the settings for the selected Card Type.
Card Types	Displays learned Card Types. Each card type is selectable.
Analyze Card ID	Displays status to the user: "Card ID found", or "Contact rf IDEAS for additional support" if no results are found.
Configuration #	Write multiple configurations to the reader by selecting the configuration # from the drop-down and clicking the "Write" button.

Write	Writes the configuration to the reader.
Auto Config	Go back to the "Auto Config" screen.
Exit	<ul> <li>This button has the following functions:</li> <li>If the user has not written configurations, pressing the "Exit" button will return user to rfIDEAS config utility without making any changes.</li> </ul>
	<ul> <li>If the user has written configurations, pressing the "Exit" button will return user to rfIDEAS config utility with new card settings.</li> </ul>

#### To analyze a card:

1. Enter the "ID" or "FAC" or both numbers (A) in the "User Input Fields" section.



2. Click the "Analyze" button (B) to begin the search.

The result is displayed in the "Analyzed Card ID" (C) field.



After the completion the status changes to "Analyze Completed". If Card ID is not found, a "Card ID not found" message is displayed in the "Analyzed Card ID "field.

- 3. Select the Configuration # from the "Configuration #" drop-down (D) and press the "Write" (E) button to write the settings to the reader.
- 4. If "Card ID not found" is displayed, retry with a different card by pressing "Auto Config" button (F) and moving back to "Learn Card" screen, or proceed to step 5.
- 5. After writing the configurations to the reader, Press the "Exit" button (G) to stop the Card Analyzer and return to the main Card Analyzer window

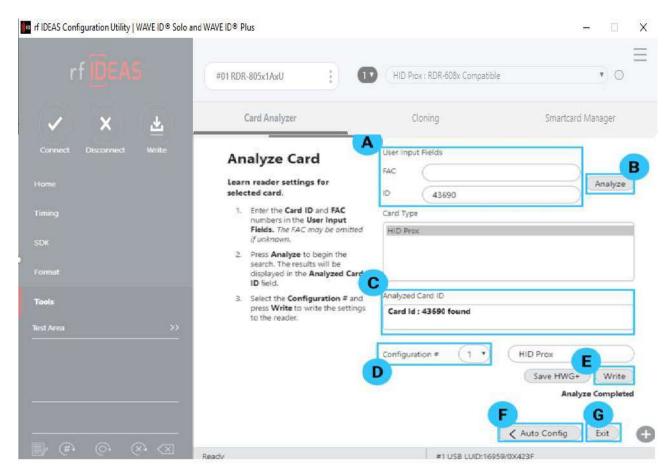


Image 71: Analyzing the Card

#### Exiting

It's easy to exit the Card Analyzer at any time. If no configurations have been written, the reader will return to the original state. If configurations have been written during the "Auto Configuration" or "Analyze" processes, while exiting from the window user is asked if he wants to keep original configuration (which were there before starting card analyze process) or he wants to keep the new written configurations into the reader.

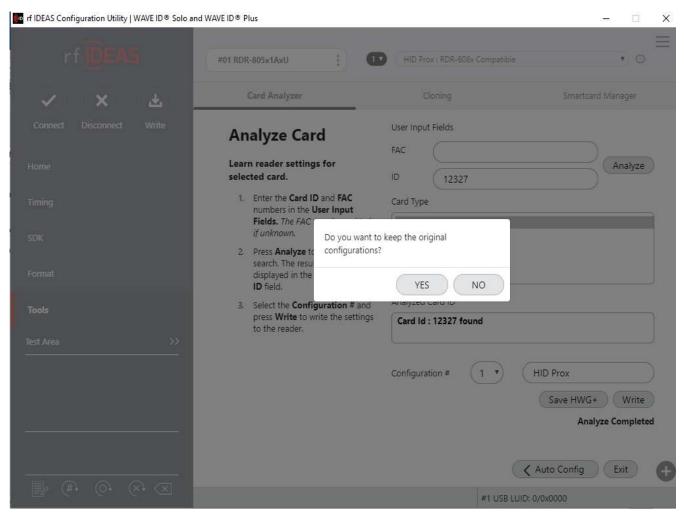


Image 72: Pop-up on clicking Exit Button on Screen

After exiting, the main Card Analyzer screen appears. Either continue with analyze process again or come back to main utility.

Vol RDR-805x1AzU   USB (immare: 16.50   UD: 65535/0KFFFF   C273BFA FF IDes:     Immare: 16.50   USB (Universal Serial Bus) ports     Immare: 10:00   Sok   Format:   Tools   Test Area:     IP Address	rf IDEAS	DEVICE LIST	CONFIGURATION(s)		Ξ
V VISB firmuare 16.0.0   UD: 05335/04FFF   COnnect   Disconnect   Write     Home   Timing   sok   Format   Tools   Tools   Test Area     Y     USB firmuare 16.0.0   UD: 05335/04FFF   Q:Z738FA FF Ibas     Connection Type     Connection Type     Iming   Sok   Format   Tools   Test Area     Y     Connection Type     Iming   Sok   Format   Tools     Tools   Test Area     Y     Port     IP Address     IP Address     IP Address     IP Address     Iming     Sok     Port     ID Address     Iming     Sok     Format     Tools     IP Address     IP		401 RDR-805+14+11	HID Prox : RDR-608x Compatible	•	0
Connect       Disconnect       Write         Home <ul> <li>Connection Type</li> <li>OUSB (Universal Serial Bus) ports</li> <li>OUSB (Universal Serial Bus) ports</li> <li>Sok</li> <li>Format</li> <li>Tools</li> <li>Test Area</li> <li>Connection IP 192.168.43.227)</li> <li>Fehrmet (Local IP 192.168.43.227)</li> <li>Fort</li> <li>Toolo 1</li> <li>Find Next IP</li> <li>Find Next IP</li> </ul>		USB Firmware: 16.9.0			
Home       Connection Type         Timing       Image: Sok         Sok       Serial: RS-232 and virtual COM ports         Luse COM ports       Image: Test Area         You       Image: Test Area       You         Image: Test Area       You       Image: Test Area       You         Image: Test Area       You       Test Area       You       Test Area         You       Test Area       You       Test Area       You       Test Area       You       Test Area       You       Test Area       You       Test Area       You       Test Area       Test Area       You       Test Area       You       Test Area					
Timing         SDK         Format         Tools         Test Area             IP Address	Connect Disconnect Write		4 (OFF	*)	0
Timing   SDK   Format   Tools     Test Area      Port       Port      IP Address      Port       Port       Find Next IP	Home	Connection Type			
Format Tools Test Area $\rightarrow$ Test	Timing	USB (Universal Serial Bus) p	ports		
Format       Use COM ports       1       through       255       Default 1.8       Baudrate       9600       •         Tools       •		Serials DS 222 and virtual O	OM ports		
Tools  Tools  Pest Area  Point  Point  Find Next IP  Find Next IP	SDK	Denai: Ko-252 and Virtual C	Chai hours		
Tools  Test Area  Tools  Test Area  Tools  Test Area  T	SUK	+	+		
est Area       >>         IP Address       0         +       +         +       +         Port       10001         -       -		Use COM ports 1	through 255 Default 18 Bau	udrate 9600	•
est Area >> IP Address 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0	Format	Use COM ports 1	through 255 Default 18 Bau	udrate 9600	•
IP Address     0     0     0     0       +     Fort     10001     Find Next IP	Format	Use COM ports 1	through 255 Default 18 Bau	udrate 9600	
Port Toto Find Next IP	Format Tools	Use COM ports 1	through 255 Default 18 Bau	udrate 9600	•
	Format Tools	Use COM ports + Use COM ports + •	+ Default 18 Bau + 3.227) + + + +	udrate 9600	•
	Format Tools	Use COM ports + Use COM ports + •	+ Default 18 Bau + 3.227) + + + +	udrate 9500	•
	Format Tools	Use COM ports	+     Default 18     Bau       43.227)     +     +     +       •     0     •     0	udrate 9600	•
	Format Tools	+ Use COM ports 1 • • • • • • • • • • • • • • • • • • •	+     Default 18     Bau       13.227)     +     +     +       0     +     0     -       01     Find Next IP	udrate 9600	
	Format Tools	+ Use COM ports 1 • • • • • • • • • • • • • • • • • • •	+     Default 18     Bau       13.227)     +     +     +       0     +     0     -       01     Find Next IP	udrate 9600	
	Format Tools	+ Use COM ports 1 • • • • • • • • • • • • • • • • • • •	+     Default 18     Bau       13.227)     +     +     +       0     +     0     -       01     Find Next IP	udrate 9600	

Image 73: New Configuration in the Utility

## Smartcard Manager

The Smartcard Manager function allows for the configuration of WAVE ID secure reader (MIFARE, LEGIC, etc).

Make sure you connect the secure reader to the PC and to the rf IDEAS utility. Below is the screenshot for Smartcard Manager Tab screenshot.

To initiate the Smartcard Manager utility:

- Plug in Secure reader to system and click the "Connect" button to connect reader to utility.
- Under the Tools tab, select Smartcard Manager and click on the Launch button.

nf IDEAS Configuration Utility   WAVE ID® Solo and	I WAVE ID® Plus				D.	×
rf DEAS	#01 RDR-805x1AxU-SLB	OFF		•	0	Ξ
Connect Disconnect Write	Card Analyzer	SmartCard Manager	Cloning			
Home				-		
Timing		nartcard Manager	secure readers			
SDK		(MIFARE, LEGIC, etc). ve your secure reader plugged into th				
Format	connected ("Co	nnect") to the rf IDEAS Configuration Then click on Launch	Utility.			
Tools		Launch				
Test Area >>						
Card type 0x0301 from reader is not in card list. Selection set to OFF						
(♣, (☉, (冬, (⊠)	eady	#1 USB LUID:	: 0/0x0000			Ð

Image 74: Smart Card Manager Launch Screen

To learn about the reader's info from the Smartcard Manager utility:

- Click on Help
- Click on About Reader

The reader's information will be displayed in the dialogue box as shown below.

eral Settings	
otocol: Keystroke/SDK	Connect/Reconnect
and Conferentians	
rrent Card Configurations:	Vo Secure Sectors
HID Prox : RDR-608x Compatible	No Secure Sectors
Off	No Secure Sectors
Off	No Secure Sectors
igh Priority Card: None ∽ Read card data	Create tab for Host Encryption
	Create tab for Host Encryption Reader X
	Reader X

Image 75: Smartcard Manager Utility Screen with Reader Information

NOTE: For more information regarding the Smartcard Manager utility please contact techsupport@rfideas.com.

Chapter 3

# Troubleshooting

## **3.1** Troubleshooting

If the reader is not working or the following error message is displayed:



Image 76: No Reader Connected

1. Check to be sure the reader is connected to the USB or RS-232 port. When no card is being read, the LED is red. A valid proximity card causes the LED to turn green.

Only one COM port application can own the RS-232 port at a time. Make sure there is not another COM port application running. This prevents our software from seeing the reader.

2. If the reader still does not work, disconnect it, remove 'General USB Reader' using Windows 'Control Panel' 'Add/Remove' Hardware. Then reboot the workstation. When the workstation boots up, re-attach the reader USB and the OS should re-install the Windows driver automatically.

# Linux and Mac Permissions Setup 4.1 Linux Platform

#### Installation and Usages:

1. To install the application directly from the package on Linux platform, internet connection is required. If no internet connection is possible, run the following command on Command Line Interface to install:

E.g. sudo dpkg -i location of package sudo dpkg -i Downloads/rfideasconfigurationutility6.0.6beta3.deb

2. Permission Pop-up: The Linux PC requires user to give permission to rfIDEAS reader. Instructions will be shown to the user at the time of running the application for first time after installation.

Here is the screenshot for reference:

	rf IDEAS Configuration Utility   WAVE ID® Solo and WAVE ID® Plus	
	Please provide permissions to rf IDEAS Reader on Linux before using the Utility	7 0
		-
~	IMPORTANT-READ CAREFULLY: Whenever RFIDeas readers are connected to a Linux machine, users have to give the	*) 6
	appropriate permissions to readers to communicate with them. However, when giving permissions manually, even though it is not a hard task, the user has to connect and disconnect various readers frequently and quickly becomes a burdening task. To	
me	improve this situation, there is a onetime setup approach to give permission to all readers. After performing this process the user will never have to give permissions to any RFIDeas reader (devices with VID: 0c27) on that Linux machine.	
	This step requires creating a rules on Linux systems (works with any Linux based machines like Raspberry Pi machines too).	
	STEPS:	-
	1. Open the terminal: First Step is to install libudev1 using below command:	
	apt-get install libudev1	600
	2. Now depending on the system architecture move to appropriate directory using below command:	000
	(for 64-bit)	
	cd /lib/x86_64-linux-gnu/ (for 32-bit)	
	cd /lib/i386-linux-gnu/	
	3. Then create a softlink by using this command:	
	In -s libudev.so.1 libudev.so.0	
	4. Now, Run the below command to create rules for rf IDEAS Reader:	
	sudo vi /etc/udev/rules.d/rfideas.rules	
	5. Type the following lines in the rfideas.rules file and save it.	
	I have followed all the steps mentioned above for giving the permissions to rf IDEAS readers,     Proceed	

Image 77: Providing permission to rf IDEAS reader on Linux.

**NOTE**: - User may see the instructions later by under 'Help' menu.

r	f IDEAS Configuration Utility   W	AVE ID® Solo and WAVE ID® Plus	- 8
rf <mark>IDEAS</mark>	DEVICE LIST	CONFIGURA	
	#01 RDR-800x1AxU USB Firmware: 16.9.0	1 HID Prox : RDR-608x Compatib (2) HID iCLASS ID (IClass SE)	Auto Connect
Connect Disconnect Write	LUID: 0/0x0000 0C27:3BFA RF IDeas	3 OFF	Device
Connect Disconnect white		(4) ( OFF	View
Home	Connection Type	Read user manual	Help
Timing	<b>O</b> USB (Universal Serial Bus)	Read End-User License Agreement (EULA)	Check for update
SDK	O Serial: RS-232 and virtual 0		
Format	Use COM ports 1	www.rfideas.com	Baudrate 9600 •
Tools	O Ethernet (Local IP 127.0.0.1		
Test Area >>	IP Address		)
	Port 100		
			A
<b>₽ #</b> ⊙	Help	#1 USB L	UID: 0/0x0000

Image 78: Steps to provide permission to rfIDEAS readers.

3. Linux O/S does not support NTWCC type readers therefore "Install libusb for NTWCC reader" option will be disabled (greyed out).

rfIDEASConfigurationUtility_v6.0.6 Beta2			🏚 🚮 💼 🖬 3:55 PM 🚸
O Ubuntu 🔿 rf IDEAS Configuration Utility   WAVE	ID® Solo and WAVE ID® Plus		२ 🗉 🗉
rf DEAS	DEVICE LIST	CONFIGURATION(x)	
	01 RDR-800x1AxU SB Firmware: 16.9.0 :		
Connect Disconnect Write	UID: 63527/0xFFF7 3 C27:38FA RF IDeas 4		0
Home	nection Type		
Home Corr	) USB (Universal Sorial Bos) ports:		
SDK C	) Serial: RS-232 and virtual CDM ports +	+	
Format	Use COM ports 1 through	255 Default 1.8 Baudrate 9800	
Tools Tools Test Area >>	Ethermel (Local IP 10.0.2.15)	Open hwg+ file	0
Test Area >>	IP Address 0 , 0	+ + Save device data to hwg+ file	*
	+ 18001	* Trestal louds for NTWCC reader	1
	2.000	Save USB device hox raw data to (SDK) file	
📑	6	#1 USB LUID: 65527/0xFFF?	d (105.8 MB)

Image 79: Installation of libusb for NTWCC reader disabled.

4. User cannot print special characters on Linux PC using virtual keyboard.

## 4.2 MAC Platform

#### Installation and Usages:

 If the reader is not getting connect on the Mac application, please modify control permissions for the rf IDEAS Config application under system preferences:
 System Preferences > Security & Privacy > Input Manitoring

System Preferences > Security & Privacy > Input Monitoring

A. Unlock to edit.

B. Under "Allow apps below to control your computer," select rf IDEASConfiguration Utility. C. Lock to disable edits.

2. Mac versions of rf IDEAS configuration utility does not support Serial and Ethernet reader connection therefore these options will be disabled (greyed out).

• • 0	rf IDEAS Configuration Utility   WAVE ID® Solo and WAVE ID® Plus				
rf WEAS	DEVICE LIST	CONFIGURATION(s	, ≡		
Connect Disconnect Write	<b>#01 RDR-805x1AxU</b> USB Firmware: 16.9.0 LUID: 0/0x0000 0C27:3BFA RF IDeas	HID Prox: RDR-608x Compatible           RDR-758x Equivalent           Image: Second Seco			
Home	Connection Type				
Timing	USB (Universal Serial Bus) ports				
SDK	Serial: RS-232 and virtual COM p	toris			
Format	Use COM ports 1 three	Dugh 255 Default 18	Baudrate 9600 ‡		
Tools	Ethernet (Local IP 0.0.0.0)				
Test Area >>	+	+ + +			
12325 a12325 A12325 a12325 a12325	IP Address 0 . ( - + Port 10001	0 . 0 . 0 			
		Manal Studio Code	(0x0000		

Image 80: Serial & Ethernet readers not supported.

rf IDEAS	DEVICE LIST		CONFIGURATION(s)
	#01 RDR-805x1AxU USB Firmware: 16.9.0	✓ USB	Auto Connect
Connect Disconnect Write	LUID: 0/0x0000 0C27:3BFA RF IDeas	Serial	Device
	6	Ethernet	View
me	Connection Type		Help
ning	USB (Universal Serial	Bus) ports	Check for update
к	O Serial: RS-232 and vir	tual COM ports	
rmat	Use COM ports		ault 18 Baudrate 9600 💠
ols	C Ethernet (Local IP 0.0.	0.01	
	O Emerner (Locar P. O.O.	0.0)	
t Area >>			
t Area >>	IP Address		*
t Area →>			*
t Area >>>			
t Area >>	IP Address	+ 10001 Find Nex	

#### **NOTE**: - The auto-connection for serial & Ethernet readers will also remain OFF.

Image 81: Auto connection OFF for Serial & Ethernet readers

3. The Mac utility does not support connection of NTWCC type readers therefore this option will be disabled (greyed out).

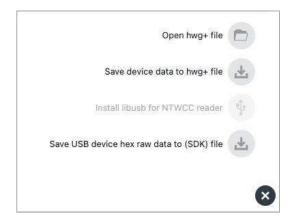


Image 82: Installation of libusb for NTWCC reader disabled.

4. There are several Keys that are disabled (greyed out) on virtual keyboard of the Mac rf IDEAS configuration utility as shown in below diagram.

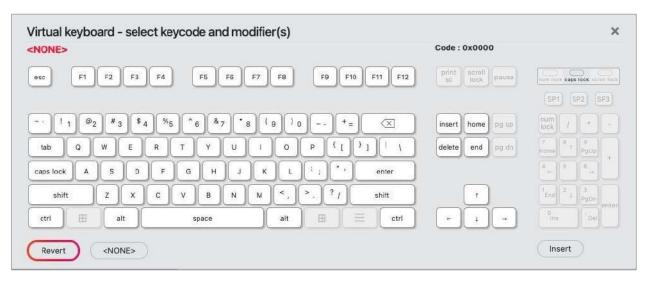


Image 83: Virtual Keyboard of Mac rf IDEAS Configuration Utility

5. The 'caps lock' key of virtual keyboard will work only when 'Key Press Time' is 80 mS or greater OR the user will need to enable the slow keys from the settings as shown below.

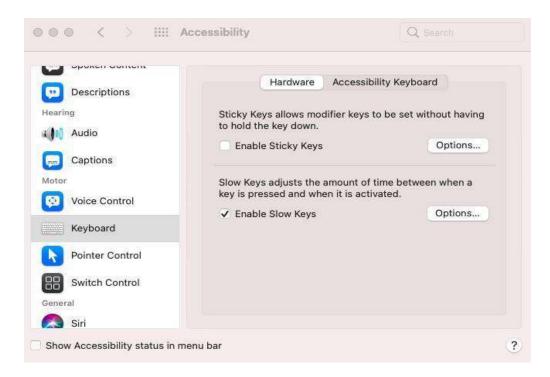


Image 84: Enabling Slow Keys

6. The 'Enable Extended Mode' is temporarily disabled on Mac rf IDEAS Configuration Utility for key-stoking (81 series) readers.

Enable Extended	Mode		
Data Format	Delimiters	Extended	Hashing

Image 85: Extended mode disabled

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# Appendix

COMPONENTS	MINIMUM SYSTEM REQUIREMENTS
Hardware	Intel® Pentium™ E5400 processor
Memory	2 GB RAM
Hard Disk Space	400 MB
1/0	1 USB port for USB device, 1 RS-232, and 1 USB port for serial device
Operating System	Windows 10 & above, Linux (Ubuntu 20.4) & MAC Big Sur / Monterey

# Use the WAVEID Plus Reader for Password Security - Complex Passwords

It is possible with certain limitations, to use the proximity token as a password for an application or operating system log on. The unique card bit-stream converted to either decimal or hexadecimal becomes the entire or a portion of the password. Enroll this card data to the password of the operating system application for the user.

Since the proximity token has no read/write memory, there is no way to change this or write alphanumeric characters such as a user name to the proximity token.Please see rf IDEAS WAVE ID Playback Starter Kit or call the Sales Department if this capability is needed.

Several companies have adopted a policy that requires users to change their password every xx number of days to increase security. The PIN is the portion of the password the user changes every xx number of days. Since the card data is completely numeric, any alpha and upper/lower case letter constraints are handled in the user supplied PIN.

#### A two-factor authentication system is made up of:

- 1. Card ID data
- 2. Personal Identification Number (PIN)

The reader may be configured to allow operation under either a one or two-factor authentication system.

#### One-Factor

In a one-factor system, the user simply scans the ID card. The reader may be configured to add TAB keystrokes ahead of the data as well as a TAB or ENTER keystroke after the card data.

#### **Two-Factor**

The two-factor approach is especially useful when insisting on password construction rules or periodic changing of passwords.

In a two-factor system, the user may enter the PIN either before or after the card data. If the user adds the PIN before the card data, the reader may be configured to append the ENTER keystroke.

Pre and Post Characters

There are some additional measures that can be taken to make it more difficult for unauthorized users to reproduce passwords.

Adding additional keystroke characters to the card information, that is difficult to reproduce, while configuring the data. These additional characters are labelled as Sp1, Sp2, and Sp3 on the Delimiters Tab menu selections.

## **ASCII Extended Procedure**

**STOP!** Before proceeding, please validate that the reader has been properly preconfigured with the Smartcard Manager Utility. Contact techsupport@rfideas.com for more information.

Referring to the figure below, use the following procedure to configure the Reader to output ASCII keystroking:

In this example, 30313233343536373839 will output as 0123456789.

- 1. Connect to the Secure Reader and insure one of the configurations has a Secure Card types configured, such as MIFARE EV1/EV2 Secure File Data.
- 2. Click on the Format tab and enable Extended mode.
- 3. In the text box on top, click Clear to remove CSN, if preferred.
- 4. Click on ASCII as Display mode.
- 5. Click on Get ID and present the Secure Card so the full range of data shows up in the Bits field.

- 6. Click on Reverse Bytes, change Start bit to 1 and Number of bits that represent the length of the desired bit field (number of ASCII characters \*8)
- 7. 'Write' settings to the reader.
- 8. When a Secure Card is presented to the properly configured reader, it will keystroke "YOUR ASCII DATA" as required.

n IDEAS Configuration Utility   WAVE ID® Solo an	d WAVE ID * Plus			- D X
rf DCAS	401 RDR-80Mx1AxU-D1	I MIFARE EVI	/EV2 Secure File Data	. ∘ ≡
Connect Disconnect Write	Data Format	Mode Delimiters	Extended	Hashing
Home Timing	Key strickes pro           F02           (F03	ecede card data: Room for 26	keystrokes.	linsert Keystroke
SDK.	(F04 (F05 (F06 (F07) (F08) (F08) (F04 (F04) (F04) (F04) (F04) (F04) (F04) (F04) (F05	al O Decimal C	) Hex 💿 ASCII O	BCD + Parity
Tools Test Area >>	F10 F11 F12 Extended C Invert	display - 0 + onversion / Hashing Key bits CReverse bits V F	leverse bytes (Set hashing ke	GetD
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80 bits: 30313233343536373839	Bits			
₽ @ @ @ ∞	Ready		#1 USB (UID: 4096/0x1000	

Image 86: ASCII Extended Mode

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