

## Configuration Utility User Manual WAVE ID® Readers



Trust begins here.™

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

# Table of Contents




<b>Glossary of Terms.....</b>	<b>5</b>
<b>Information Symbols .....</b>	<b>6</b>
<b>Reader Basics.....</b>	<b>7</b>
1.1 Difference between Single Configuration and Multi Configuration Reader .....	7
1.2 Reader Setup .....	7
<b>Software.....</b>	<b>8</b>
2.1 rf IDEAS Configuration Utility .....	8
2.2 Utility Overview .....	9
2.3 Hamburger Menu .....	9
Auto Connect Menu.....	10
Device Menu.....	10
View Menu .....	11
Help Menu .....	11
Check for Update Menu .....	12
2.4 Plus (+) Menu .....	16
2.5 Icon Toolbar .....	17
Connect.....	17
Disconnect .....	19
Write .....	20
2.6 WAVE ID Plus Configuration.....	21
Device List .....	21
Configuration(s) .....	21
2.7 Home Tab .....	22
Connection Types .....	22
Output Test Area.....	23
Status Bar .....	24
2.8 Timing Tab .....	25
2.9 SDK Tab .....	26
Disable Keystrokes for SDK.....	26
LED .....	27
Logical Unit ID.....	27
Beeper .....	27

Volume .....	27
Card ID .....	28
<b>2.10 Format Tab .....</b>	<b>30</b>
Data Format Tab .....	30
<b>Wiegand to Keystroke Data Format:-</b> .....	<b>30</b>
<b>Advanced Settings:-</b> .....	<b>31</b>
Delimiters Tab .....	32
Extended Tab .....	33
Hashing Tab .....	42
<b>2.11 Tools Tab .....</b>	<b>47</b>
Cloning .....	47
Card Analyzer .....	53
Smartcard Manager .....	73
<b>Troubleshooting .....</b>	<b>76</b>
3.1 Troubleshooting .....	76
<b>Linux and Mac Permissions Setup .....</b>	<b>77</b>
4.1 Linux Platform .....	77
4.2 MAC Platform .....	79
<b>END-USER LICENSE AGREEMENT .....</b>	<b>84</b>
<b>Index .....</b>	<b>92</b>
<b>Appendix .....</b>	<b>93</b>
Use the WAVEID Plus Reader for Password Security - Complex Passwords .....	93
ASCII Extended Procedure .....	94

# 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.
	Tip	Tips can provide hints and pointers in addition to the text.
	Important	Important information can include prerequisites, limitations, and caution.

## 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

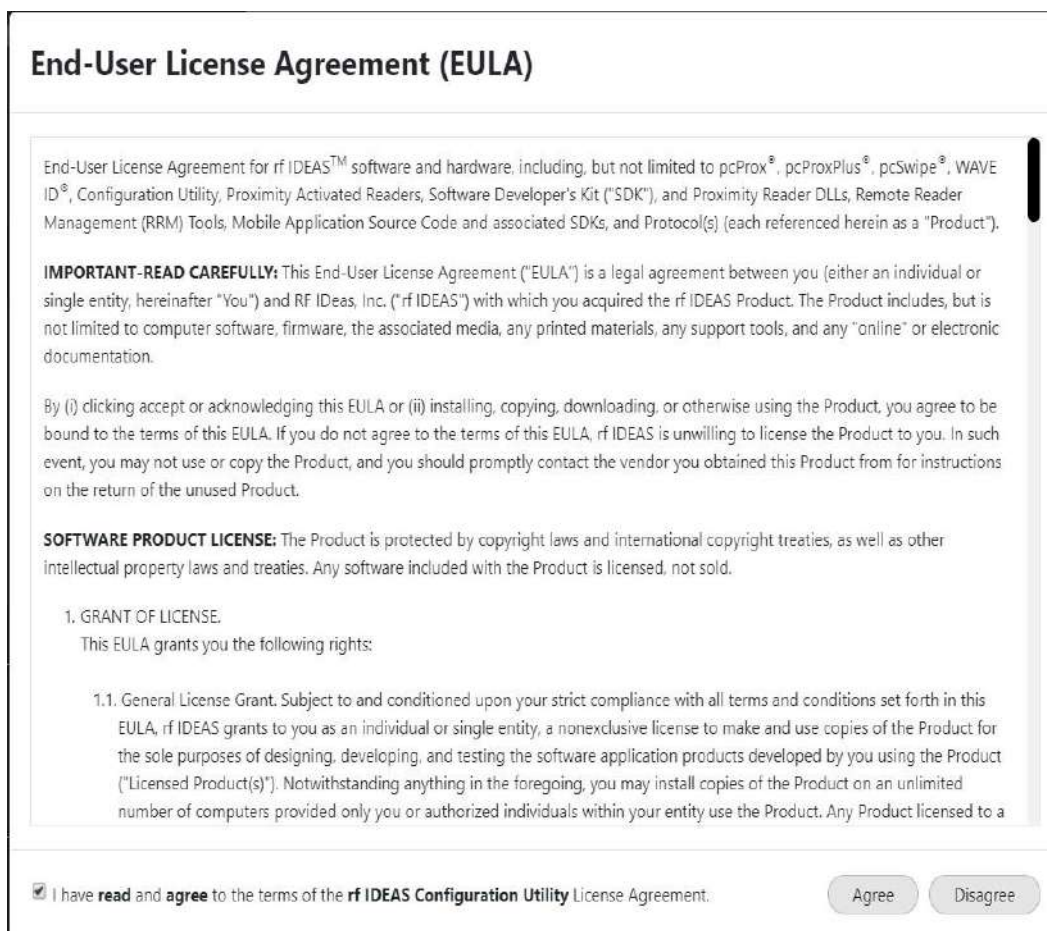
# Software

## 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:



**End-User License Agreement (EULA)**

End-User License Agreement for rf IDEAS™ software and hardware, including, but not limited to pcProx®, pcProxPlus®, pcSwipe®, WAVE ID®, Configuration Utility, Proximity Activated Readers, Software Developer's Kit ("SDK"), and Proximity Reader DLLs, Remote Reader Management (RRM) Tools, Mobile Application Source Code and associated SDKs, and Protocol(s) (each referenced herein as a "Product").

**IMPORTANT-READ CAREFULLY:** This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or single 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.

By (i) clicking accept or acknowledging this EULA or (ii) installing, copying, downloading, or otherwise using the Product, you agree to be 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, 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

☒ I have read and agree to the terms of the rf IDEAS Configuration Utility License Agreement.

Agree Disagree

Image 1: End User License Agreement (EULA)



## 2.2 Utility Overview

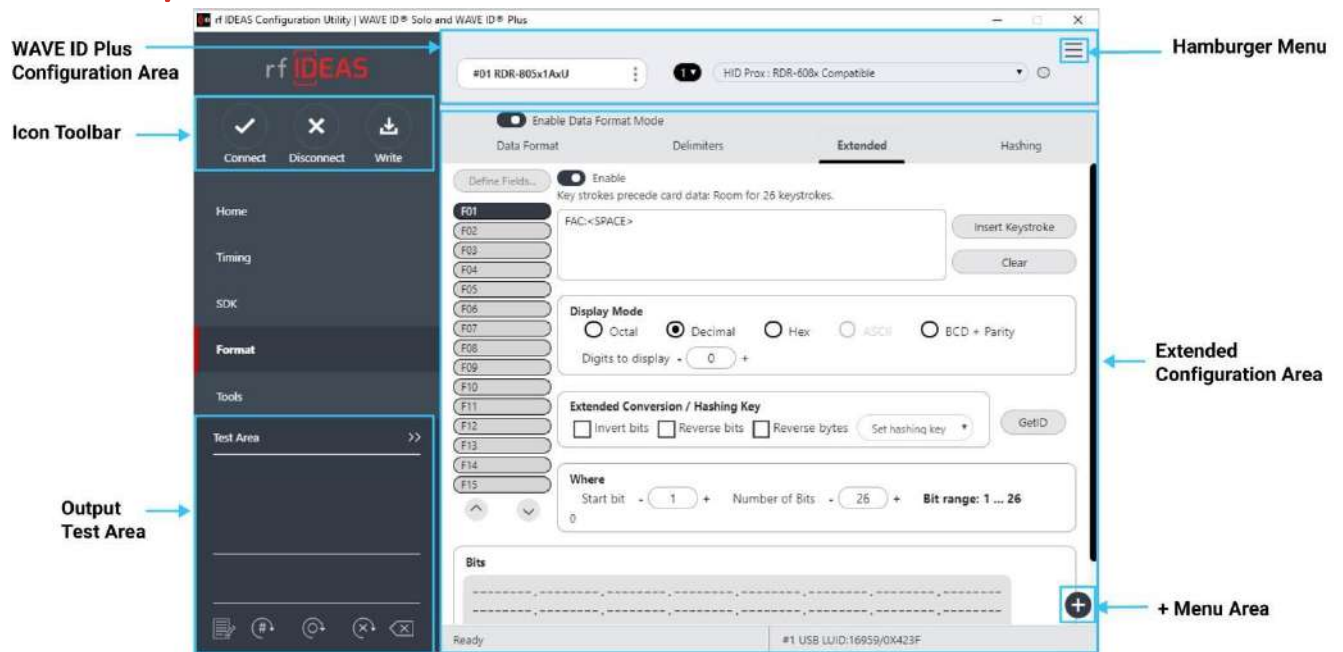


Image 2: Utility Overview

Please note that any unsupported functions will be greyed out.

## 2.3 Hamburger Menu

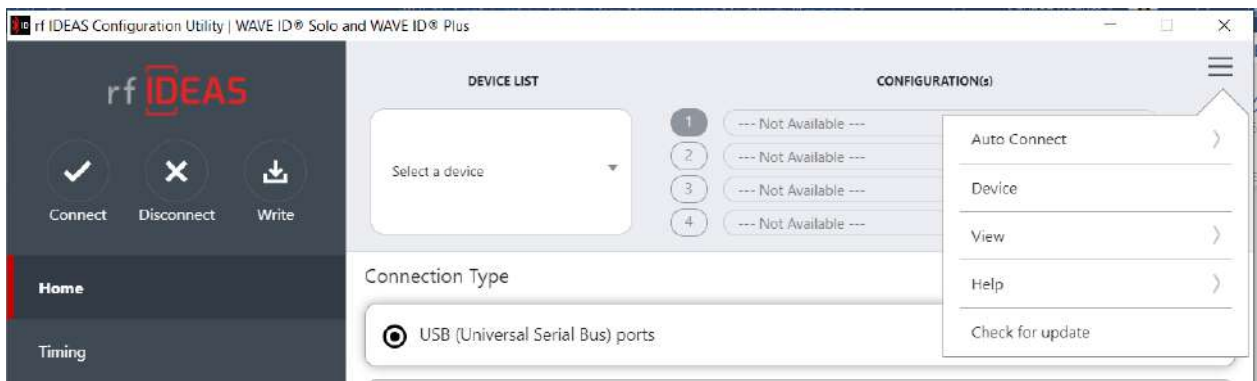


Image 3: Hamburger Menu

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

## Auto Connect Menu

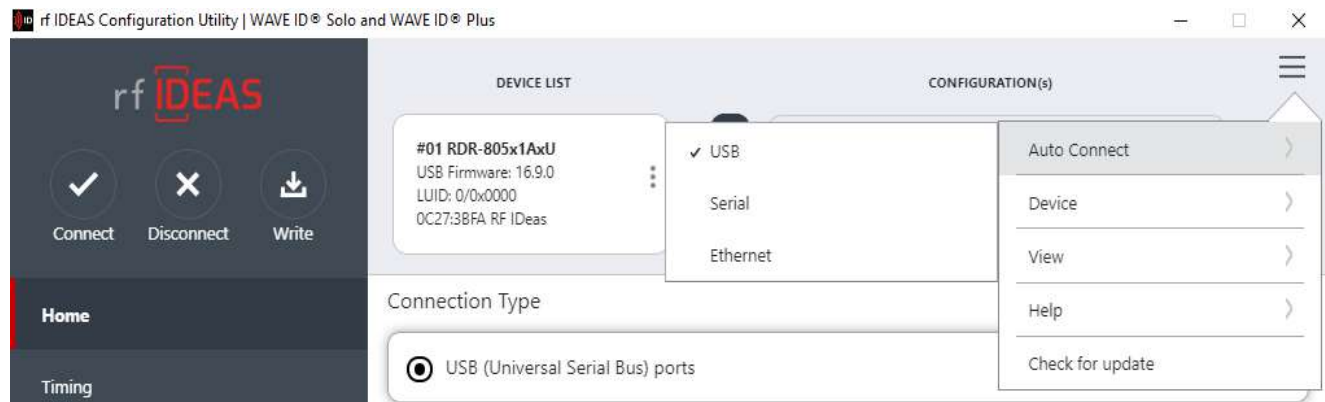


Image 4: Auto Connect Menu

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

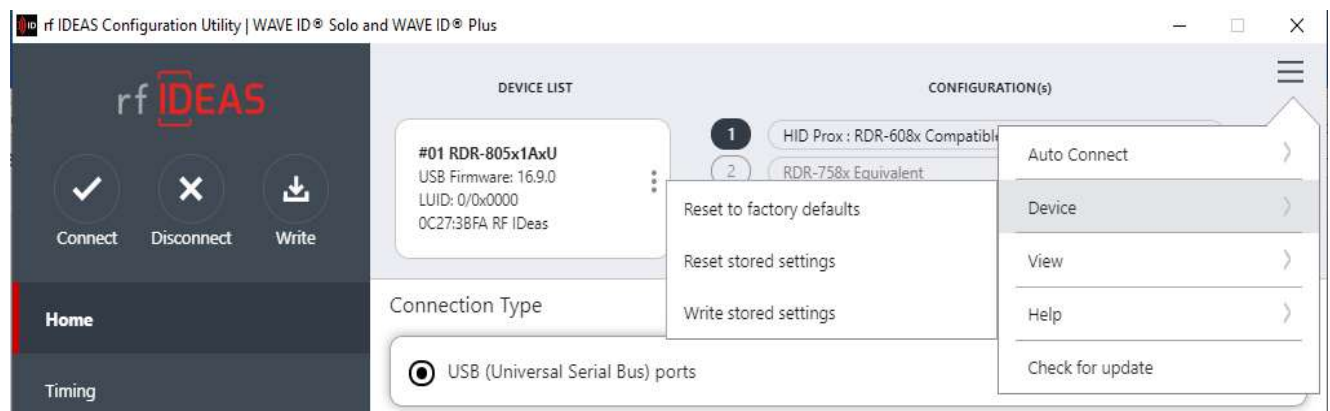


Image 5: Device Menu

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

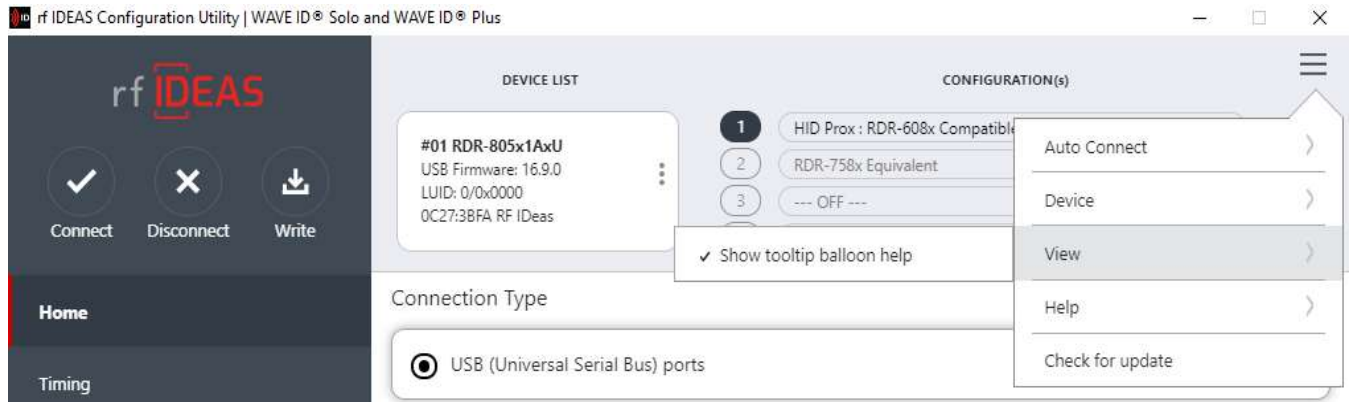


Image 6: View Menu

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

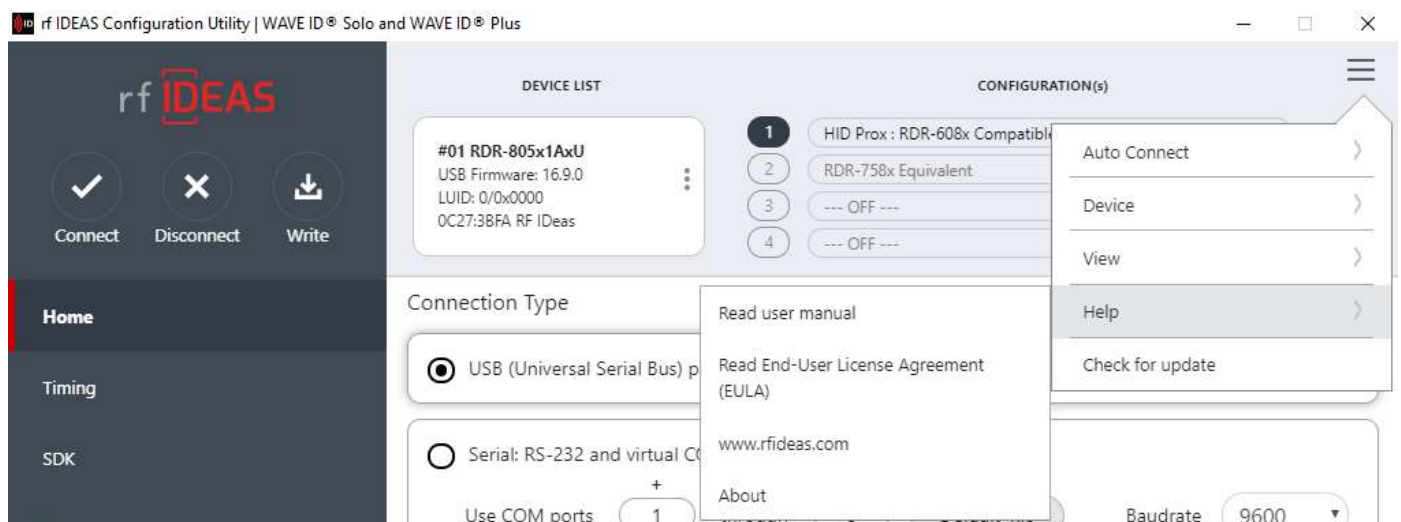


Image 7: Help Menu

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](http://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.



Image 8: 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.

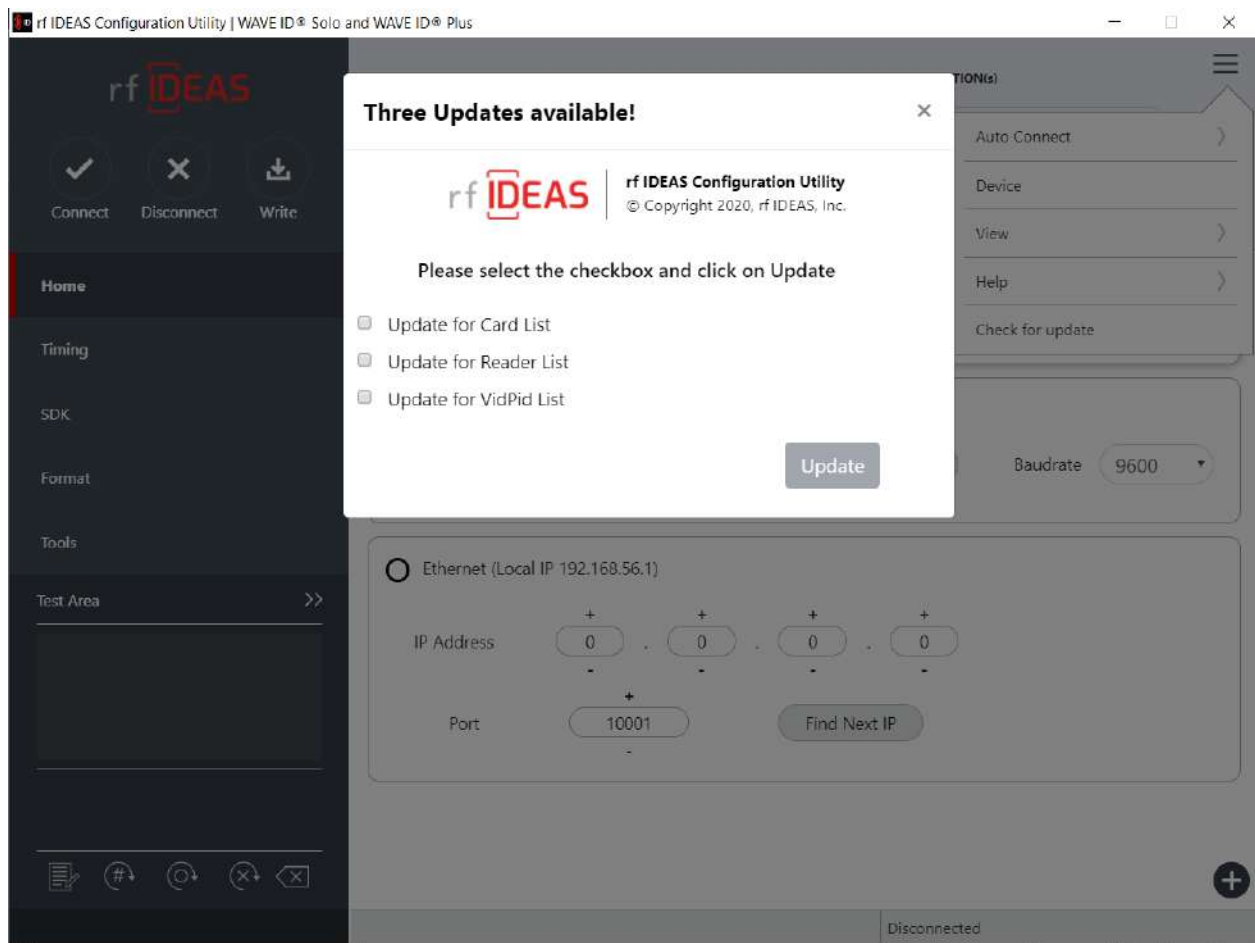


Image 9: Updates Available

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**

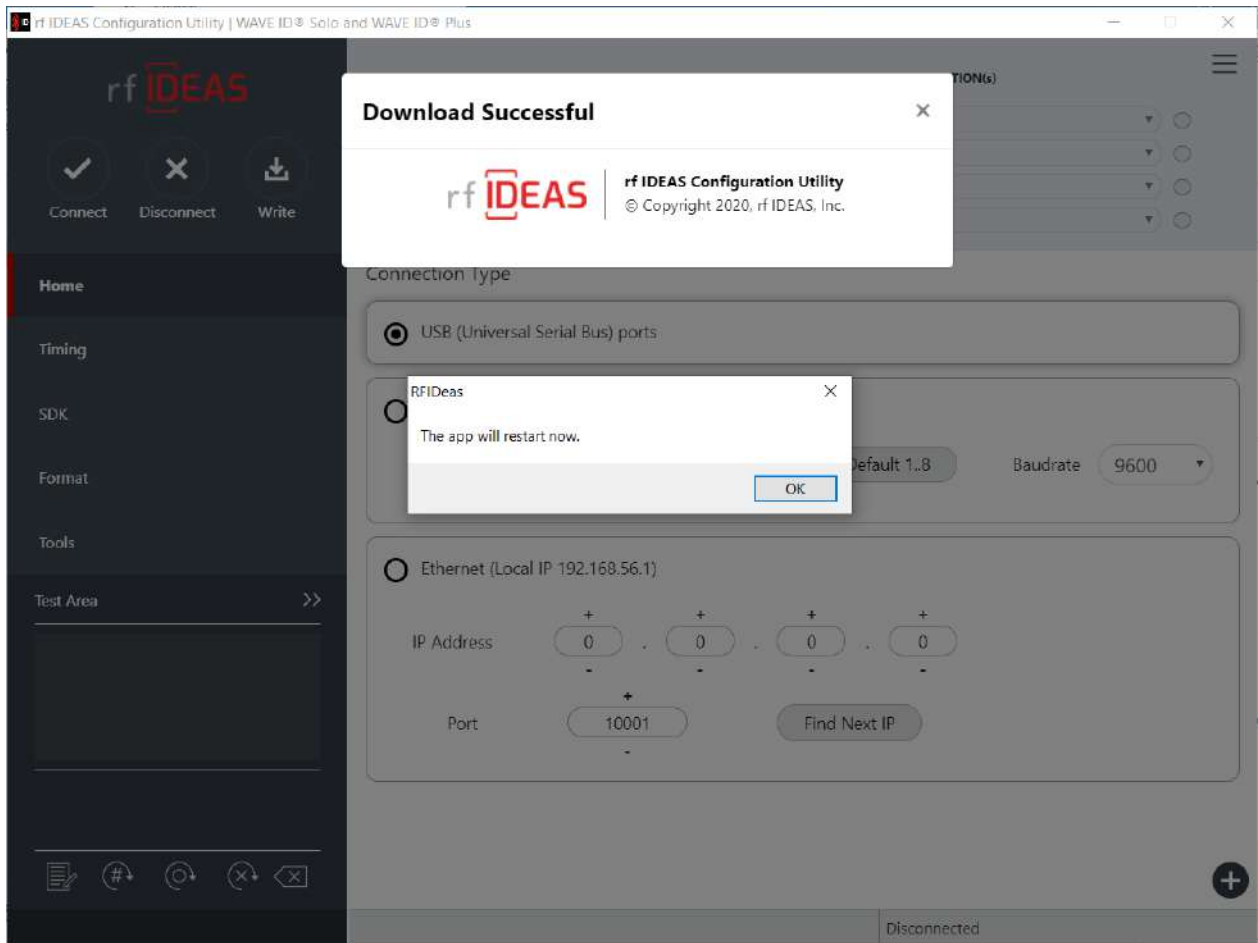


Image 10: Download Successful and App restarts

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

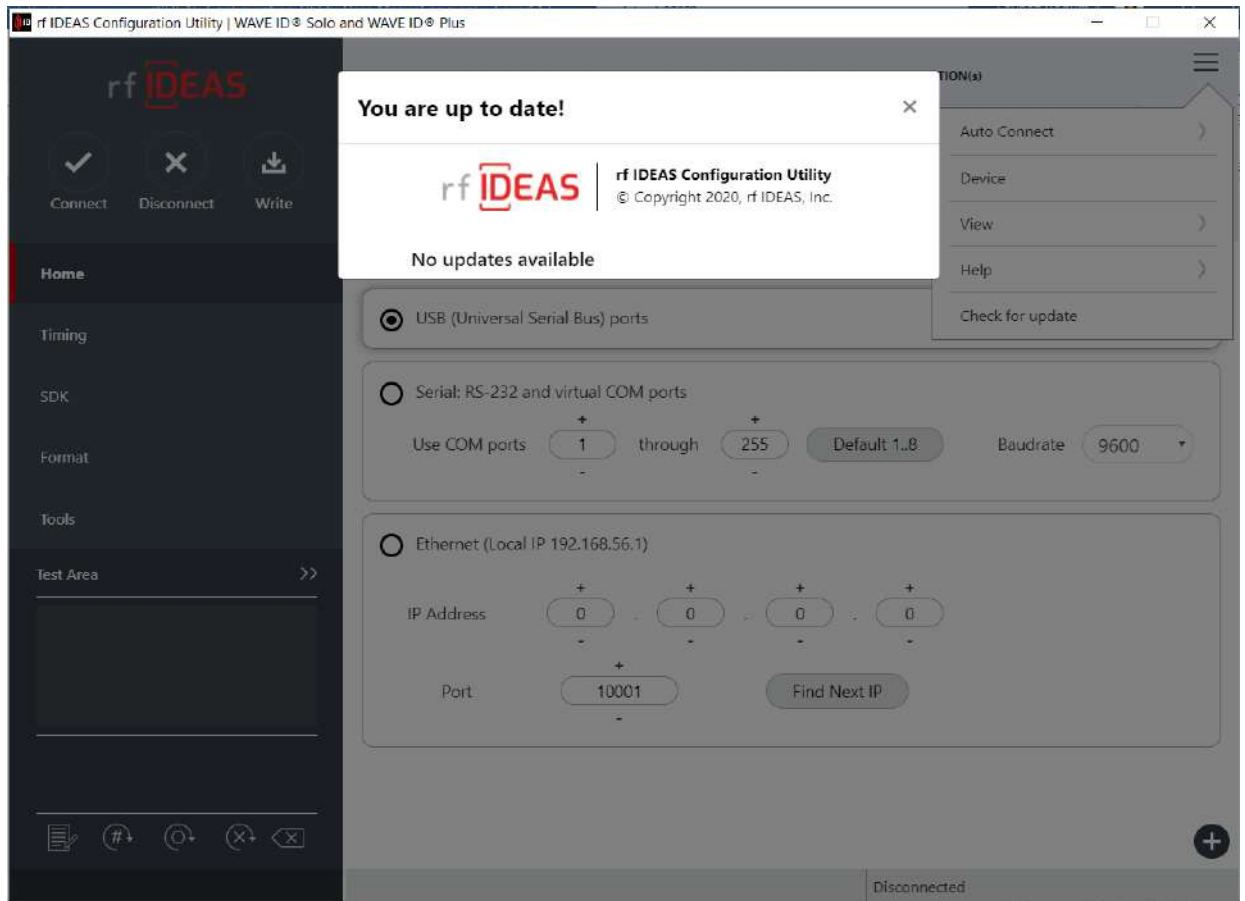


Image 11: No Updates are Available



## 2.4 Plus (+) Menu

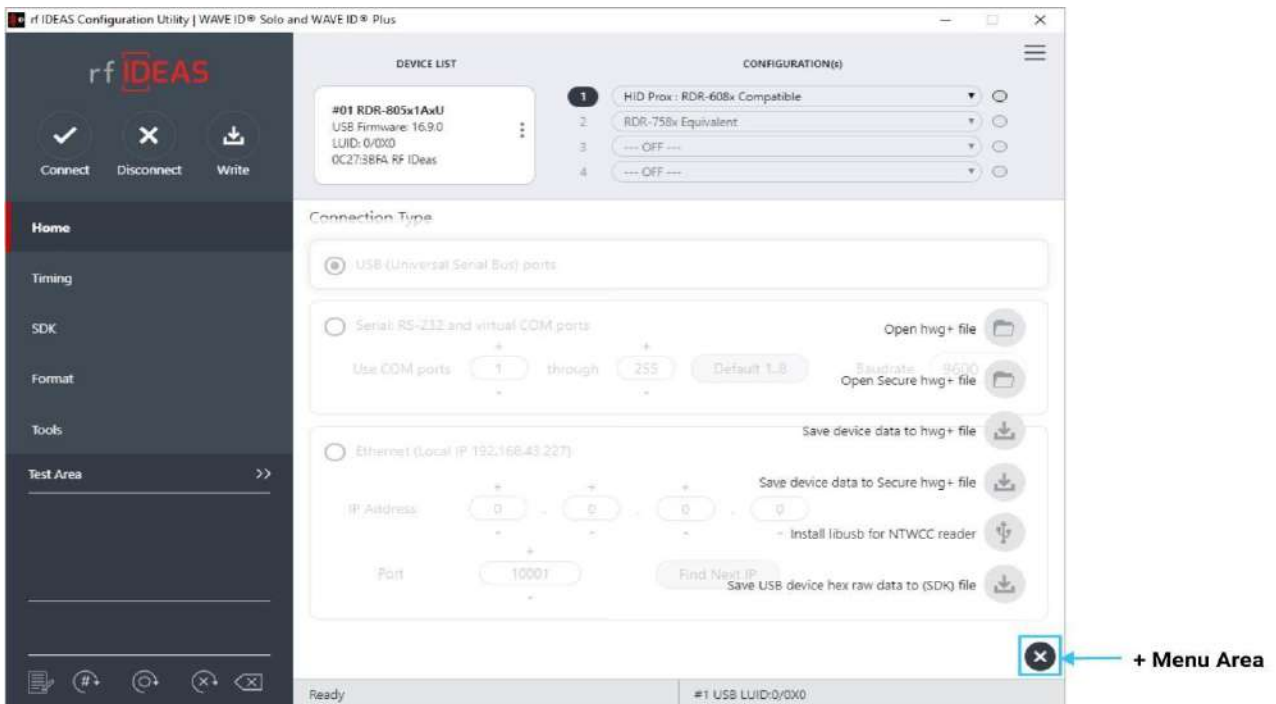
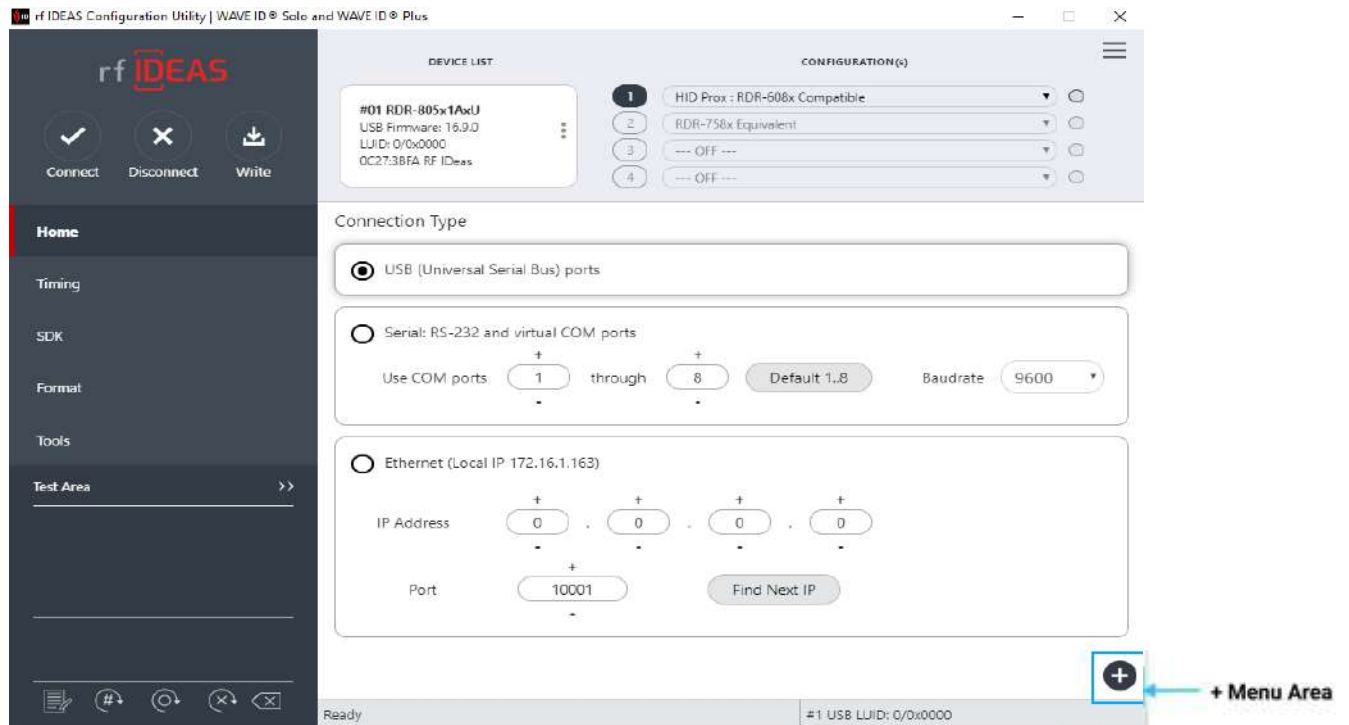


Image 12: Plus (+) Menu Overview

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

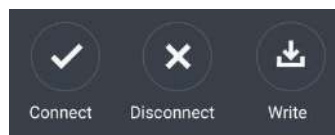


Image 13: Icon Toolbar

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.

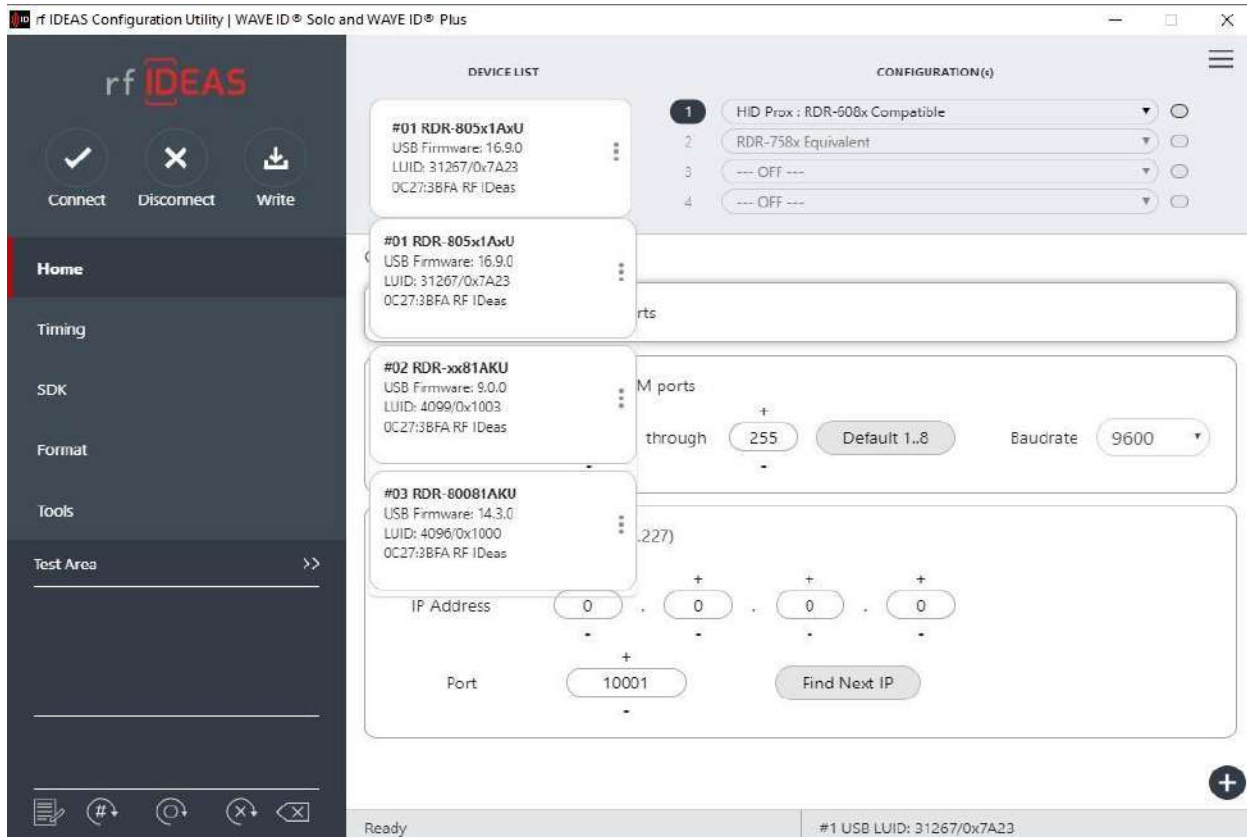


Image 15: Multiple Device Connection

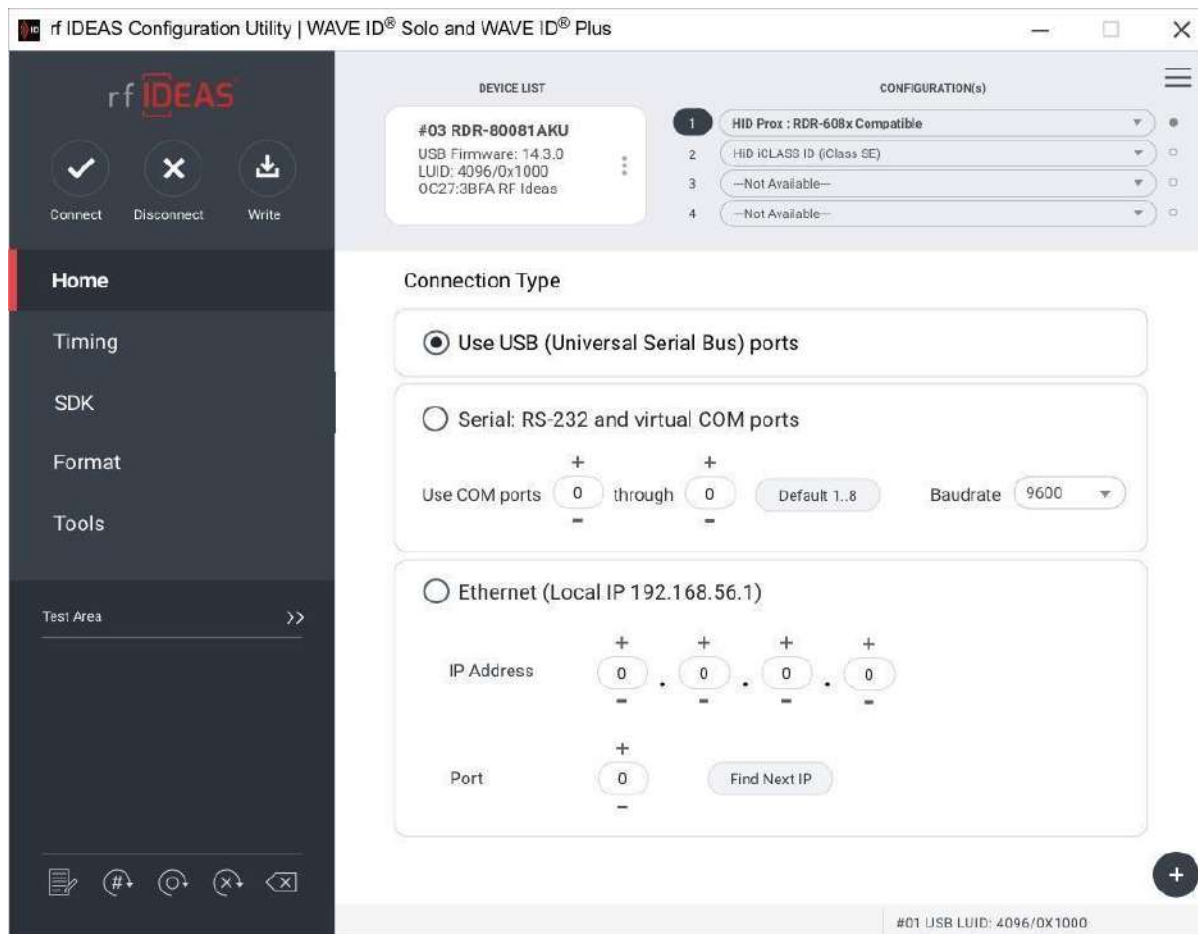


Image 16: Device List Output

## Disconnect

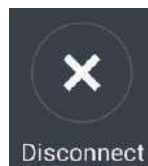


Image 17: Disconnect Button

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:

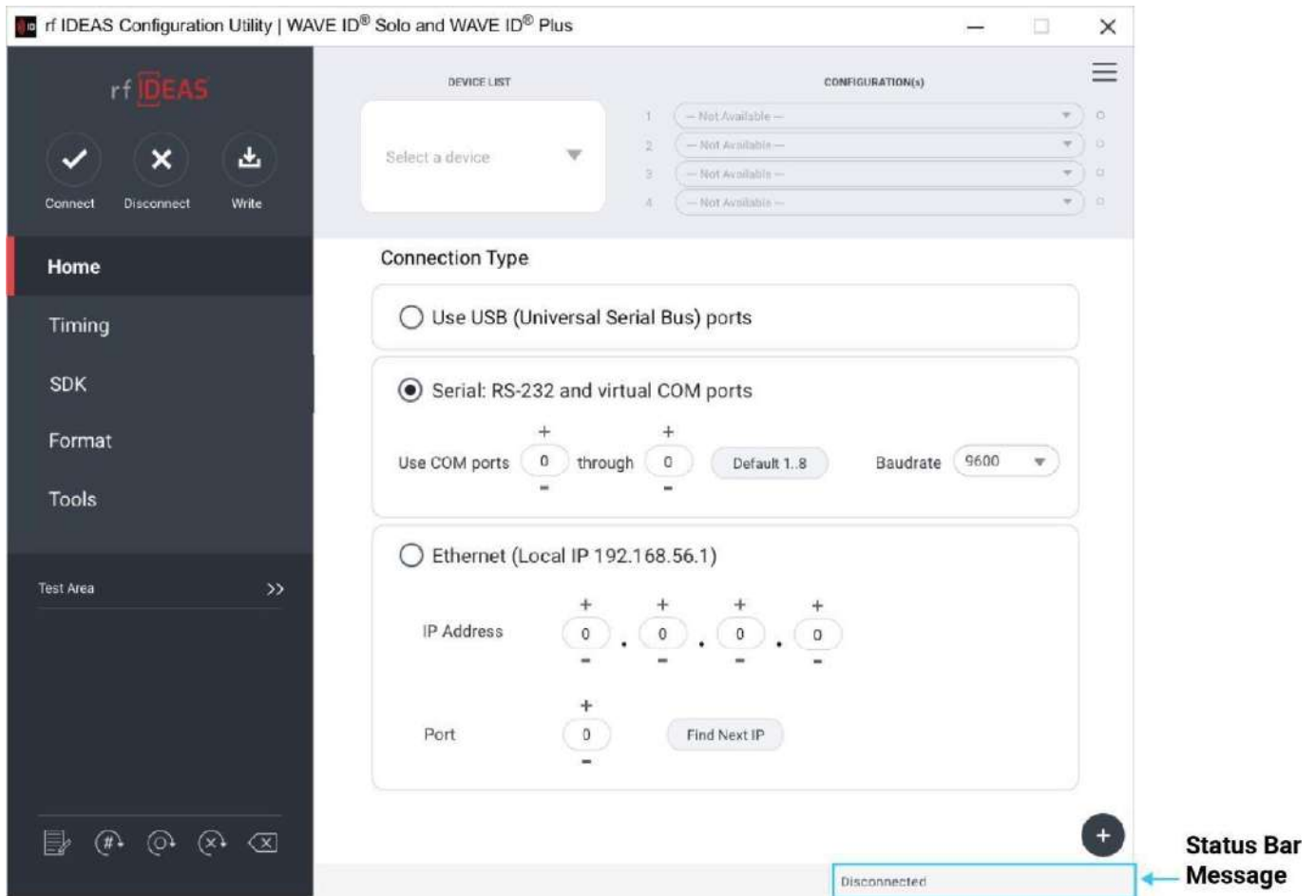


Image 18: Disconnected Message

## Write

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



Image 19: Write Button

## 2.6 WAVE ID Plus Configuration



Image 20: WAVE ID Plus Configuration Area

### Device List

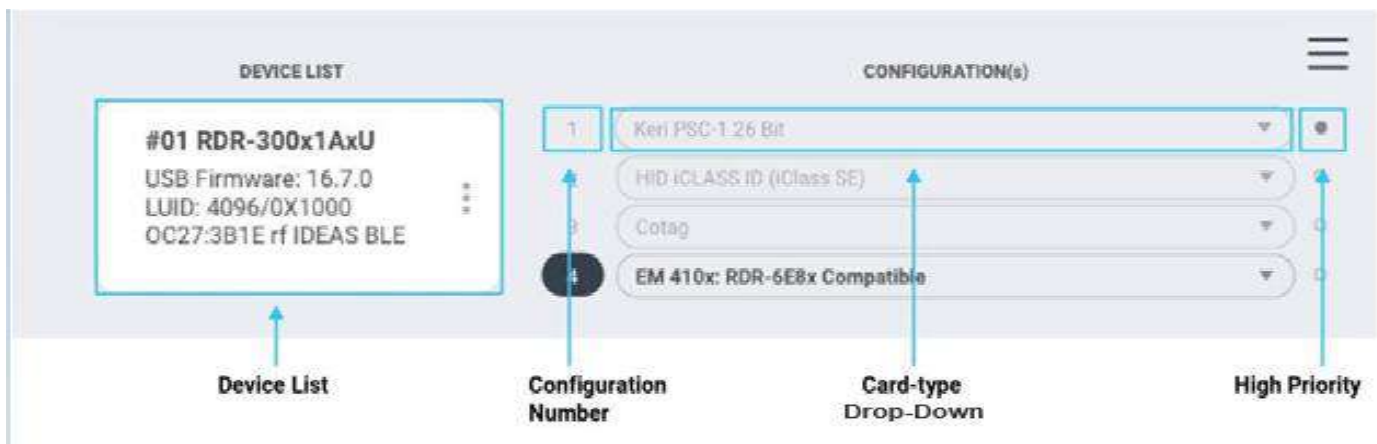


Image 21: WAVE ID Plus Configuration Header

**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

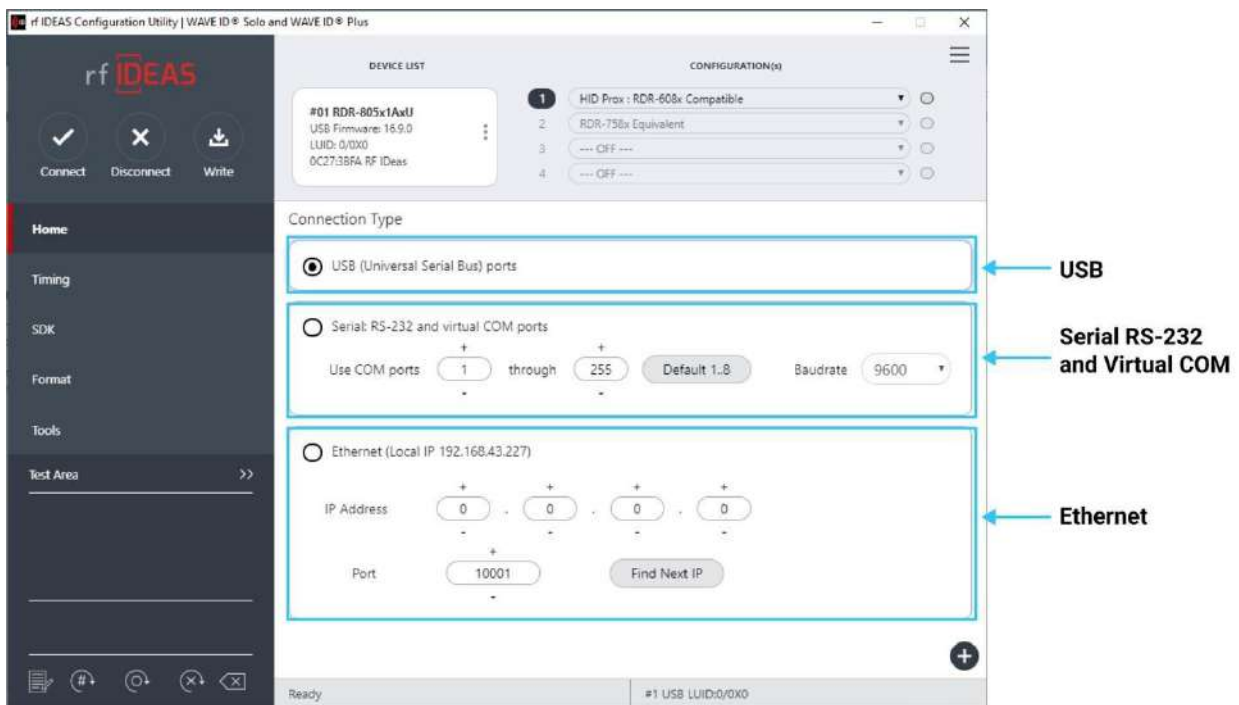


Image 22: Home Tab

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

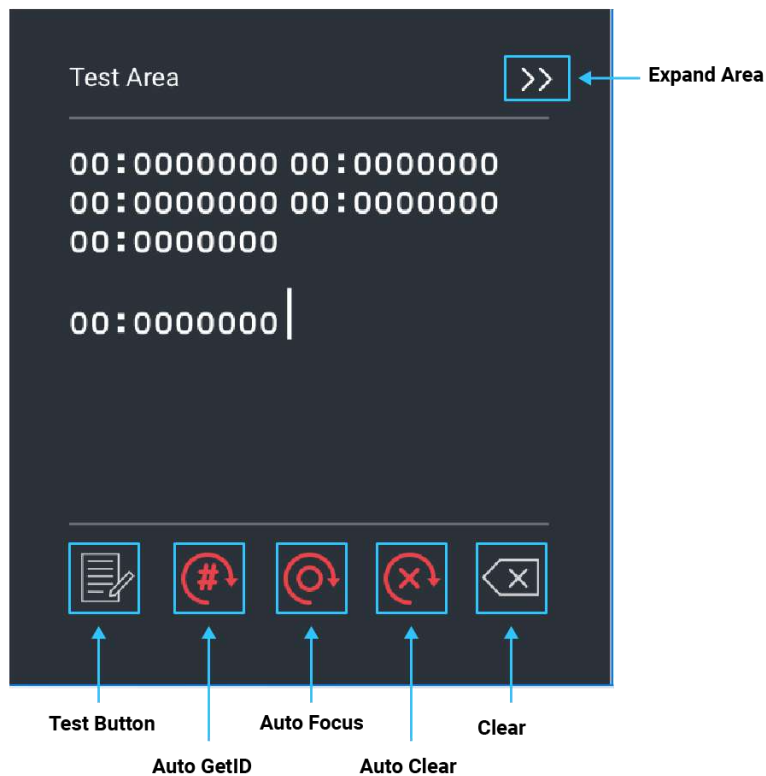


Image 23: Output Test Area

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.

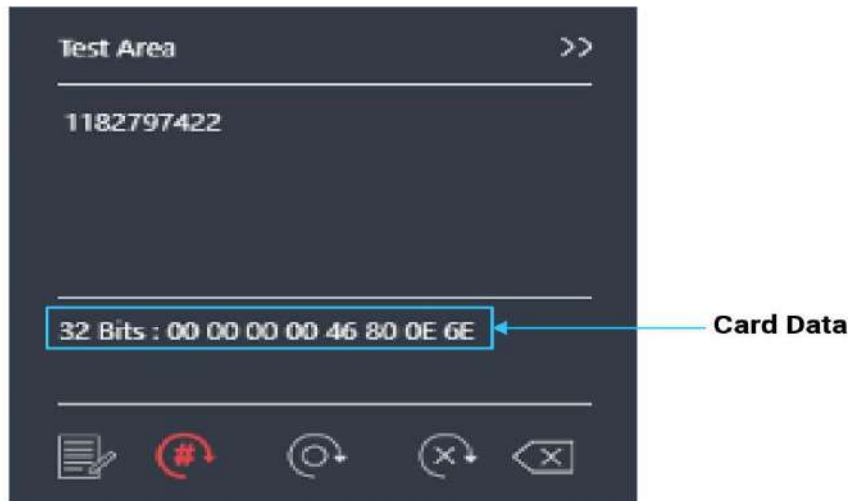


Image 24: Auto GetID

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

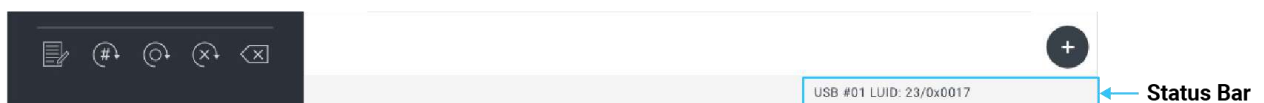


Image 25: Status Bar

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.

The image shows a configuration window titled "Card read timing". It contains three settings: "Card data hold time" set to 1000 msec, "Continuous read, send data upon read" which is an unchecked checkbox, and "Lock-out time for repetitive reads" set to 1200 msec. Each value is in a rounded input field with minus and plus buttons on either side.

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 timing

Key press time

- 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

✓ Connect

✗ Disconnect

⬇ Write

Home

Timing

**SDK**

Format

Tools

Test Area >>

1182797422

32 Bits : 00 00 00 00 46 80 0E 6E

#01 RDR-805x1AxU

HID Prox: RDR-608x Compatible

Disable Keystrokes for SDK ☒ Off

Beeper

Beep now

☐ Long beep(s)

Number of beeps - 1 +

Beep on card read ☒ On

Volume ☐ Off ☐ Low ☐ Medium ☒ High

LED

☒ Auto (controlled by reader)
 ☐ Off
 ☐ Green
 ☐ Amber
 ☐ Red

Card ID

GetID

GetID32

GetQueuedID

☐ Clear lock-out

☐ Clear UID

Data bytes

Queued ID : 0 Bits  
 00 00 00 00 00 00 00 00  
 00 00 00 00 00 00 00 00  
 00 00 00 00 00 00 00 00  
 00 00 00 00 00 00 00 00  
 Age : 00:00:00 (0x48ms)  
 Over runs : 0  
 Lockout timer : 0

Logical Unit ID (LUID)

0

0..65535 or 0x0000..0xffff

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 0..65535 or 0x0000..0xffff

#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

**Medium**- Sets beeper volume to mid-range level

**High (Default)** - Sets beeper volume to maximum level



Image 30: Beeper

## Card ID

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

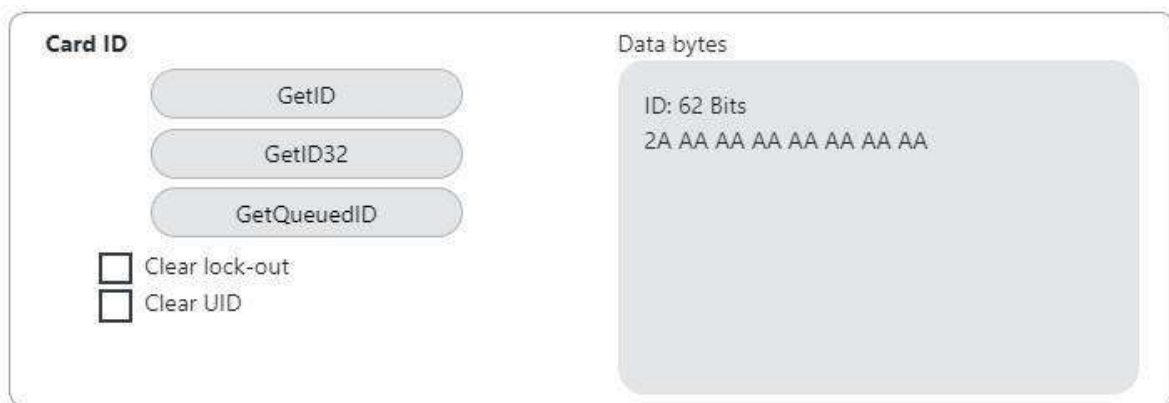


Image 31: GetID Data Display

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


Image 32: GetID (32) Data Display

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

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

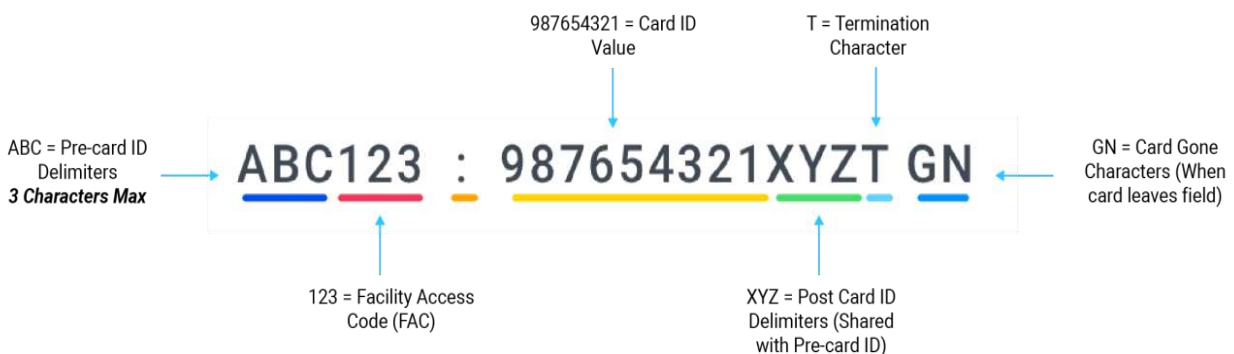
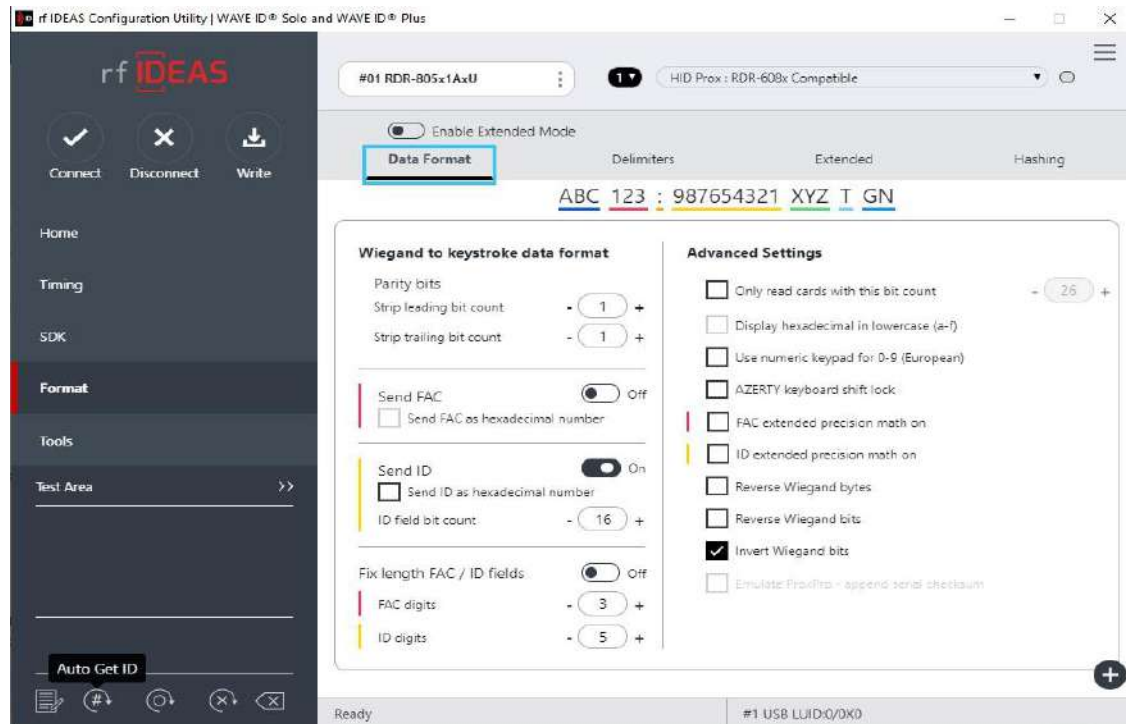


Image 34: Data Format Tab & Data Character

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 = 110111100001111010000000

Reverse Wiegand Bits: 05F0FB = 000000010111100001111011

**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.

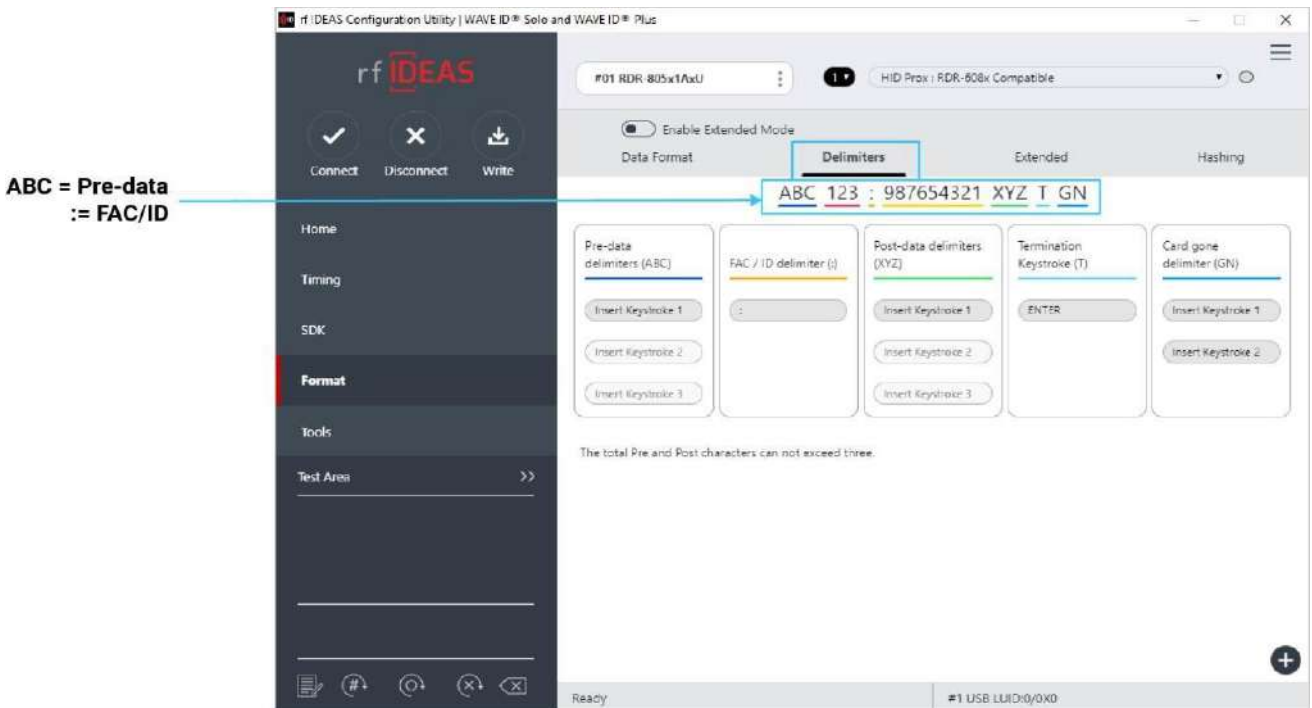


Image 35: Delimiters Tab

**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:

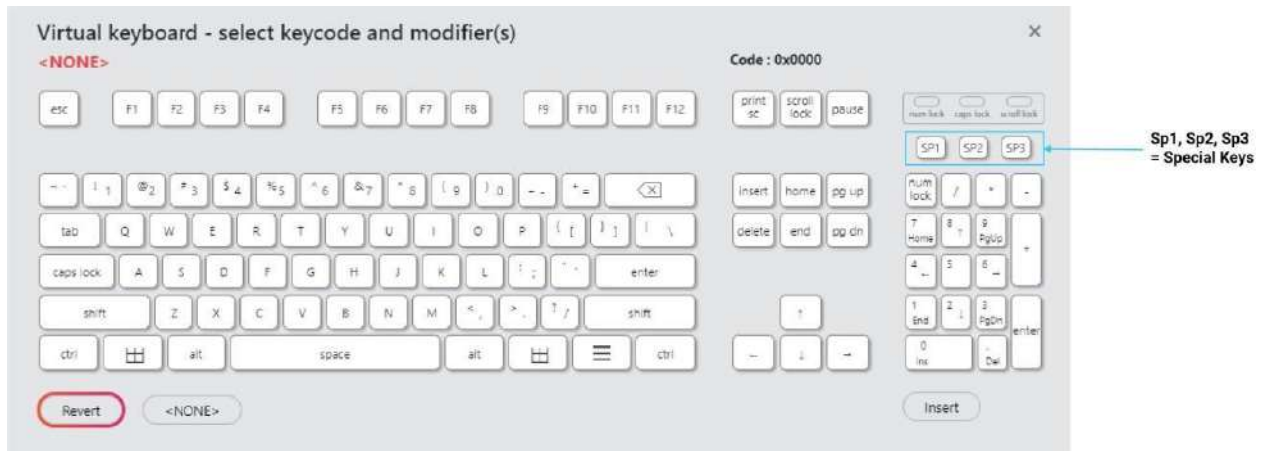


Image 37: Delimiter Keyboard

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.

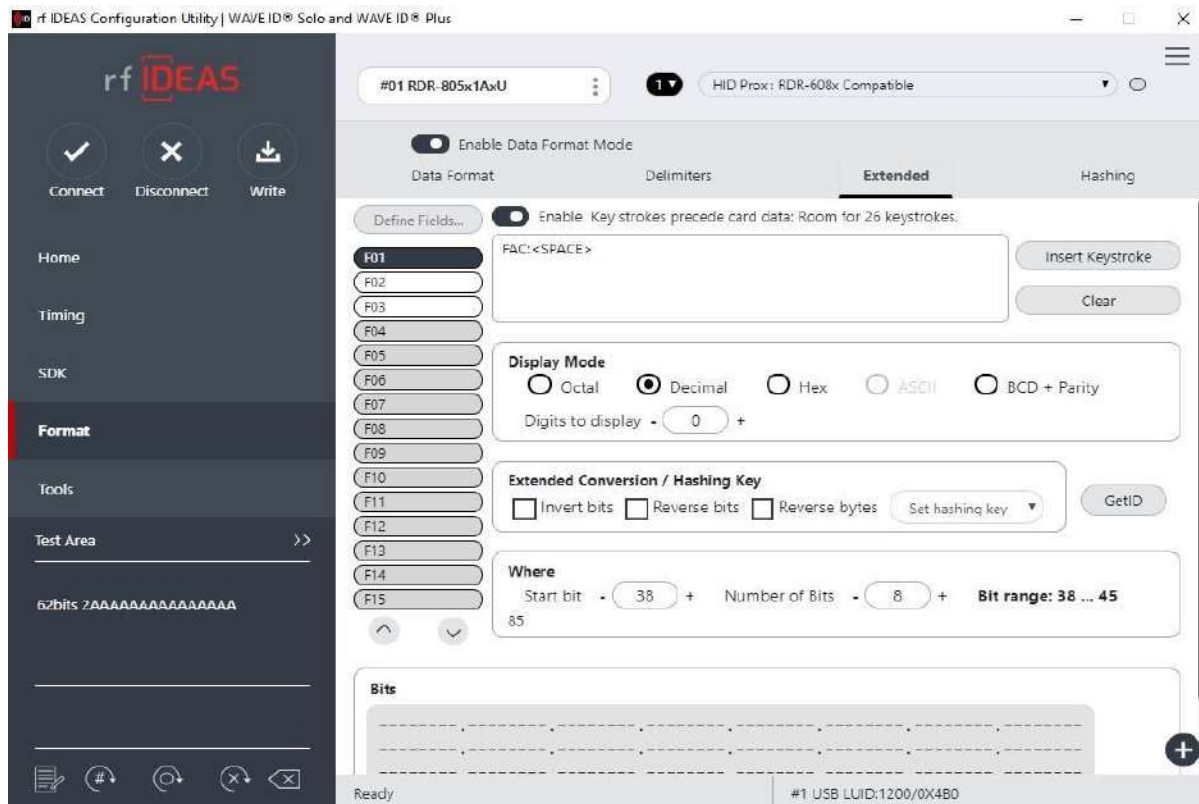


Image 38: Extended Tab

**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 [Sales@rfideas.com](mailto:Sales@rfideas.com). 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](mailto: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.

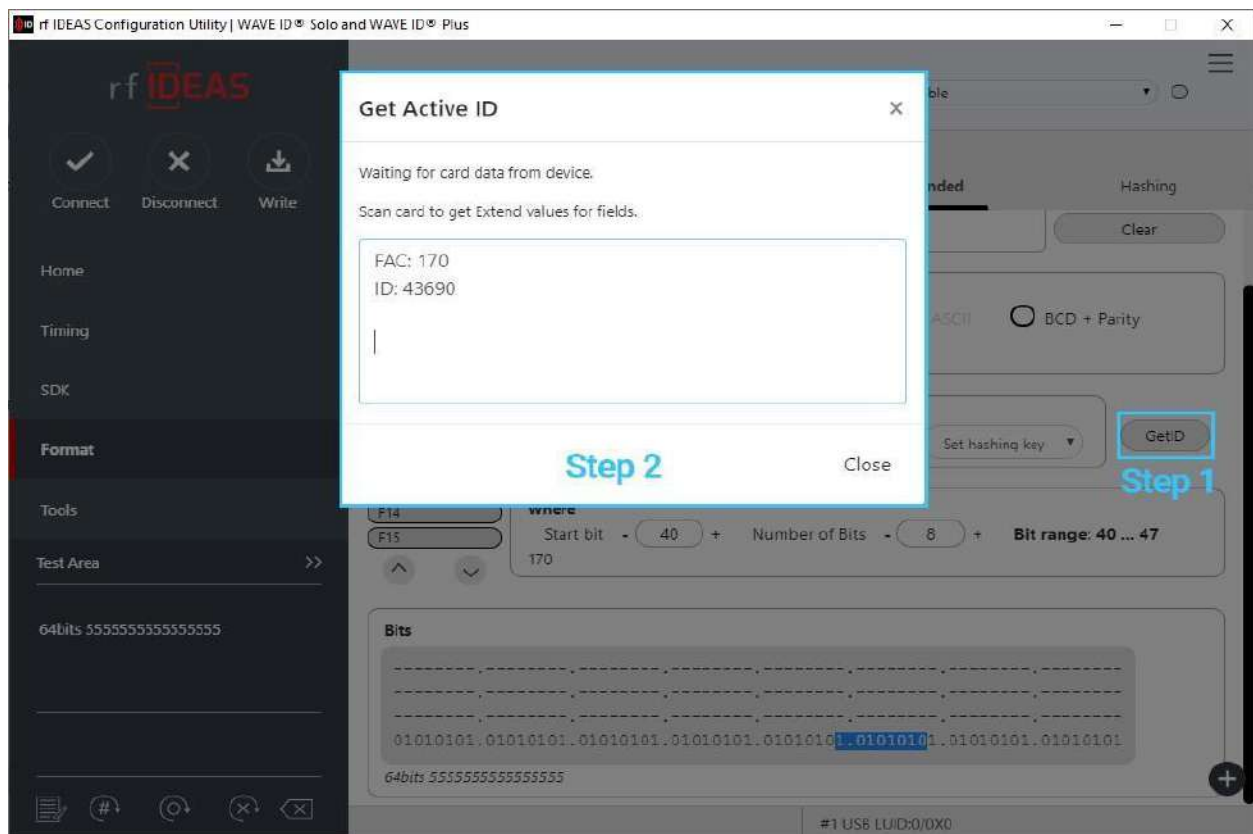


Image 39: Taking output on GetID box

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



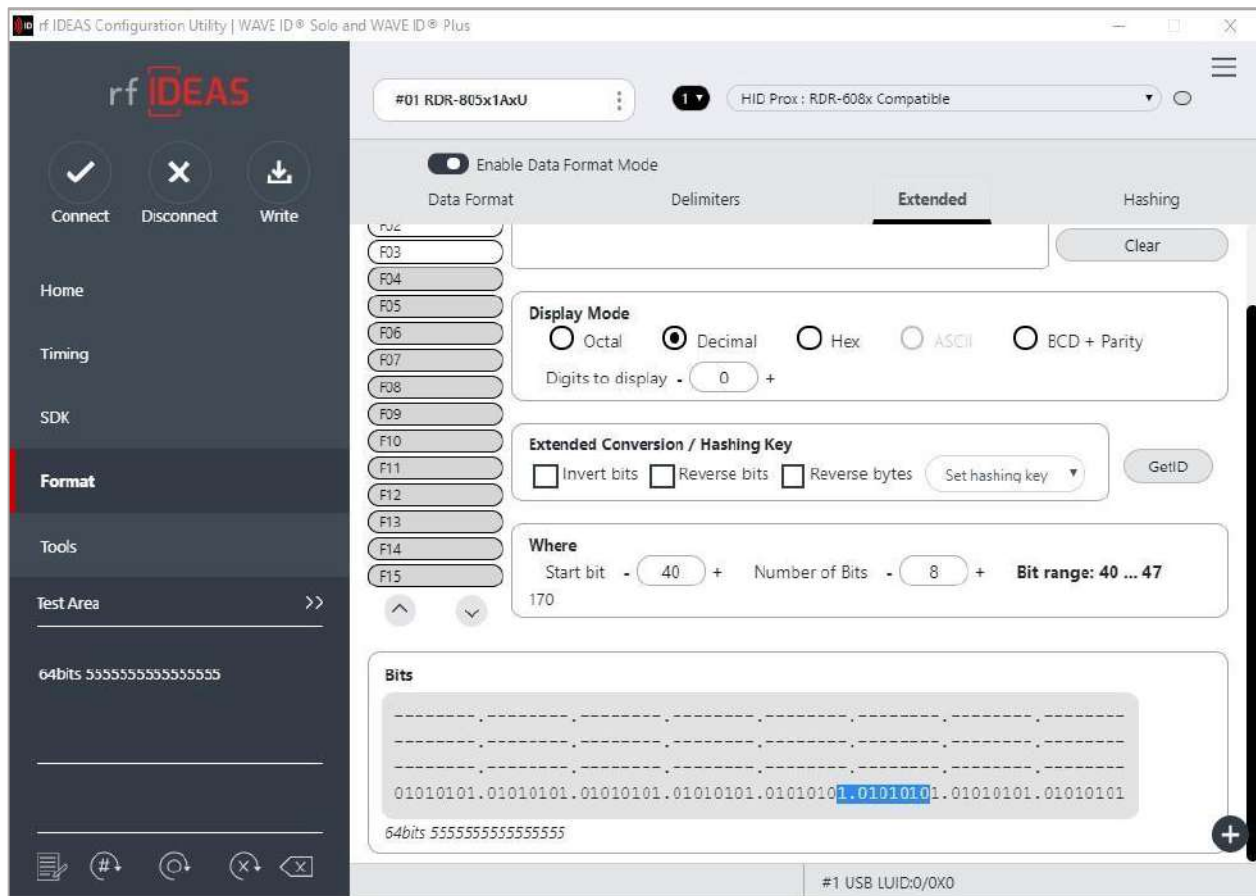


Image 40: Bits area after taking output on GetID box

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.

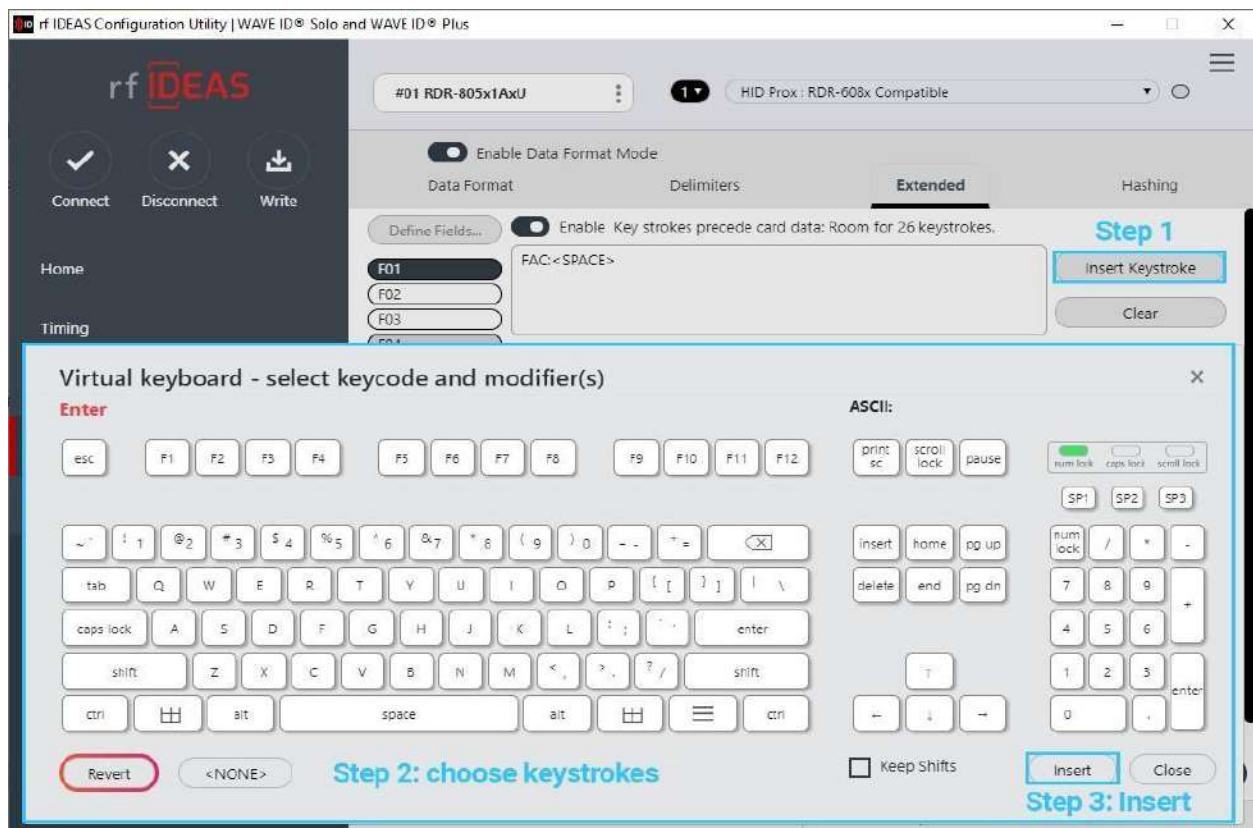


Image 41: Virtual Keyboard in Extended mode

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:

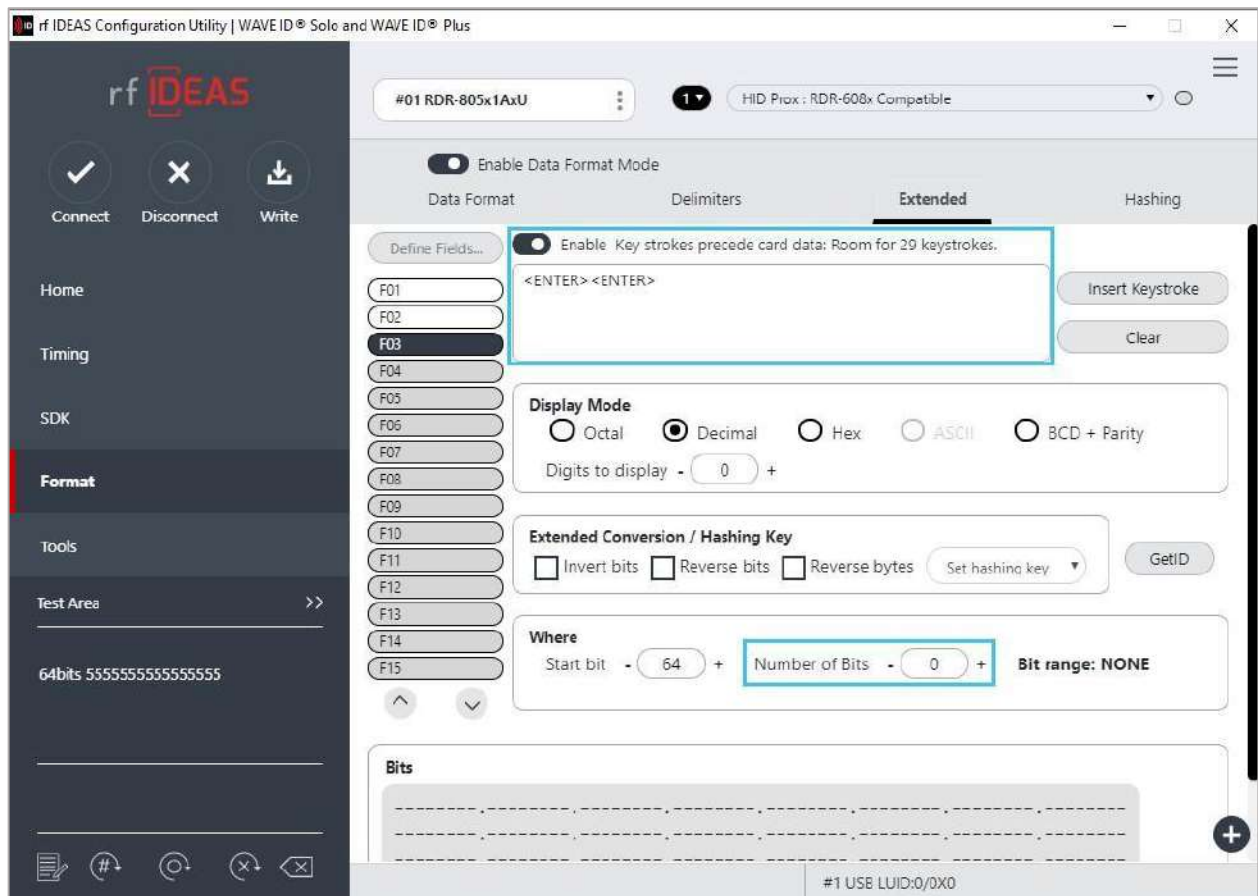


Image 42: Inserting ENTER at end of data in last enabled field

## Example configuring FIPS201 Reader using Extend:

1. Click “GetID” and present the card to the reader.

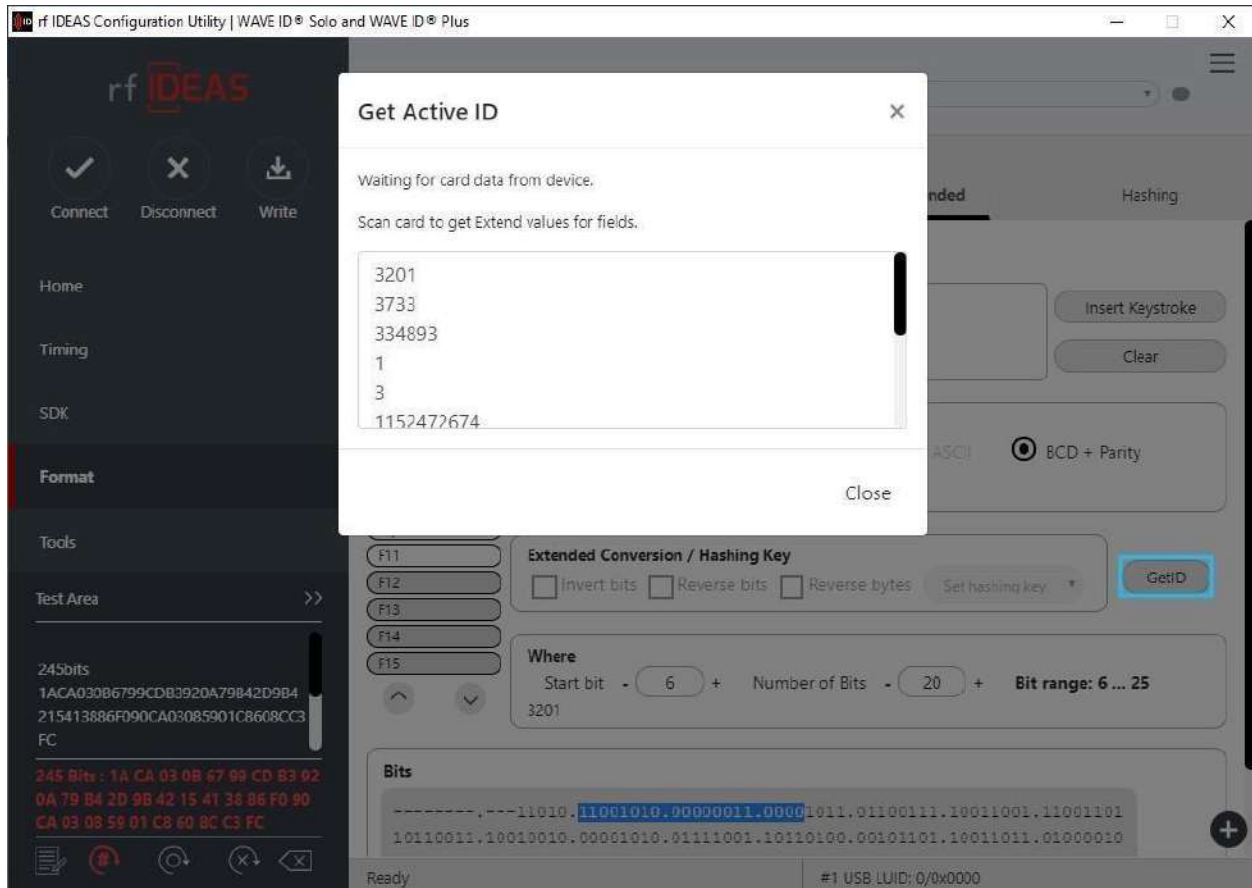


Image 43: Get Active ID Pop

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

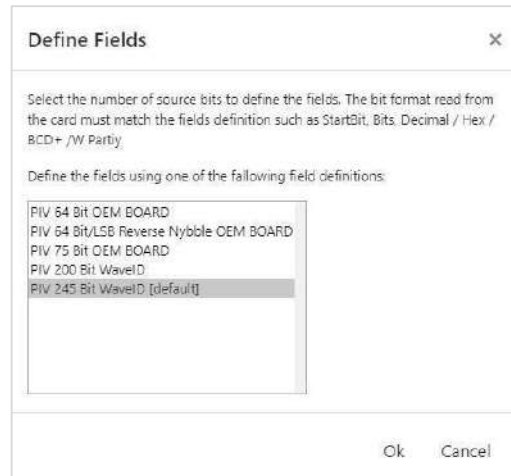


Image 44: Define Fields Dialogue Box

3. Configure any additional fields as appropriate.

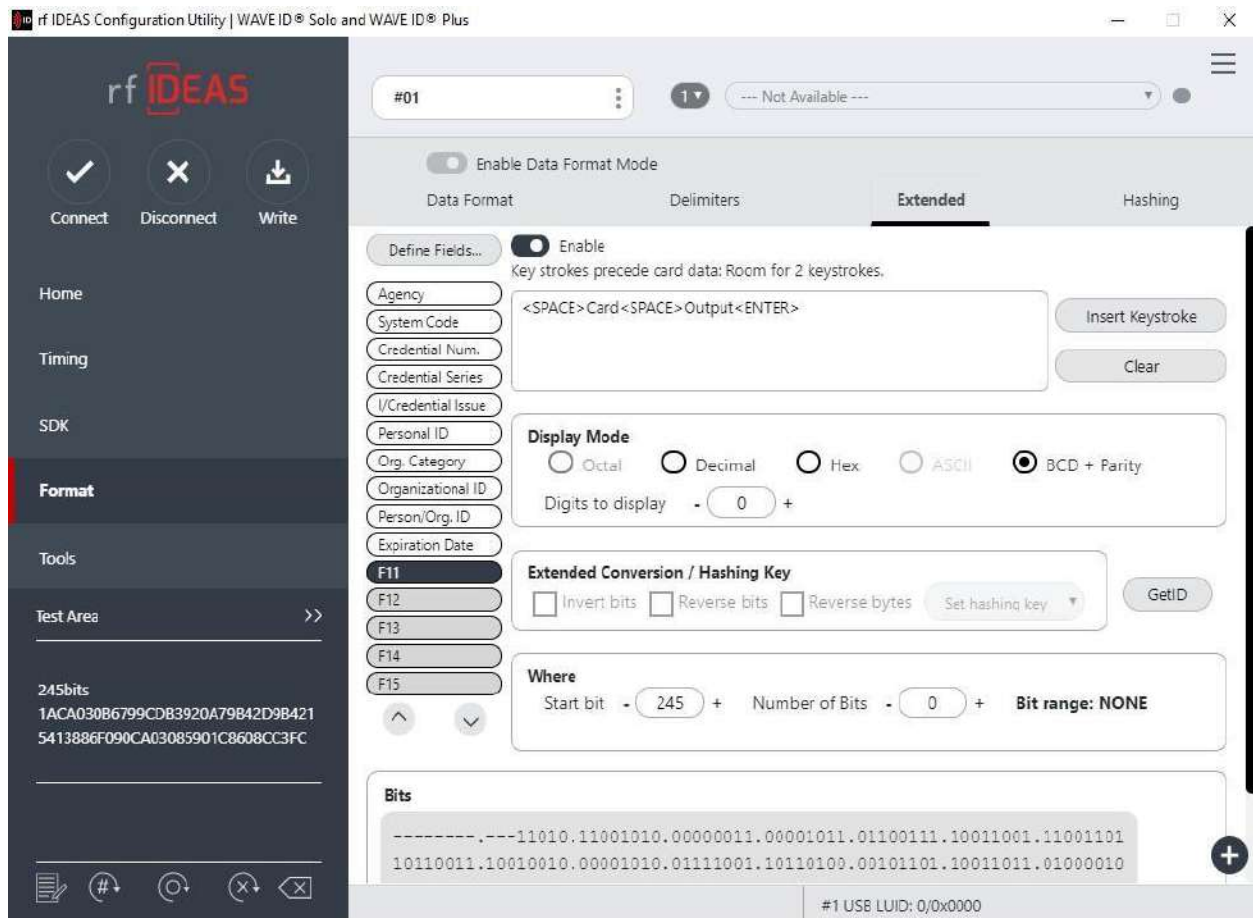


Image 45: Configuration of Additional Fields

4. Save the configuration to memory.

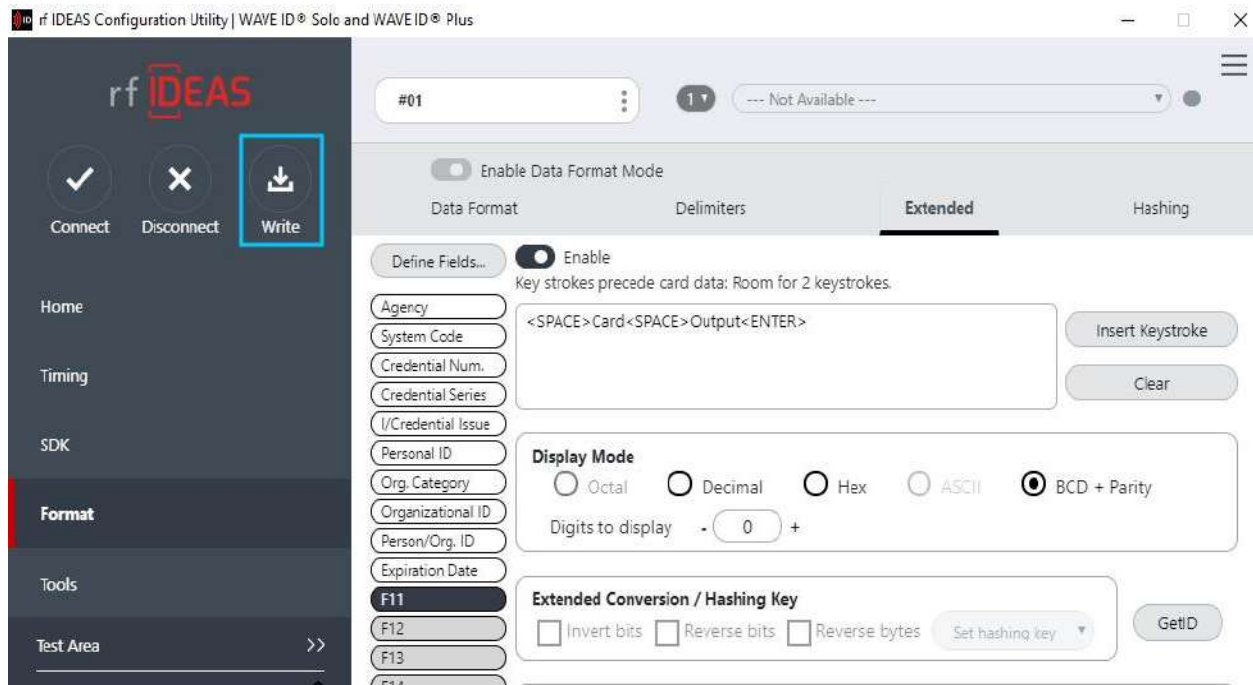


Image 46: Saving Configuration to Memory

## 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.

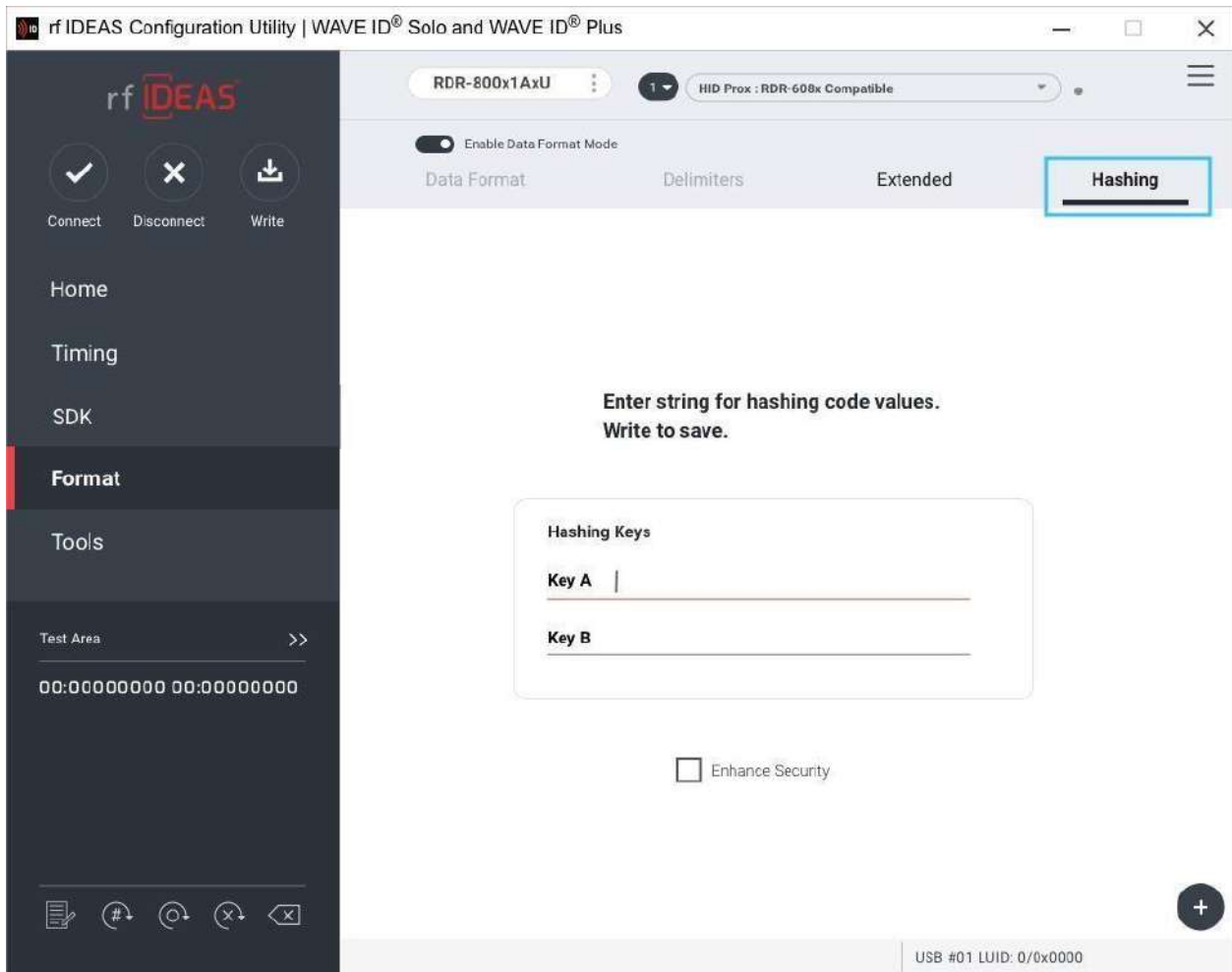


Image 47: Hashing Tab



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

FUNCTION	DEFINITION
Key A	Sixteen-character hashing key A.
Key B	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

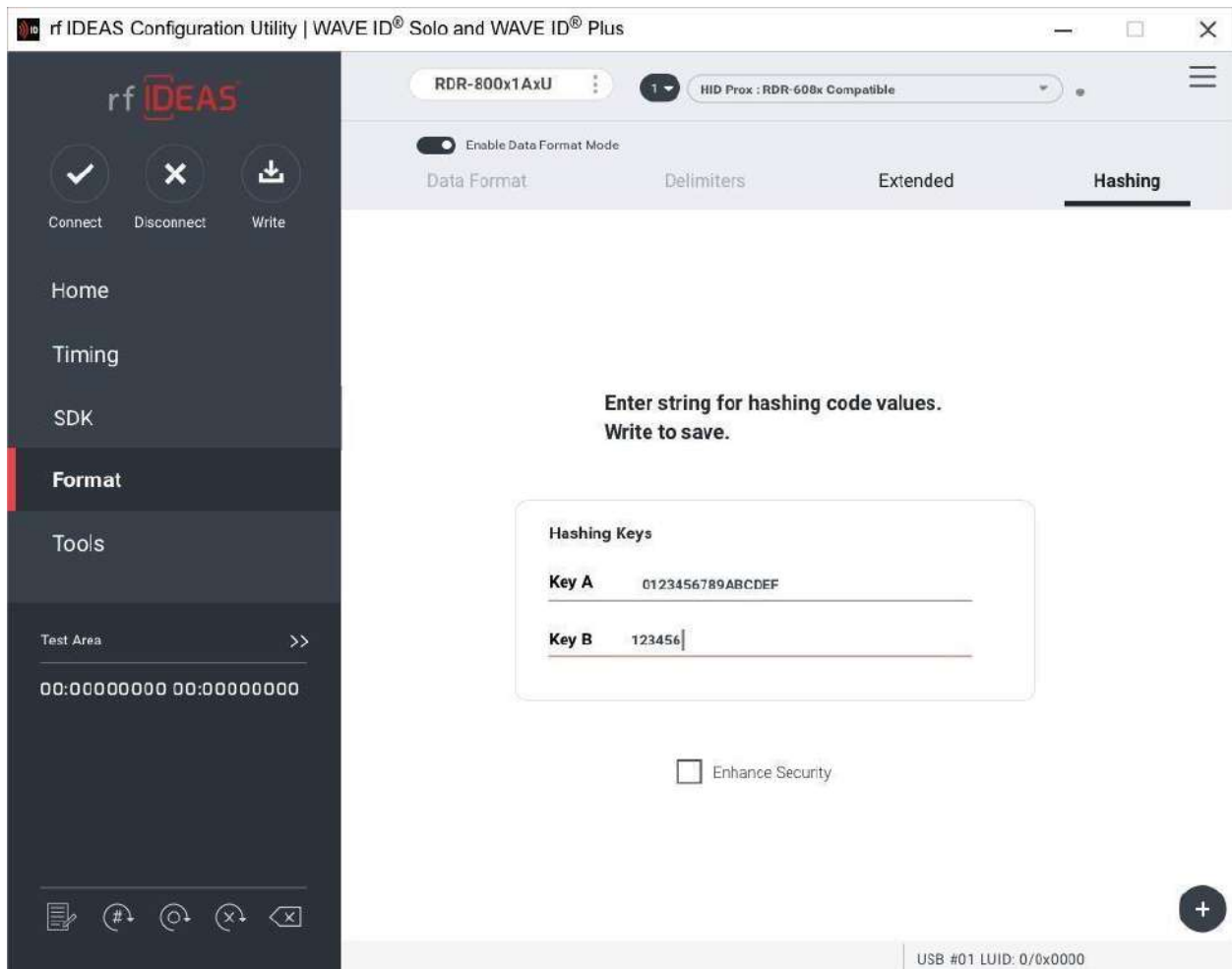


Image 48: Hashing Code Values

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.



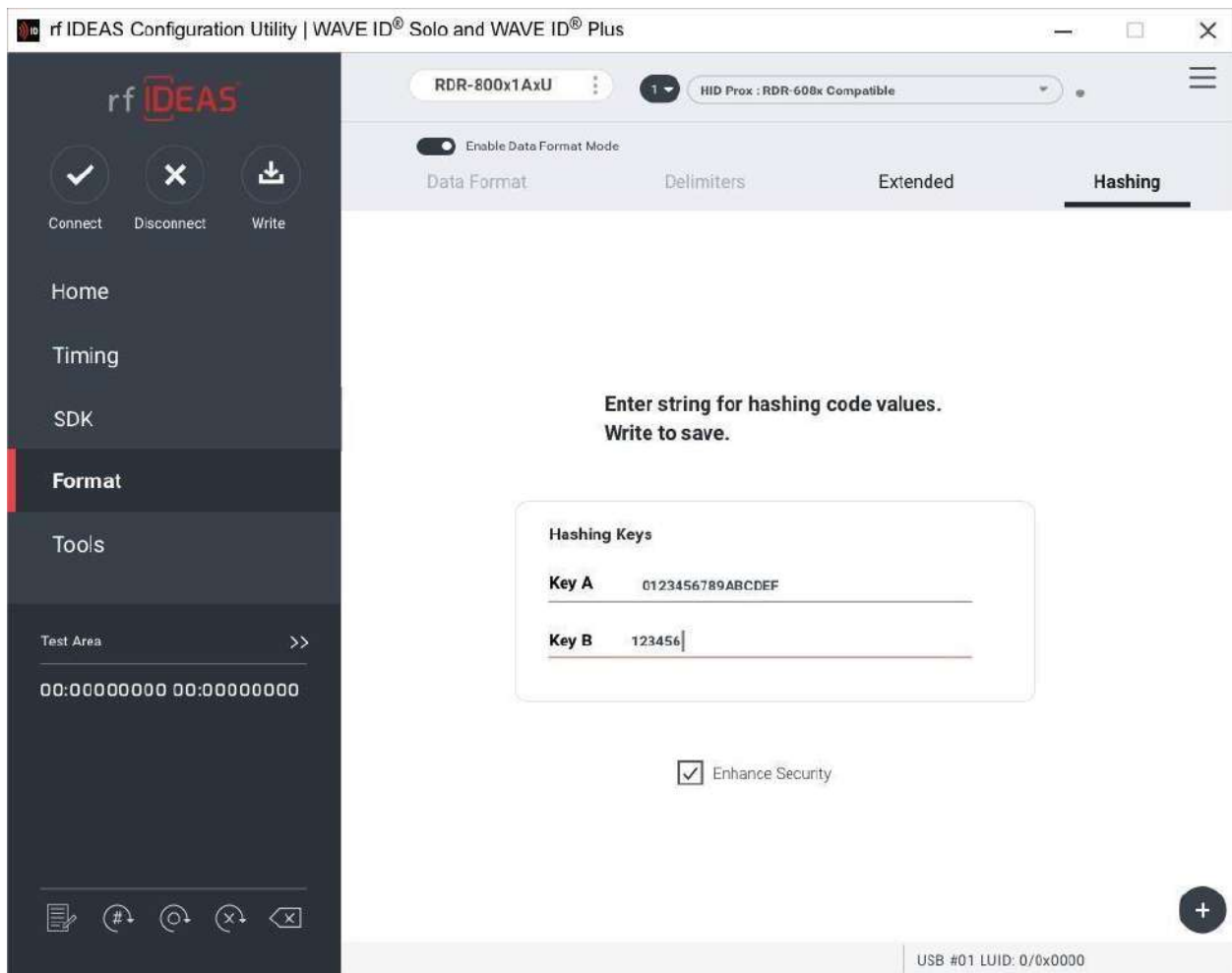


Image 49: Enhance Security Enable Box

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.

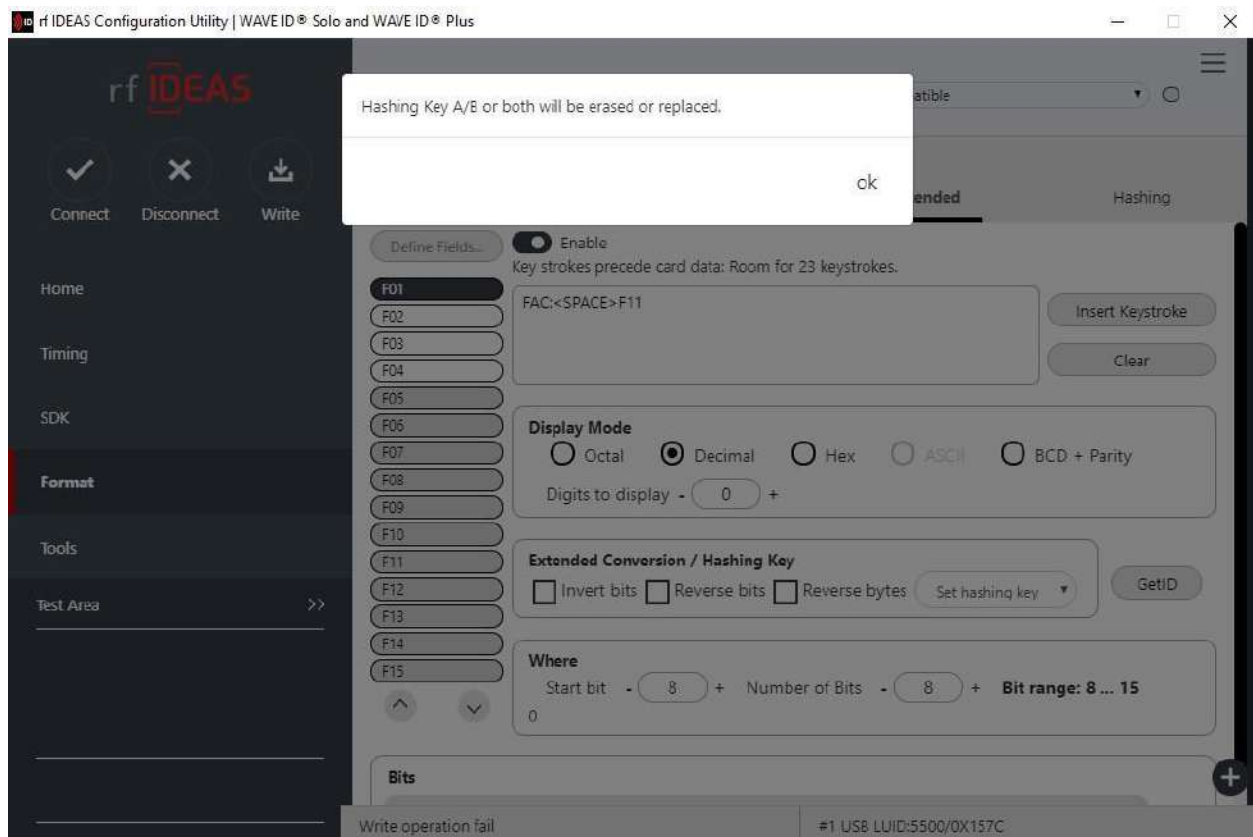


Image 50: Write Warning



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.

## 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.

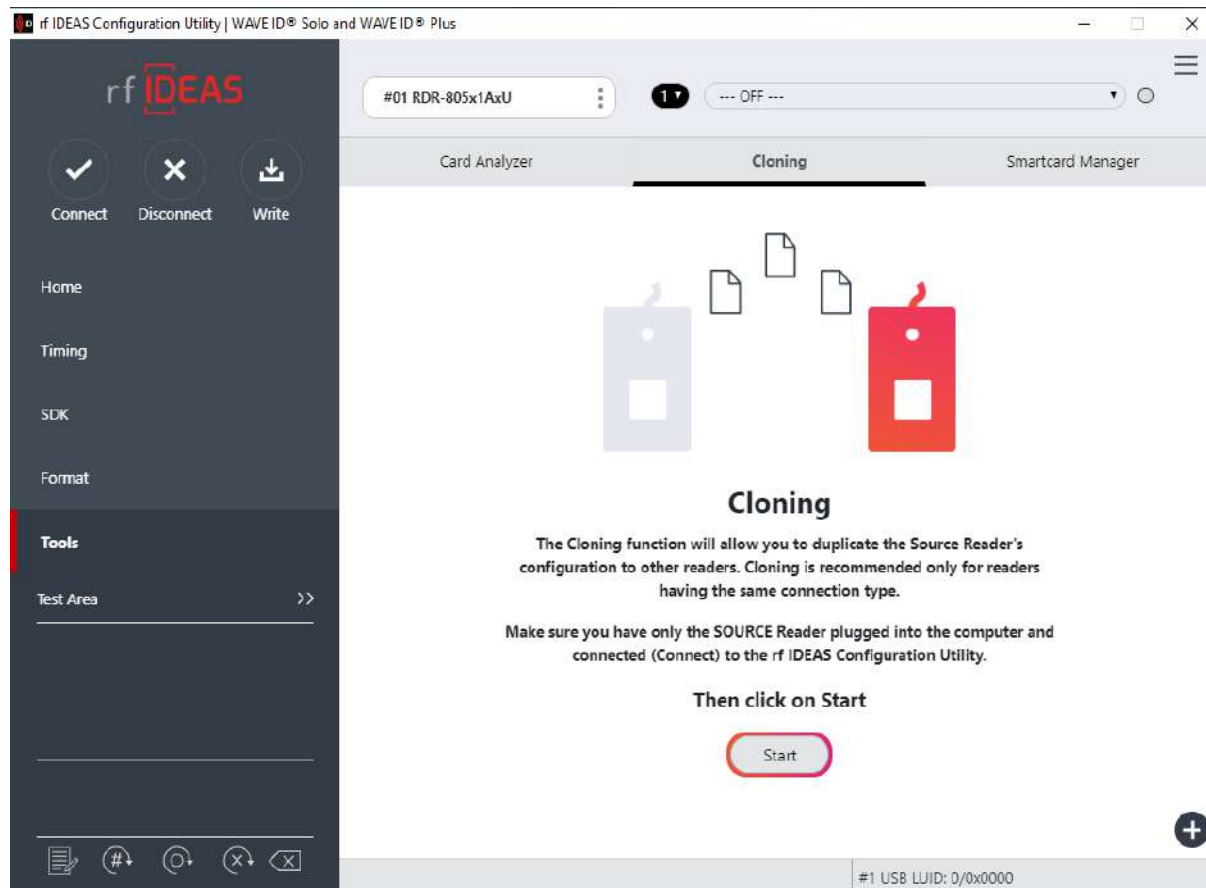


Image 51: Starting the Cloning Process

3. The cloning window will appear as shown below:

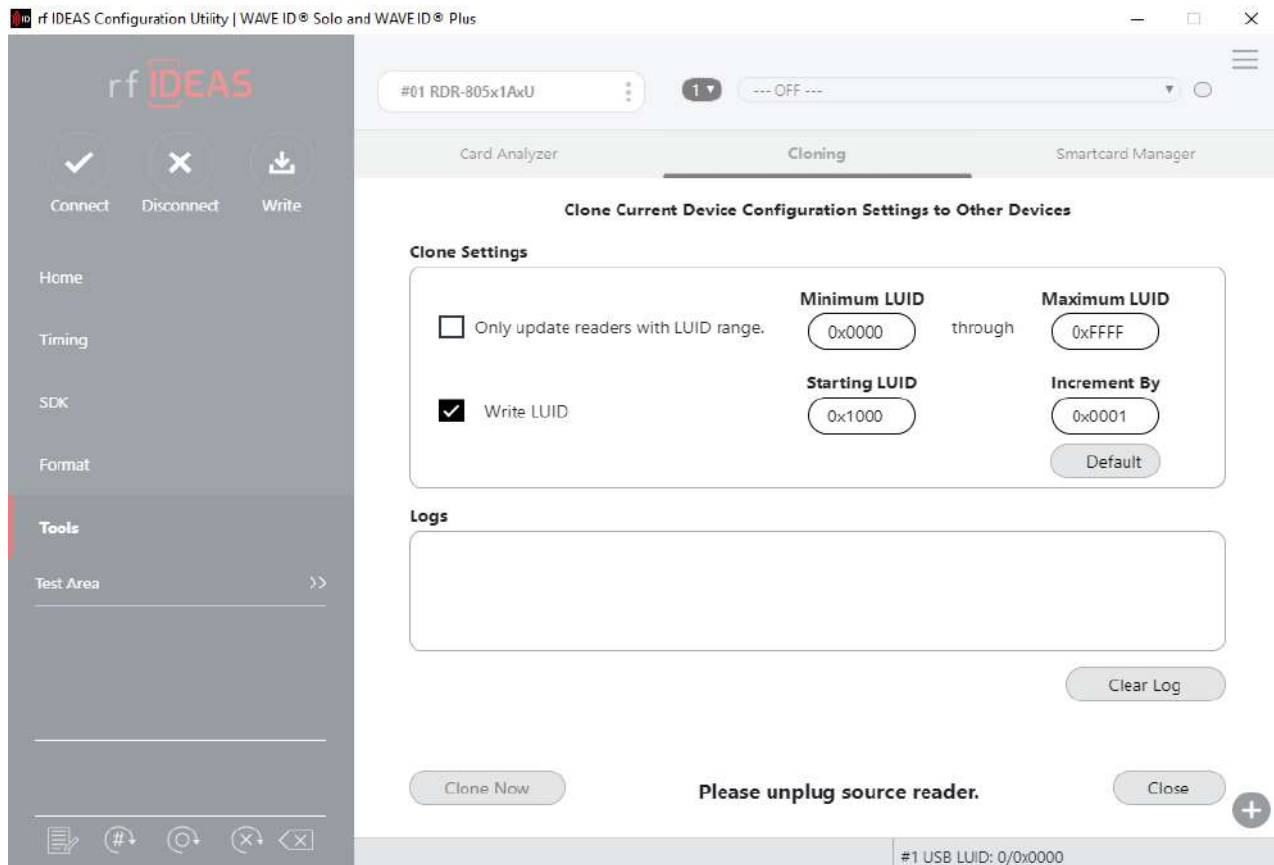




Image 52: Clone Configuration Reader Dialogue Box

 To enter LUID value in hex use '0X' 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.

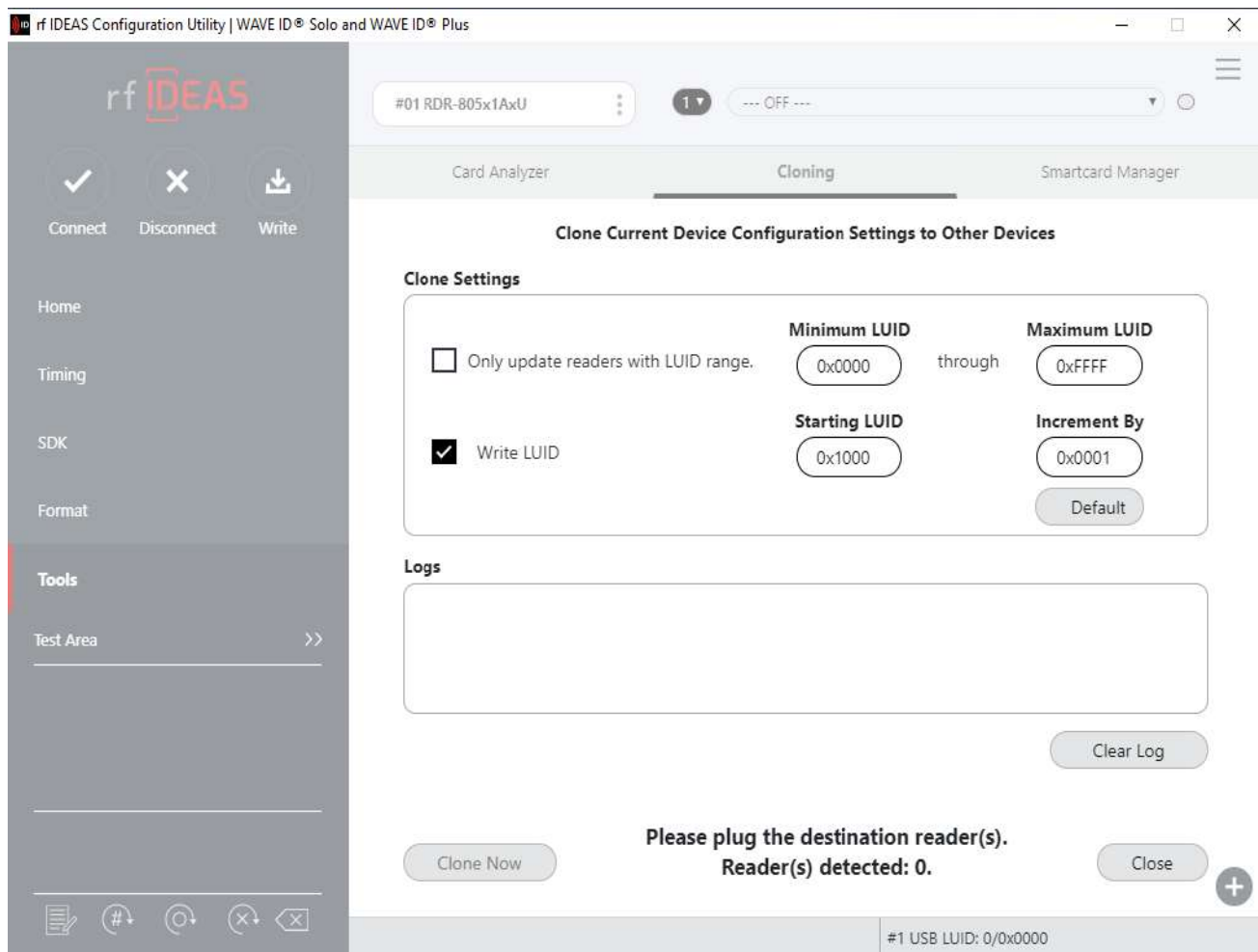



Image 53: Reader Disconnected

 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.

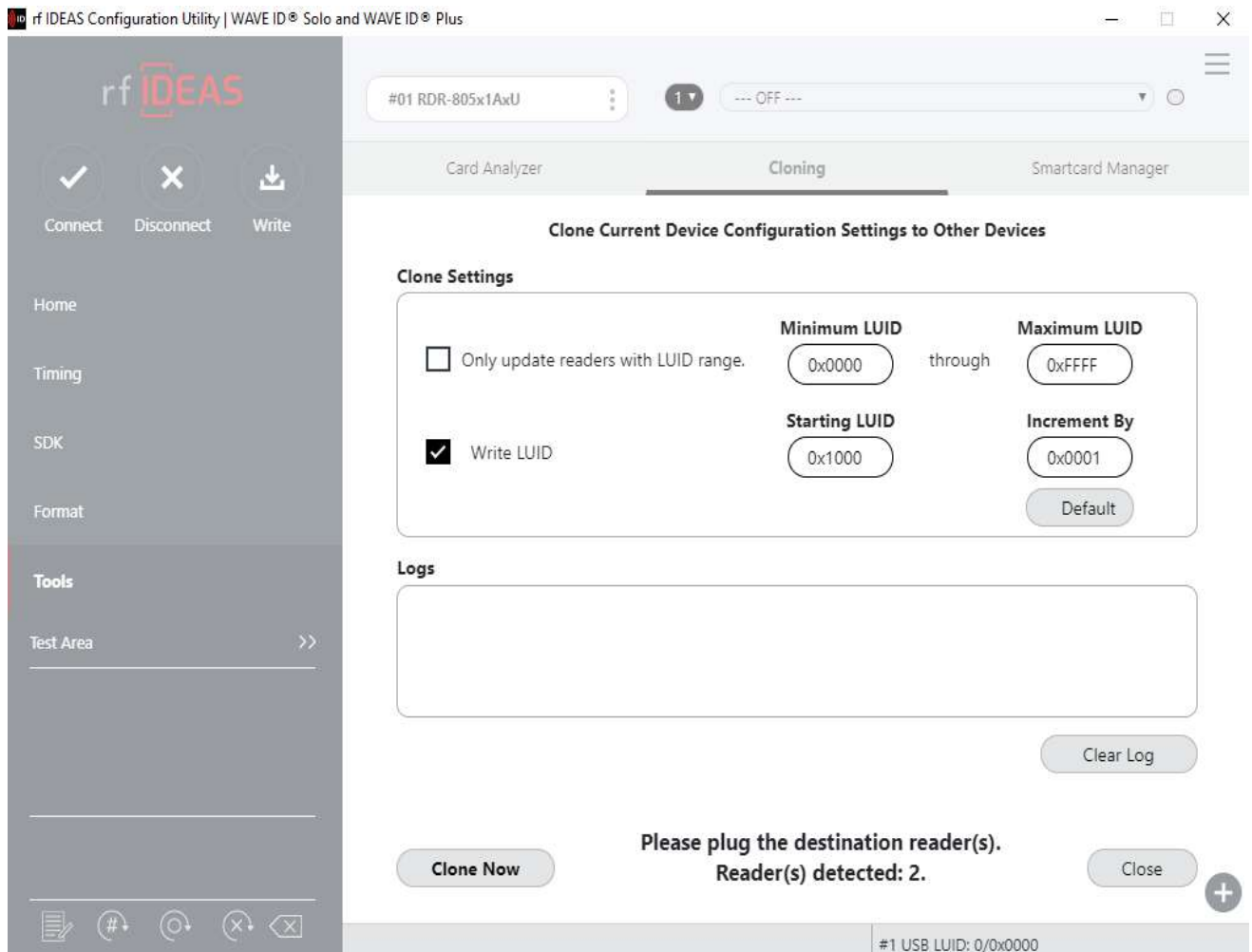


Image 54: Connecting Other Readers



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

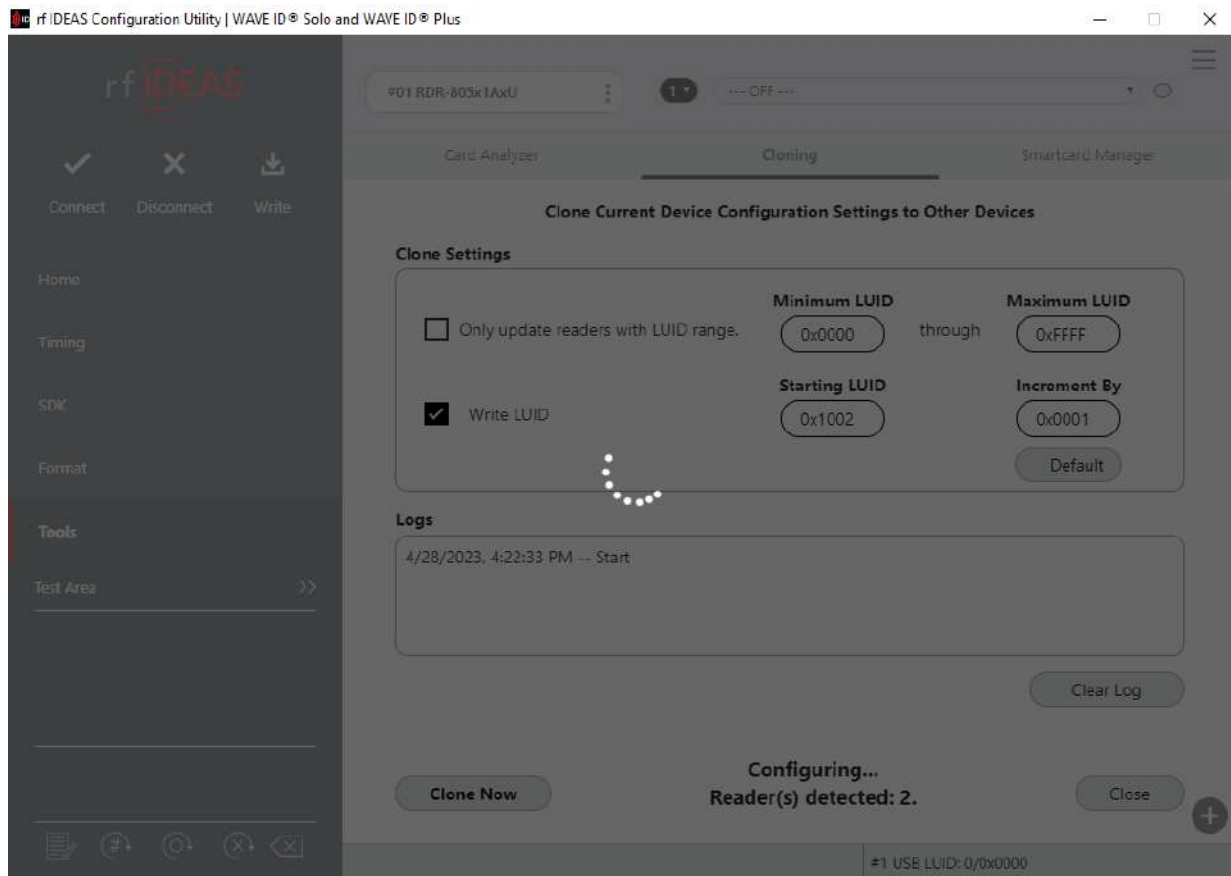


Image 55: Configuring Reader(s)

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



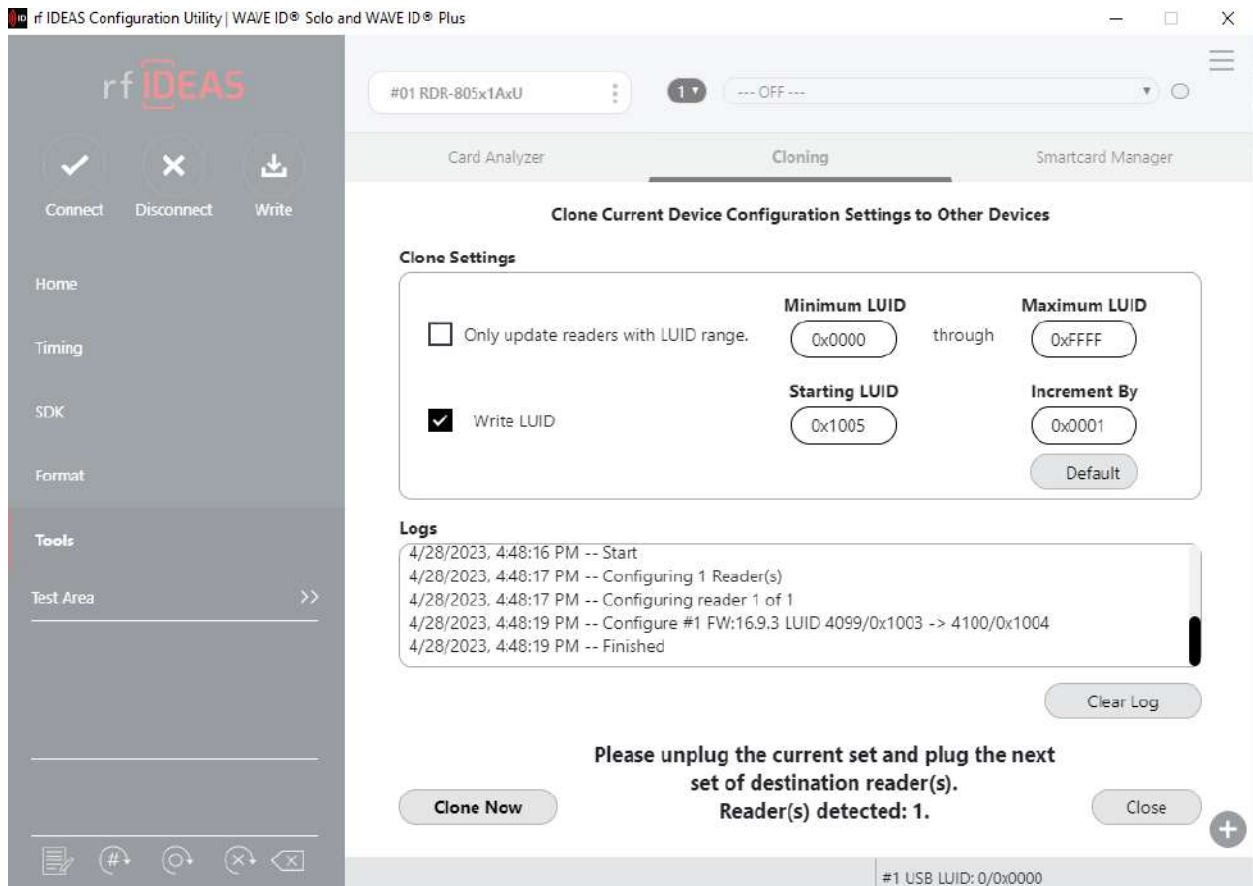


Image 56: Configuration Finished

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.

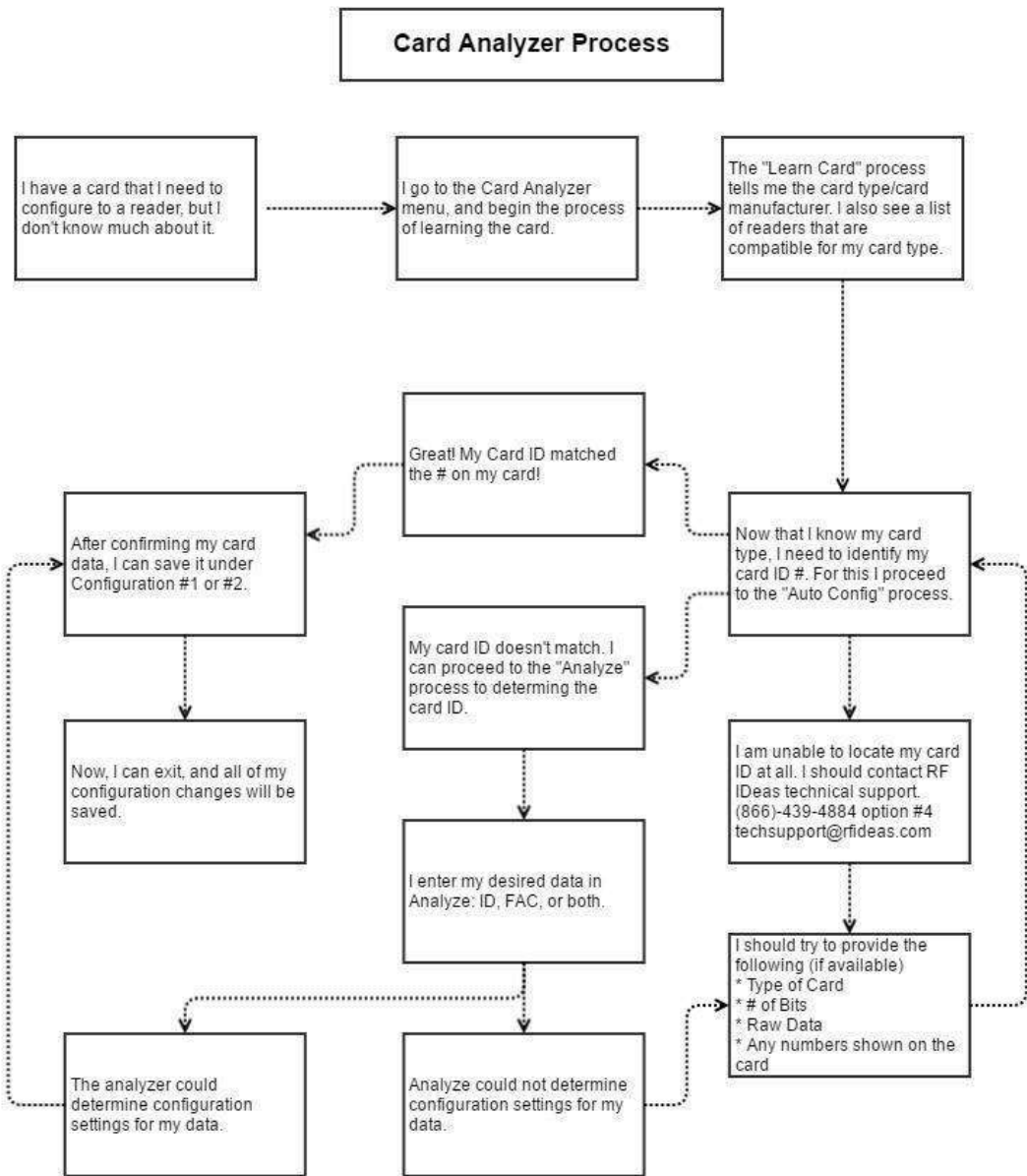


Image 57: Card Analyzer Process

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

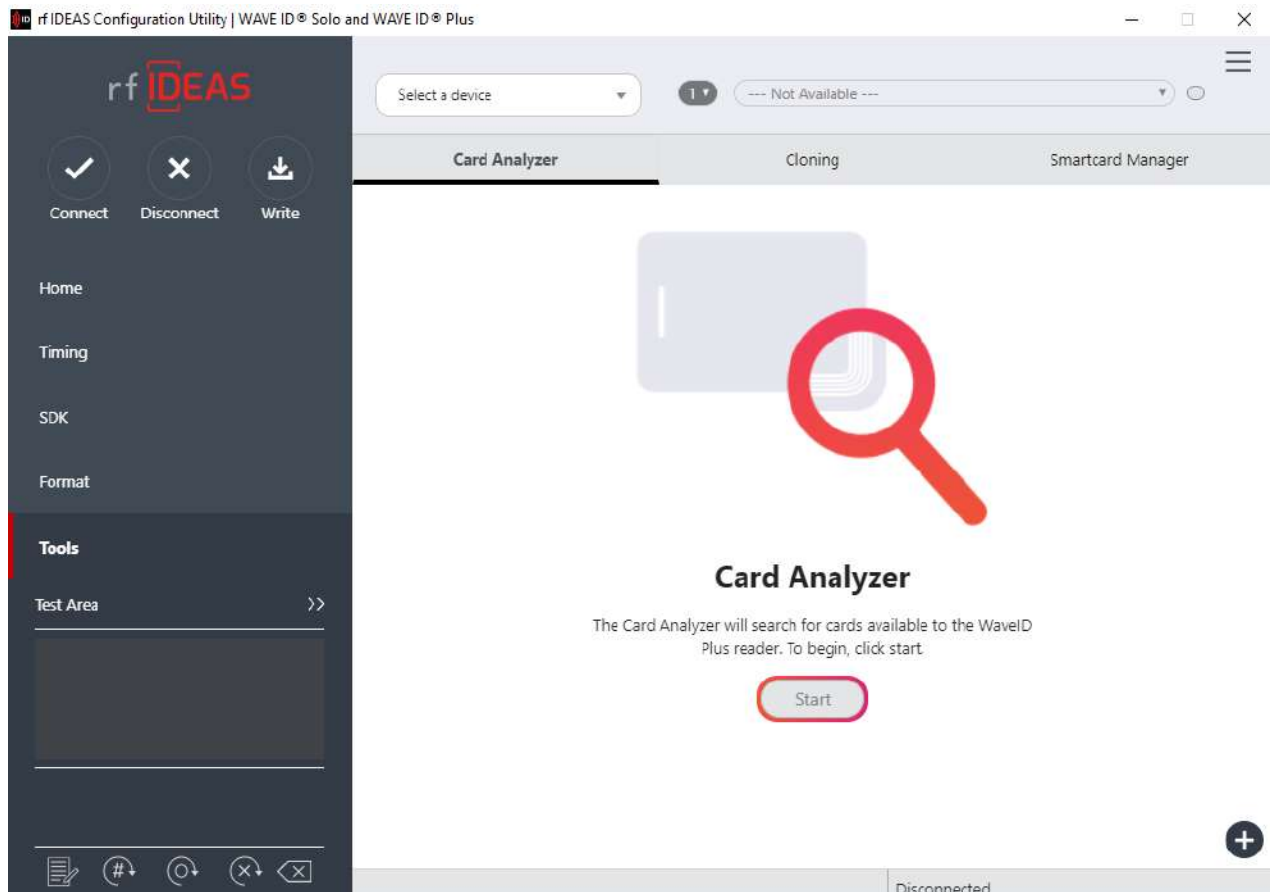


Image 58: Card Analyzer Start Screen



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.

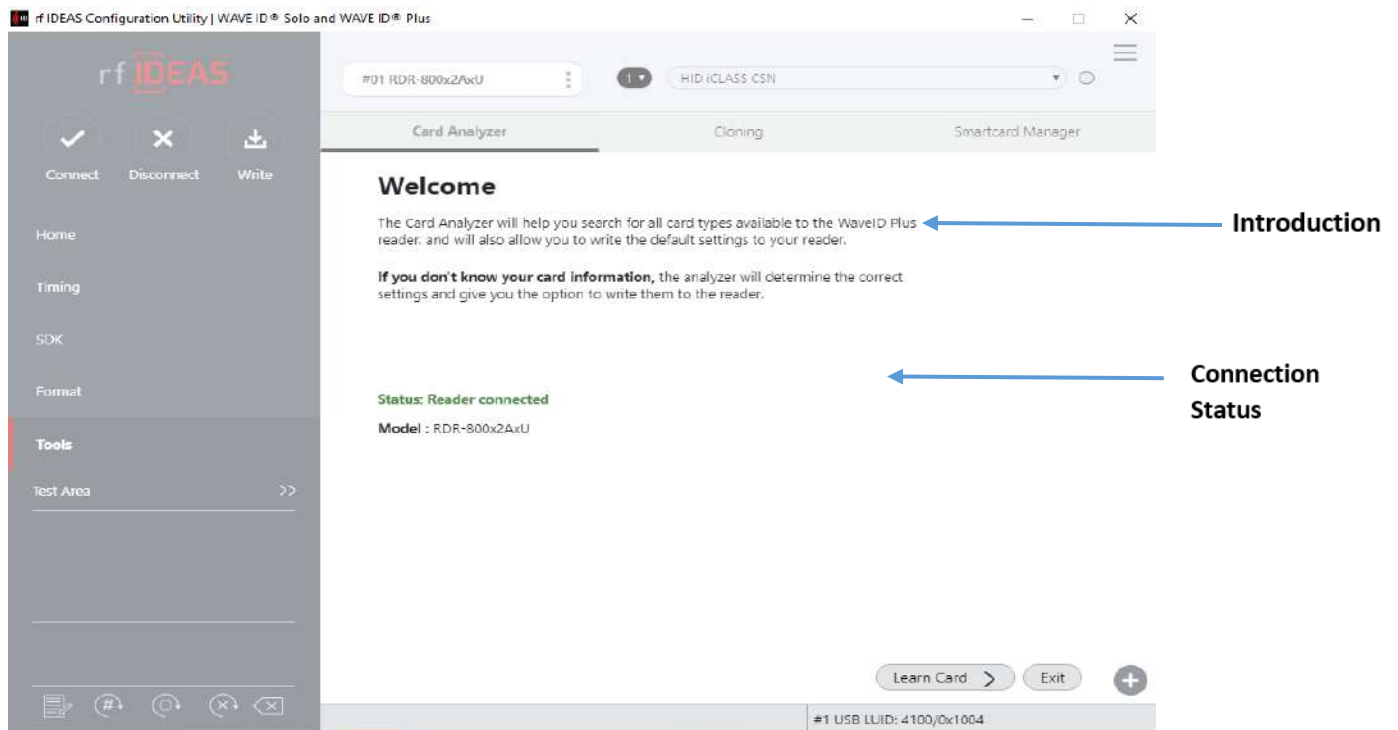


Image 59: Detecting the Reader

FUNCTION	DESCRIPTION
Status	<p>The status may display the following:</p> <ul style="list-style-type: none"> <li>• “Reader not connected”. Ensure the reader is connected properly.</li> <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-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-805x1BxU, RDR-800x2BxU, RDR-805x2BxU, RDR-805x6AxU, 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.

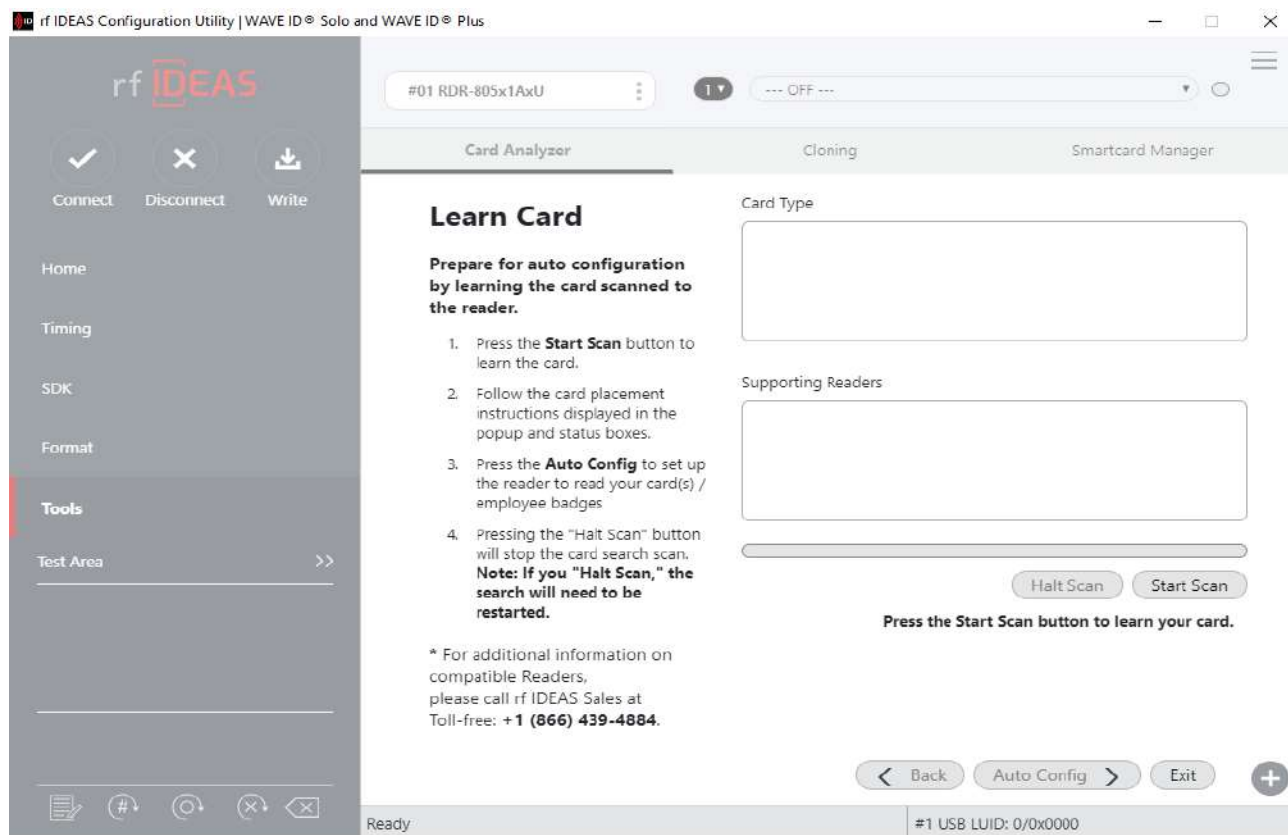


Image 60: Learn Card Screen

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:



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.

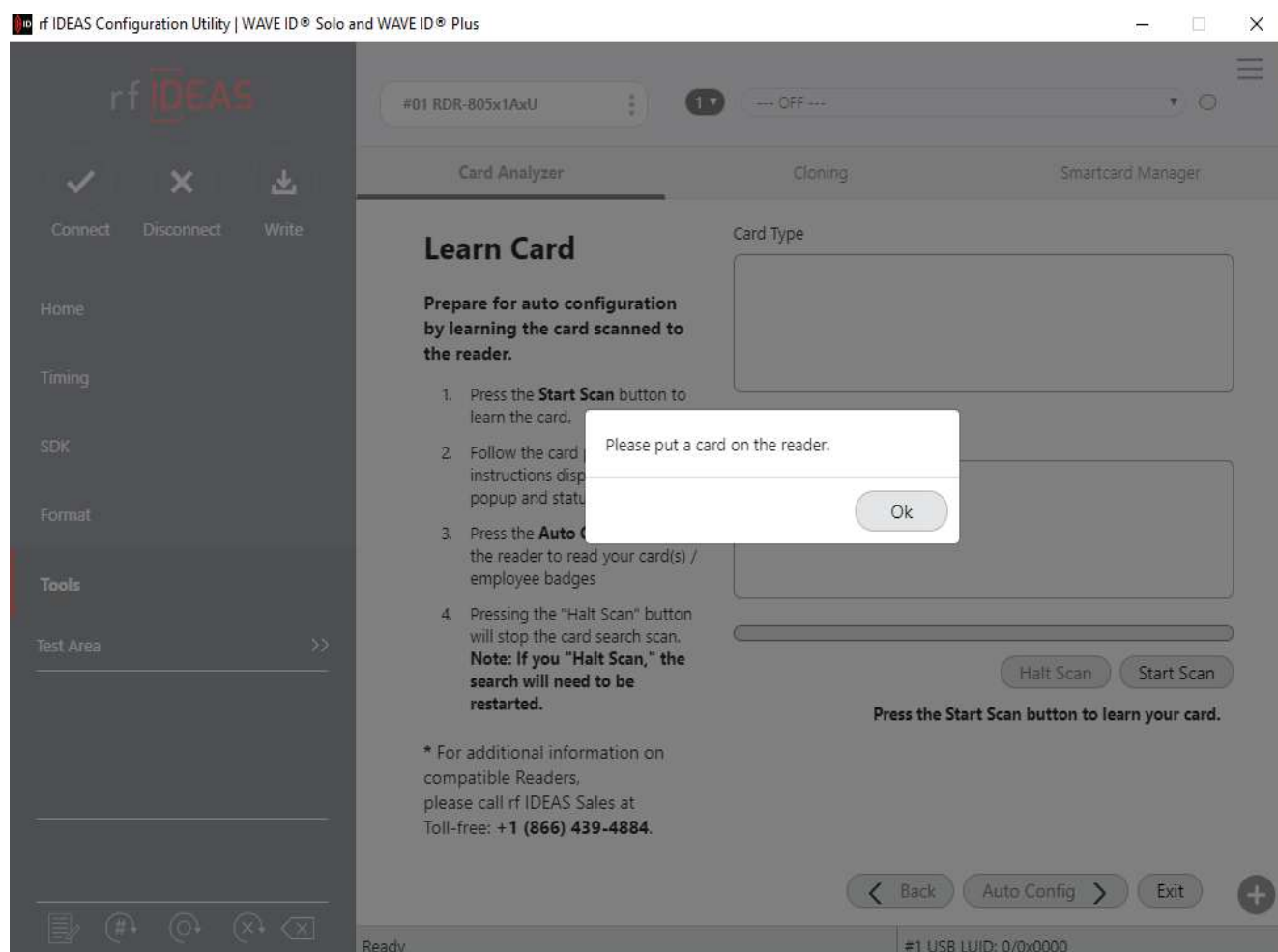


Image 61: Starting the Scan



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.

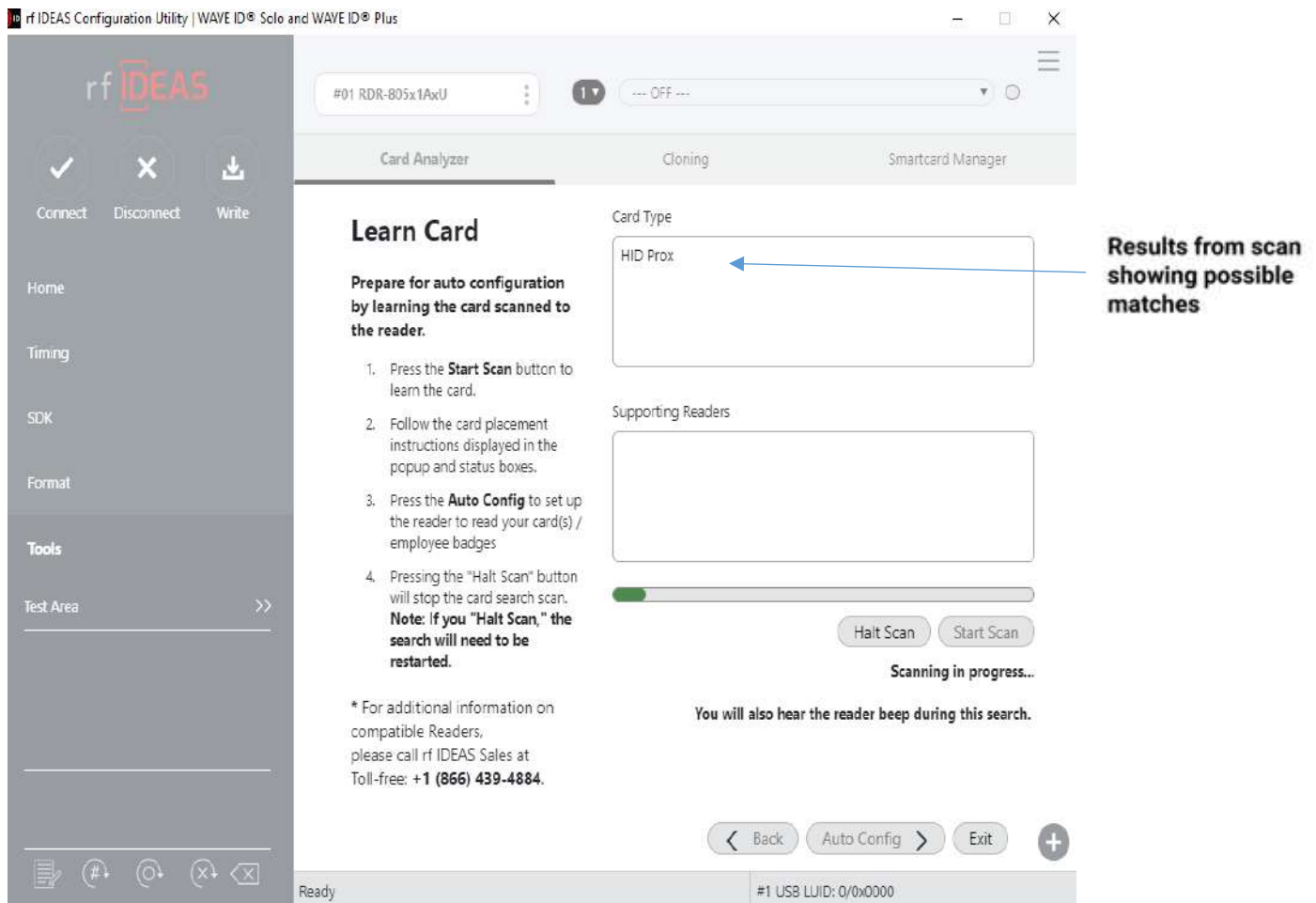


Image 62: Scanning Process



“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:

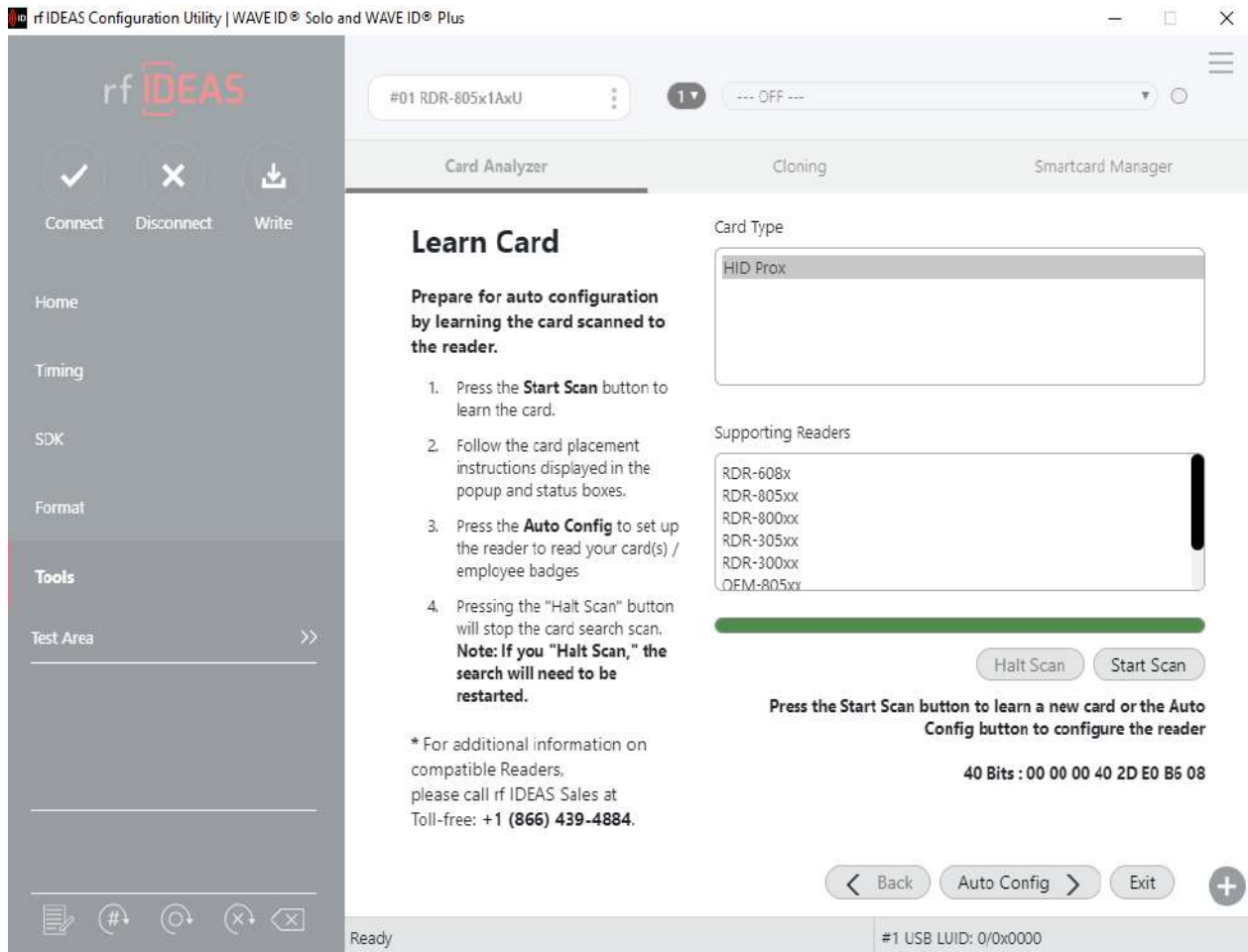


Image 63: Scanning Complete

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”.

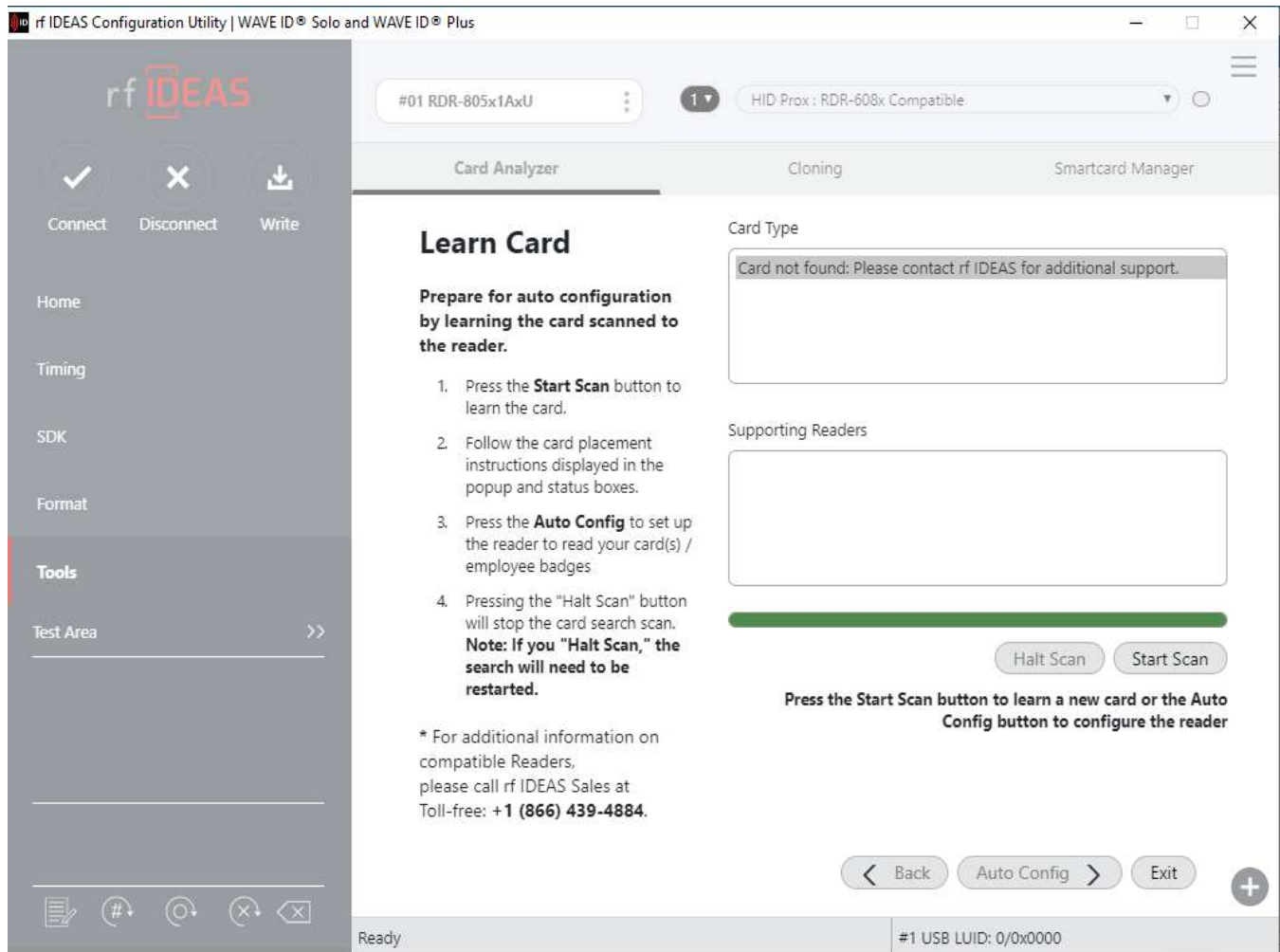


Image 64: Card Not Found Scenario

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.

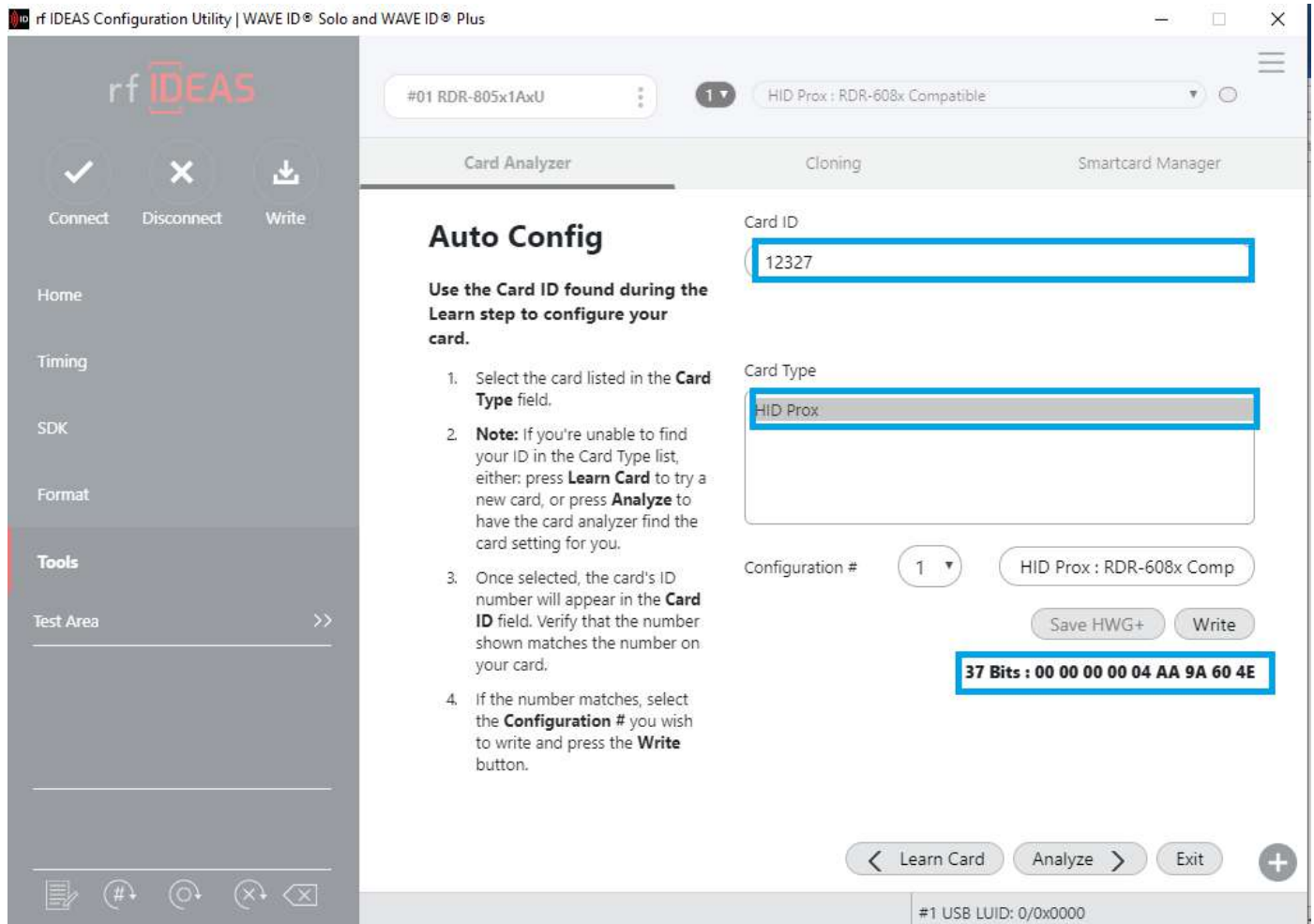


Image: 65 Auto Config Screen

- ⚠ 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.
- ⚠ Auto Config is only supported by Keystroking readers.

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	<p>This button has the following functions –</p> <ul style="list-style-type: none"> <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.

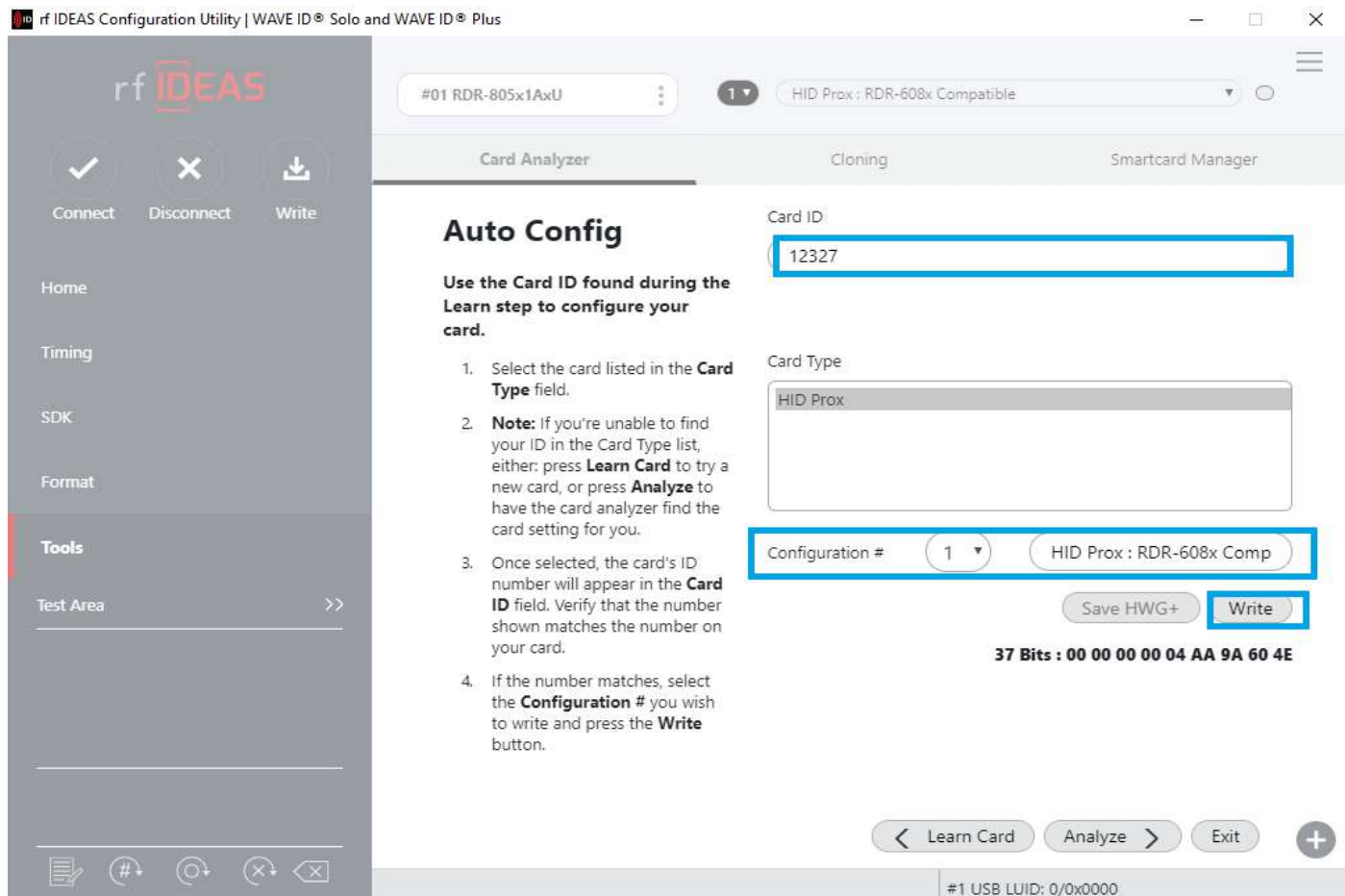


Image 66: Writing Configuration Settings to the Reader



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.

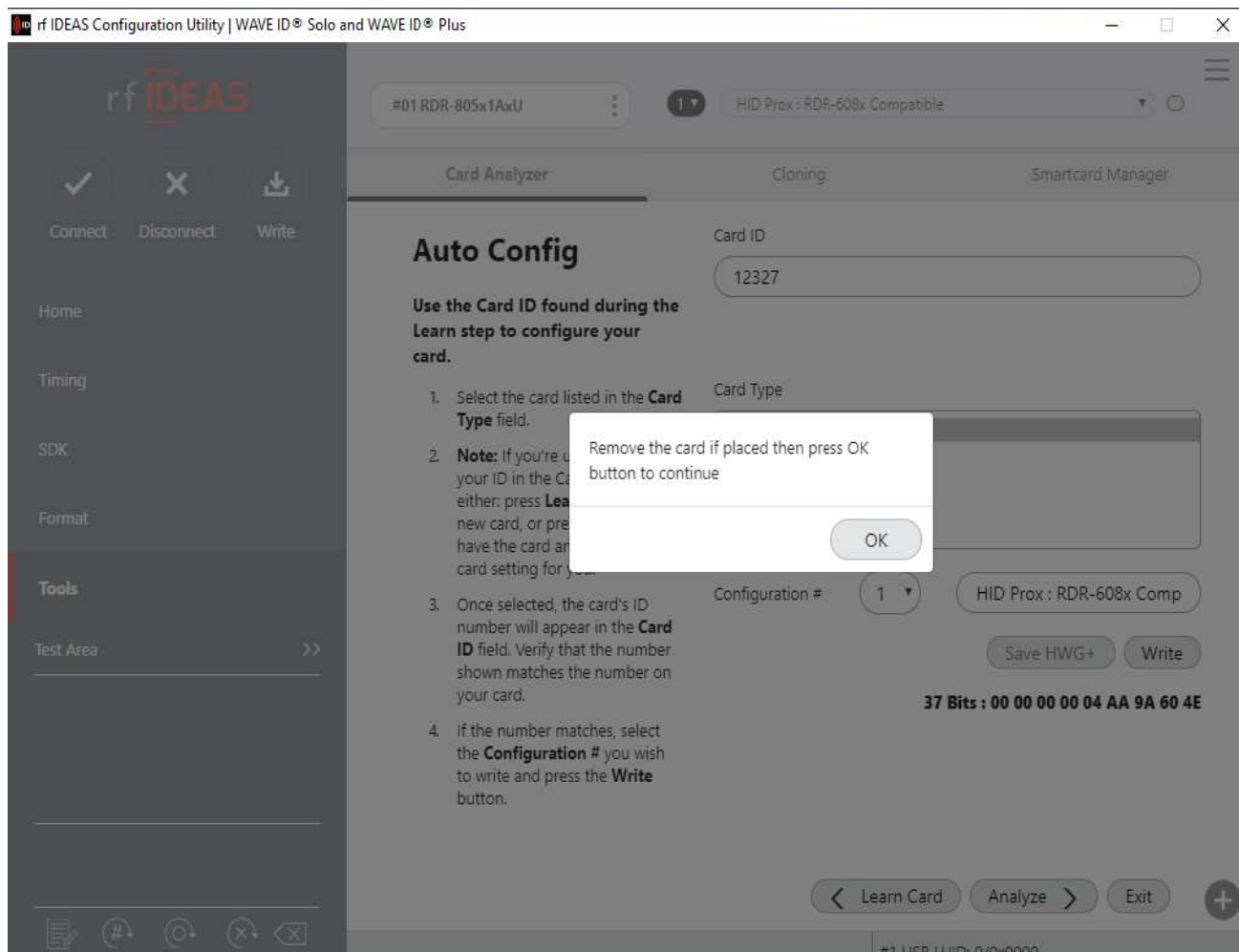


Image: 67 Pop-up Window for Removing the Card

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.

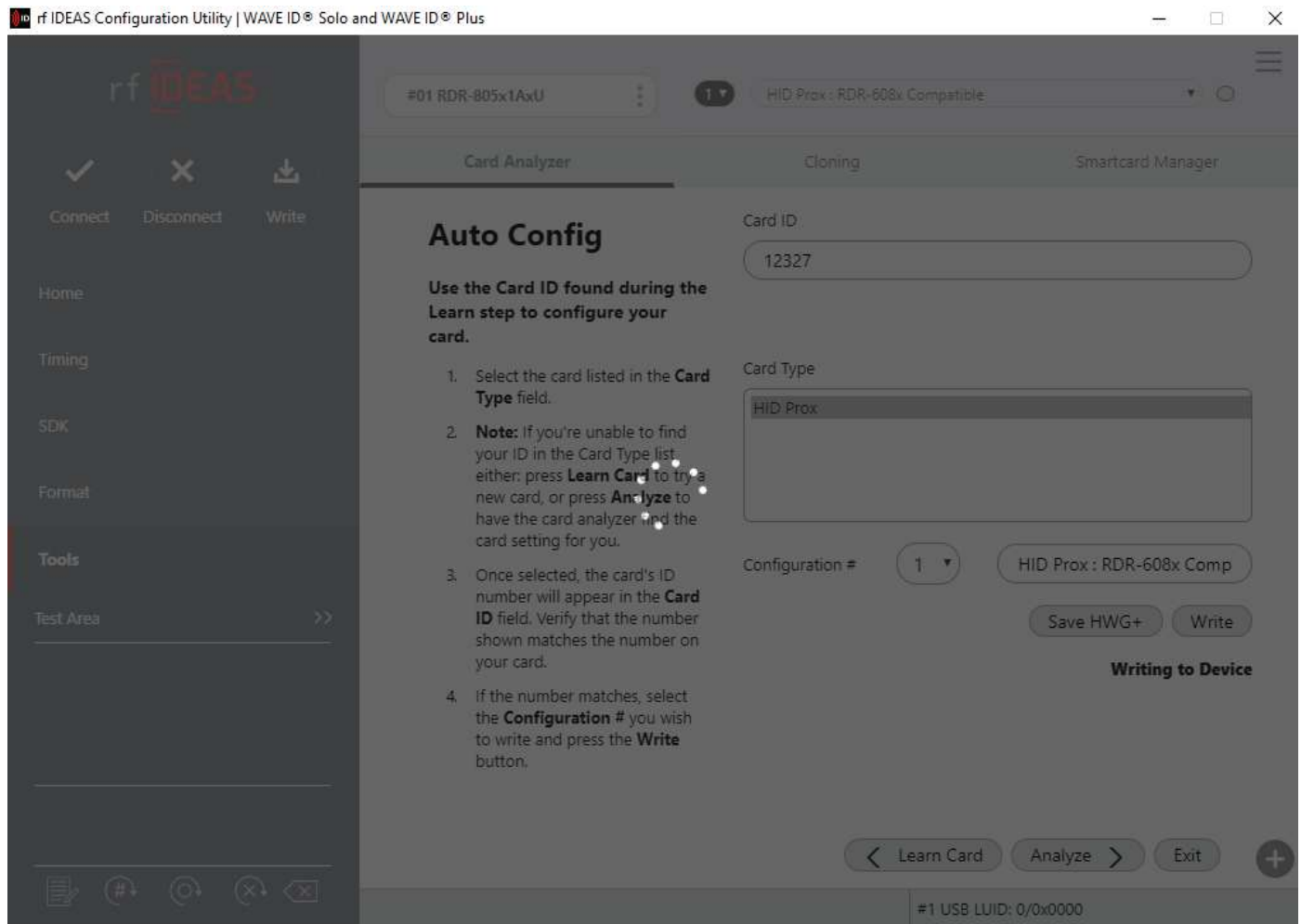


Image 68: Writing the Configuration to Reader

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

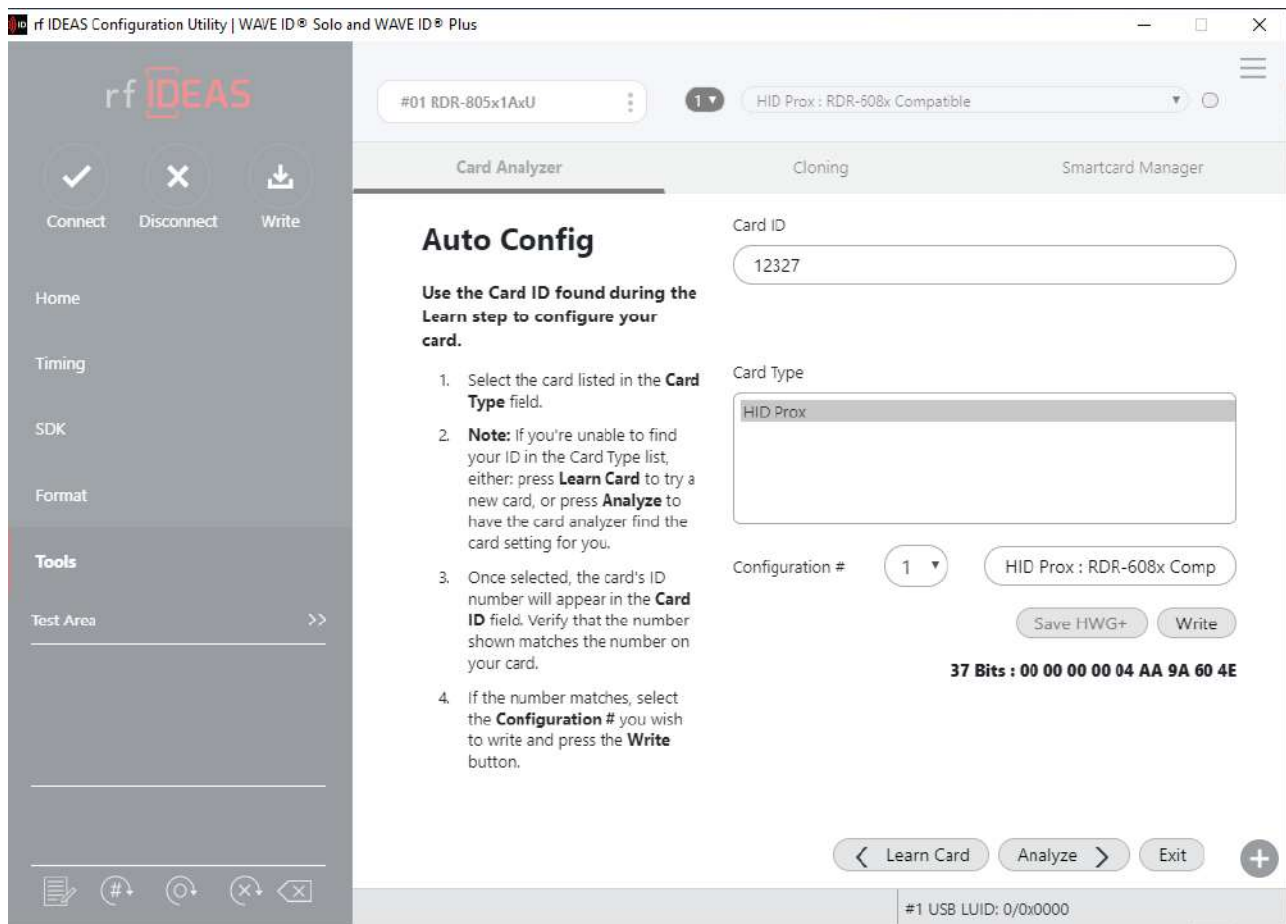


Image 69: Writing Process Complete

## 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.



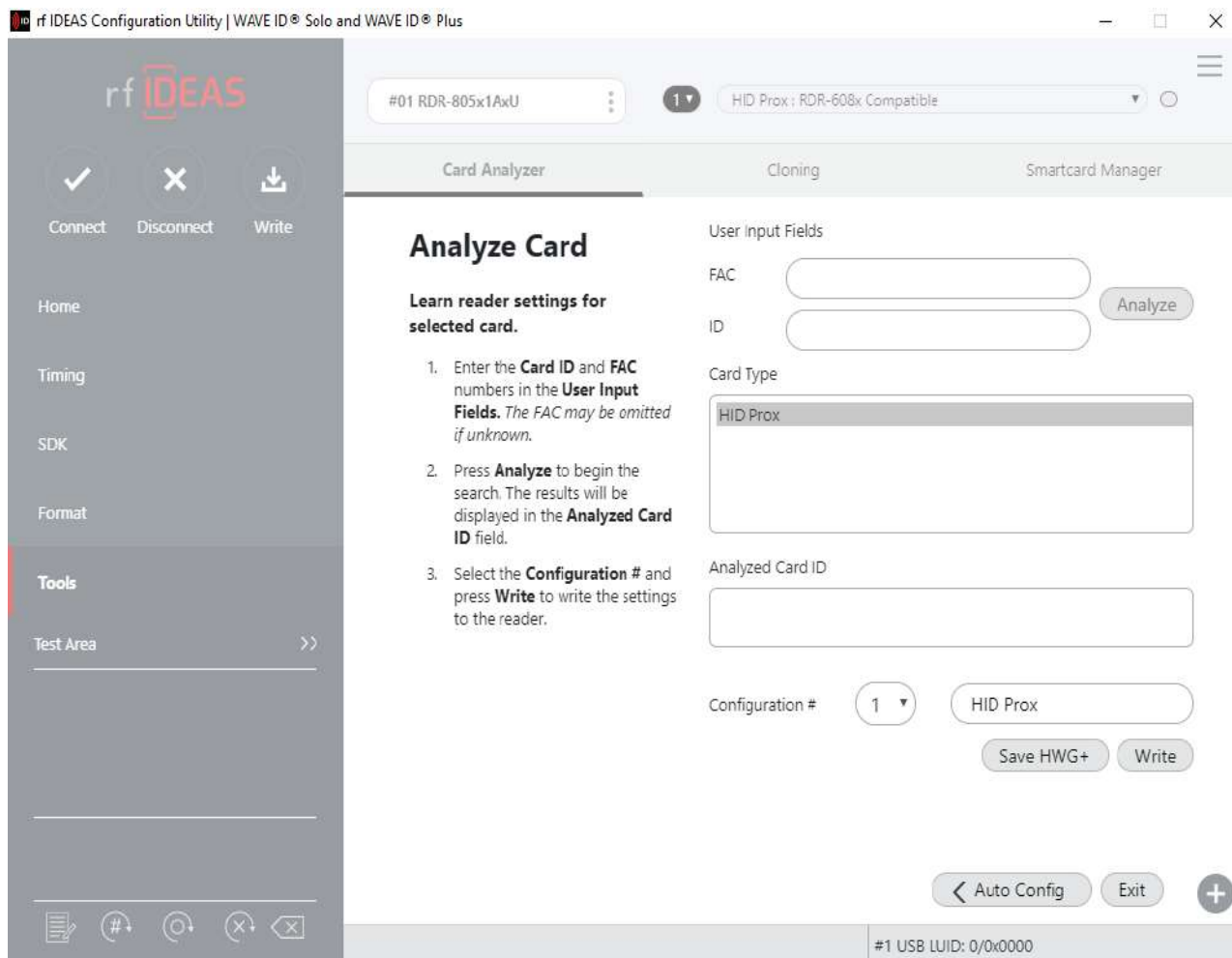


Image 70: Analyze Card Screen

FIELD/BUTTON	DESCRIPTION
<b>FAC</b>	Field to enter a Facility Access Code (FAC).
<b>ID</b>	Field to enter a card ID.
<b>Analyze</b>	Starts the card analyze function. The application will attempt to learn the settings for the selected Card Type.
<b>Card Types</b>	Displays learned Card Types. Each card type is selectable.
<b>Analyze Card ID</b>	Displays status to the user: "Card ID found", or "Contact rf IDEAS for additional support" if no results are found.
<b>Configuration #</b>	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	<p>This button has the following functions:</p> <ul style="list-style-type: none"> <li>• If the user has not written configurations, pressing the "Exit" button will return user to rfIDEAS config utility without making any changes.</li> <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.



"ID" field is mandatory to analyze the card. FAC is optional, omit if unknown. The fields support numeric data.

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

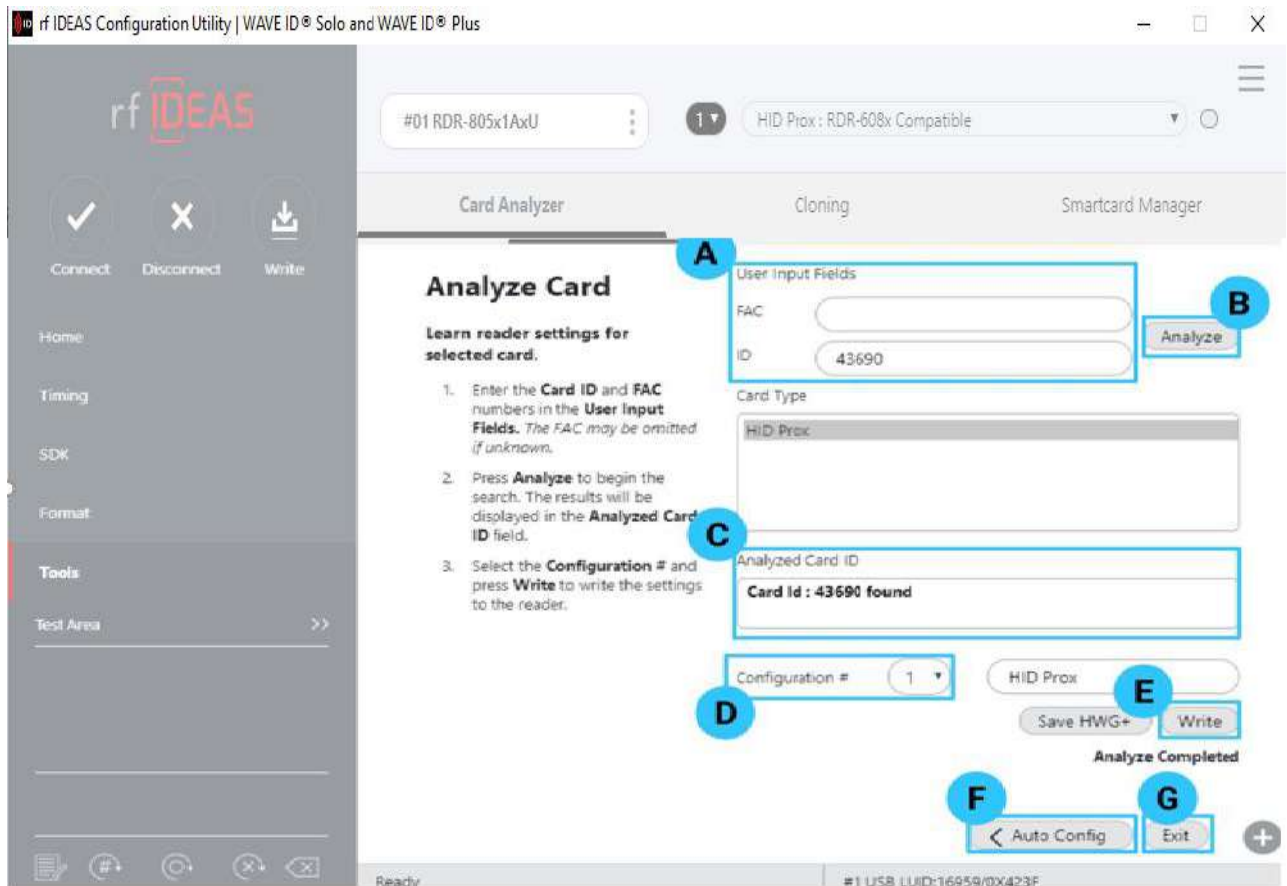


Image 71: Analyzing the Card

## 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.

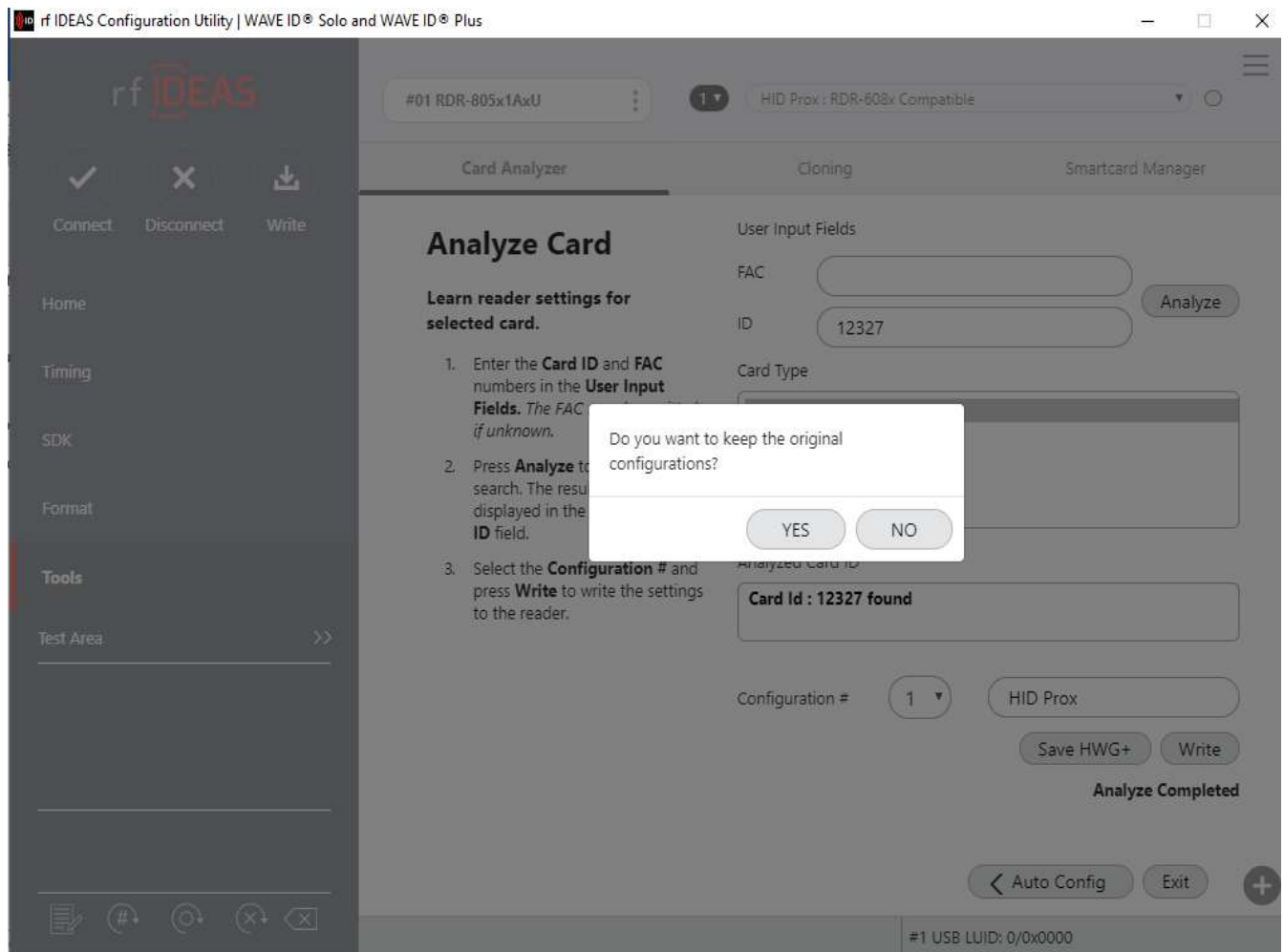


Image 72: Pop-up on clicking Exit Button on Screen

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

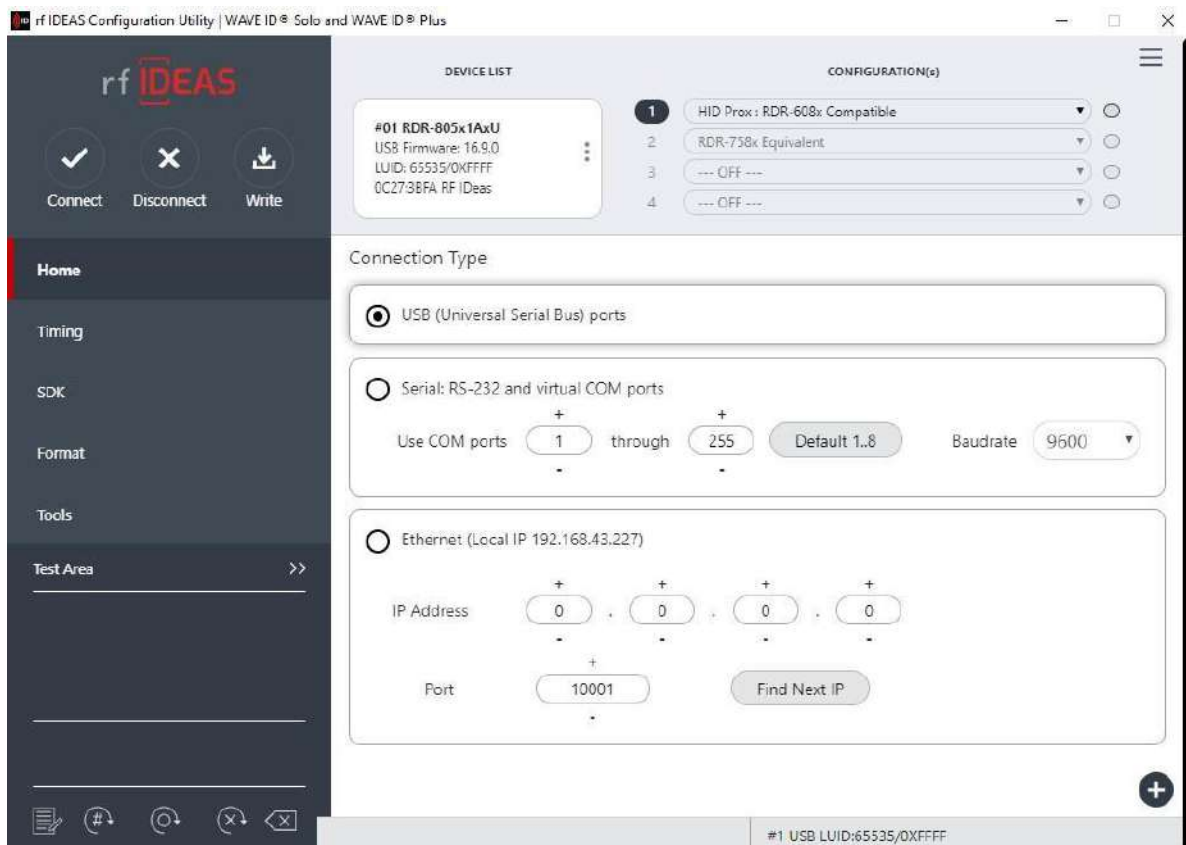


Image 73: New Configuration in the Utility

## 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.

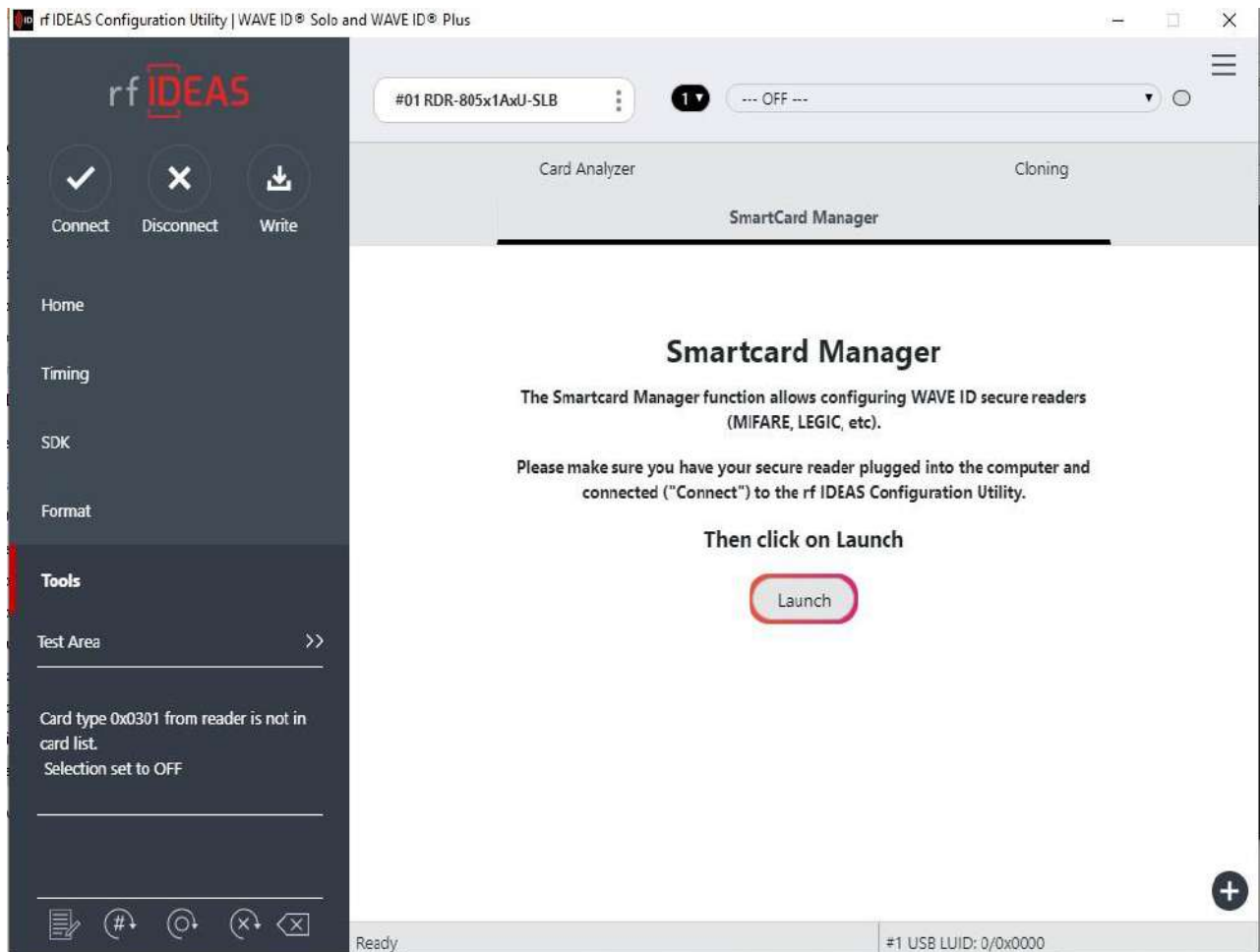


Image 74: Smart Card Manager Launch Screen

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.

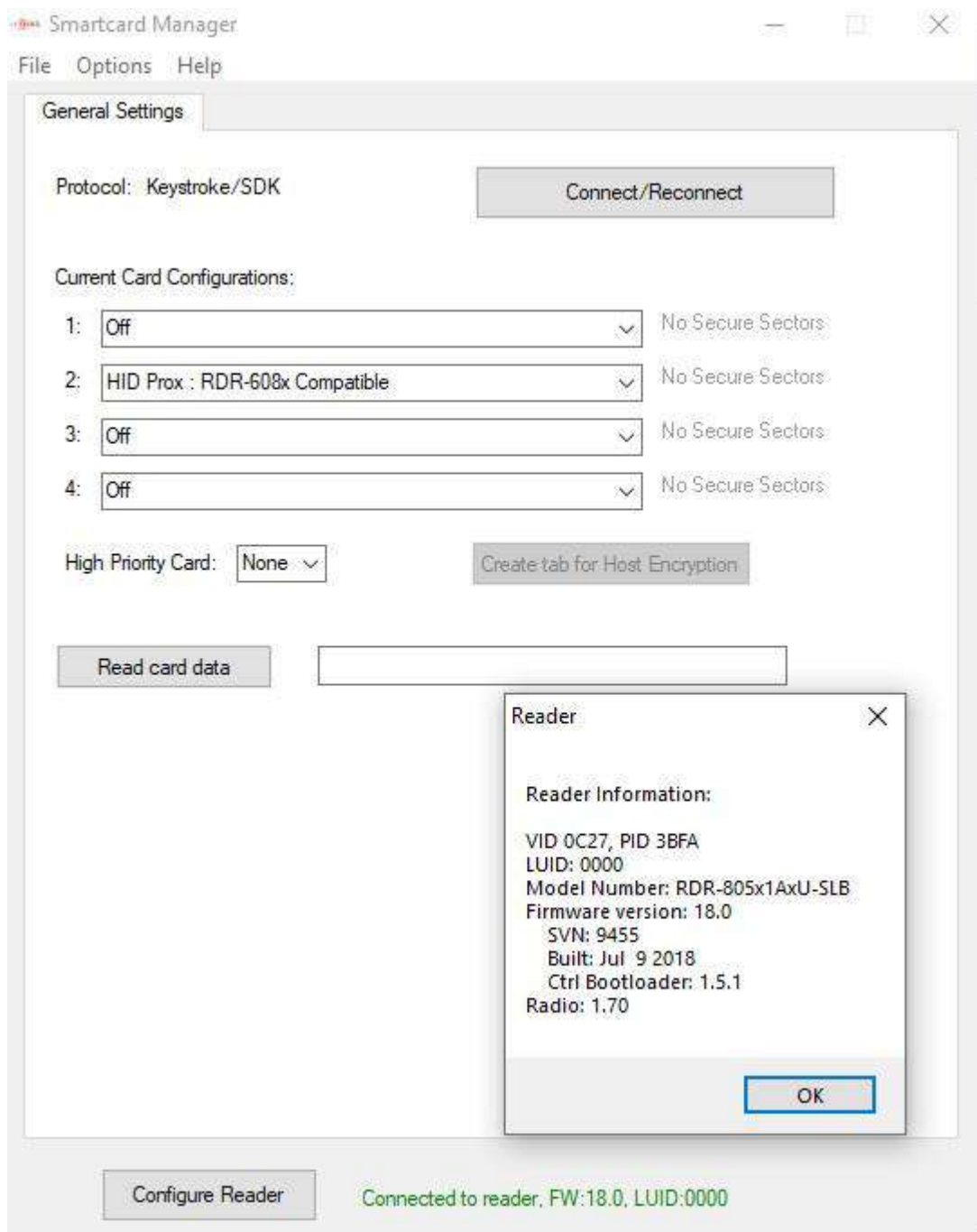


Image 75: Smartcard Manager Utility Screen with Reader Information

**NOTE:** For more information regarding the Smartcard Manager utility please contact [techsupport@rfideas.com](mailto:techsupport@rfideas.com).

## 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:

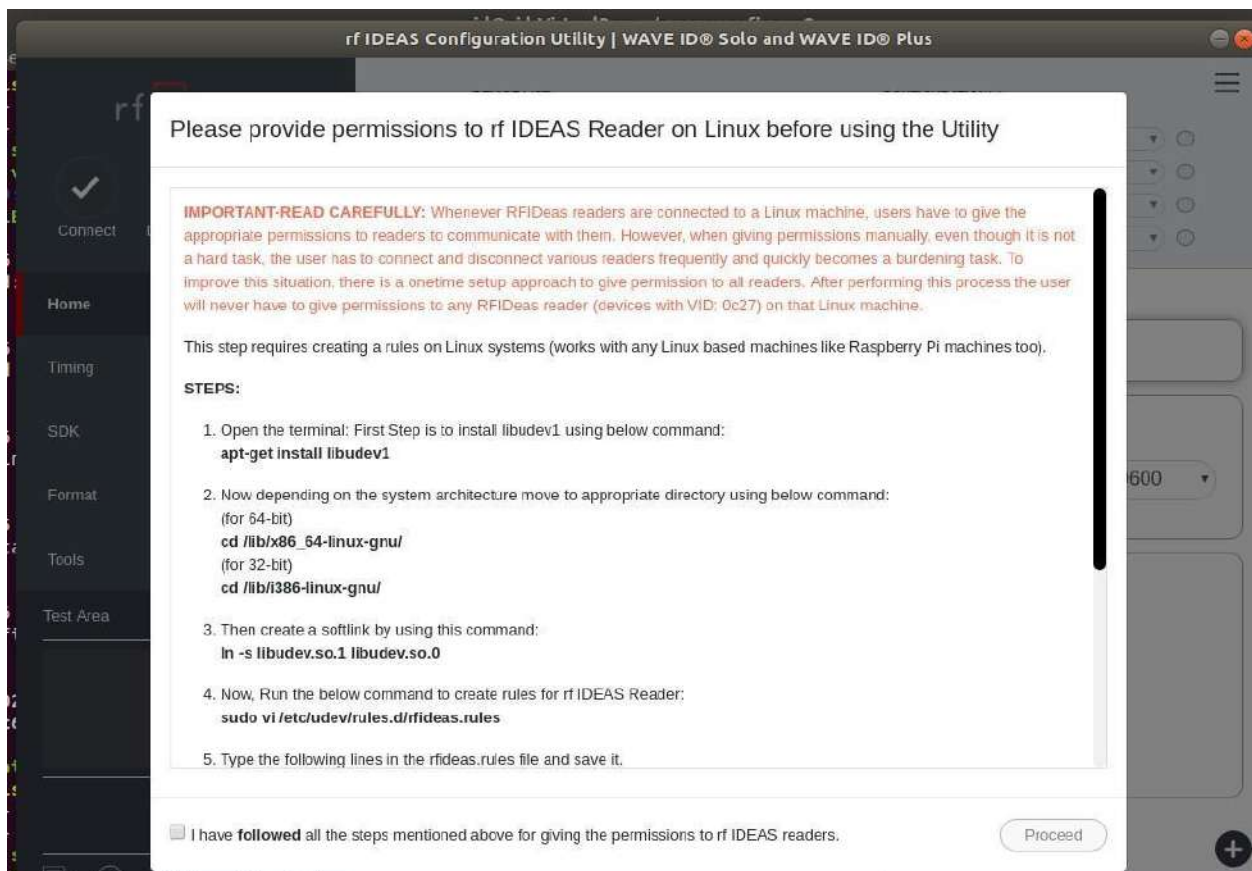


Image 77: Providing permission to rf IDEAS reader on Linux.

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

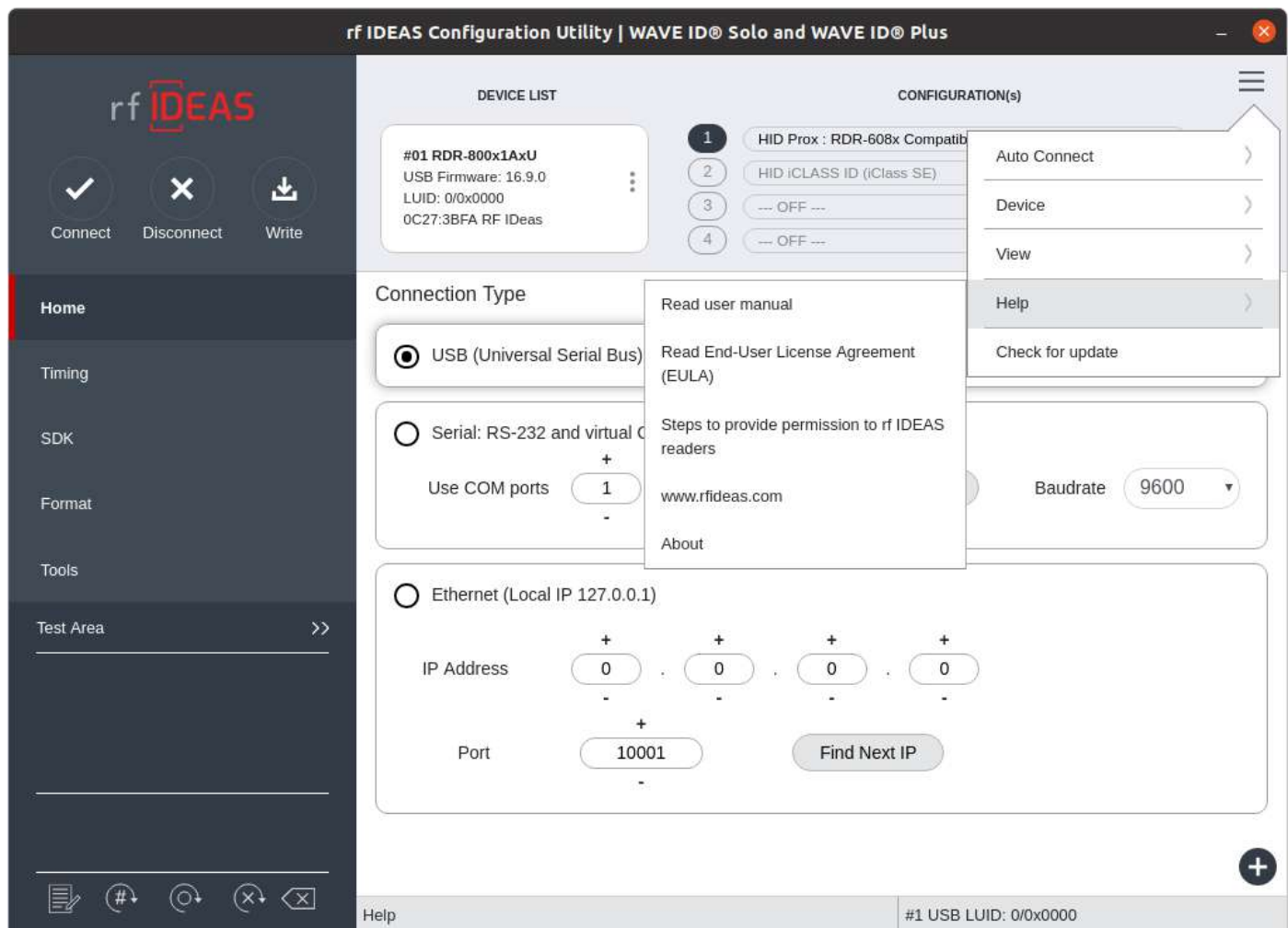


Image 78: Steps to provide permission to rfIDEAS readers.

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

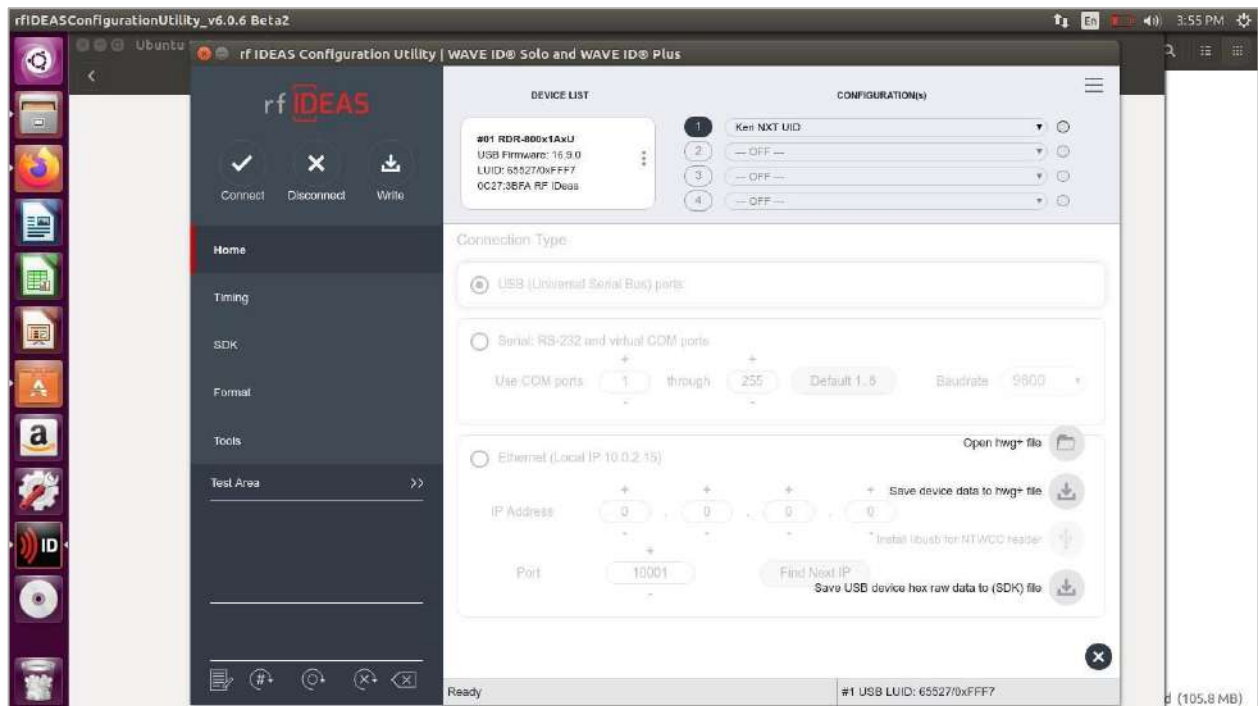


Image 79: Installation of libusb for NTWCC reader disabled.

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

## 4.2 MAC Platform

### Installation and Usages:

1. 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 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).

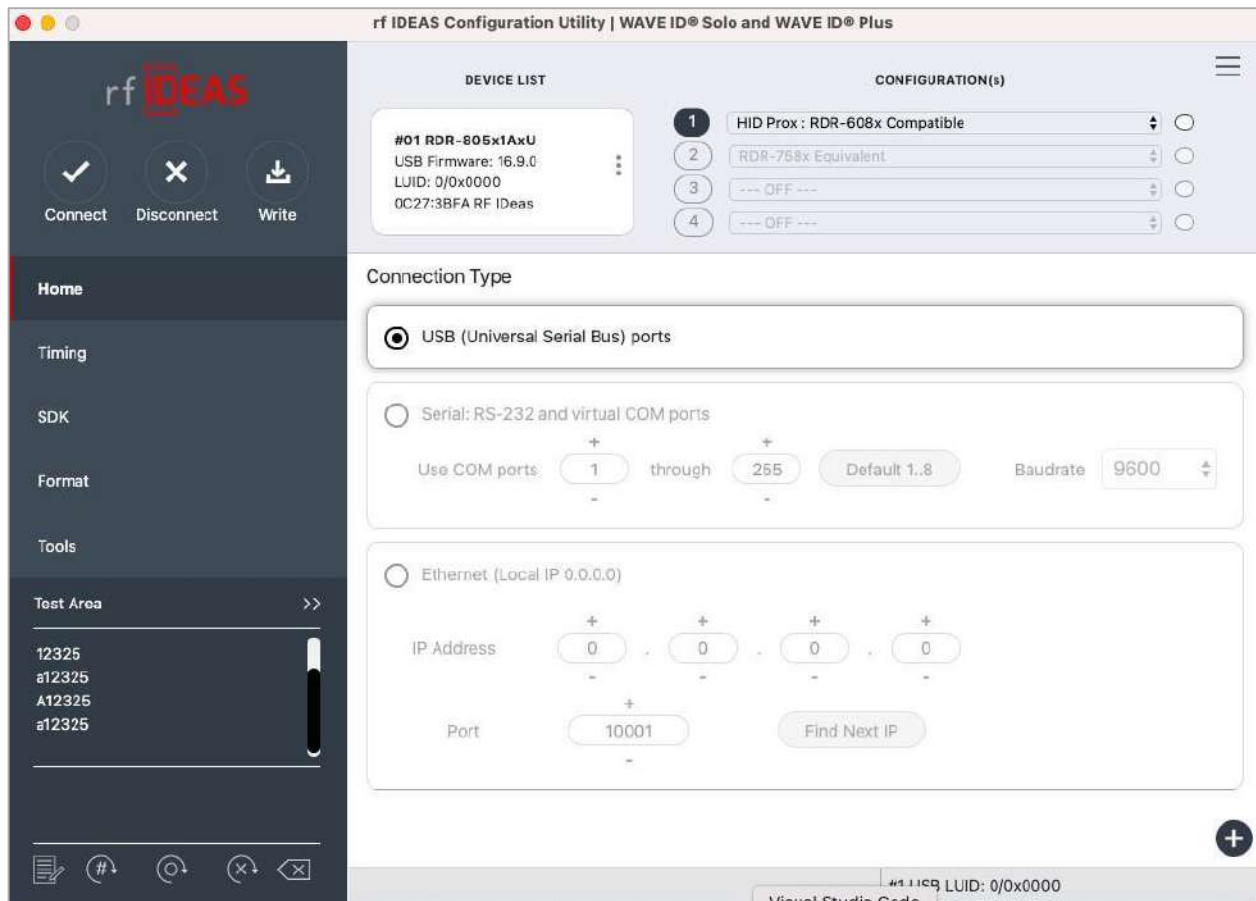


Image 80: Serial & Ethernet readers not supported.

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

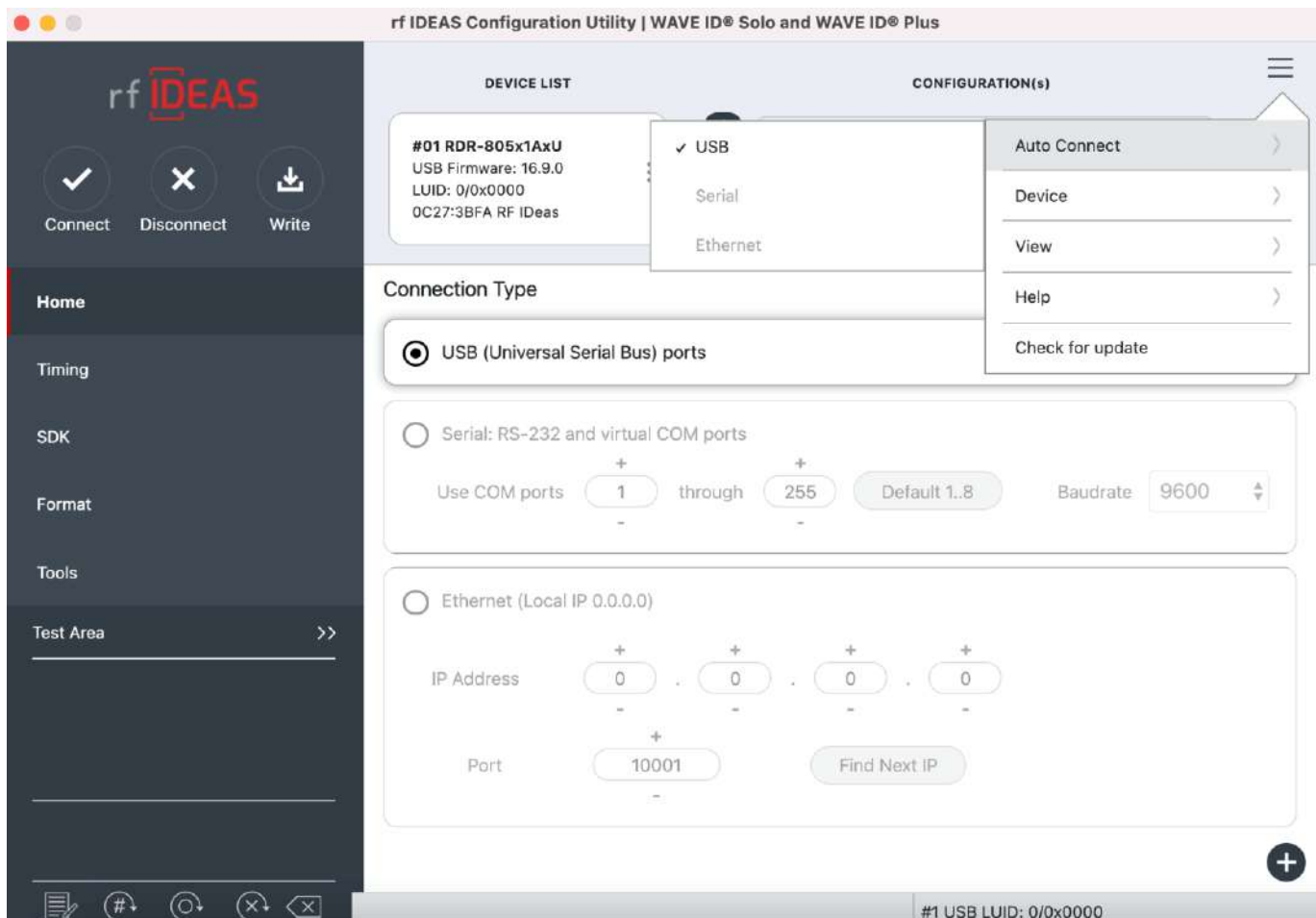


Image 81: Auto connection OFF for Serial & Ethernet readers

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.

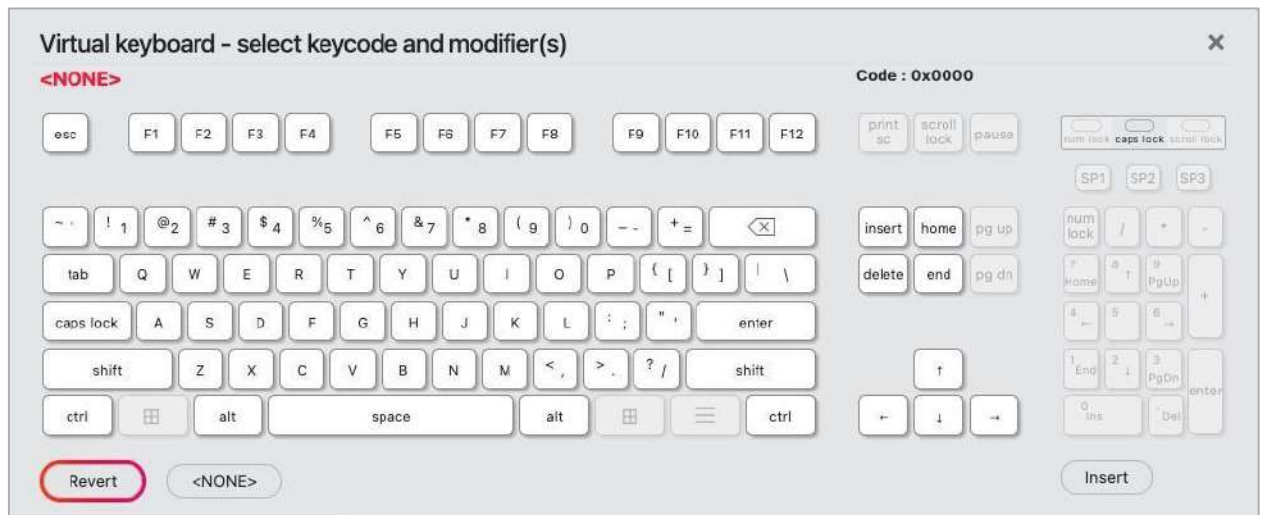


Image 83: Virtual Keyboard of Mac rf IDEAS Configuration Utility

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.

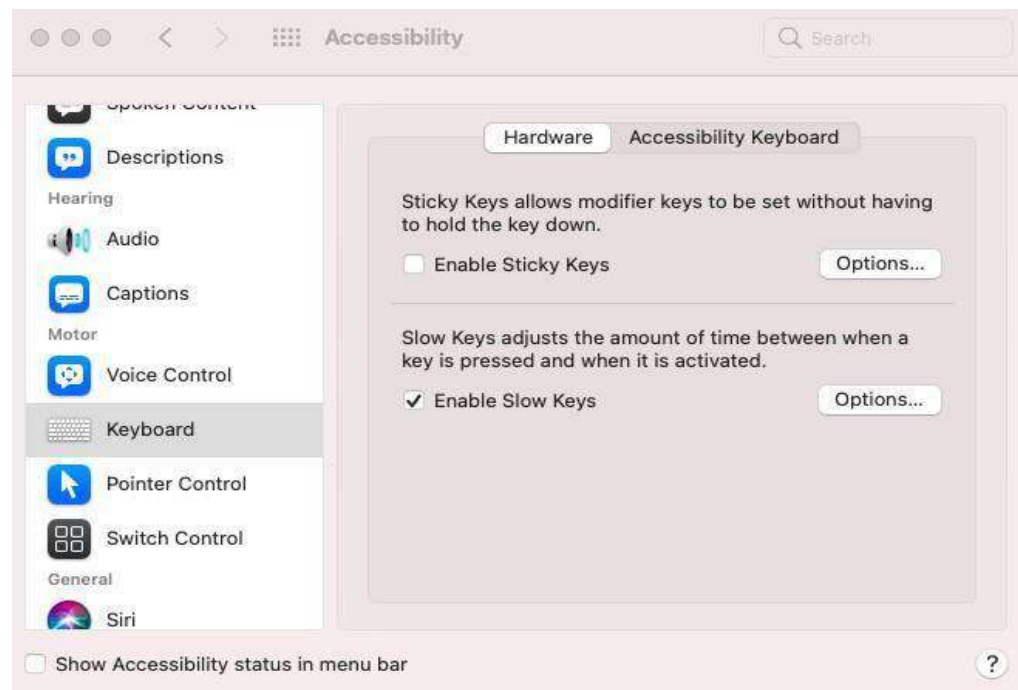


Image 84: Enabling Slow Keys

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

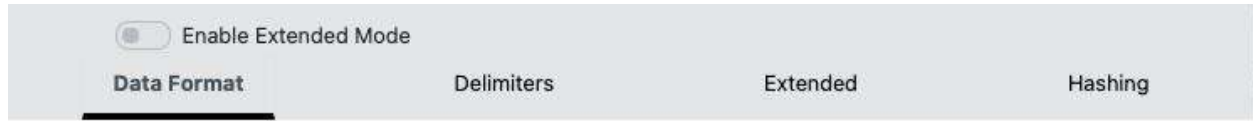


Image 85: Extended mode disabled

# END-USER LICENSE AGREEMENT

## LICENSE AGREEMENT

End-User License Agreement for rf IDEAS™ software and hardware, including, but not limited to pcProx®, pcProxPlus®, pcSwipe®, WAVE ID®, Configuration Utility, Proximity Activated Readers, Software Developer's Kit ("SDK"), and Proximity Reader DLLs, Remote Reader Management (RRM) Tools, Mobile Application Source Code and associated SDKs, and Protocol(s) (each referenced herein as a "Product").

This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or single 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.

By (i) clicking accept or acknowledging this EULA or (ii) installing, copying, downloading, or otherwise using the Product, you agree to be 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.

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, 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 single entity shall only be shared with individuals employed by that entity on a need-to-know basis.



1.2 Software. You may install and use one (1) copy of the software within the Product on the machine used for the Licensed Products.

1.3 Network Services. If the Product includes functionality that enables Licensed Products to act as a network server, any number of computers or workstations may access or otherwise utilize the basic network services of that server. The basic network services are more fully described in the printed materials accompanying the Product.

1.4 Storage/Network Use. You may store or install a copy of the underlying software of the Product on a computer to allow your other computers to use the Product over an internal network and distribute the Product to your other computers over an internal network. A single license for the Product may not be shared or used concurrently by other end users.

1.5 Documentation. This EULA grants you, a nonexclusive, terminable, non-transferable (except in accordance with this EULA) and nonsublicensable, limited license to make and use an unlimited number of copies of any documentation, provided that such copies shall be used only for purposes in accordance with this EULA and are not to be republished or distributed (either in hard copy or electronic form) beyond the user's premises and with the following exception: you may use documentation identified in the underlying software as the file format specification for rf IDEAS' proximity readers solely in connection with your development of software product(s) or an integrated work or product suite whose components include one or more general purpose software products.

1.6 Example Code and Dynamic Link Libraries. rf IDEAS grants you the right to use and modify the source code version of those portions of the underlying software identified as "examples" in the software ("Example Code"), as well as the Dynamic Link Libraries ("DLL") for the sole purposes of designing, developing, and testing your software product(s), and to reproduce and distribute the DLL and Example Code, along with any modifications of the Example Code, only in object code form.

## 2. DESCRIPTION OF OTHER RIGHTS AND LIMITATIONS

2.1 Limitations on Reverse Engineering, Decompilation and Disassembly. You may not reverse engineer, decompile, or disassemble the Product, except and only to the extent such activity is expressly permitted by applicable law notwithstanding this limitation. You may

not reproduce or otherwise emulate, in whole or in part, any form of the protocol(s) defined within the Product for use without or outside of a Product. Except where otherwise provided in this EULA or explicitly provided for by rf IDEAS in writing, you may not (i) modify, adapt or create derivative works of the Product; (ii) make the functionality of the Product available to third parties, whether as an application or service provider, or on a rental, service bureau, cloud service, hosted service, or other similar basis; (iii) use any Product that is licensed for a specific device, whether physical or virtual, with another device; or (iv) remove, modify, or conceal any product identification, copyright, proprietary, intellectual property notices or other marks on or within the Product.

### 3. REDISTRIBUTABLE CODE

3.1 If you are authorized and choose to redistribute Example Code and DLL ("Redistributables"), you agree to (i) distribute the Redistributables in object code only, in conjunction with, and as part of a software application product developed by you using the Product accompanying this EULA that adds significant and primary functionality to the Licensed Product; (ii) not use rf IDEAS' name, logo, or trademarks to market the Licensed Product without the express written permission of rf IDEAS; and (iii) include a valid copyright notice on the Licensed Product.

3.2 You also agree not to permit further distribution of the Redistributables by your end users except: (i) you may permit further redistribution of the Redistributables by your distributors to your end-user customers if your distributors agree to only distribute the Redistributables in conjunction with, and as part of, the Licensed Product and you and your distributors comply with all other terms of this EULA; and (ii) in the manner described in Section 1.6.

### 4. SEPARATION OF COMPONENTS.

The Product is licensed as a single product. Its component parts may not be separated for use on more than one computer.

### 5. SOFTWARE TRANSFER.

You may permanently transfer all of your rights under this EULA only as part of a sale or transfer of the device used for the Licensed Product, provided you retain no copies, you transfer all of the Product (including all component parts, the media and printed materials, any upgrades, this EULA, and, if applicable, the Certificate(s) of Authenticity), and the recipient agrees to the terms of this EULA.

If the Product is an upgrade, any transfer must include all prior versions of the Product.

## 6. TERM AND TERMINATION.

6.1 The grant of license described in Section 1 above will continue to apply, subject to the terms of this EULA, until terminated by either your or rf IDEAS as set forth below.

6.2 If you want to terminate this EULA, you may do so by ceasing your use of the Product and any relevant developer credentials.

6.3 rf IDEAS may, at any time, terminate this EULA if: (i) you have breached any provision of this EULA; (ii) rf IDEAS is required to do so by law; (iii) rf IDEAS decides to no longer provide the Product or certain parts of the Product to users in the country in which you are a resident or from which you use the service, or the provision of the Product, or certain Product services to you by rf IDEAS, or if in the sole discretion of rf IDEAS, is no longer commercially viable; or (iv) in its sole discretion and at its convenience, without cause, rf IDEAS decides to terminate this EULA.

6.4 When the license comes to an end, you must destroy all copies of the underlying software and all of its component parts.

6.5 All of the legal rights, obligations and liabilities that you and rf IDEAS have benefited from, been subject to (or which have accrued over time whilst the license has been in force) or which are expressed to continue indefinitely, shall be unaffected by this cessation, and the provisions of Section 15 shall continue to apply to such rights, obligations and liabilities indefinitely.

## 7. UPGRADES.

If the Product contains an upgrade of the underlying software, you may use that upgraded Product only in accordance with this EULA. If the Product is an upgrade of a component of a package of software programs which you licensed as a single product, the Product may be used and transferred only as part of that single product package and may not be separated for use on more than one computer or device.

## 8. OEM COPYRIGHT.

All title and copyright in and to the Product (including, but not limited to, any images, photographs, animations video, audio, music, text, and “applets,” incorporated into the Product), the accompanying printed materials, and any

copies of the underlying software, are owned by rf IDEAS or its suppliers. The Product and underlying software are protected by copyright laws and international treaty provisions.

#### 9. OWNERSHIP.

rf IDEAS or its licensors retains ownership of all intellectual property rights in and to the Product and underlying software, including copies, improvements, enhancements, derivative works and modifications hereof, whether created by rf IDEAS or you. Your rights to use the Product and underlying software are limited to those expressly granted by this EULA. No other rights with respect to the Product or underlying software or any related intellectual property rights are granted or implied.

#### 10. LIMITED WARRANTY

THE PRODUCT IS PROVIDED TO YOU "AS IS" AND WITH ALL FAULTS AND DEFECTS WITHOUT WARRANTY OF ANY KIND. TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW, RF IDEAS, ON ITS OWN BEHALF AND ON BEHALF OF ITS AFFILIATES AND ITS AND THEIR RESPECTIVE LICENSORS AND SERVICE PROVIDERS, EXPRESSLY DISCLAIMS ALL WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT, AND WARRANTIES THAT MAY ARISE OUT OF COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OR TRADE PRACTICE. WITHOUT LIMITATION TO THE FOREGOING, RF IDEAS PROVIDES NO WARRANTY OR UNDERTAKING, AND MAKES NO REPRESENTATION OF ANY KIND THAT THE LICENSED PRODUCT AND UNDERLYING SOFTWARE WILL MEET YOUR REQUIREMENTS, ACHIEVE ANY INTENDED RESULTS, BE COMPATIBLE OR WORK WITH ANY OTHER SOFTWARE, APPLICATIONS, SYSTEMS OR SERVICES, OPERATE WITHOUT INTERRUPTION, MEET ANY PERFORMANCE OR RELIABILITY STANDARDS OR BE ERROR FREE OR THAT ANY ERRORS OR DEFECTS CAN OR WILL BE CORRECTED.

#### 11. INDEMNIFICATION

11.1 You agree to indemnify, defend and hold harmless rf IDEAS from and against any losses incurred by rf IDEAS in connection with any action by a third party arising out of or relating to your or your employees', agents', affiliates or representatives':

11.1.1 Breach of any representation, warranty, covenant or other term or condition of this EULA;

11.1.2 Handling, storage, installation, operation, service or use of any Product;

11.1.3 Design, manufacture, modification, combination or installation of Product or underlying software not directed by rf IDEAS, including any application you develop on the Product that infringes any copyright, trademark, trade secret, trade dress, patent, or other intellectual property right of any person or defames any person or violates their rights of publicity or privacy;

11.1.4 Negligent acts or omissions related to your use of the Product;

11.1.5 Violation of law; or

11.1.6 Other breach of this EULA or any third-party rights.

## 12. EXCLUSION OF REMEDIES

RF IDEAS AND ITS AFFILIATES SHALL NOT BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR OTHER INDIRECT DAMAGES OR LOSSES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFIT, INTERRUPTED OR LOSS OF BUSINESS, LOSS OF GOODWILL, LOSS OF USE, OR LOSS OF DATA OR INFORMATION OF ANY KIND, HOWEVER CAUSED, OR FAILURE OF ANY DELIVERABLE PROVIDED HEREUNDER TO PERFORM IN ACCORDANCE WITH THE APPLICABLE SPECIFICATION, WHETHER OR NOT THE POSSIBILITY OF SUCH DAMAGES WAS DISCLOSED TO RF IDEAS OR COULD HAVE BEEN REASONABLY FORESEEN BY RF IDEAS. IN STATES AND JURISDICTIONS IN WHICH LIMITATIONS OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARE PROHIBITED, SUCH LIMITATIONS SHALL APPLY TO THE FULLEST EXTENT PERMITTED.

## 13. LIMITATION OF LIABILITY

ALL LIABILITY OF RF IDEAS, ITS PARENT, SUBSIDIARIES, AFFILIATES, OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, SUPPLIERS, AND LICENSORS COLLECTIVELY, TO YOU, IF ANY, WHETHER BASED IN WARRANTY, CONTRACT, TORT (INCLUDING NEGLIGENCE), OR OTHERWISE, SHALL BE LIMITED TO DIRECT DAMAGES AND SHALL NOT EXCEED THE LESSER OF (I) AMOUNT WHICH HAS BEEN PAID BY YOU TO RF IDEAS OR ANY AUTHORIZED SOURCE PURSUANT TO THE RELEVANT PURCHASE ORDER OR (II) TWENTY THOUSAND DOLLARS (\$20,000). NO ACTION ARISING OUT OF THIS EULA, REGARDLESS OF THE FORM OF ACTION, MAY BE BROUGHT BY YOU OR ANY THIRD PARTY MORE THAN TWO (2) YEARS AFTER THE PRODUCT IS FIRST RECEIVED BY YOU. NOTHING IN THIS EULA LIMITS OR EXCLUDES ANY LIABILITY THAT CANNOT BE LIMITED OR EXCLUDED UNDER APPLICABLE LAW.

#### 14. BASIS OF THE BARGAIN.

The Limited Warranty, Exclusion of Remedies and Limitation of Liability set forth above are fundamental elements of the basis of the EULA between rf IDEAS and you. rf IDEAS would not be able to provide the Product on an economic basis without such limitations. Such Limited Warranty, Exclusion of Remedies, and Limitation of Liability inure to the benefit of the licensors and resellers of rf IDEAS.

#### 15. GENERAL LEGAL TERMS.

15.1 This EULA constitutes the whole legal agreement between you and rf IDEAS and governs your use of the Product (excluding any services which rf IDEAS may provide to you under a separate written agreement or any confidentiality agreements), and completely replaces any prior agreements between you and rf IDEAS in relation to the Product.

15.2 You agree that if rf IDEAS does not exercise or enforce any legal right or remedy contained in this EULA (or which rf IDEAS has the benefit of under any applicable law), this will not be taken to be a formal waiver of rf IDEAS' right and that those rights and remedies will still be available to rf IDEAS.

15.3 If any court of law, having the jurisdiction to decide on this matter, rules that any provision of the EULA is invalid, then that provision will be removed from the EULA without affecting the rest of the EULA. The remaining provisions of the EULA will continue to be valid and enforceable.

15.4 You acknowledge and agree that each member of the group of companies of which rf IDEAS is the parent shall be third party beneficiaries to this EULA and that such other companies shall be entitled to enforce, and rely upon, any provision of this EULA that confers a benefit on (or rights in favor of) them. Other than this, no other person or company shall be a third-party beneficiary to the EULA.

15.5 This EULA, and your relationship with rf IDEAS under this EULA, shall be governed by the laws of the State of Delaware without regard to its conflict of laws provisions. You and rf IDEAS agree to submit to the exclusive jurisdiction of the courts located within the County of Cook, Illinois to resolve any legal matter arising from the EULA. Notwithstanding the foregoing, you agree that rf IDEAS shall still be

allowed to injunctive relief (or other forms of equitable relief) in any jurisdiction.

Copyright by rf IDEAS 1997-2023. All rights reserved.

Reproduction or distribution of this document in whole or in part in any form is prohibited without express written permission from rf IDEAS.

All rf IDEAS products are trademarks of rf IDEAS. All other product names or names are trademarks or registered trademarks of their respective holders.

# Index

## A

ASCII, 32, 86

## B

Beeper, 23

## C

Card Data Hold Time, 20

Configuration, 16

Continuous Read, 20

## D

Decimal, 27, 32

Delimiter Keyboard, 29, 30

## E

Ethernet, 8, 18

## F

FAC, 27, 29, 67

FIPS, 37

## G

GetID, 24, 32, 33

GetQueuedID, 25

## H

Hashing, 40

## I

Icon Toolbar, 12

ID Digits, 27

## K

Key Press Time, 21

Key Release Time, 21

## L

LED, 20, 22, 23, 71

Lock-Out Time, 20

Logical Unit ID, 13, 20, 23, 46

## M

MIFARE, 82, 86

Minimum system requirements, 85

## O

OEM, 54, 82

Output Test Area, 18

## P

Parity, 33

## R

RS-232, 18, 71, 82, 85

## S

SDK, 12, 21, 22

Serial, 18, 28, 32

Special Keys, 30

## T

Termination Keystroke, 29

## U

USB, 8, 12, 17, 85

## W

Wiegand, 28



## Appendix

COMPONENTS	MINIMUM SYSTEM REQUIREMENTS
Hardware	Intel® Pentium™ E5400 processor
Memory	2 GB RAM
Hard Disk Space	400 MB
I/O	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](mailto: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.

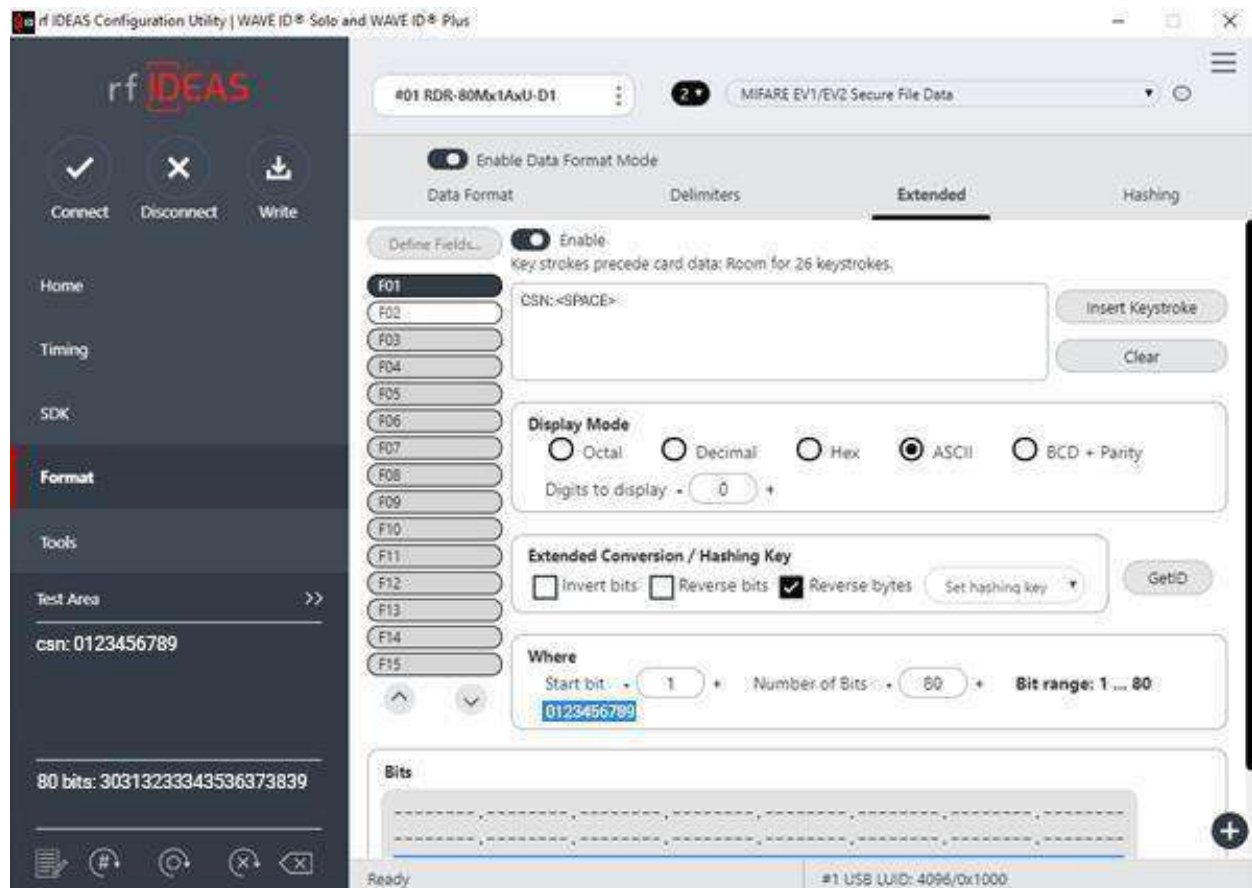


Image 86: ASCII Extended Mode

## **rf IDEAS**

© 2023 rf IDEAS. All rights reserved.

Specifications subject to change without notice.

Windows is a trademark of Microsoft.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by rf IDEAS is under license.

All other trademarks, service marks, and product or service names are property of their respective owners.

Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. rf IDEAS assumes no responsibility regarding the performance or use of these products.

All understandings, agreements, or warranties, if any, take place directly between the vendors and the prospective users.

Please feel free to call, e-mail, or visit our web site for a full list of applications, products, configuration options, supported cards, and form factor specifications. Our web site includes application videos, support materials, case studies, and detailed information about our product line.

Every effort has been made to ensure that the information in this manual is accurate. rf IDEAS is not responsible for printing or clerical errors.