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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
	Note	Notes are useful information related to the text.
7	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:

E	nd-User License Agreement for rf IDEAS TM software and hardware, including, but not limited to pcProx [®] , pcProxPlus [®] , pcSwipe [®] , WAVE
1	o, Configuration Utility, Proximity Activated Readers, Software Developer's Kit ("SDK"), and Proximity Reader DLLs, Remote Reader
1	Vanagement (RRM) Tools, Mobile Application Source Code and associated SDKs, and Protocol(s) (each referenced herein as a "Product").
I	MPORTANT-READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or
S	ingle entity, hereinafter "You") and RF IDeas, Inc. ("rf IDEAS") with which you acquired the rf IDEAS Product. The Product includes, but is
	not limited to computer software, firmware, the associated media, any printed materials, any support tools, and any "online" or electronic documentation.
1	By (i) clicking accept or acknowledging this EULA or (ii) installing, copying, downloading, or otherwise using the Product, you agree to be
ł	bound 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
-	event, you may not use or copy the Product, and you should promptly contact the vendor you obtained this Product from for instructions
	on the return of the unused Product.
	SOFTWARE PRODUCT LICENSE: The Product is protected by copyright laws and international copyright treaties, as well as other
	intellectual property laws and treaties. Any software included with the Product is licensed, not sold.
	1. GRANT OF LICENSE.
	This 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, if 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

End User License Agreement (EULA)

2.2 Utility Overview



Please note that any unsupported functions will be greyed out.

2.3 Hamburger Menu

rf IDEAS	DEVICE LIST	c	ONFIGURATION(s)
		Not Available	Auto Connect
	Select a device	2 Not Available	Adio Connect
Č Č 💾		3 Not Available	Device
Connect Disconnect Write		4 Not Available	View
ome	Connection Type		Help
	USB (Universal Serial Bus) ports		Check for update

Hamburger Menu

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

Auto Connect Menu

nf IDEAS Configuration Utility WAVE ID® Sole	and WAVE ID® Plus			
rf IDEAS	DEVICE LIST	_	CONFIGURATION(s)	Ξ
	#01 RDR-800x28xU	✓ USB	Auto Connect	2
× × ±	LUID: 145/0x0091 0C27:3BFA RF IDeas	Serial	Device	>
Connect Disconnect write	Consection and a section of the sect	Ethernet	View	>
Home	Connection Type		Help	>
Timing	USB (Universal Seri	al Bus) ports	Check for Updates	

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

nf IDEAS Configuration Utility WAVE ID® Solo	o and WAVE ID ® Plus		— 🗆 🗙
rf IDEAS	DEVICE LIST	CONFIGU	
	#01 PDP-900-28-11	HID Prox : RDR-608x Compa	Auto Connect
	USB Firmware: 1.6.3	HID iCLASS ID (iClass SE)	Auto Connect
	LUID: 145/0x0091 0C27:3BFA RF IDeas	Reset to factory defaults	Device
Connect Disconnect write		Reset stored settings	View
Home	Connection Type	Write stored settings	Help
Timing	USB (Universal Serie	al Bus) ports	Check for Updates

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

DEVICE LIST			
	CONFIGU	IRATION(s)	=
#01 PDP 900-2P-11	HID Prox : RDR-608x Compa	A da Conced	
USB Firmware: 1.6.3	2 HID iCLASS ID (iClass SE)	Auto connect	
LUID: 145/0x0091 0C27:3BFA RF IDeas	3 OFF	Device	>
	✓ Show tooltip balloon help	View	>
Connection Type		Help	>
USB (Universal Serial	Bus) ports	Check for Updates	
	#01 RDR-800x28xU USB Firmware: 1.6.3 UUD: 145/0x0091 0C27:38FA RF IDeas Connection Type USB (Universal Serial	#01 RDR-800x28xU 1 HID Prox : RDR-608x Compa USB Firmware: 1.6.3 2 HID iCLASS ID (iClass SE) UDD: 145/0x0091 3 OFF 0C27:38FA RF IDeas ✓ Show tooltip balloon help Connection Type USB (Universal Serial Bus) ports	#01 RDR-800x28xU Image: Firmware: 1.6.3 USB Firmware: 1.6.3 Image: Firmware: 1.6.3 UDID: 145/0x0091 3 0C27:3BFA RF IDeas Image: Firmware: 1.6.3 Image: View Image: Firmware: 1.6.3 Image: View Image: View Image: View Image: View

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	DEVICE LIST	CONFIGUR	ATION(s)
V X Ł	#01 RDR-805x1BxU USB Firmware: 24.0	HID Prox: RDR-608x Compa RDR-758x Equivalent	Auto Connect
Connect Disconnect Write	0C27/38FA RF IDeas	(3) (OFF (4) (OFF	View
Home	Connection Type	Read User Manual	неір
Timing	USB (Universal Serial Bu	Read End-User License Agreement (EULA)	Check for Updates
SDK	O Serial: RS-232 and virtu. +	www.rfideas.com About	
Format	Use COM ports	Submit Support Ticket	Baudrate 9600 V

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.

Submit Support Ticket: Opens a new window where user will be able to submit a support ticket.

Check for Updates Menu

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



Check for Updates

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 Updates.
- 2. The latest updates will be shown in the below screenshot.

rf IDEAS Configuration Utility WAVE ID & Solo	and WAVE ID® Plus	- 🗆 🗙
rf DEAS	Three Updates available! ×	
Connect Disconnect Write	rf IDEAS rf IDEAS Configuration Utility © Copyright 2020, rf IDEAS, Inc.	Auto-Connect) Device
Home	Please select the checkbox and click on Update	Help >
Timing	Update for Reader List Update for VidPid List	Check for update
SDK Format	Update	Baudrate 9600 *
Tools	O Ethernet (Local IP 192,168.56.1)	
Test Area >>	IP Address + + + + 0 . 0 . 0 • • • • • • • •	
	Disconne	ected

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	nd WAVE ID® Plus	- D X
rf DEAS	Download Successful ×	
Connect Disconnect Write	copyright 2020, rf IDEAS, Inc.	• 0 • 0 • 0
Home	Connection Type	
Timing	O USB (Universal Serial Bus) ports	
SDK	O RFIDeas X The app will restart now.	
Format	Default 1.8	Baudrate 9600 +
Tools	O Ethernet (Local IP 192.168.56.1)	
Test Area >>>	IP Address $\begin{pmatrix} * \\ 0 \\ \cdot \\ \cdot$	
	Port 10001 Find Next IP	
		e
	Discon	ected

Download Successful and App restarts

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

rf IDEAS Configuration Utility WAVE ID® Solo a	nd WAVE ID® Plus	- 🗆 X
rf IDEAS	You are up to date!	
	Tou are up to date.	Auto Connect >
Connect Disconnect Write	rf IDEAS Configuration Utility © Copyright 2020, rf IDEAS, Inc.	Device
		View
Home	No updates available	Help >
Timing	USB (Universal Serial Bus) ports	Check for update
SDK	O Serial: RS-232 and virtual COM ports	
	Use COM ports 1 through 255 Default 1.8	Baudrate 9600 •
	O Ethernet (Local IP 192.168.56.1)	
Test Area >>	$IP \text{ Address} \qquad \underbrace{\overset{*}{0}}_{-} \cdot \overset{$	
	Port 10001 Find Next IP	
		Ð
	Disconne	ected

No Updates are Available

2.4 Plus (+) Menu

rf IDEAS Configuration Utility WAVE ID® So	olo and WAVE ID . Plus		-	Lu.	×
rfIDEAS	DEVICE LIST		CONFIGURATION(s)		≡
	101 PDR 005034/0	HID Prox : RDR-60	8x Compatible	• C	>
· · ·	COM8:	2 (RDR-758: Equivale	ent	- 0	
	Firmware: 14.3.3 LUID: 4096/0x1000	3 (Not Available -		~) C	>
Connect Disconnect Write		(4) - Not Available -		*) C	
ome	Connection Type				
ling	O USB (Universal Serial Bus)	ports			
бок	Serial: RS-232 and virtual C	COM ports			
ormat	Use COM ports	through 255 Defa	ult 18 Baudrate 960	0~	
	· · ·	-			
ols	C Ethernet (Local IP 192 168 59	5.1)			
st Arca >>		~~~,			
	IR Address 0	÷ ÷	<u> </u>		
	· ·	· • • • •	<u>.</u>		
	+				
	Port 1000	1 Find Next I	IP		
					-
$\mathbb{B} (\mathfrak{h}, \mathbb{O}, \mathbb{N}) \propto$					U
	Ready		#1 Serial COM8: LUID: 4096/0x100)	

Plus (+) Menu Overview

rf IDEAS Configuration Utility WAVE ID® Solo	and WAVE ID® Plus	-	- E	×
rf DEAS	DEVICE LIST	CONFIGURATION (s)		\equiv
	Commune	HID Prox : RDR-608x Compatible	• 0	0
	#01 RDR-805×1AxU USB Firmware: 16.9.0 1	2 RDR-758x Equivalent		3
· · ·	LUID: 0/0X0	3 (OFF	*) ©	2
Connect Disconnect Write	OC273004 Nr IDeas	4 (OFF	•) 0	2
	Connection Type			
ting	USB (Universal Senal Bus) ports			
ĸ	O Serial: R5-232 and virtual COM	ports Open hwo	+ file	-
		+	100	
at	Use COM poits 1 5	Mough 255 Default 1_B Backharte Mg	file [
	C Elbernet/Land /D 102 102 /01 12	Save device data to hwg	- file	<u>+</u> ,
sa >>	O consider of the local of		-	L
	10 Nidowe	save device data to secure rivig	- me	<u>v</u> 1
		Install libusb for NTWCC m	ader	Þ
	Port	Find Next IP Save USB device hex raw data to (SDP) file	<u>+</u> ,
				8
(#) (O) (*) (X)	Ready	#11/SR11/IP-0/0X0		-

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



Icon Toolbar

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

Connect



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.

rf IDEAS Configuration Utility WAVE ID® Solo and	I WAVE ID® Plus		- D
rfIDEAS	DEVICE LIST	CONFIGURATION(5)	=
Connect Disconnect Write	#01 RDR-805x1AxU USB Firmware: 16.9.0 LUID: 31267/0x7A23 0C27:3BFA RF IDeas	HD Prox : RDR-508x Compatible 2 RDR-758x Equivalent 3 OFF 4 OFF	• • • • •
Home	#01 RDR-805x1AxU USB Firmware: 16.9.0 LUID: 31267/0x7A23 CC27:3BFA RF IDees	rts	
Timing SDK Format	#02 RDR-xx81AKU USB Firmware: 90.0 LUID: 4099/0x1003 OC27:3BFA RF IDeas	M ports through 255 Default 18 Ba	audrate 9600 🔹
Tools Test Area >>	#03 RDR-80081AKU USB Firmware: 14.3.0 LUID: 4096/0x1000 0C27:3BFA RF IDeas	227)	
	IP Address 0		
	Port 10	1 Find Next IP	
	Deady	#11/07/11/00/31327/007633	

Multiple Device Connection

f IDEAS Configuration Utility WAVE ID	$^{\otimes}$ Solo and WAVE ID $^{\otimes}$ Plus				-		×
rf IDEAS	DEVICE LIST			CONFIGURATION(s)			Ξ
	#03 RDR-80081 AKU		HID Prox : RDR-608x	Compatible		*	•
	USB Firmware: 14.3.0	2	HID ICLASS ID (IClass	: SE)		*) 0
	OC27:3BFA RF Ideas	3	-Not Available			*) •
Connect Disconnect Write		4	-Not Available-			•) •
Home	Connection Type						
Timing	• Use USB (Universal	Serial B	us) ports				
SDK	O Serial: RS-232 and v	irtual CO)M ports				
Format	+	+					
	Use COM ports 0 through	ugh 0	Default 18	Baudrat	e 9600	•	
Tools	-	50					
Test Area >>	O Ethernet (Local IP 1)	92.168.9	56.1)	4			
	IP Address 0		n á c	0			
		• -		-			
	Port 0		Find Next IP				
	-						
				#01 USB LUID:	4096/0X100	0	Ð

Device List Output

Disconnect



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 below:

IDEAS Configuration Utility WAVE	ID [®] Solo and WAVE ID [®] Plus		×
rf DEAS	DEVICE LIST	CONFIGURATION(s)	\equiv
		1 (-Not/Available-	• (·
	Select a device 🗸	2 (-Not Available -	0 0
		3 (Not Available*	2 "
nnect Disconnect Write		A (-Nor Available -	9 e
ome	Connection Type		
ning	O Use USB (Universal Se	rial Bus) ports	
ĸ	• Serial: RS-232 and virtu	ual COM ports	
ormat	+	+	
211144	Use COM ports 0 through	Default 18 Baudrate 9600 v	
bls	-		
	O Ethernet (Local IP 192	168.56.1)	
Area >>	+	+ + +	
	IP Address 0	0.0.0	
	-		
	+		
	Port	Find Next IP	
(#) (0) (X) (X)			Ð
		Disconnected	4

Disconnected Message

Write

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



Write Button

2.6 WAVE ID Plus Configuration

Configuration	
IID Prox : RDR-608x Compatible	
DR-758x Equivalent	3
ndala ASP 26 bit (Motorola) : RDR-638x Compatible	
eri NXT UID	

WAVE ID Plus Configuration Area

Device List



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

I of IDEAS Configuration Utility WAVE ID ® Solo an	d WAVE ID® Plus		- 0	×	
rfIDEAS	DEVICE LIST	CONFIGURATION(s)		=	
Brid		HID Prox : RDR-608x Compatible	• 0	c	
	USB Firmware: 16.9.0	2 RDR-758x Equivalent	• 0	2	
	LUID: 0/0X0 0C27:385A RF IDeas	3 (OFF		2	
Connect Disconnect Write		4 (OFF	(y) (
Home	Connection Type				
Timing	USB (Universal Serial Bus) por	ts.		+	USB
SDK Format	O Serial: RS-232 and virtual COM Use COM ports 1	A ports + through 255 Default 18 Baudra	te 9600	•	Serial RS-232 and Virtual COM
Tools	C Ethemet (Local JP 192 168 d3	227)			
Test Area >>					
	IP Address			-	Ethernet
	Port	Find Next IP			
				Đ	
📑 (#• (0• (X• 🛛	Ready	#1 US8 LUID:0/0X0			



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



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.



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



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

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.

s keystioke tin	iniy			
ley press time	-(20	+ msec.	
key release	- (20	+ msec.	

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, enable and disable transparent mode, control BEEPER and LED behavior, and define device Logical Unit ID.

rf DEAS	#01 RDR-30Lx1ExU		ox : RDR-608x (Sompatible		• • •
✓ X ±	Disable Keystrokes for SDK	Off	Transparen	t Mode	• Off	
Connect Disconnect Write	Beeper Beep now	Long be	ep(s)	N	imber of beeps -	
tome	Beep on card read	Volume	O off	O Low	• Medium	O High
5DK	LED Auto (controlled by reader)		0	Green	O Amber	O Rea
Format	Card ID		Data byte	5		
roots	GetID GetID32		Queue 00 00	d ID : 0 Bits		
est Area >>	GetQueuedID		00 00	00 00	00 00 00 00	
	Clear lock-out		Age:0 Over re Lockou	00 00 00 00:00:00 (0x4 uns:0 ut timer:0	30 00 00 00 8ms)	
3.	Logical Unit ID (LUID)	(220		0655	35 or 0x00000xfff	f

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.

Transparent Mode

Transparent Mode functionality is only compatible with LEGIC 6300 readers. Users will only see the Transparent Mode toggle switch if a LEGIC 6300 reader is connected to the Configuration Utility.

The rf IDEAS LEGIC 6300 line of readers can be placed into Transparent Mode to allow users to interface directly with the LEGIC 6300 module. When the rf IDEAS reader is in Transparent Mode, users can connect to the LEGIC 6300 module using LEGIC applications like LEGIC Flasher Pro and LEGIC Development Kit Software (DKS).

Note that when an rf IDEAS LEGIC 6300 reader is placed into Transparent Mode, card polling is suspended. When the rf IDEAS reader is taken out of Transparent Mode, card polling resumes.

- > The value shown in the toggle will be the current Transparent Mode status of the reader.
 - If the reader's Transparent Mode status is Off, then the toggle will be set to Off.
 - \circ If the reader's Transparent Mode status is On, then the toggle will be set to On.
- > Setting the Transparent Mode toggle to On or Off without writing to flash will temporarily place the reader in/out of Transparent Mode.
 - If user disconnects reader and then reconnects, then the Transparent Mode toggle will render the value in the reader's flash memory that was set before the user set the Transparent Mode toggle value.
- > Setting the Transparent Mode toggle to On or Off, then writing to flash will set the Transparent Mode setting to the reader's flash memory.

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
	#1 USB LUID	D:256/0X0100

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

Medium- Sets beeper volume to mid-range level

High (Default) - Sets beeper volume to maximum level

Beep now	Long b	eep(s)	Nur	nber of beeps -	(1)+
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.

	CatID		
	Geno	ID: 62 Bits	
	GetID32	2A AA AA AA AA AA AA AA	
	GetQueuedID		
	lear lock-out		
🗌 C	lear UID		

GetID Data Display

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

	GetID	ID: 62 Bits	
	GetID32		
	GetQueuedID	00 00 00 00 00 00 00 00 00	
Cle	ear lock-out	2A AA AA AA AA AA AA AA	
Cle	ar UID		

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			
GetID	Queued ID : 62 Bits			
CotID32	00 00 00 00 00 00 00 00			
Gendaz	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)			
Clear UID	Over runs : 0			
	Lockout timer : 0			

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





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.

XYZ = Post Card ID

Delimiters (Shared with Pre-card 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.

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123 = Facility Access

Code (FAC)

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 = 1101111100001111101000000 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.



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

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.

FAC/ID Delimiter

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

Delimiter Keyboard:



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.

rf IDEAS Configuration Utility WAVE ID @ Solo an	d WAVE ID @ Plus			- 🗆 🗙
rf <mark>ID</mark> EAS	#01 RDR-805x18xU	HID Prox : R	DR-608x Compatible	
Connect Disconnect Write	Data Format	mat Mode Delimiters	Extended	Hashing
Home Timing	FD1 FD2 FD3 FD3 FD4 FD4 FD4 FD4 FD4 FD4 FD4 FD4 FD4 FD4	precede card data: Room for 26 ke	ystrokes.	Insert Keystroke Clear
SDK Format	F05 F06 F07 F08 Display O Display Display Display	Mode Octal O Decimal O H to display - 0 +	Hex O ASCII O	BCD + Parity
Tools	F10 Extende F11 Inve	d Conversion / Hashing Key ert bits Reverse bits Rev	verse bytes Set hashing key	GetID
	F14 F15 Start I 0	oit - 10 + Number of	f Bits - 16 + Bit	range: 10 25
v	Bits			
			#1 USB LUID: 4098/0x	1002

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 bringthe reader to its last saved settings from where you will need to do the settings allover 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.

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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:

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

Get Active ID Sorrect Disconnect Virte Get Active ID Waiting for card data from device. Scan card to get Extend values for fields. FAC: 170 ID: 43690 Itiming SDK Format Toole Tect Arros F14 Ymmere 10 Step 2 Close Ext Arros Bits Intermediation of the state of the	rf IDEAS Configuration Utility WAVE ID® S	lo and WAVE ID® Plus		- <u>-</u>
Connect Disconnect Write Waiting for card data from device. Home Scan card to get Extend values for fields. Timing ID: 43690 SDK BCD + Paints Format Step 2 Tools Fit Text Area >> G4bits 5555555555 Bits		Get Active ID ×	ble	
Home FAC: 170 Timing ID: 43690 SDK ID: 43690 Format Step 2 Close Set hashing key Tools Start bit - 40 + Number of Bits - 8 + Bit range: 40 64bits 55555555555 Bits	Connect Disconnect Write	Waiting for card data from device. Scan card to get Extend values for fields.	nded	Hashing
SDK Format Tools Text Area Step 2 Close Set hashing key Close Step 2 Close Set hashing key Close Step 2 Close Step 3 Clos	Home	FAC: 170 ID: 43690	ASCI	O BCD + Parity
Format Step 2 Close Set hashing key Image: 40 million Tools (F14 Winere Start bit 40 + Number of Bits 8 + Bit range: 40 Fext Area >> (Non-1) 170 170 170 64bits 555555555555 Bits (Non-1) (Non-1) (Non-1) (Non-1) 01010101.00100101.00100101.00100101.001001	SDK			
Incls Image: 14 Variable act Area >>> 170 54bits 5555555555 Bits Bits	Format	Step 2 Close	Set hashir	ing key
iet Area >> 170 54bits 5555555555 Bits 01010101.01010101.01010101.01010101.01010101.01010101.01010101.01010101.01010101.01010101.01010101.01010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.0101010101.01010101.0101010101.01010101.0101010101.0101010101.01010101.0101010101.010101.010101.01010101.01001.01001.01001.000000	Tools	(F14 venere Start bit + 40 + Number of Bits +	8)+	Bit range: 40 47
S4bits 55555555555 Bits	iest Area >	170		
01010101.01010101.01010101.01010101.01010101.01010101 64bitt 55555555555	54bits 55555555555555555	Bits		
01010101.010101.01010101.01010101.01		······································		
64bit: 555555555555		01010101.010101.01010101.01010101.01010101.010101	0 1.010161	01.01010101
		64bit: 55555555555555		

Taking output on GetID box

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

f IDEAS Configuration Utility WAVE ID® Solo and WAVE ID	@ Plus		- D X
rf DEAS (#01	RDR-805x1AxU	HID Prox : RDR-608x Compatible	∈
Connect Disconnect Write	Enable Data Format Mode Data Format Delimit	ters Extended	Hashing
Home (F04 (F05 (F06 (F07 (F08 (F08)) (F08) (F08)	Display Mode O Octal O De Digits to display .	cimal O Hex O ASCII O	BCD + Parity
SDK (F10 Format (F12	Extended Conversion / Ha	ashing Key rse bits Reverse bytes Set hashing key	GetID
Tools	Where Start bit - 40 +	► Number of Bits - 8 + Bit	range: 40 47
Test Area >> 64bits 555555555555 Bits	······································		01010101
			9
		#1 036 1010.0/070	

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.

n IDEAS Configuration Utility WAVE ID® Solo and WAVE ID® Plus	- X
rf DEAS #01 RDR-805x1AxU : 10 HID Prox: RDR-608x Compatible	, ∘ ≡
Connect Disconnect Write	Hashing
Define Fields C Enable Key strokes precede card data: Room for 26 keystrok	ses. Step 1
Home F01 FAC: <space></space>	Insert Keystroke
Timing	(Clear
Virtual keyboard - select keycode and modifier(s)	×
Enter ASCII:	
esc F1 F2 F3 F4 F5 F6 F7 F6 F9 F10 F11 F12 print scroll pt	puse
	SP1 SP2 SP3
~* ! 1 @2 # 3 \$ 4 %5 * 6 &7 * 8 (9) 0 += 🔀 Insert home p	gup num / + -
	gdn 789 +
caps lock A S D F G H J K L * ; * enter	456
shift Z X C V B N M ×, ×, ? / shift T	1 2 3 enter
ctrl ⊞ ait space ait ⊞ ctrl ⊷ ⊥	- • •
Revert (NONE> Step 2: choose keystrokes	Insert Close Step 3: Insert

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:

f IDEAS Configuration Utility WAVE ID® Sole and W	AVE ID® Plus	×
rf IDEAS	#01 RDR-805x 1AxU HID Prox : RDR-608x Compatib	le ▼ ⊙
Connect Disconnect Write	Enable Data Format Mode Data Format Delimiters Exten Define Fields Enable Key strokes precede card data: Room for 29 key	ded Hashing ystrokes.
Home	<pre>col</pre>	Insert Keystroke
Timing	02 03 04	Clear
SDK	Display Mode Oos Oor Oor Digits to display - O	ASCII O BCD + Parity
Tools	Extended Conversion / Hashing Key III Invert bits Reverse bits Reverse bytes	Set hathing key
Test Area >> 64bits 555555555555555555555555555555555555	Where Start bit - 64 + Number of Bits - 0	+ Bit range: NONE
	Bits	
	#1 USB LUID:0/02	×0

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.

In rf IDEAS Configuration Utility WAVE ID ® Solo	and WAVE ID [®] Plus			– 🗆 X
rfideas	Get Active ID		×	=
✓ X 土 Connect Disconnect Write	Waiting for card data fr Scan card to get Extend	om device. I values for fields.	nded	Hashing
Hame	3201 3733 334893			Insert Keystroke
SDK	1 3 1152472674			Clear
Format			Close	BCD + Parity
Tools	[F11	Extended Conversion / Hashing Key		CotiD
Test Area >>>	(F12 (F13 (F14	Invert bits Reverse bits Re	verse bytes Set hashing i	
245bits 1ACA03086799CD83920A79842D984 215413886F090CA03085901C8608CC3 FC	(†15 ^ ~	Where Start bit - 6 + Number of 3201	of Bits - 20 + B	it range: 6 25
245 Bits : 1A CA 03 08 67 99 CD B3 92 0A 79 B4 2D 9B 42 15 41 38 86 F0 90 CA 03 08 59 01 C8 60 8C C3 FC	Bits	11010- <mark>11001010-00000011-0000</mark> 10	11.01100111.10011001	.11001101
🖹 🖗 🖗 🐼	Ready	talitation and the second s	41 USB LUID: 0/0x0000	

Get Active ID Pop

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

elect the number of source bits to define the fields.	The bit format read from
he card must match the fields definition such as Star	tBit, Bits, Decimal / Hex /
SCD+ /W Partiy	
Nefine the fields using one of the fallowing field defin	autions
content of the ready using one of the functioning field deal	ind of the
VIV 64 BIT OEM BOARD	
PIV 64 Bit/LSB Reverse Nybble OEM BOARD	
PIV 75 Bit OEM BOARD	
PIV 200 Bit WaveID	
Piv 245 Bit wavelo (default)	

Define Fields Dialogue Box

3. Configure any additional fields as appropriate.

rf IDEAS Configuration Utility WAVE ID ® Solo ar	nd WAVE ID [®] Plus				- 0 >
rf IDEAS	#01	: 0	Not Available		
Connect Disconnect Write	Data Format	Format Mode Delim	iters	Extended	Hashing
Home	Define Fields Agency System Code Credential Num.	inable okes precede card dat CE>Card <space>Out</space>	ta: Room for 2 keystroke iput <enter></enter>	25.	Insert Keystroke
sDK Format	Credential Series (I/Credential Issue Personal ID Org. Category Organizational ID	ay Mode) Octal O D	ecimal O Hex	O ASCII 💿	BCD + Parity
Tools Test Area >>	Expiration Date	gits to display -	ashing Key erse bits Reverse	bytes Set hashing ke	GetiD
245bits 1ACA03086799CD83920A79842D98421 5413886F090CA03085901C8608CC3FC	F13 F14 (F15 Sta	re art bit • 245	+ Number of Bits	- () + Bit	range: NONE
	Bits	0.11001010.0000	00011.00001011.0	1100111.10011001.	11001101
	10110011.10010010		#1 USB	DI01101.10011011.	01000010

Configuration of Additional Fields

4. Save the configuration to memory.

rf IDEAS Configuration Utility WAVE ID ® Solo ar	nd WAVE ID⊗ Plus			- 🗆 X
rf DEAS	#01	i Oo Not Availal	ble	=
Connect Disconnect Write	Data Format	ormat Mode Delimiters	Extended	Hashing
Home	Define Fields En Key stroke (Agency (System Code)	able es precede card data: Room for 2 key >Card <space>Output<enter></enter></space>	rstrokes.	Insert Keystroke
Timing	Credential Num. Credential Series			Clear
SDK	Personal ID Display	y Mode	u	PCD - Davity
Format	Organizational ID (Person/Org, ID)	ts to display - 0 +		BCD + Panty
Tools	Expiration Date Extend	ed Conversion / Hashing Key		
Test Area >>		vert bits 🗌 Reverse bits 🗌 Rev	verse bytes Set hashing ke	GetiD

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.

pr f IDEAS Configuration Utility WAVE	$D^{\mathbb{R}}$ Solo and WAVE $D^{\mathbb{R}}$ Plus	– 🗆 X
rf DEAS	RDR-800x1AxU HID Prox : RDR-60	D8x Compatible • •
Connect Disconnect Write	Enable Data Format Mode Data Format Delimiters	Extended Hashing
Home		
l iming SDK	Enter string for hashin Write to save.	ng code values.
Format		
Tools	Hashing Keys Key A	
Test Area >>	Key B	
00:0000000 00:0000000		
	Enhance Sect	unity
		•
		USB #01 LUID: 0/0x0000

Hashing Tab

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
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nf IDEAS Configuration Utility WAVE I	$D^{ extsf{R}}$ Solo and WAVE $ID^{ extsf{R}}$ Plus		())	
rf IDEAS	RDR-800x1AxU	HID Prox : RDR-608x Compatible	•)•	Ξ
	Enable Data Format Mode			
	Data Format De	limiters Ext	ended I	Hashing
Connect Disconnect Write				
Home				
Timing				
SDK	Enter stri Write to s	ng for hashing code val save.	ues.	
Format				
Tools	Hashing Keys			
	Key A 01234	56789ABCDEF		
Test Area >>	Key B 123456			
00:0000000 00:0000000				
	F	1		
	L	Enhance Security		
📑 (#) (0) (X) 🗵				
			USB #01 LUID: 0/0x0000	

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.

rf IDEAS Configuration Utility WAVE	ID^{\circledast} Solo and WAVE ID^{\circledast} Plue	S	3 7-3 0	
rf DEAS	RDR-800x1AxU	HID Prox : RDR-608x Compatible	۳) ه	Ξ
Connect Disconnect Write	Enable Data Format Mode Data Format	Delimiters Ex	tended	Hashing
Home				
Timing				
SDK	E	nter string for hashing code va /rite to save.	lues.	
Format				
Tools	Hashing Key A	0123456789ABCDEF		
Test Area >>	Key B	123456		
00:0000000 00:0000000				
		Enhance Security		
				Ð
			USB #01 LUID: 0/0x0000	

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.

n rf IDEAS Configu	uration Utility \	WAVE ID ® Solo	and WAVE ID ® Plus			- 🗆 🗙
			Hashing Key A/B or both will be	erased or replaced.	atible	
Connect	X	للے Write			ok ended	Hashing
Home			Define Fields. Ena F01 FAC: <sp4< td=""> F02 FAC:<sp4< td=""></sp4<></sp4<>	ble s precede card data: Room for 23 ACE>F11	keystrokes.	Insert Keystroke
SDK			F04 F05 F06 F07 Conservation	Mode Octal	Hex O ASCI O	BCD + Parity
Tools			F10 F11 Extended	s to display - 0 +		
Test Area			F12 Inv F13 Where F14 Start 0 0	ert bits Reverse bits Reverse bits Reverse bits bits bits Reverse bits Reverse bits Reverse bits Reverse bits R	everse bytes Set hashing ke	range: 8 15
			Bits Write operation fail		#1 USB UUID:5500/0X157C	

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.

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.



Starting the Cloning Process

3. The cloning window will appear as shown below:

rf IDEAS Configuration Utility WAVE ID® Solo and	WAVE ID® Plus		- □ ×
rf IDEAS	#01 RDR-805x1AxU	OFF	• •
✓ × ∓	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write	Clone Current E	evice Configuration Settings to Other	Devices
Home	Clone Settings	Minimum LUID	Maximum LUID
Timing	Only update readers with LU	Starting LUID	n OxFFFF
SDK	Vrite LUID	0x1000	
Tools	Logs		
Test Area >>			
			Clear Log
	Clone Now	Please unplug source reader.	Close
E (#+ (0+ (×+ <×		#1 USB LUID: 0	I/0x0000

Clone Configuration Reader Dialogue Box



- 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.

n flDEAS Configuration Utility WAVE ID® Solo and V	VAVE ID® Plus		-
rf DEAS	#01 RDR-805x1AxU	••• OFF	• 0
 ✓ × ∓ 	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write	Clone Co	urrent Device Configuration Settings t	to Other Devices
Home	Clone Settings	Minimum UUD	Maninum IIIID
Timing	Only update readers	with LUID range. 0x0000	through OxFFFF
SDK	Vrite LUID	Starting LUID	Increment By
Format			Default
Tools	Logs		
Test Area >>			
			Clear Log
	Class New	Please plug the destination r	eader(s).
		Reader(s) detected: 0	e close e
		#1 US	SB LUID: 0/0x0000

Reader Disconnected

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

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.

nf IDEAS Configuration Utility WAVE ID® Solo and	WAVE ID ® Plus		- 🗆 X
rf IDEAS	#01 RDR-805x1AxU	••• OFF	≡
 × ▼ 	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write	Clone Curre	nt Device Configuration Settings to Other I	Devices
	Clone Settings		
Home Timing	Only update readers wit	Minimum LUID h LUID range. 0x0000 through	Maximum LUID
SDK	Vrite LUID	Starting LUID	Ox0001
Format			Default
Tools	Logs		
Test Area >>			
			Clear Log
	Clone Now	Please plug the destination reader(s Reader(s) detected: 2.). Close +
🗐 (#) (0) (x) 🗙		#1 USB LUID: 0/	0x0000
	Connecting Otl	her Readers	

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

nf IDEAS Configuration Utility WAVE ID ® Solo an	nd WAVE ID® Plus		– 🗆 X
rf <mark>IDEAG</mark>	#01 RDR-805x1AaU		÷ ₀ =
✓ × ₹	Card Analyzer	Cloning	
Connect Disconnect Write	Clone Current Device Cor	nfiguration Settings to Other I	Devices
	Clone Settings		
Home		Minimum LUID	Maximum LUID
Timing	Only update readers with LUID range.	(0x0000) through	OxFEEF
stik	Write LUID	0x1002	0x0001
Format			Default
Thirds:	Logs		
10015	4/28/2023. 4:22:33 PM Start		
Test Area >>			
			Clear Log
		Configuring	
	Clone Now Rea	der(s) detected: 2.	Close
		#1 USB LUID: 0/	0x0000

Configuring Reader(s)

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

nf IDEAS Configuration Utility WAVE ID® Solo and	WAVE ID® Plus		- 🗆 X
rfiDEAS	#01 RDR-805x1AxU	••• OFF) o
	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write	Clone Current	Device Configuration Settings to Othe	er Devices
	Clone Settings		
Timing	Only update readers with I	Minimum LUID LUID range.	Maximum LUID Igh OxFFFF
SDK	Vrite LUID	Ox1005	0x0001
Format			Default
Tools	Logs		
	4/28/2023, 4:48:16 PM Start 4/28/2023, 4:48:17 PM Configu	ring 1 Reader(s)	
Test Area >>	4/28/2023, 4:48:17 PM Configu	ring reader 1 of 1	
-	4/28/2023, 4:48:19 PM Configu 4/28/2023, 4:48:19 PM Finished	re #1 FW:16.9.3 LUID 4099/0x1003 -> 41	00/0×1004
			Clear Log
	Please	unplug the current set and plug	the next
	Clone Now	Reader(s) detected: 1.	Close
		#1 USB LUID	: 0/0x0000

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.



Card Analyzer Process

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

📠 rf IDEAS Configuration Utility WAVE ID® Solo a	nd WAVE ID ® Plus		- 🗆 X
rf DEAS	Select a device	🗊 Not Available	=
~ × Ŧ	Card Analyzer	Cloning	Smartcard Manager
Connect Disconnect Write			
Home		1	
Timing			
SDK			
Format			
Tools			
Tort Area		Card Analyzer	
	The Card	Analyzer will search for cards available to	the WaveID
		Start	
			0
🖹 (#† (0† (x† 🛛		Discon	nected

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.



Detecting the Reader

FUNCTION	DESCRIPTION
Status	The status may display the following:
	• "Reader not connected". Ensure the reader is connected properly.
	 "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-305x1BxU, RDR-305x2BxU, RDR-300x1BxU, RDR-300x2BxU, OEM-805x2BxU-LNV, RDR-80581AKU-RA, RDR-805x1AxU-RA, RDR-300x1CxU, RDR-30Mx1CxU-MXS, RDR-8XMx1AxU, RDR-800x1BxU, RDR-800x6AxU. "Reader connected".
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	and WAVE ID® Plus	×
rf DEAS	#01 RDR-805x1AxU	(OFF • O
~ × Ŧ	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Learn Card	ard Type
Home	Prepare for auto configuration by learning the card scanned to the reader.	
Timing	 Press the Start Scan button to learn the card. 	
SDK	2. Follow the card placement S instructions displayed in the	upporting Readers
Format	 Press the Auto Config to set up the reader to read your card(s) / 	
Tools Test Area >>	employee badges 4. Pressing the "Halt Scan" button will stop the card search scan. Note: If you "Halt Scan," the	
	search will need to be restarted.	Press the Start Scan button to learn your card.
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: +1 (866) 439-4884 .	
		K Back Auto Config Exit
(#+ (0+ (×+ (×	Ready	#1 USB LUID: 0/0x0000

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:

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	(OFF	• •
~ × т	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	 Press the Start Scan button to learn the card. 	<u></u>	
SDK	 Follow the card Please put a card instructions disp popup and statu 	i on the reader.	
Tools	 Press the Auto (the reader to read your card(s) / employee badges 		
Test Area >>>	 Pressing the "Halt Scan" button will stop the card search scan. 	c	
	Note: If you "Halt Scan," the search will need to be		Halt Scan Start Scan
	restarted.	Press the Star	t Scan button to learn your card.
	* For additional information on compatible Readers		
	please call rf IDEAS Sales at		
	Toll-free: +1 (866) 439-4884.		
		Back	Auto Config > Exit
	Ready	#1 USB LU	/ID: 0/0x0000

Starting the Scan



- 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.

rf IDEAS Configuration Utility WAVE ID® Sclo and	I WAVE ID® Plus		×
rf DEAS	#01 RDR-805x1AxU	E	
	Card Analyzer	Cloning Smartcard Manager	
Connect Disconnect Write	Learn Card	Card Type	ults from scan
Home	Prepare for auto configuration by learning the card scanned to the reader		wing possible ches
Timing	 Press the Start Scan button to learn the card. 		
SDK	 Follow the card placement instructions displayed in the popup and status boxes. 	Supporting Readers	
Format	 Press the Auto Config to set up the reader to read your card(s) / employee hadnes 		
Test Area >>	 Pressing the "Halt Scan" button will stop the card search scan. Note: If you "Halt Scan " the 		
	search will need to be restarted.	Halt Scan Start Scan Scanning in progress	
	* For additional information on compatible Readers, please call rf IDEAS Sales at Toll-free: + 1 (866) 439-4884.	You will also hear the reader beep during this search.	
		Back Auto Config Exit	D
Reference and Re	leady	#1 USB LUID: 0/0x0000	
	Scanning P	rocoss	

Scanning Process

"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:

n fiDEAS Configuration Utility WAVE ID® Solo	and WAVE ID® Plus	- 🗆 X
rf DEAS	#01 RDR-805x1AxU) (OFF • O
 × ▼ 	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Learn Card	Card Type
Home	Prepare for auto configuration by learning the card scanned to	IND THORE
Timing	The reader. 1. Press the Start Scan button to learn the card.	
SDK	 Follow the card placement instructions displayed in the population and other board. 	Supporting Readers RDR-608x
Format	 Press the Auto Config to set up the reader to read your card(s) / 	RDR-805xx RDR-800xx RDR-305xx PDR-300xx
Tools	emplcyee badges 4. Pressing the "Halt Scan" button will stop the card search scan.	OFM-805xx
IEST AIEd //	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	Config button to configure the reader 40 Bits : 00 00 00 40 2D E0 B6 08
	Toll-free: +1 (866) 439-4884.	K Back Auto Config Exit
(#+ (0+ (X+ (X	Ready	#1 USB LUID: 0/0x0000

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".

🚾 rf IDEAS Configuration Utility WAVE ID ® Solo a	nd WAVE ID® Plus	- 🗆 X
	#01 RDR-805x1AxU :	HID Prox : RDR-608x Compatible
 ✓ × ∓ 	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write	Learn Card	Card Type
	Prepare for auto configuration by learning the card scanned to the reader.	Card not found: Please contact rf IDEAS for additional support.
Timing	 Press the Start Scan button to learn the card. 	
SDK	 Follow the card placement instructions displayed in the popup and status boxes. 	Supporting Readers
Format	 Press the Auto Config to set up the reader to read your card(s) / employee badges 	
Test Area >>	 Pressing the "Halt Scan" button will stop the card search scan. Note: If you "Halt Scan," the search will need to be restarted. 	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: + 1 (866) 439-4884 .	Config button to configure the reader
		Auto Config Exit
	Ready	#1 USB LUID: 0/0x0000

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 and	WAVE ID ® Plus	- 🗆 X
rf DEAS	#01 RDR-805x1AxU HID Prox : RDR-608x Compatible	• •
✓ × ∓	Card Analyzer Cloning Sm	artcard 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 Card Card Type Type field.	
SDK Format	 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 Configuration #	RDR-608x Comp
Test Area >>	number will appear in the Card ID field. Verify that the number shown matches the number on your card	tWG+ Write
	John Carda J	00 04 AA 9A 60 4E
	Learn Card Analyze	> Exit
	#1 USB LUID: 0/0x0000	



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 -
	• 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.
	• If the user has written configurations, pressing the "Exit" button will return user to main Card Analyzer window with the new card settings.

To auto configure:

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

rf IDEAS Configuration Utility | WAVE ID® Solo and WAVE ID® Plus

In IDEAS Configuration Othery WAVE ID + Solo an		^
rf DEAS	#01 RDR-805x1AxU 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	1. Select the card listed in the Card Type field. Card Type	
SDK.	2. Note: If you're unable to find your ID in the Card Type list, either: press Learn Card to try a paw cord or press Apalyze to	
Tools	ave the card analyzer to have the card analyzer find the card setting for you. 3. Once selected, the card's ID Configuration #	1
Test Area >>	number will appear in the Card ID field. Verify that the number shown matches the number on vour card	
	 4. If the number matches, select the Configuration # you wish to write and press the Write button. 	
	K Learn Card Analyze Kit	Ð
	#1 USB LUID: 0/0x0000	

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.



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.

rf IDEAS Configuration Utility | WAVE ID ® Solo and WAVE ID ® Plus

	#01 RDR-805x1AxU	HID Prox : RDR-608x Compatible • O
 ×< ₹ 	Card Analyzer	Cloning Smartcard Manager
	Auto Config	Card ID (12327
	Use the Card ID found during the Learn step to configure your card.	
	1. Select the card listed in the Card	Card Type
	 Note: If you're unable to find your ID in the Card Type list 	HID Prox
	new card, or press Analyze to have the card analyzer and the	
	card setting for you, 3. Once selected, the card's ID number will appear in the Card	Configuration # 1 • HID Prox : RDR-608x Comp
	ID field. Verify that the number shown matches the number on your card.	Save HWG+ Write
	 If the number matches, select the Configuration # you wish to write and press the Write button. 	Writing to Sevice
		C Learn Card Analyze S Exit
B (F (C (X (X)		#1 USB LU/D: 0/0x0000

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.

V

ne rf IDEAS Configuration Utility WAVE ID® Solo and	WAVE ID® Plus - 🗆 🗙
rf DEAS	#01 RDR-805x1AxU Image: HID Prox : RDR-508x Compatible Image: Optimized compatible <td< th=""></td<>
✓ × ₹	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 Card Card Type
SDK	Type field. HID Prox Note: If you're unable to find
Format	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 Configuration # 1 HID Prox : RDR-608x Comp
Test Area >>	number will appear in the Card ID field. Verify that the number Save HWG+ Write
	shown matches the number on your card. 37 Bits : 00 00 00 04 AA 9A 60 4E
- <u></u>	 If the number matches, select the Configuration # you wish to write and press the Write button.
	Learn Card Analyze Exit Exit
	#1 USB LUID: 0/0x0000

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 a	and WAVE ID® Plus	- 🗆 X
rf DEAS	#01 RDR-805x1AxU HID Prox : RDR-608x Compatible	• •
	Card Analyzer Cloning Smartca	rd Manager
Connect Disconnect Write Home Timing SDK Format Tools Yest Area	Analyze Card User Input Fields Learn reader settings for selected card. ID 1. Enter the Card ID and FAC numbers in the User Input Fields. The FAC may be omitted if unknown. ID 2. Press Analyze to begin the search. The results will be displayed in the Analyzed Card ID field. Card Type 3. Select the Configuration # and press Write to write the settings to the reader. Analyzed Card ID Configuration # and press Write to write the settings Configuration # and press Write to write the settings) Analyze
		Exit 🕂

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	 This button has the following functions: If the user has not written configurations, pressing the "Exit" button will return user to rfIDEAS config utility without making any changes. If the user has written configurations, pressing the "Exit" button will return user to rfIDEAS config utility with new card settings.

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.

- 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

rf IDEAS	#01 RDR-805x1AxU	HID Prox : RDR-608x Compatible 🔹 🕚
✓ X 🛓	Card Analyzer	Cloning Smartcard Manager
Connect Disconnect Write ome	Analyze Card	User input Fields FAC Analyze
ming DK	 Enter the Card ID and FAC numbers in the User Input Fields. The FAC may be omitted if unknown. Press Analyze to begin the search. The results will be 	Card Type HID Prox
aola stAese >>	 Select the Configuration # and press Write to write the settings to the reader. 	Analyzed Card ID Card Id : 43690 found
	(Configuration # 1 • HID Prox Save HWG+ Write Analyze Complete

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.


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.

rf IDEAS Configuration Utility WAVE ID® Solo	and WAVE ID @ Plus		: 0)	□ ×
rf DEAS	DEVICE LIST	CONFIGURATION(s)		Ξ
		HID Prox : RDR-608x Compatible	•	Ø
	USB Firmivare: 16.9.0	2 RDR-758x Equivalent		0
· · ·	LUID: 65535/0KFFFF 0C27-3BEA RE IDeas	3 (OFF		O
Connect Disconnect Write		4 (OFF	*	0
Home	Connection Type			
Timing	USB (Universal Serial Bus) ports			
SDK	O Serial: RS-232 and virtual COM p	ports		
Format	Use COM ports 1 thr	rough 255 Default 1.8 Baudrate	e (9600	•
Tools				=
	O Ethernet (Local IP 192.168.43.22	7)		
Test Area >>	+	+ + +		
	IP Address D . (0.0.0		
	· .			
	Port 10001	Find Next IP		
 .				
	<u>(</u>			
				Ð
🗐 (#. (). (X. 🗙	a P 27 Marine			-
		#1 USB LUID:65535/0XFFFF		

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 an	d WAVE ID ® Plus		- 🗆 🗙
rf DEAS	#01 RDR-805x1AxU-SLB	• (OFF	
✓ X 土 Connect Disconnect Write	Card Analyzer	Clonin SmartCard Manager	lg
Home			
Timing	Sr	nartcard Manager	
toy.	The Smartcard Manage	r function allows configuring WAVE ID secure read (MIFARE, LEGIC, etc).	ders
золк	Please make sure you ha	ave your secure reader plugged into the computer	and
Format	connecteu (co	Then click on Launch	
Tools		Launch	
Test Area >>			
Card type 0x0301 from reader is not in card list. Selection set to OFF			
			Đ
🖹 (#) (0) (x) (X	Ready	#1 USB LUID: 0/0x0000	

Smartcard 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.

100	ral Settings	
rot	ocol: Keystroke/SDK	Connect/Reconnect
un	ent Card Configurations:	
1:	Off	Vo Secure Sectors
2:	HID Prox : RDR-608x Compatible	Vo Secure Sectors
3:	Off	No Secure Sectors
4:	Off	No Secure Sectors
Hig	h Priority Card: None ✓	Create tab for Host Encryption
Hig	h Priority Card: <u>None</u> ∽ Read card data	Create tab for Host Encryption
Hig	n Priority Card: <u>None</u> ∽	Create tab for Host Encryption Reader × Reader Information: × VID 0C27, PID 3BFA × LUID: 0000 Model Number: RDR-805x1AxU-SLB Firmware version: 18.0 × SVN: 9455 Built: Jul 9 2018 Ctrl Bootloader: 1.5.1

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:



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.

Chapter 4

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/rfideasconfigurationutility6.5.0.deb
- 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	-	8
rf	Please provide permission to rf IDEAS Reader on Linux before using the Utility		Ξ
Connect	IMPORTANT-READ CAREFULLY: Whenever RFIDeas readers are connected to a Linux machine, users have to give the 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 improve this situation, there is a onetime setup approach to give permission to all readers. After performing this process the user will never		
Home	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:		
SDK Format	 Please check the below box and click on Proceed. After proceed, it will ask for system password. NOTE: Please Make sure you are connected to the internet. 	600 -	
Tools Test Area			
	I have read all the instruction. Proceed).	Ø
	[0 ⁺ (× ⁺ ≺×) Disconnected		

Providing permission to rf IDEAS reader on Linux.

3. User need to provide system password and click on Authenticate as shown below:

rf IDEAS Configuratio	n Utility WAVE ID® So	lo and WAVE ID® Plus	- 8
		- Nor Avenue	
Connection Ty	Authoptics	tion Dogwisod	
O USB (Uni	Authentica	cion Required	
	Authentication is nee the s	ded to run `/bin/bash' as uper user	-
O Settal RS		~	
Use COM		0	Baudrate 9600 •
	ſ	ntime	
C Ethenset			1114
O Emender	Password	Ø	1 1 1 1 S
IP Address			
	Cancel	Authenticate	Contraction of the
Port	10001	Find Next IP	

Providing system password

NOTE: - User may also provide permission later by under 'Help' menu.

- 4. If User clicks Cancel button or encounters any internet issues during providing permission, then please follow below step.
- 5. Go to Hamburger menu -> Help and click on "Add read-write permission to RFIDEAS readers." after clicking, user will get a popup for system password for providing the permission to rf IDEAS readers..

i	= f IDEAS Configuration Utility W	AVE ID® Solo and WAVE ID	© Plus – 😣	
rf DEAS	DEVICE LIST			
Connect Disconnect Write	Select a device	Not Available Not Available Not Available Not Available 4 Not Available	Auto Connect	
tions	Connection Type	Read user manual	View)	
Timing	USB (Universal Serial Bus)	Read End-User License Agreem (EULA)	ent Check for update	
SDK	Serial: RS-232 and virtual (Add the read Write permission to IDEAS readers	hit	
Format	Use COM ports 1	www.rlideas.com About	Baudrate 9600 •	
Tools	O Ethernet (Local IP 172.20.1	0.4)		
Test Area >>>	IP Address 0 + Port 100	+ + + 0	t IP	
	How to give permission to rf IDEAS read	ders on Linux	Disconnected	

Steps to provide permission to rfIDEAS readers.

Manual steps to provide permission required on Linux Platform

Please follow below steps:

- 1. Open the terminal: First Step is to install libudev1 using below command: apt-get install libudev1
- 2. Now depending on the system architecture move to appropriate directory using below command:

(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. KERNEL=="hidraw*", ATTRS{idVendor}=="0c27", MODE="0666" KERNEL=="hidraw*", ATTRS{idVendor}=="0c27", ATTRS{idProduct}=="3bfa", MODE="0666" SUBSYSTEM=="tty", ATTRS{idVendor}=="0c27", MODE="0666" SUBSYSTEM=="tty", ATTRS{idVendor}=="0c27", ATTRS{idProduct}=="3bfa", MODE="0666" SUBSYSTEM=="tty*", ATTRS{idVendor}=="0403", ATTRS{idProduct}=="6001", MODE="0666" SUBSYSTEM=="tty*", ATTRS{idVendor}=="067b", ATTRS{idProduct}=="2303", MODE="0666"
- 6. After typing this, Press 'esc' key and type ':wq' then press 'Enter' to save the rules.
- 7. Type the following command to activate the newly created rules for RFIDeas devices:

sudo udevadm trigger

After following the above steps, whenever an rf IDEAS reader is connected, it will have the appropriate permissions to communicate with the operating system.

rfiDEASConfigurationUtility_v6.0.6 Beta2			🏗 💼 💼 📢 3:55 PM 🔱
🔗 🔍 Ubuntu 🔞 rf IDEAS Configuration Utility	WAVE ID® Solo and WAVE ID® Plus		२ 🗉 🖩
rf DEA5	DEVICE LIST	CONFIGURATION(s)	=
	#01 RDR-800x1AxU	Keri NXT UID	0
	LUID: 65527/0xFFF7 0C27.3BFA RF IDeas	3) (- OFF	0
Connect Disconnect Write	(Caracterization of C	4) (-OFF	0
Home	Connection Type		
Timing	OSB (Universal Seniel Bus) ports		
SDK	Serial RS-282 and virtual COM po	in .	
Format	Vie COM ports	gh 255 Oefault 1.8 Baudrate 9600	
Taols	Elizamet (Local IP 10.0.2.15)	Open hwg+ file	6
Test Area >>	P Andreas	Save device data to mug+ file	4
·)) ID •		* metall libueb for NTWOC feeder	9
•	Port	Find Next IP Save USB device hex raw data to (SDK) file	*
			8
🔝 (k) (c) (×) 🛛	Ready	#1 USB LUID: 65527/0xFFF7	d (105.8 MB)

Installation of libusb for NTWCC reader disabled.

- 6. Linux O/S does not support NTWCC type readers therefore "Install libusb for NTWCC reader" option will be disabled (greyed out).
- 7. User cannot print special characters on Linux PC using virtual keyboard.

4.2 MAC Platform

Installation and Usages:

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).

	rf IDEAS Configuration Utility WAV	/E ID® So	lo and WAVE ID® Plus			
rf OEAS	DEVICE LIST		CONFIGURATION	(s)	Ξ	-
Connect Disconnect Write	#01 RDR-805x1AxU USB Firmware: 16,9.0 LUID: 0/0x0000 0C27:3BFA RF IDeas	1 2 3 4	HID Prox : RDR-608x Compatible RDR-758x Equivalent OFF OFF		÷ 0 0 0	
Home	Connection Type					
Timing	USB (Universal Serial Bus) po	rts				
SDK	O Serial: RS-232 and virtual CO	M ports	+			
Format	Use COM ports 1	through	265 Default 18	Baudrate 96	\$ 00	ļ
Tools	O Ethernet (Local IP 0.0.0.0)					1
Test Area >> 12325 a12325 a12325	IP Address 0	+	$\cdot \begin{array}{c} \bullet \\ \bullet $			
a12325 a12325	Port	D	Find Next IP			
<u>∎</u> (#: ©: ≪: ⊠			#1 LICG LUID:	0/0x0000	C)

Serial & Ethernet readers not supported.

	rf IDEAS Configuration Utili	ty WAVE ID® Solo and WAVE ID® Plus			
rf IDEAS	DEVICE LIST CC				
	#01 RDR-805x1AxU	✓ USB	Auto Connect		
Connect Disconnect Write	LUID: 0/0x0000 0C27:3BFA RF IDeas	Serial	Device)		
Connect Disconnect write		Ethernet	View		
Home	Connection Type		Help		
Timing	O USB (Universal Serial	Bus) ports	Check for update		
SDK	O Serial: RS-232 and vi	rtual COM ports			
Format	Use COM ports	1 through 255 Default 7	18 Baudrate 9600 \$		
Tools	O Ethernet (Local IP 0.0	.0.0)			
Test Area >>	-	+ + +	+		
	IP Address	0.0.0.0.0	0		
		+			
·	Port	10001 Find Next IP			
			0		
		#11	JSB LUID: 0/0x0000		

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

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).



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.



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.



Enabling Slow Key

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

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® Sole and	WAVE ID & Plus			- o ×
rfideas	#01 RDR-80Mx1AxU-D1	E @ MIEARS	EV1/EV2 Secure File Data	• •
Connect Disconnect Write	Define Fields	nat Mode Delimiters Ne precede card data: Boom fo	Extended	Hashing
Home Timing	F01 F02 F03 F04	CE>		Insert Keystroke Clear
SDK Format	F05 Display I F07 O F08 Digits F09 Digits	Mode Dotal O Decimal to display + 0 +	O Hex ASCII O	BCD + Parity
Tools Test Area >>	(F10) (F11) (F12) (F13) (F10) (Extended (Inve	d Conversion / Hashing Ke ert bits Reverse bits	2 Reverse bytes Set hashing ke	y • Getto
csn: 0123456789	FI4 FI5 Start t 01224	nit • 1 • Nurr	iber of Bits + 80 + Bit	range: 1 80
80 bits: 30313233343536373839	Bits	,,		
▶ @ @ @ ⊗ ⊠	Ready		#1 USB (UID: 4096/0x1000	

ASCII Extended Mode

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