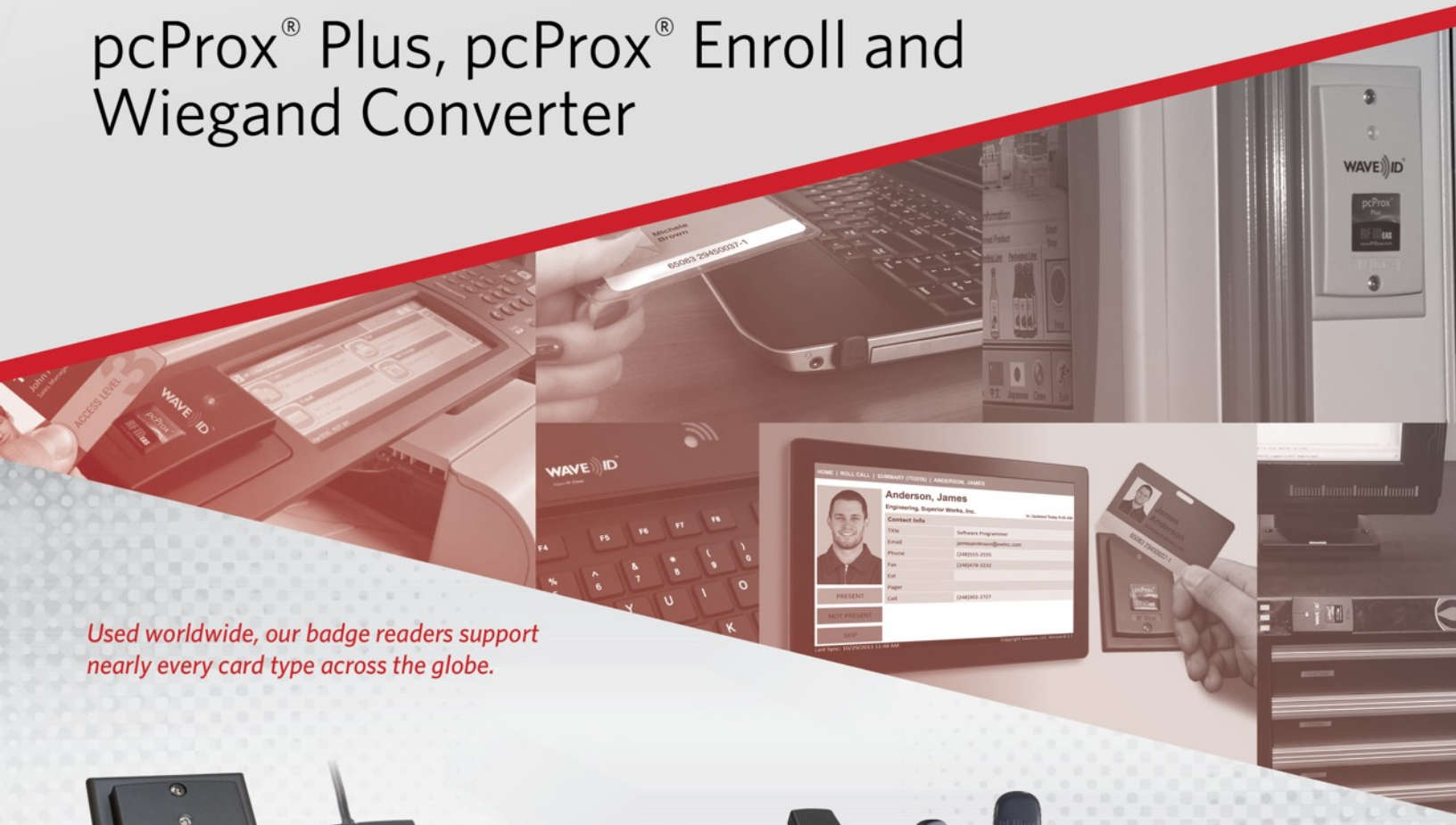
RF IDEAS

Configuration Utility User Manual

pcProx® Plus, pcProx® Enroll and Wiegand Converter



Used worldwide, our badge readers support nearly every card type across the globe.

99009010 Rev B11

Thank You!

Congratulations on the purchase of your pcProx® Enroll, pcProx® Plus, or Wiegand device(s).

RF IDeas hopes you enjoy using the readers as much as we enjoyed creating and developing them. Configuration is easy, so you will be able to quickly take advantage of a more secure environment in your business, school, or organization.

Please call our Sales department if you have any questions or are interested in our OEM and Independent Developer's programs.

We look forward to your comments and suggestions for our product line! Please go to www.RFIDeas.com and follow the Support ⇨ Learning Center link for more details about our product line.

We are always discovering new applications for our product line(s). There are several software developer's licensing our technology so the solution you are looking for may already be developed.

Thank you,

The RF IDeas Staff

Need Assistance?

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Support: TechSupport@RFIDeas.com

Glossary of Terms

Terms	Definitions
ASCII	The American Standard Code for Information Interchange codes represent text in computers, communications equipment, and other devices 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.
pcProx	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 devices.
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.

Contents

Chapter 1.The Basics

1.1 Wireless Identification Overview

pcProx® Activated Identification

Employers are more security conscious than ever. More buildings, machines, systems, and applications require identification information to gain access. RF IDeas devices allow the building access cards to be used as a digital identifier throughout the workplace.

Various pcProx applications include:

- Card enrollment
- Application log-on
- Form filler to existing software applications
- PC/LAN log On
- Cafeteria purchases/vending
- Machine access
- PLC and embedded controllers
- Time/attendance
- **Bluetooth®** Low Energy Technology-enabled applications

Our pcProx Plus devices are easily configured to increase security and reliability. Companies using proximity and/or contactless technology for building access immediately benefit, as their employee identification cards can also be used with the proximity/contactless device for additional authentication applications. Thus, the majority of deployment and enrollment costs are quickly recovered.

1.2 ID Card Reader System

The diagram on the following page is a high-level overview of how the reader works. The reader sends RF signals to the card and the card sends signals back to send data. The card data is output by the reader in keystrokes or ASCII characters. This card data can be configured to include delimiters to separate the data. This reader can be used as a standalone system or seamlessly integrated with other software applications using the optional Software Developer's Kit (SDK).

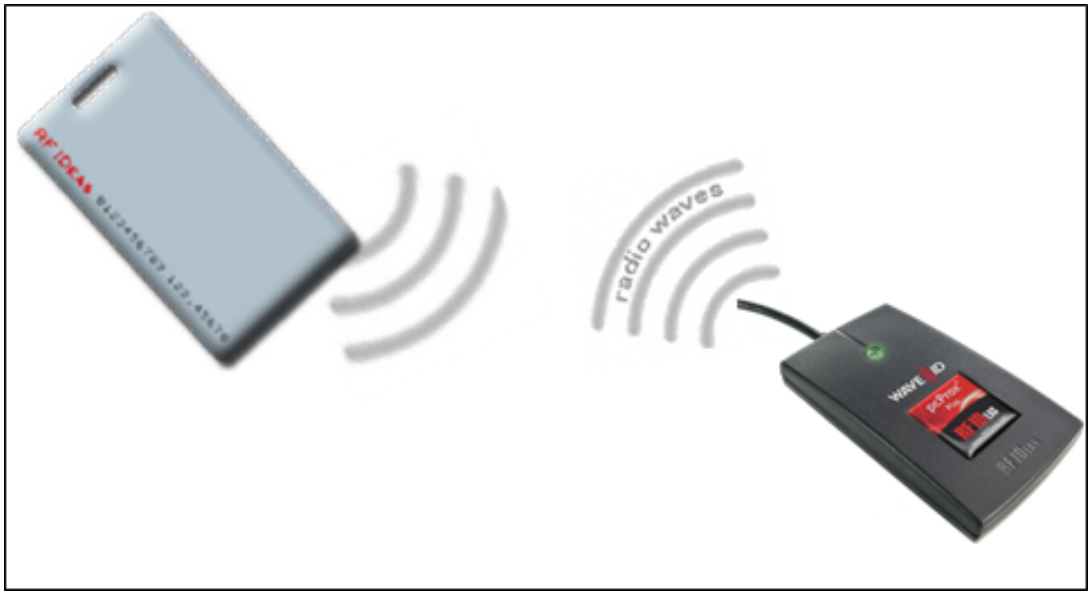

Image 1: Card Reader Overview

1.3 Output Formats

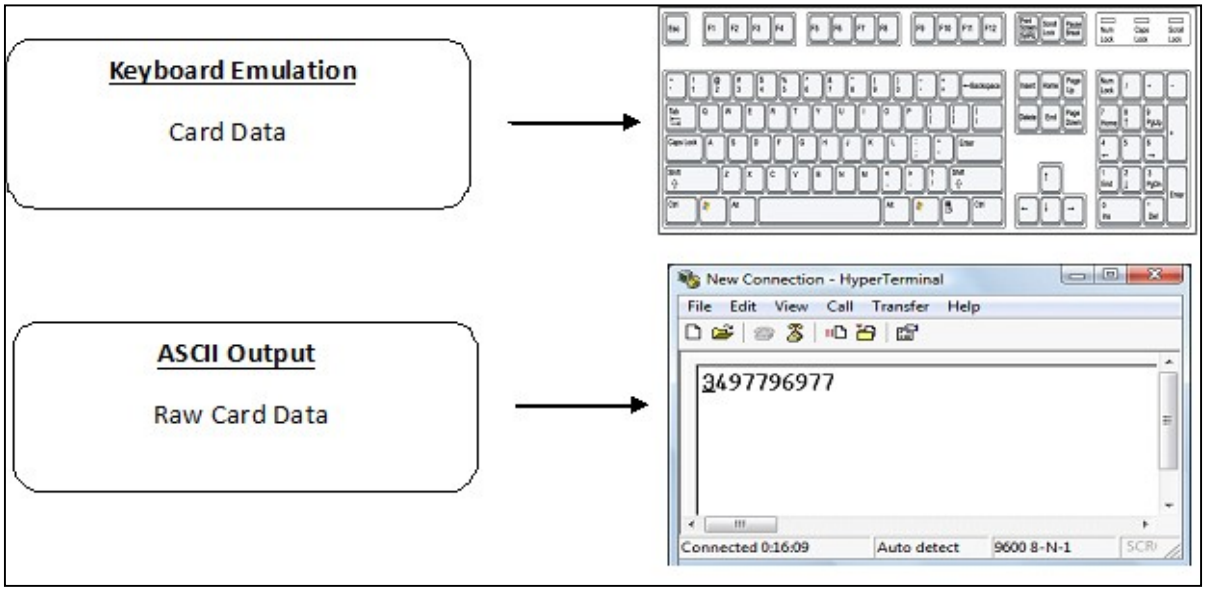

Image 2: Output Formats

1.4 Credential Form Factors

Credentials are inactive electronic devices that rely on readers to supply the required power for start-up and communication. The credential itself, consists of antennas that produce proximity or contactless frequencies. Proximity and contactless smart card technology cards allow users to effortlessly manage multiple applications through a single credential.

Data: The data on access cards are a string of binary numbers set with a fixed configuration and length.

Frequencies: RF IDeas' access control readers and credentials utilize the low-frequency 125 kHz (proximity) band and/or the high-frequency 13.56 MHz (contactless) band.

Credential Form Factors: With over 300 million physical access credentials in use worldwide, there are a variety of low and high frequency form factors, customers can choose from to meet their particular needs.

Image 3 illustrates some of the various form factors available:

Image 3: Available Form Factors

1.5 Manufacturer/Vendor Card Compatibility

Please go to www.RFIDeas.com for specific device part numbers associated to card types.

1.6 Reader Configuration Purposes

The method of encoding data on a card and transmitting data to the reader differs accordingly in each technology involved. The reader is highly configurable and its configurations may need to be set to achieve a desired user output such as FAC or ID or obtaining a desired data format (i.e. decimal, lowercase, upper- case, hexadecimal).

1.7 Difference Between pcProx Plus and Non-Plus Reader

The pcProx 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 pcProx Plus reader, our standard pcProx Enroll proximity and contactless readers function on a single frequency band, and single card type, which is either 125 kHz proximity or 13.56 MHz contactless.

Chapter 2.Hardware

2.1 What's in Your Part Number?

All RF IDeas reader part numbers follow a distinct system of categorization to allow for an ease of differentiation between products.

Below is the basic part number scheme:

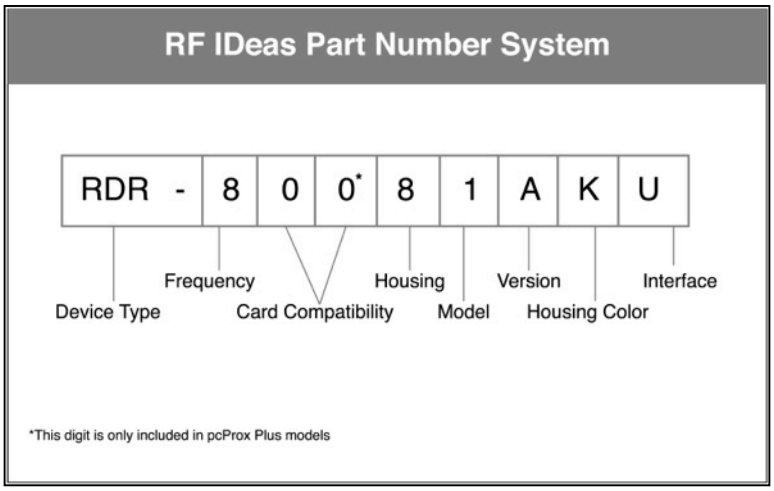

Image 4: Reader Part Number Scheme

Device Type: The device type distinguishes between Standard Reader (RDR), Wiegand Converter (OEM), Converter (C), Kit (KT), or Mag Stripe Reader (MS3).

Frequency: RF IDeas' badge readers are available in low-frequency 125 kHz proximity (6), high-frequency 13.56 MHz contactless (7), or dual with both 125 kHz and 13.56 MHz technologies (8).

Card Compatibility: The card type allows for the selection of over 45 different card types for reader compatibility. (Please visit www.RFIDeas.com, choose a product and locate the Part Numbers (SKUs) tab for specific device part numbers associated to card types.)

Housing: Various form factor housing options exist for RF IDeas' readers. The housings include; Small Desktop (8), Large Desktop (7), Vertical Nano (1), Horizontal Nano (2), Surface Mount (W), USB Dongle (D), PCMCIA (P), Non-Housed (N), ExpressCard (E), or custom (call Sales for custom housing). (For more on form factors, please visit www.rfideas.com/products/readers, click your appropriate reader and select the Data Sheets tab.) ***Please NOTE that an "X" in the Housing field can represent any of the aforementioned housing definitions.***

Model: The model selection corresponds to the type of reader, whether it is a Standard "Keystroker" (1), SDK (2), Writer (0), or Playback (5). (For more on model types, visit www.rfideas.com/products/readers)

Version: The version refers to the selection of either our Standard (A) or Custom builds. (For more on Custom builds, call our Sales department at (866) 439 - 4884).

Housing Color: The color category simply allows for the selection of either our Black (K), Pearl (P), White (W), or Gray (G) housings. (Colors are not available in all housings.) ***Please NOTE that an "X" in the Housing Color field can represent any of the aforementioned housing color definitions.***

Interface: This option specifies the type of connection for the reader. Connectors include: Ethernet ASCII (E), Ethernet ASCII PoE (E-P), E/IP PoE (B-P), ExpressCard (U), PCMCIA (P), Serial 5V Ext Power RS232 (8), Serial 5V Pin9 RS232 (5), Serial 5V PS2 RS232 (2), Serial 5V USB Power Tap RS232 (9), Serial 9V Pin9 RS232 (6), USB (U), USB CDC Virtual COM (0).

2.2 Interface (Connectors)

Connectors

Connectors include:

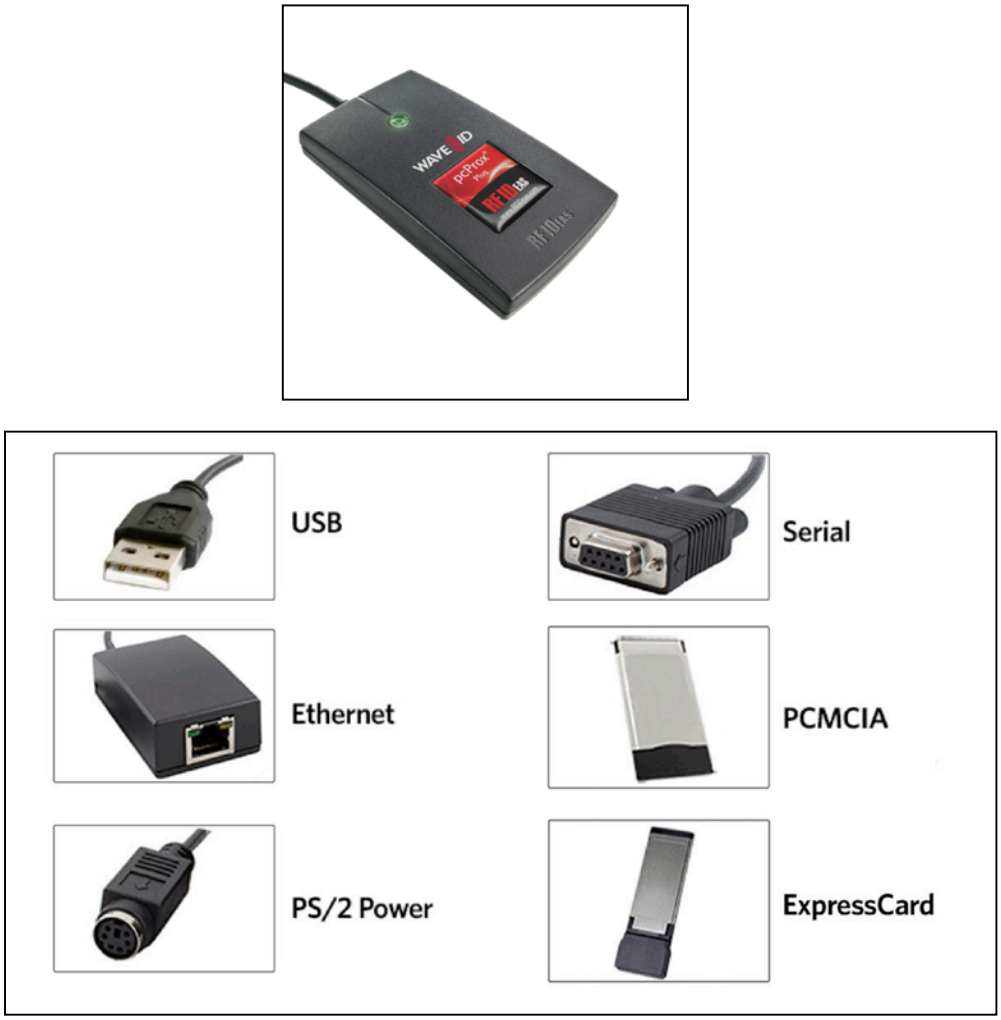

Image 5: Connector Types

Output

Output includes:

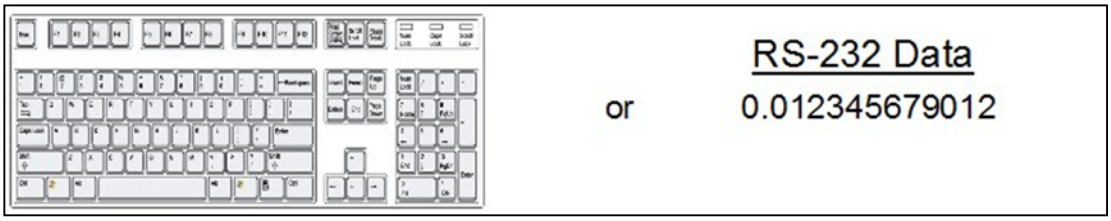

Image 6: Output Types

2.3 USB Readers and Wiegand Converters

The pcProx USB keystroke device operates in two modes:

1. USB keyboard. It reads the card data and sends it as keystrokes as if the user typed the ID data on a keyboard.

2. Under the application programmer interface (API) defined in the pcProx SDK. When it reads card data, the active application receives the entire card data.

The pcProx ExpressCard operates as a USB reader.

2.4 RS-232 Readers and Converters

The RS-232, Ethernet, or virtual COM port device operates in two modes:

1. ASCII output device. In this mode the user card data is read and sent as a decimal or hexadecimal number in ASCII characters.

2. API defined in the pcProx SDK. The device attaches to a computer serial port. When it reads card data, the active application receives the entire card data.

The pcProx PCMCIA operates as an RS-232 reader.

2.5 Minimum System Requirements

Components	Minimum System Requirements
Hardware	Pentium Class PC
Memory	64 MB RAM
Disk	650 MB Hard Disk Space
I/O	1 available RS-232 or USB Port
Operating System	Any operating system that supports a USB keyboard including Microsoft Windows 2000®, XP®, Vista®, 7®, 8®, 8.1®, 8.2®, Server 2003®, and Server 2008®.

The software does not perform any data validation checking. The data must be known before it is read to verify its validity.

2.6 Reader Setup Basics

To setup the reader:

1. Plug the connector into the workstation's (or available on any peripheral) open RS-232, USB, or Ethernet plug.

2. Place the device next to the monitor, beside the workstation, or where appropriate.

3. The workstation should detect new hardware for USB connections. Verify the workstation recognizes this connection using Device Manager.

4. Verify the correct COM port for RS-232 DB9 connections using Device Manager.

When the software is installed, it should recognize these connections in order to configure the appropriate device. Once the device is configured and written to its flash memory, these settings will not have to be configured again.

2.7 LED

The desktop, USB dongle, surface mount, and non-housed model readers can be equipped with a LED on the front cover.

(See LED and Beeper functions in the Software section)

2.8 Beeper

If equipped, the reader can be configured to produce a beep when a credential is detected by the reader. The Beeper is configurable through the utility software.

(See LED and Beeper functions in the Software section 3.8)

Chapter 3.Software

3.1 pcProx Configuration Utility

The pcProx Configuration Utility provides users with the ability to configure their pcProx Enroll, pcProx Plus, or Wiegand devices to meet their needs. Through the configuration process, desired credential data output and access privileges for cardholders can be established.

The Utility allows pcProx plus to be configured for 2 or 4 (depending on model) card types. RF IDeas pcProx Plus readers with extended functionality can operate in one of two modes “Standard” ID processing or the “Extended” ID processing for output generation. The default mode of processing is Standard mode.

The RF IDeas pcProx Plus readers with extended enables additional flexibility manipulate card data and increase security with encryption.These highly-configurable readers help organizations leverage their existing card technology, streamline the enrollment process, and also provides options for increasing security.

3.2 Utility Overview

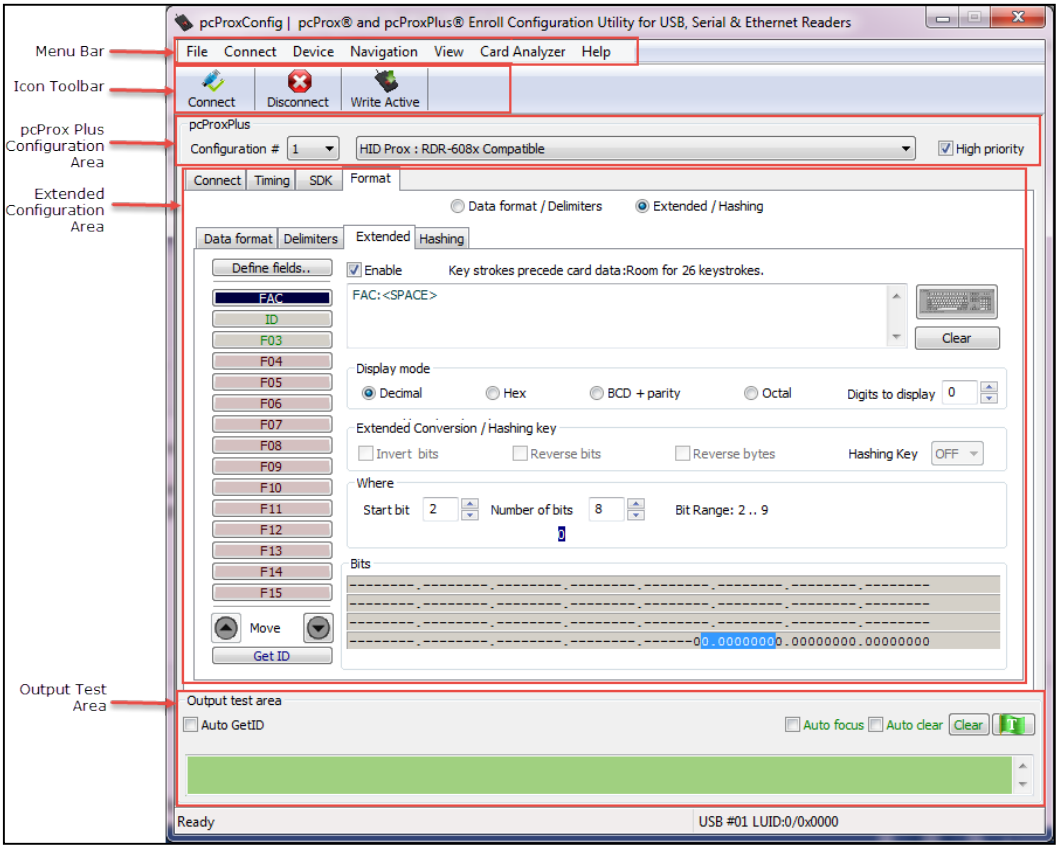

Image 7: Utility Overview

3.3 Menu Toolbar

Image 8: Menu Toolbar

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

File Menu

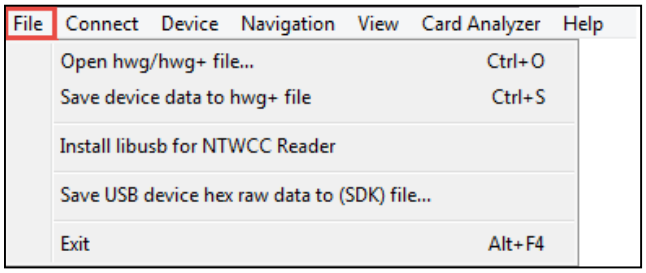

Image 9: File Overview

The File menu lists the options for opening .hwg and saving .hwg files.

Open hwg/hwg+ file…: Opens either an .hwg or .hwg+ file. An .hwg or .hwg+ file contains all the configuration settings for the reader. The utility comes with sample .hwg/.hwg+ files.

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

What is an .hwg/.hwg+ file?
There are two kinds of configuration files - an .hwg file, and an .hwg+ file. An .hwg file can only be created with previous pcProx application utility version. An .hwg+ file can only be saved using this new utility. An .hwg+ can configure a pcProx Plus reader as well as a single configuration reader.

Exit: Exits out of the entire utility.

Connect Menu

The Connect menu provides options for device to utility connections.

Auto Connect to USB on Start-up: Set as utility default connection. Through this connection the utility searches for a USB connection on startup.

Auto Connect to Serial on Start-up: With this selection, the utility searches for any available serial connections on startup.

Auto Connect to Ethernet on Start-up: Utility option to search for Ethernet connections on startup.

Auto Connect: This selection has the utility search for a device connection through all available port connections.

For further information on the connect option, see *3.4 Icon Toolbar*, under the *Connect* section.

Connect to USB: Connects to current specified reader through USB.

Connect to Serial: Connects to current specified reader through serial.

Connect to Ethernet TCP/IP: Connects to current specified reader through Ethernet TCP/IP.

Disconnect: Disconnects all connected devices from every available interface connection from the configuration utility.

For further information on the disconnect option, see *3.4 Icon Toolbar* under the *Disconnect* section.

Device Menu

The Device menu lists the options for resetting, writing to, and reading the device's configuration. The device menu options are altered depending on the type of device that is connected. A single configuration reader device has different device menu options than a two or four configuration reader.

Single Configuration Readers

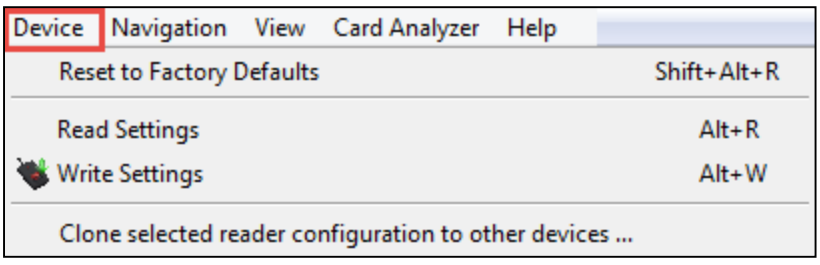

Image 10: Device Menu for Single Configuration Readers

1. *Reset to Factory Defaults*: Resets all configuration parameters to factory defaults.
2. *Read Settings*: Displays the current connected device configuration.
3. *Write Settings*: Writes the current configuration settings to the connected device.

For more information on the Write Settings option, see *3.4 Icon Toolbar* under the *Write Settings/Write Active* section.
For more information on the Clone selected reader configuration to other devices option, refer to the next page.

pcProx Plus - 2 and 4 Configuration Reader

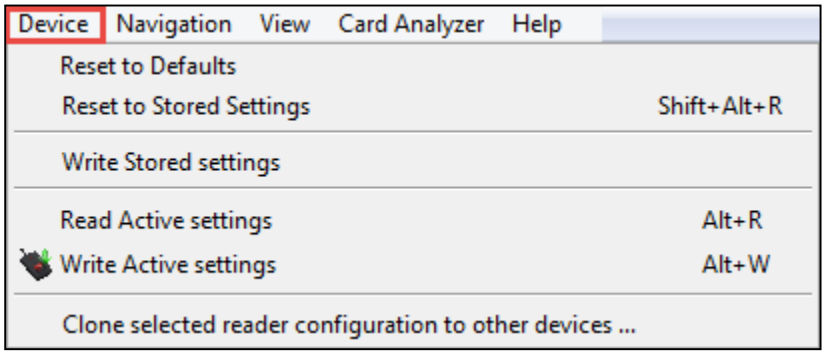

Image 11: Device Menu for pcProx Plus -2 Configuration Readers

- *Reset to Defaults*: Resets all configuration parameters to defaults.
- *Reset to Stored Settings*: This selection allows users to reset the device to their own personally defined stored settings.
- *Write Stored Settings*: Writes the current configuration settings to stored settings.

Stored settings are defined as configuration settings created by a user and set/written to the device through the utility as a stored settings.

- *Read Active*: Reads the current configuration. Active settings are what allow the device to function.
- *Write Active*: Writes the current configuration to active settings.

For more information on the Write Active option, see *3.4 Icon Toolbar* under the Write *Settings/Write Active* section.

Device Menu options are altered when a two configuration device (pcProx Plus) is connected to the utility.

Clone Reader Configuration

The cloning feature clones the current device configuration settings to other devices.

Functions	Descriptions
Only update readers within the LUID range	Check to filter which devices will be cloned. Uncheck to clone all devices.
Minimum LUID	Minimum LUID value to filter a range of devices to be cloned. Default is 0x0000.
Maximum LUID	Maximum LUID value to filter which devices will be cloned. Default is 0xFFFF.
Write LUID	Check to write a new LUID to the device 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 device. 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.

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

To initiate the cloning process:

1. Connect reader to PC and click the "Connect" button.
2. Under the "Device" menu, click "Clone selected reader configuration to other devices…" option.

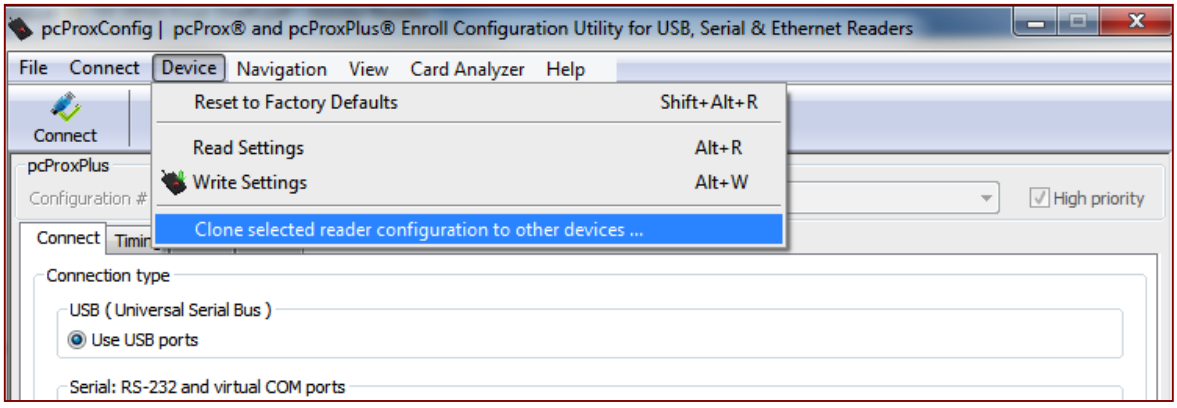

Image 12: Starting the Cloning Process

3. The "Clone Reader Configuration" dialogue box will appear as shown below:

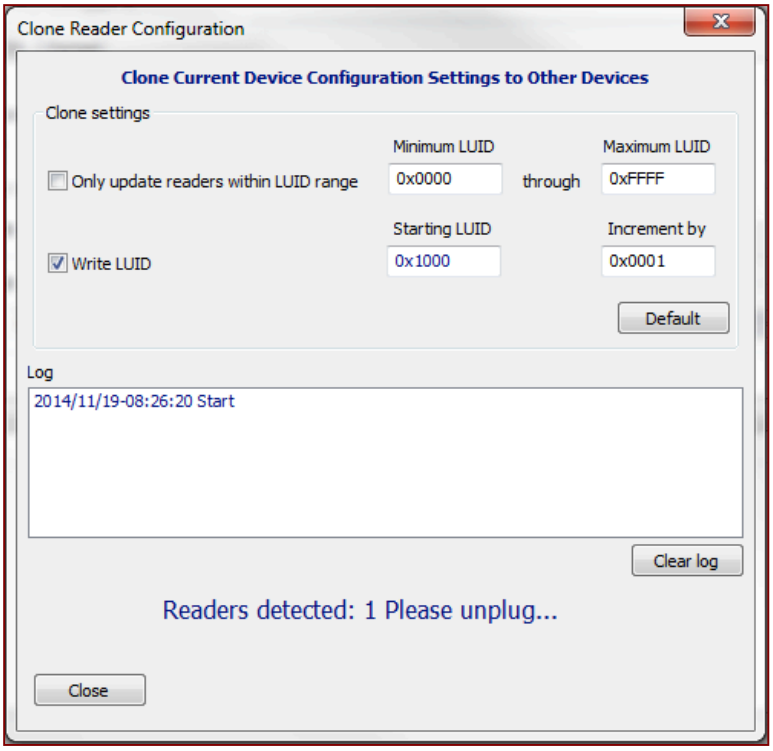

Image 13: Clone Configuration Reader Dialogue Box

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 reader.

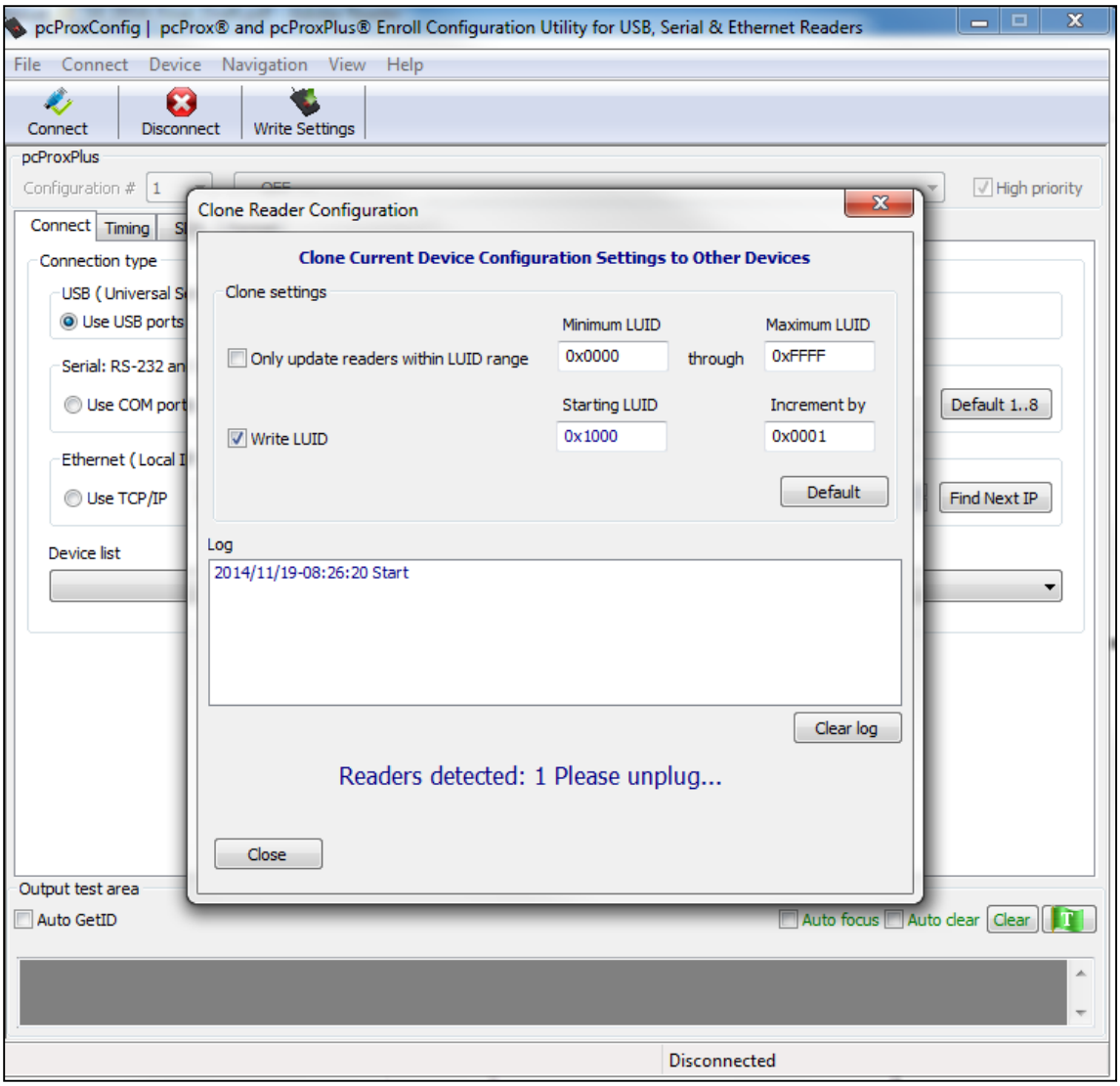

Image 14: Reader Disconnected

You have approximately 18 seconds after disconnecting the reader to connect the readers to be cloned.

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

5. Connect the reader(s) that will be undergoing the cloning process.

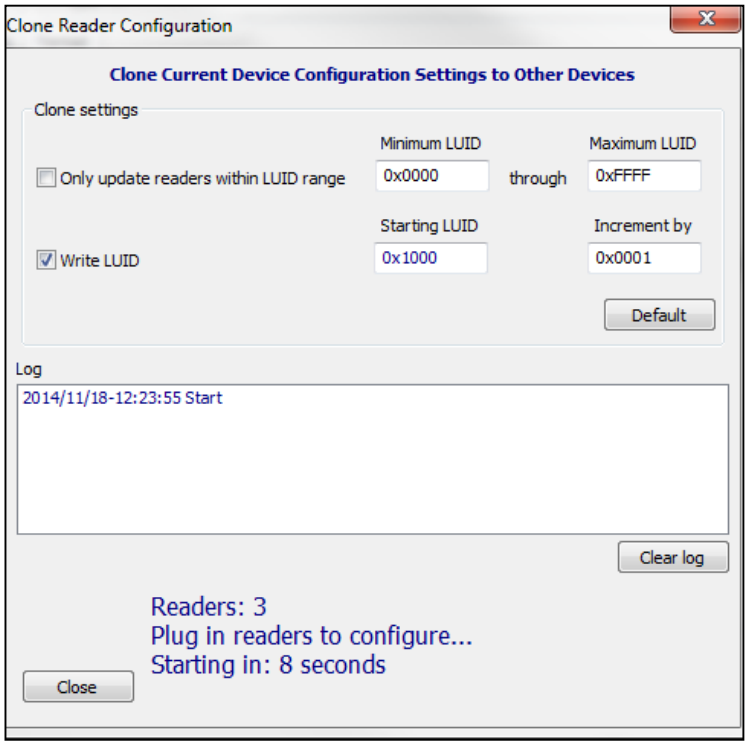

Image 15: Connecting Other Readers

More than one reader can be configured. Configuration will be done one reader at a time.

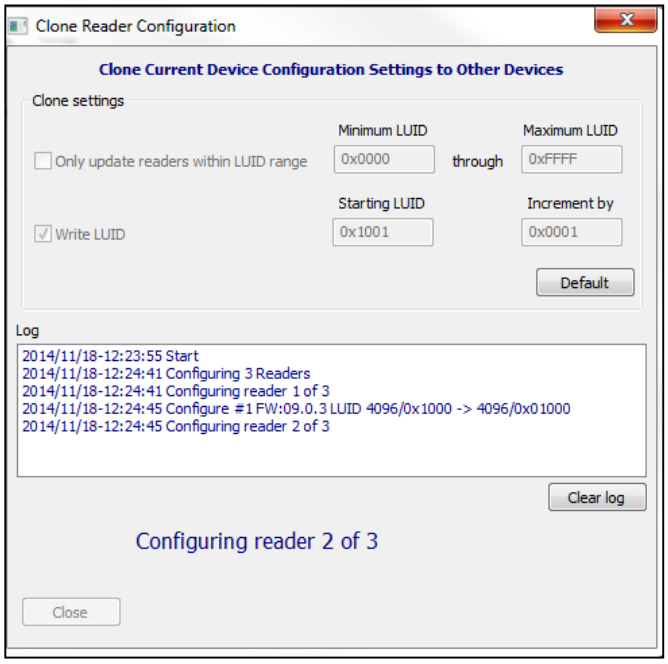

Image 16: Connecting Second Reader

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

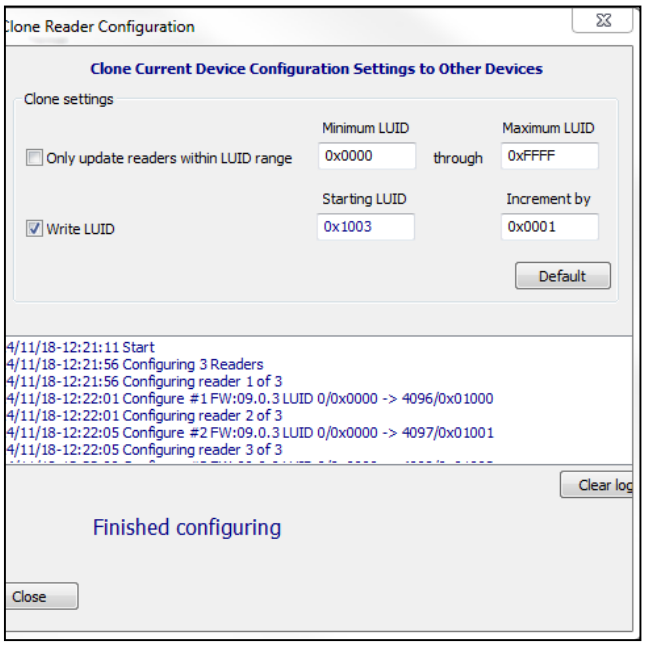

Image 17: Configuration Finished

6. Click the “Close” button to close the “Clone Reader Configuration” dialogue box.

7. Click the “Connect” button in the “Configuration Utility” to check the new cloned configuration of the connected readers.

Navigation Menu

The Navigation menu gives users the ability to navigate in and out of the utility tabs through the use of hot keys. This menu lists the hot key commands for the tabs as seen on the Standard Configuration Area (an explanation of each tab can be found in the Standard Configuration Area section of this manual).

For example, pressing the F5 key on the keyboard will open the Data Format sub-tab:

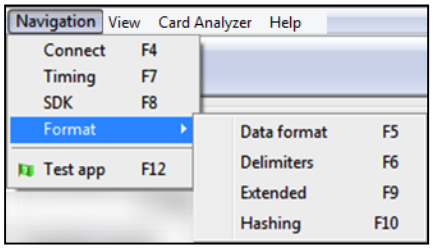

Image 17: Navigation Menu Hot Keys

A Test App hot key command is also available in this list. This command opens any keystroking capturing program (i.e. Notepad, WordPad etc.) in a new window. The Test App default opening program is set as Notepad.

View Menu

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

Show Tooltip Balloon: Menu option for displaying or not displaying the tooltip pop-up balloon.

> Tooltip balloons appear automatically, or pop up, when the user hovers over a tool or other UI element. The tooltip appears near the pointer and disappears when the user moves the pointer away from the tool, or simply waits for a few seconds. The tooltip displays descriptive information of the specific element or tool that the mouse is currently hovering over.

Show Text under Toolbar Icons: Provides option to display or remove text under icons in the Icon Toolbar (for more information on the Icon Toolbar, see *3.4 Icon Toolbar* section of this manual).

Show Pop-Up Warning Dialogues: Gives option for user to display or remove warning pop-up dialogue boxes.

For example, if the Show Pop-Up Warning Dialogues option is selected, then a warning dialogue box, as seen below, will display on your screen. The below warning dialogue box has been displayed to alert the user that the utility has not detected a connected device.

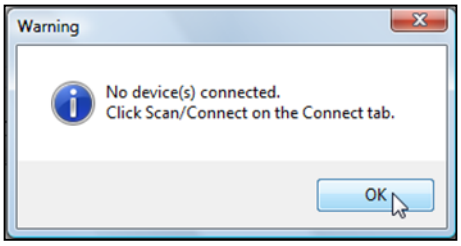

Image 19: Pop-Up Warning Dialogue Example

Show Confirm Dialogue: Menu option for displaying yes/no confirmation dialogues before certain utility operations are completed.

For example, if the Show Confirm Dialogue option is selected, a confirmation dialogue window will appear when a user clicks to reset their device to factory defaults.

If the Show Confirm Dialogue option is not selected, all utility operations will continue upon user selection without the need for confirmation.

Beep on Warnings: Provides an audible system beep when warnings are detected.

With the Beep on Warnings option, the audible beeps will sound even if the Show Pop-Up Warning Dialogues option is not selected.

Resize Window: The utility window is designed for users to optionally resize, by making the window larger or smaller (the smallest resize choice will eliminate the view of the Output Test Area). If a user resizes the utility window, clicking this Resize Window option will resize the window to its original size.

Card Analyzer Menu

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

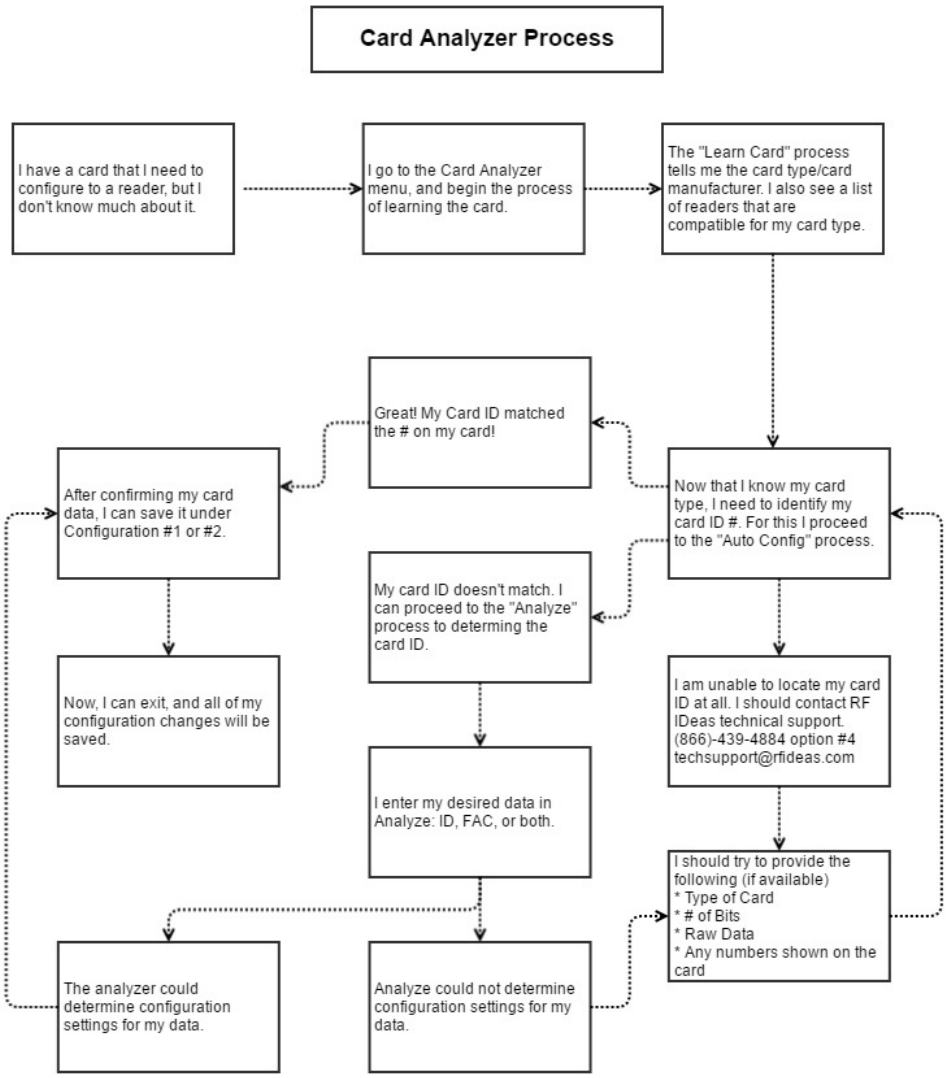

Image 20: Card Analyzer Process

It is possible to configure a card from the main utility, but leading/trailing parity and number of bits for the ID are required.

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

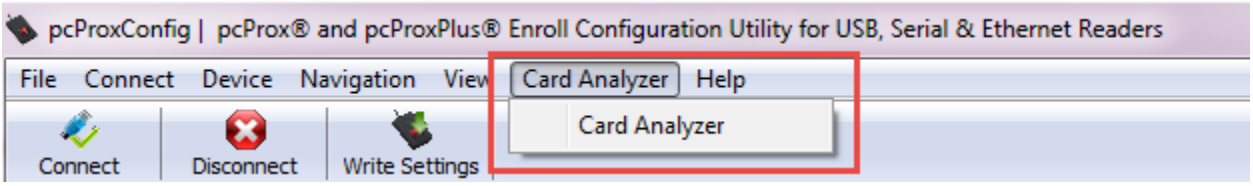

Image 21: Card Analyzer Menu

The Card Analyzer utility supports pcProx® Plus RDR-80581AKU or RDR-80081AKU readers only.

Detecting the Reader

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

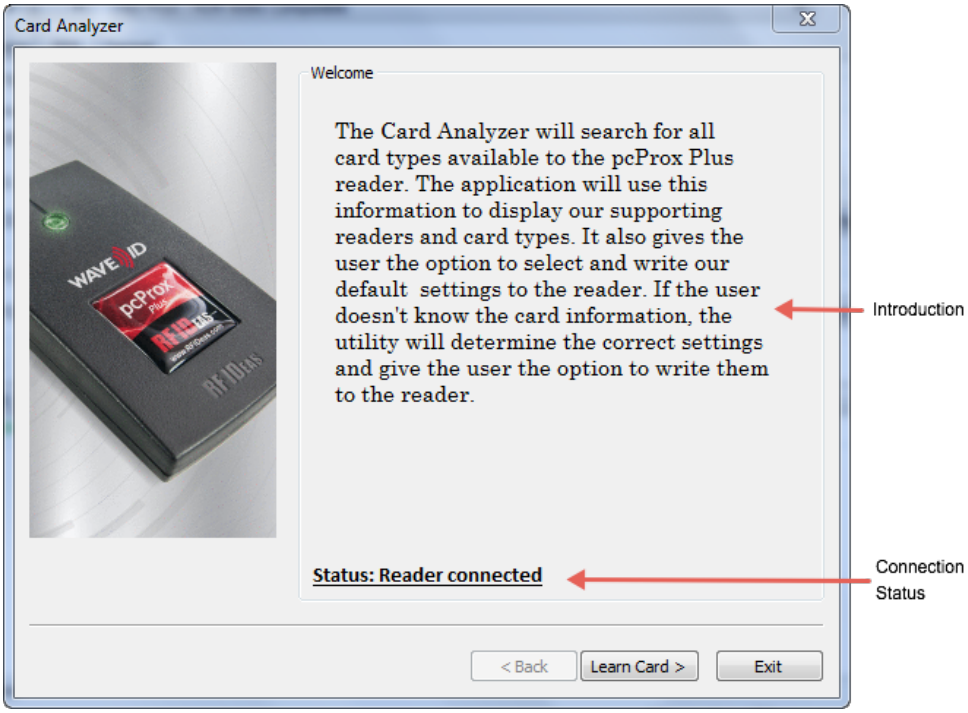

Image 22: Detecting the Reader

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 pcProx® Plus Readers (800x1AxU, 800x2AxU, 805x1AxU, 805x2AxU). • "Reader connected".
Back	By default, this button is disabled in the welcome screen.
Learn Card	Press to transition to the Learn Card screen. This button becomes active only when connected to the correct reader.
Exit	Close the Card Analyzer and return to pcProxConfig 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 of the utility.

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

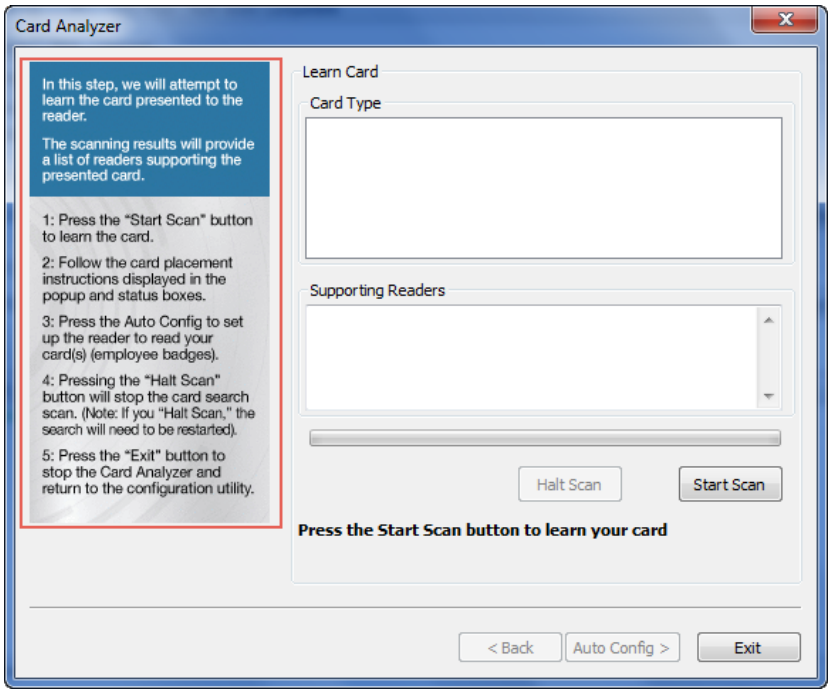

Image 23: Learn Card Screen

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.
Back	By default, this button is disabled on this screen.
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	This button has the following functions – • If the user has not written configurations, pressing the "Exit" button will return user to pcProx utility without making any changes. • If the user has written configurations, pressing the "Exit" button will return user to pcProx utility with new card settings.

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.

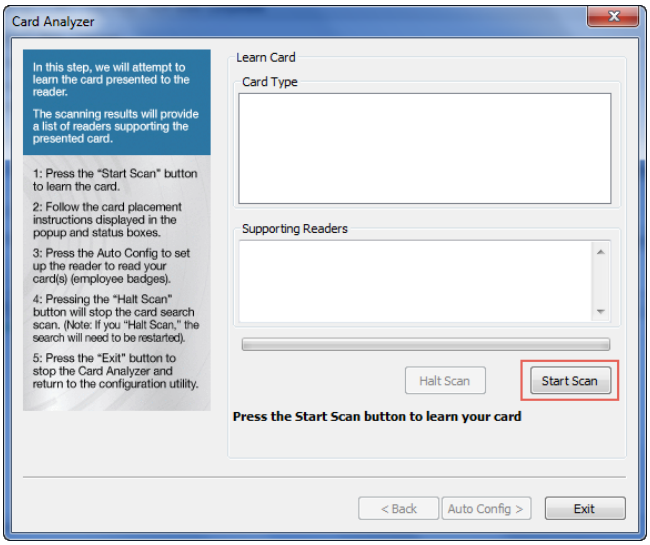

Image 24: Starting the Scan

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.

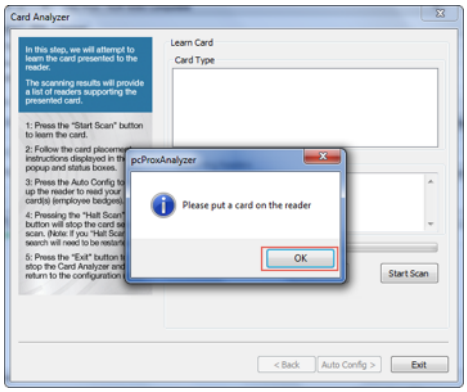

Image 25: Placing the Card

3. The analyzer will begin scanning the card for potential card type matches. Matches are displayed in the “Card Type” field.

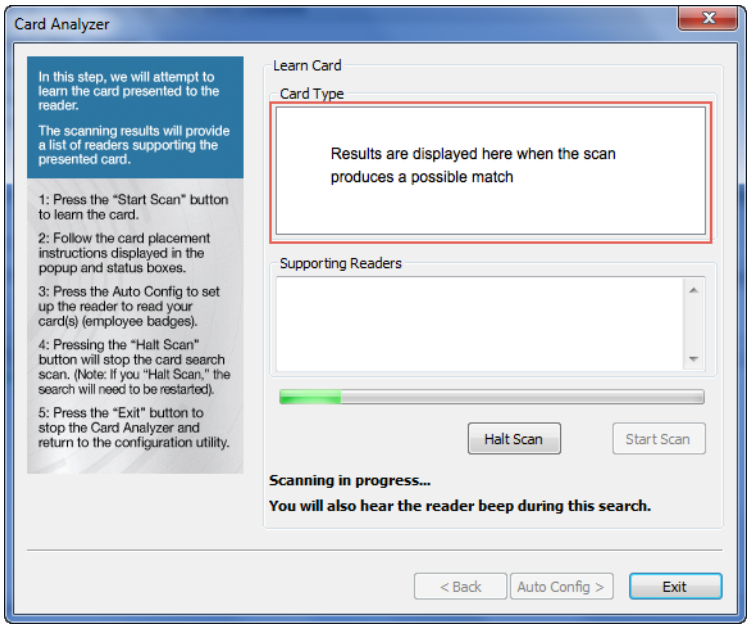

Image 26: Scanning Process

“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:

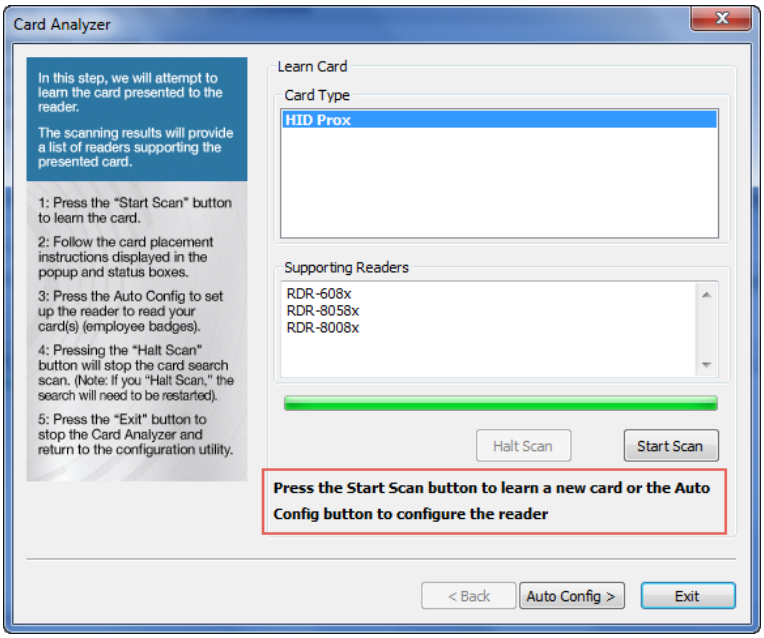

Image 27: Scanning Complete

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".

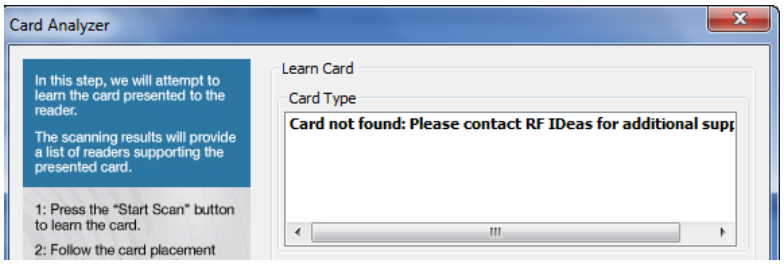

Image 28: Card Not Found Scenario

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.

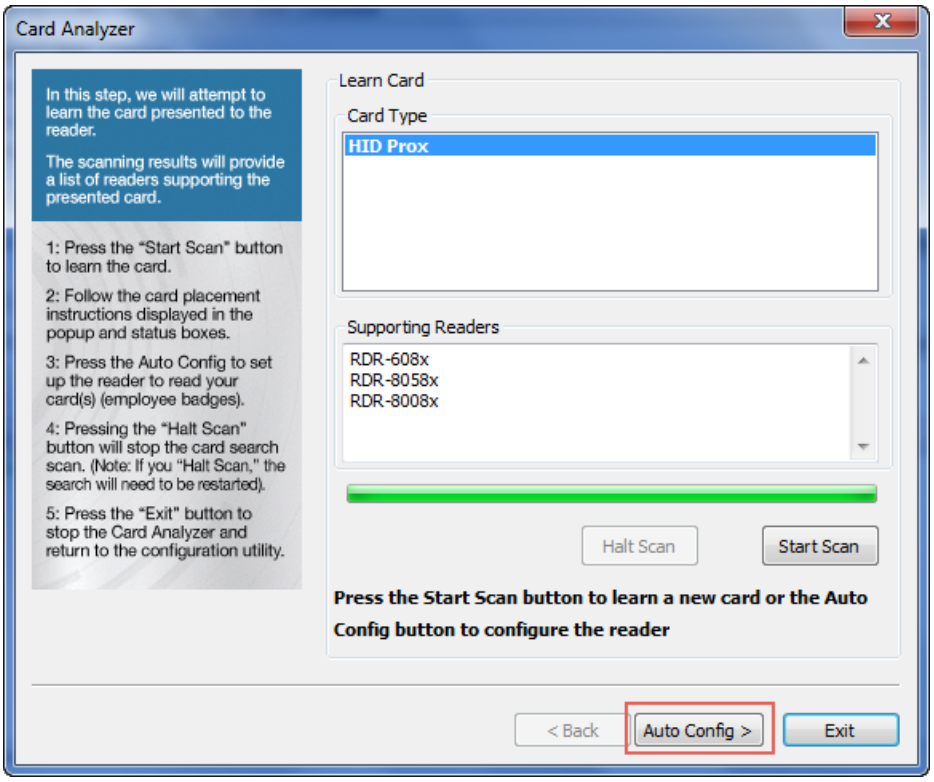

Image 29: Starting the Auto Configuration

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.

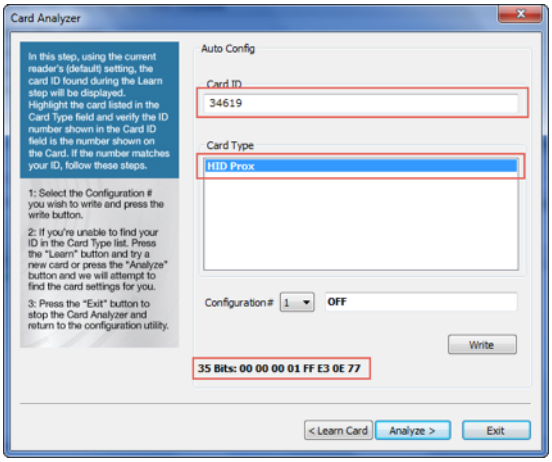

Image 30: Auto Config Screen

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

Field/Button	Description
Card ID	Contains the Card ID based on the defaults 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 drop-down and clicking the “Write” button.
Write	Writes the configuration to the reader for the selected card type.
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 configurations, pressing the “Exit” button will return user to pcProx utility without making any changes. • If the user has written configurations, pressing the “Exit” button will return user to pcProx utility with new card settings.

To auto configure:

1. Select each card type and match the Card ID listed with the ID on the card.
2. Select the Configuration # and click the “Write” button.

   The “pop-up” window appears.

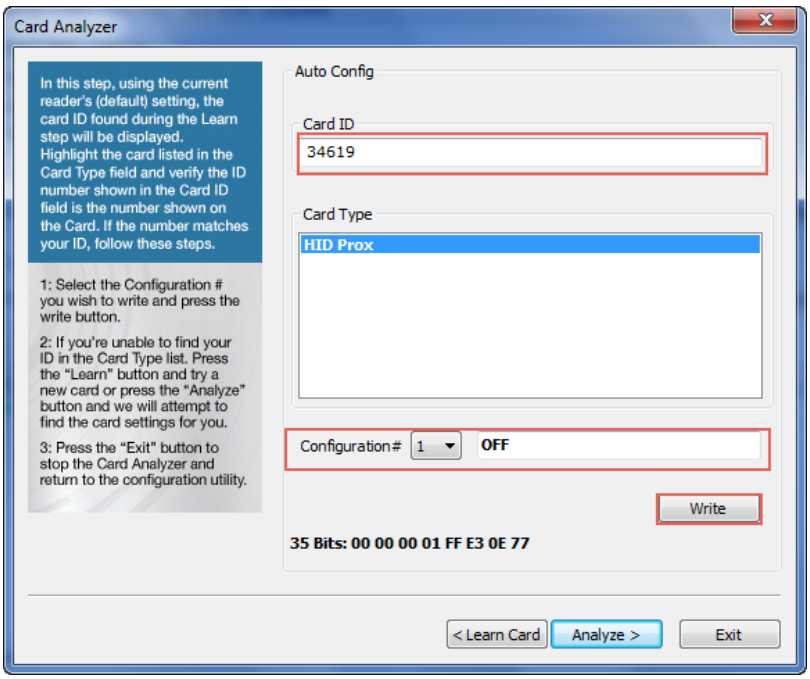

Image 31: Writing Configuration Settings to the Reader

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.

By default, "Configuration #" is set to off prior to writing.

3. After the card is removed from the reader, click the "OK" button to continue writing the configuration to the reader.

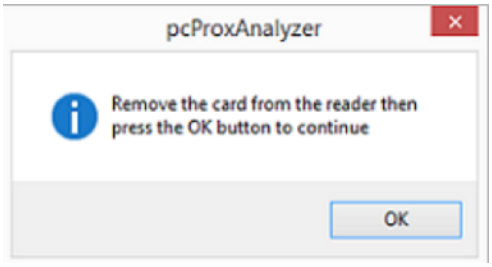

Image 32: Pop-up Window for Removing the Card

4. The Card Analyzer will then automatically begin writing the chosen configuration to the reader.

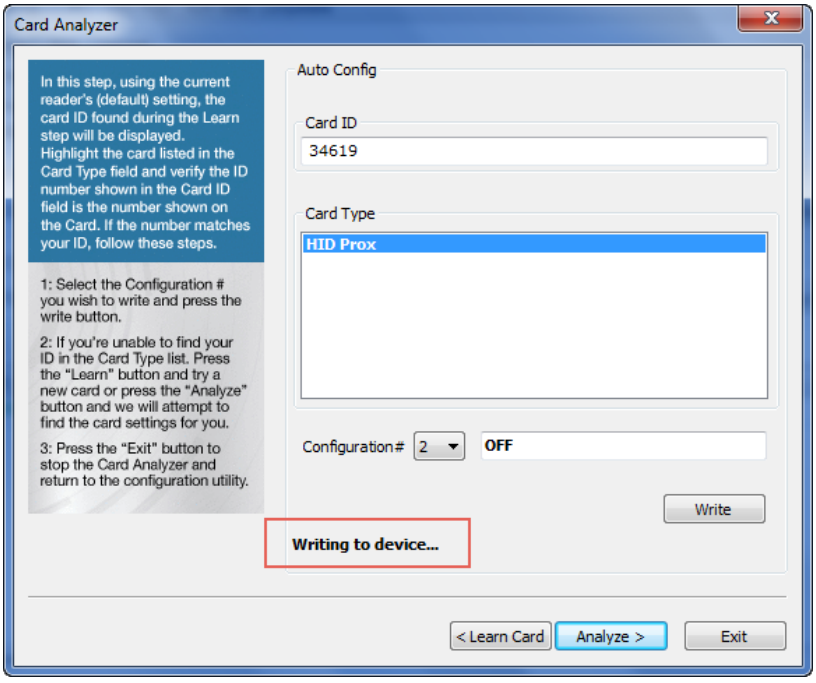

Image 33: Writing the Configuration to Device

5. After configuring the reader with default settings, a message will appear in the status bar.

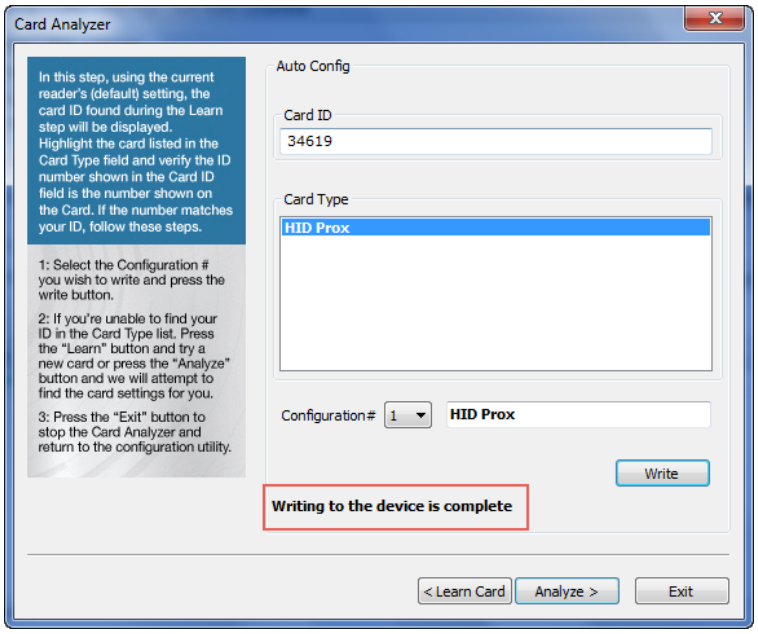

Image 34: Writing Process Complete

Analyze Card

Configurations can be written in the Analyze Card section, much like the Auto Config section. This is a useful feature when the card doesn't match the default ID. It's also possible to analyze the reader settings for the selected Card Type. On-screen instructions are provided to add clarity.

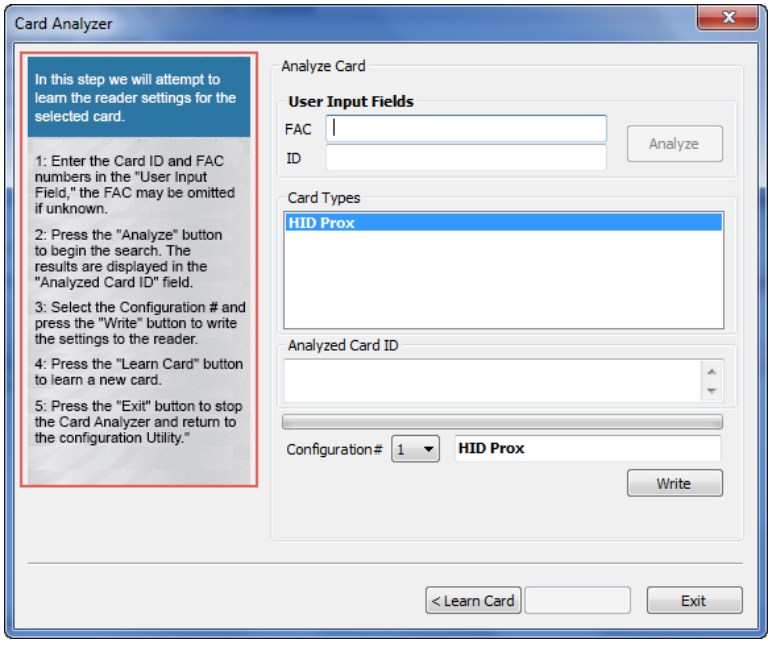

Image 35: Analyze Card Screen

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.
Learn Card	Go back to the “Learn Card” screen.
Exit	This button has the following functions – • If the user has not written configurations, pressing the “Exit” button will return user to pcProx utility without making any changes. • If the user has written configurations, pressing the “Exit” button will return user to pcProx 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.

“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.

During Analyze the status changes to “Analyzing”. 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 “Learn Card” button (F), 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 configuration Utility.

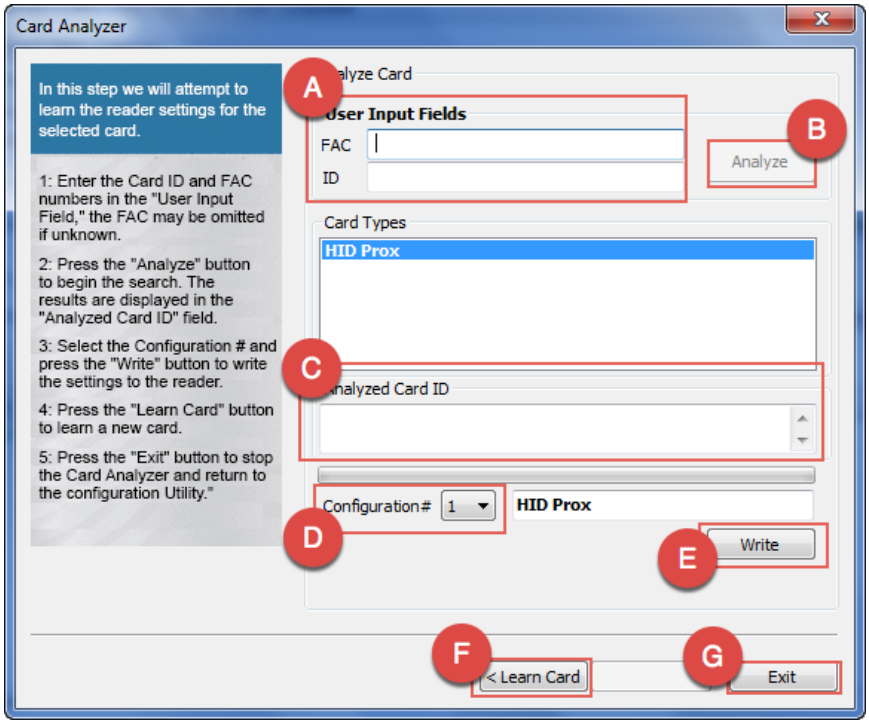

Image 36: Analyzing the Card

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, simply exit the Card Analyzer.

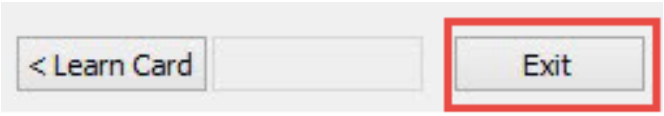

Image 37: Exit Button on Screen

After exiting, the main pcProx Plus Configuration screen appears. Either continue with additional configuration settings or close the utility.

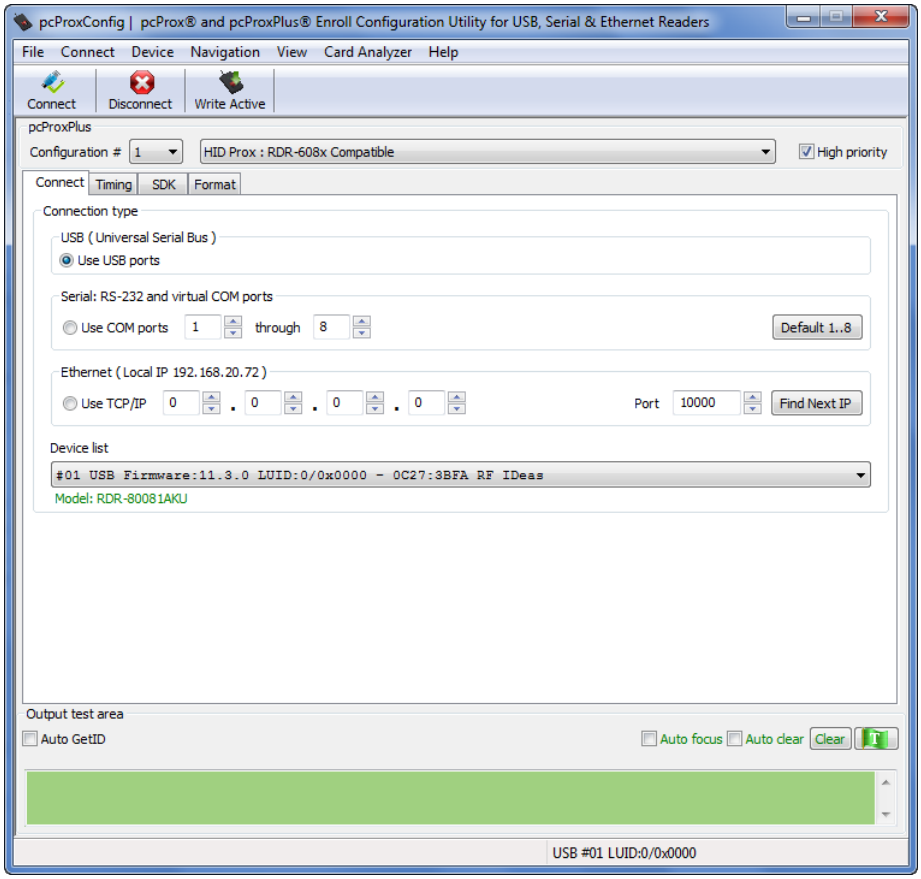

Image 38: New Configuration in the Utility

Help Menu

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

Read User Manual: Opens the user manual that is provided in the download with the configuration utility.

> The user manual can also be found in the directory folder in which the configuration utility was installed.

www.RFIDeas.com: This operation will open a new window to the RF IDeas website.

About: This selection's menu options differ when a device is connected to the utility vs. when there is no device connected. Without a connected device, the "About" informational content simply displays the utility version. When a device is connected, the firmware information is also provided. The RF IDeas Tech support email and website address are displayed in both modes.

3.4 Icon Toolbar

Image 39: Icon Toolbar

The Icon Tool Bar contains the three most general configuration controls for the utility. These controls are also found in the Menu Toolbar under Connect (for connect and disconnect) and Device (for write settings and write active).

Connect

Image 40: *Connect Button*

Clicking the Connect icon button commands the utility to search for a device through selected port connections.

Once the utility detects a device connection, the Device List pull-down menu in the Standard Configuration Area displays the interface connection, firmware, and LUID information for the connected device. The model number of the device will be displayed below the Device List pull-down and the Output Test Area will turn from gray to green (*Image 41)*.

More than one device can be connected simultaneously to the utility. To switch between devices, select the desired connected device from the Device List pull-down menu.

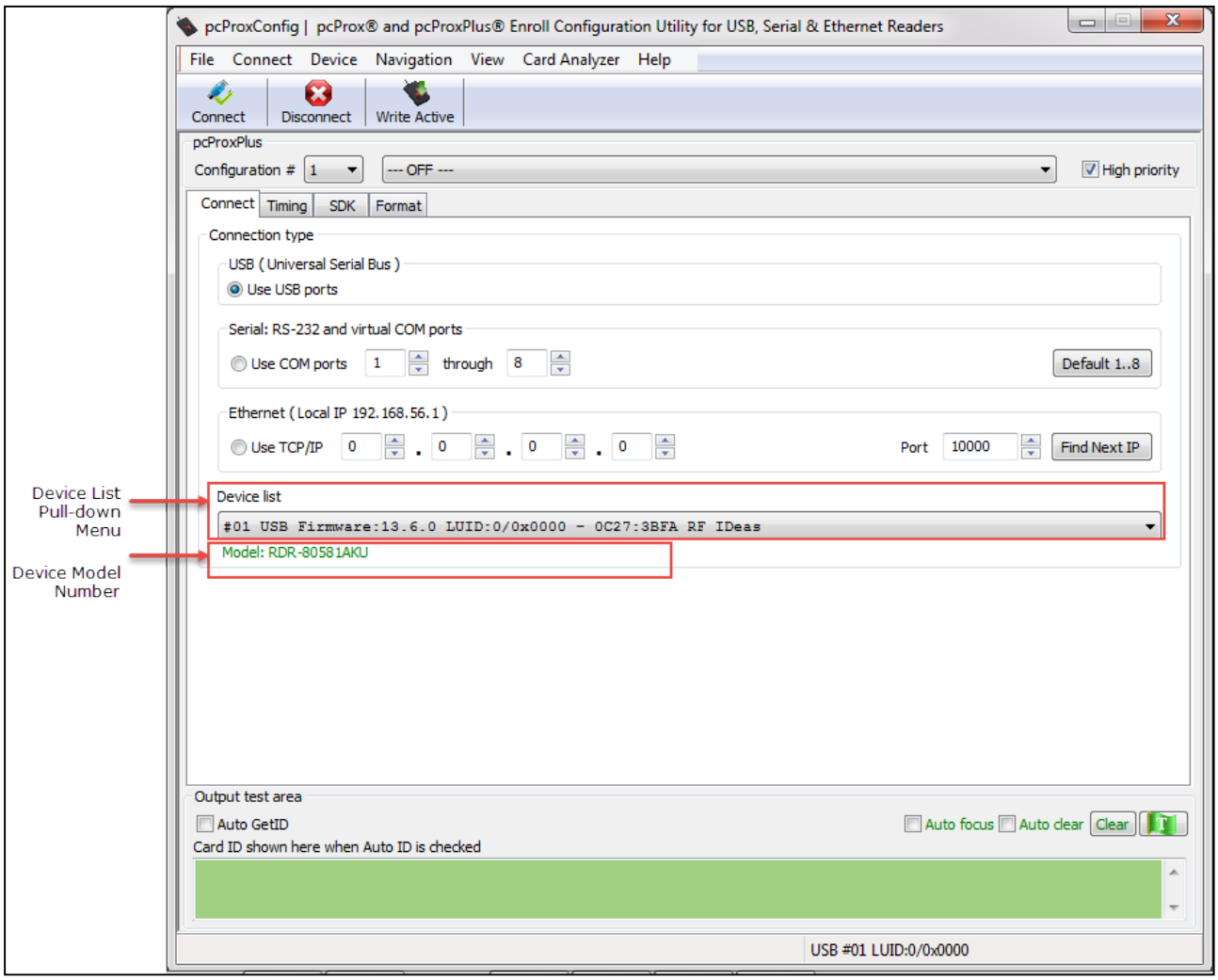

Image 41: Device List Output

If an attempt to connect to a device is made and the utility does not detect a device through any of the available interface connections, a *no devices found* message will display in the utility's status bar area, as shown in *Image 42*.

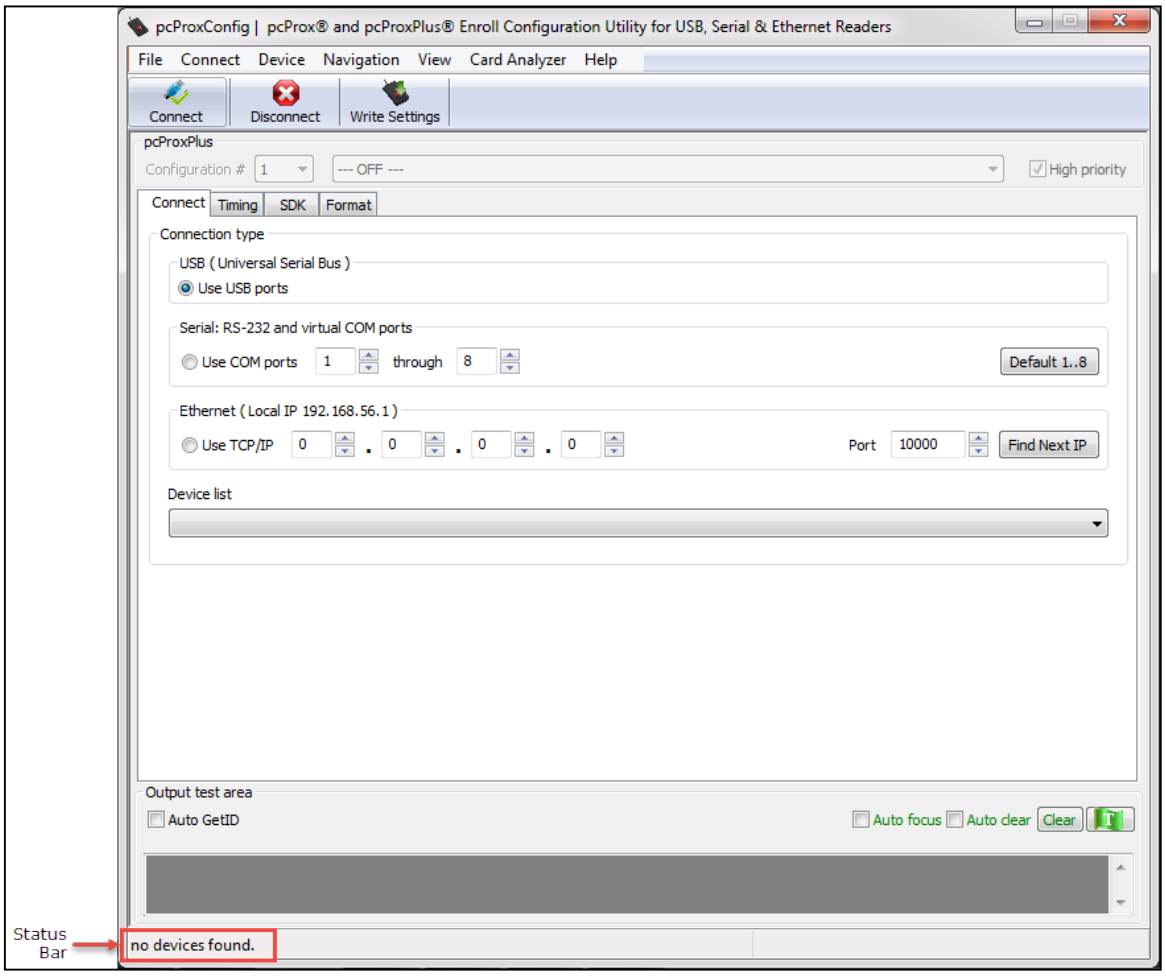

Image 42: Status Bar

Disconnect

Image 43: Disconnect Button

Clicking the disconnect icon button, commands the utility to disconnect from all devices connected through any and all available port connections.

Once the utility disconnects from all device connections, the Device List pull-down menu and device model number are cleared from the Standard Configuration Area and the Output Test Area will turn from green to gray.

The status bar will display a *Disconnected* message, as shown in *Image 26:*

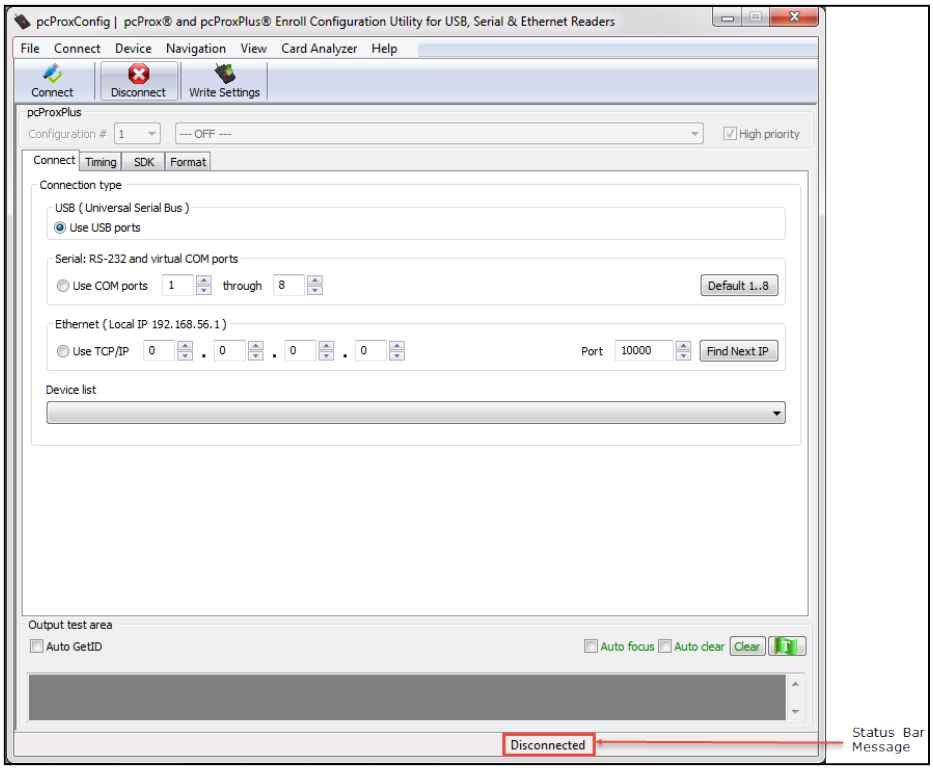

Image 44: *Disconnected Message*

Write Settings/Write Active

Image 45: Write Settings Button

The Write Settings icon button prompts the utility to write the current defined configuration settings to the device. When a single configuration device is connected, the icon text will read “Write Settings,” as shown in Image 45.

When a two or four configuration device is connected, the icon text will change to read “Write Active,” as shown in Image 46.

Image 46: Write Active Button

3.5 pcProx Plus Configuration

The pcProx Plus Configuration Area is only available to configure selections when a two or four configuration device is connected to the utility.

Image 47: pcProx Plus Configuration Area

When a single configuration device is connected to the utility, the pcProx Plus Configuration area is greyed out (as seen above) and selections within this area are not possible, as shown in Image 47.

The pcProx Plus Configuration area allows users to set-up two or four different configurations for their device. The configurations can be any mix of 125 kHz or 13.56 MHz card types. The configurations can also be of the same card type.

If configuring the reader for HID 26-bit and HID 35-bit, remember to set one configuration to read only 26 bits and the other configuration to read only 35 bits.

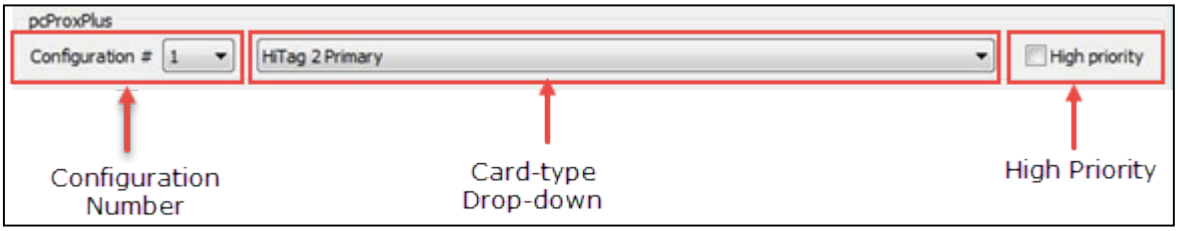

Image 48: pcProx Plus Configuration Functions

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.

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 pcProx Plus user the ability to give a certain configuration a higher priority than another. This is useful when the user has a population of cards consisting of a combination of 13.56 MHz/125kHz cards as well as single-technology cards, and one of those is preferred over the other.

With the High priority feature enabled, the reader will try to read that card type multiple times before switching to the other configuration.

If a Low Priority card is found, the reader will check for a High Priority card. If the High Priority card is found, it reports it; otherwise, it reports the Low Priority card. Only one configuration can have High Priority. If multiple configurations have High Priority selected, only the first one (by configuration order) is considered High Priority.

Reader Performance Factors

- Card type and form factor: There are a number of different card types in each band (low frequency and high frequency). Card types can have varying sensitivity, radiating capability, and data rates and each form factor (i.e. ISO card, clamshell, key fob and sticker) has different performance characteristics that influences read range and response time performance.

- Environmental factors: Reader performance can be impacted by materials adjacent to the reader. Metals can reduce the field strength or detune the reader resulting in reduced read range or 'dead zones.' Certain nearby electrical devices can generate interference that impairs the reader's card read capability.

- Priority: Readers with multiple card configurations have the ability to prioritize which card is read first. In some cases, there may be different card types in the population and one of them is the target. Another case is with Dual-technology (low and high frequency) cards where the high priority technology (high frequency) has shorter read range compared to the low priority technology (low frequency). With priority enabled, the reader will attempt to read a high priority card multiple times before trying to read a low priority card. If the reader reads a low priority card, it will also attempt to read the high priority card multiple time before outputting the low priority card data. One side effect is that response time is longer when reading a low priority card. For optimal response time, ensure the target card type is high priority.

3.6 Connect Tab

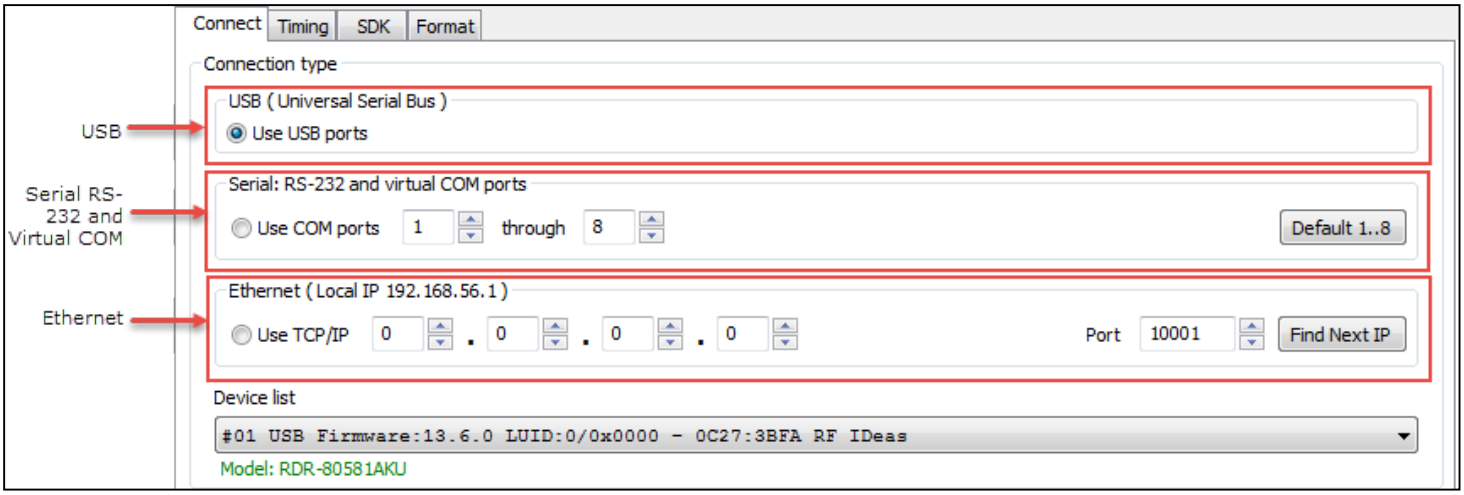

Image 49: Connect Tab

The Connect tab offers various ways a device can connect to the configuration utility. The different selections allow the user to choose the connection type for the specific logical protocol of their reader.

Only one connection type at a time will be shown.

USB: Make this selection if the connected device has a USB logical protocol. The utility will then proceed to scan any available USB bus for connected devices.

Serial RS-232 and Virtual COM Ports: This option provides devices that are RS-232 or Virtual COM port logical protocols to connect to the utility. This section scans for RS-232, CDC, and PCMCIA devices.

When making this selection, the lower and upper limits of the COM ports to scan need to be set. The port values range from 1 to 256. The default COM ports are set at 1 through 8.

Default 1.8: This option sets the COM port values back to the default of 1 and 8.

Serial devices may slow when scanning a wide port range.

Ethernet (Local IP 10.10.10.65): Connects to an Ethernet reader at the given IP address and opens a TCP/IP on the given port. The first, second, third, and fourth byte of the TCP/IP address must be entered for the interface to connect to the reader. The IP port number will also be required.

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

Ports below 1024 are for system use only.

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

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

For example, if you have an RJ45 connector (as seen below) then the specific logical protocol connection to be selected is Ethernet.

Connectors

Remember, not all USB interface connections necessarily connect logically through a USB. If your device has a USB connector, and your device part number suffix is xx0 or xxF, the logical protocol connection is made through COM. A device with a USB interface connector and a part number suffix of xxU will connect through the USB connect option.

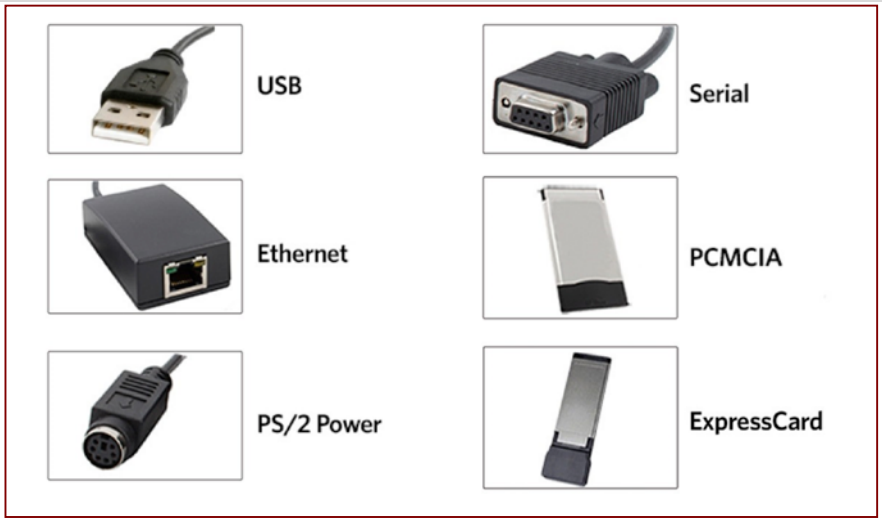

Image 50: Connectors

Output Test Area

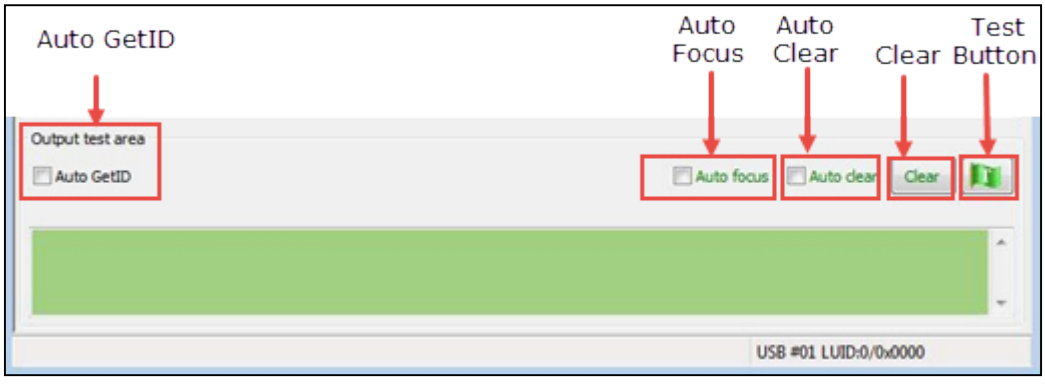

Image 51: Output Test Area

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

The **Auto GetID** box can be checked for the utility to poll the reader for a card ID and displays the results directly under the checkbox, as seen in *Image 52.*

Image 52: Auto GetID

The **Auto Focus** box keeps the cursor in the test area box to capture the keystrokes output by the device.

> When the Auto Focus box is checked, it is possible that the selection may conflict with the menus and drop downs, due to the fact that the cursor will attempt to move back into the test area. If this problem arises, simply uncheck the box.

The **Auto Clear** box clears all text in the Output Test Area.

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

The **Test** button (Green Flag) starts the batch file “testarea.bat” or script “testarea” to bring up a user’s own application to view the readers keystrokes. It opens any keystroking capturing program (i.e. notepad, wordpad etc).

Status Bar

Image 53: Status Bar

3.7 Timing Tab

Use this tab to configure the device’s card timing and USB keystroke timing.

Card Data Hold Time: This option allows users to determine in millisecond’s how long they need to wait before the device is able to read the next card in line (which is also how long the LED will remain green after a card read).

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

This is how long the data is available for the SDK user.

Continuous Read, Sends Data upon Read: When a card is placed on a device, this option will allow the data to be sent continuously.

Lock-Out Time for Repetitive Reads: The time that 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.

For a 2 or 4 configuration device (pcProx Plus) the lock-out time is the same as card data hold time.

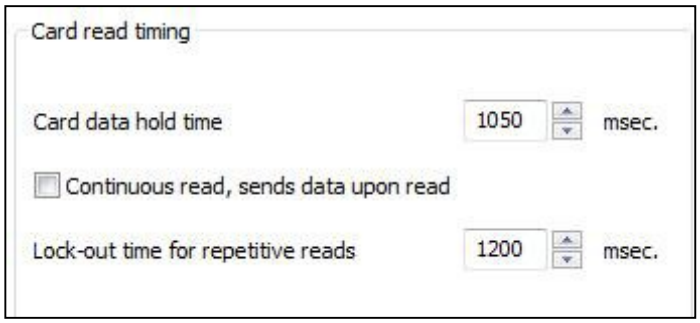

Image 54: Card Read Timing

Card data hold time, and Lock-out time for repetitive reads are adjustable in increments and decrements of 50 msec.

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.

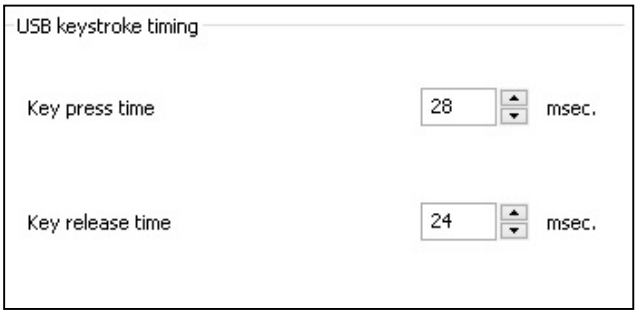

Image 55: USB Keyboard Emulation Timing

Key press time and Key release time are adjustable in increments and decrements of 4 milliseconds.

3.8 SDK Tab

Use this tab to configure the Software Developer's Kit (SDK) functions, as well as enable and disable keystroking.

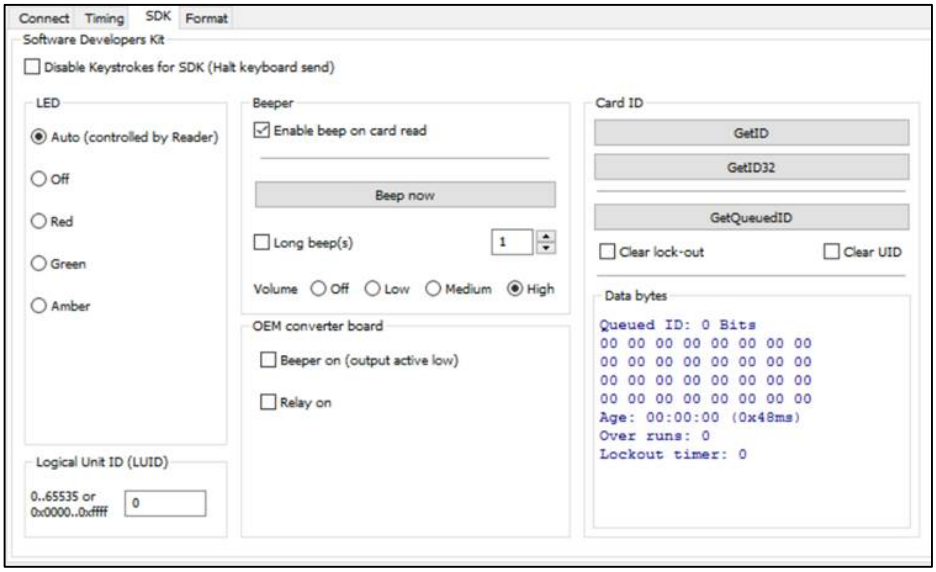

Image 56: SDK Tab

Function	Description
Disable Keystrokes for SDK (Halt Keyboard Send)	Check to disable keystroking. When keystroking or unsolicited (Halt Keyboard Send) serial out is disabled, all card data must be read via the SDK functions.

LED

Users can control the LED actions on the device to provide information regarding the card data.

Functions	Descriptions
Auto	Select this to make the device set the LED color.
Off	Select this to set the LED to off.
Red	Select this to set the LED color to red.
Green	Select this to set the LED color to green.
Amber	Select this to set the LED color to amber.

Logical Unit ID

A user defined 16-bit Logic Unit ID to identify one device from another.

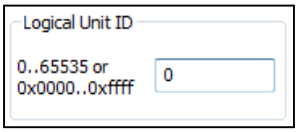

Image 57: Logical Unit ID

Beeper

Functions	Descriptions
Enable Beep on Card Read	Check this to set the device to beep when a card is read.
Beep Now	Press to listen to the beep the reader will provide when in use.
Long Beep(s)	By default, the beep is set to a short beep. 2 long beeps or 5 short beeps are allowed.

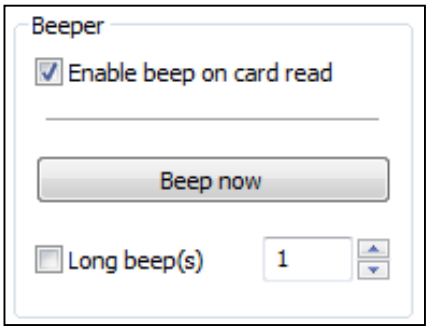

Image 58: Beeper

The number value input area to the right of the Long Beep(s) box is designated for the number of beeps to produce.

Volume

Applicable only on readers equipped with Volume Control. For readers that do not incorporate Volume Control, refer to the Beeper section above.

Functions	Descriptions
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

OEM Converter Board

Functions	Descriptions
Beeper On (Output Active Low)	Check this to turn the device beeper on.
Relay On	Check this to turn on relay output on converter board.

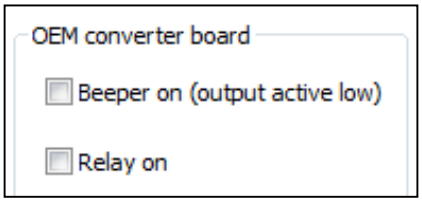

Image 59: OEM Converter Board

Card ID

Functions	Descriptions
GETID	Click while scanning a card over the device. The ID displays under the button. This returns 64 bits maximum.
GETID(32)	Click while scanning a card over the device. The ID displays under the button. This returns 255 bits maximum.
GetQueuedID	Click to display the last card data read. This returns 255 bits maximum.
Clear Lockout	Check to clear the time remaining to allow the device to read the next card immediately.
Clear UID	If clear UID is set, the card and the overrun counters will be cleared for the next read. If clear Hold is set, the reader will be ready to read another card.

GETID Data Display

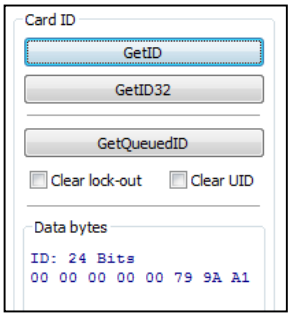

Image 60: GETID Data Display

The Most Significant Byte is first – 79. The Least Significant Byte is last – A1

GETID (32) Data Display

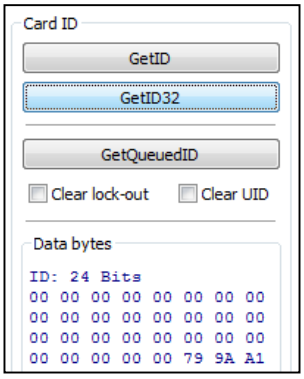

Image 61: GETID (32) Data Display

GetQueuedID Data Display

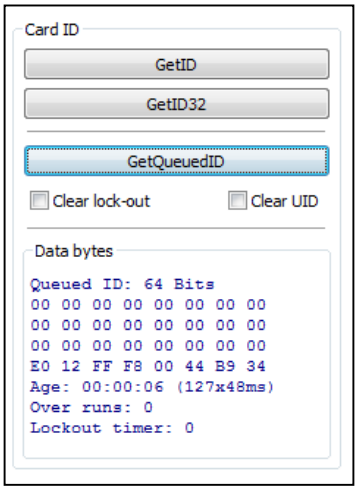

Image 62: GETQueuedID Data Display

HH:MM:SS displays – 00:00:06

3.9 Format Tab

Data Format Tab

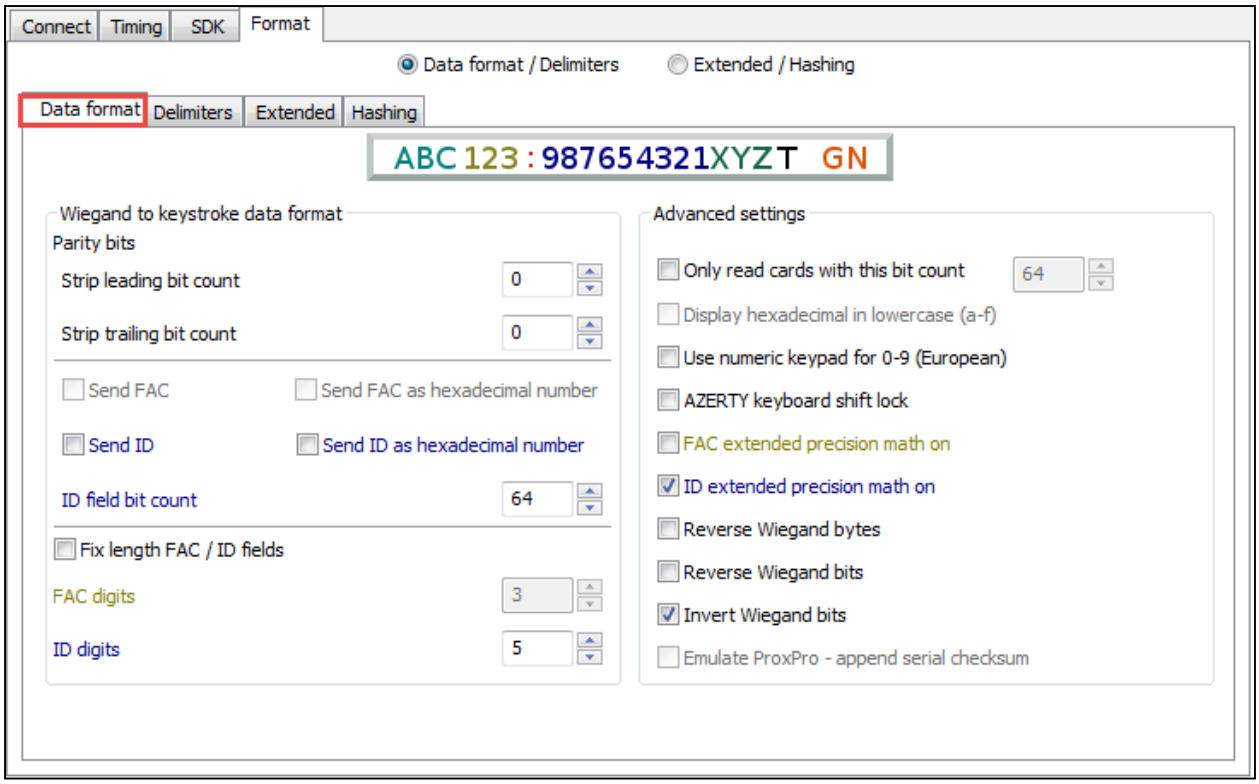

Image 63: Data Format Tab

This tab provides users the ability to format how the data on a card will be keystroked out by the reader.

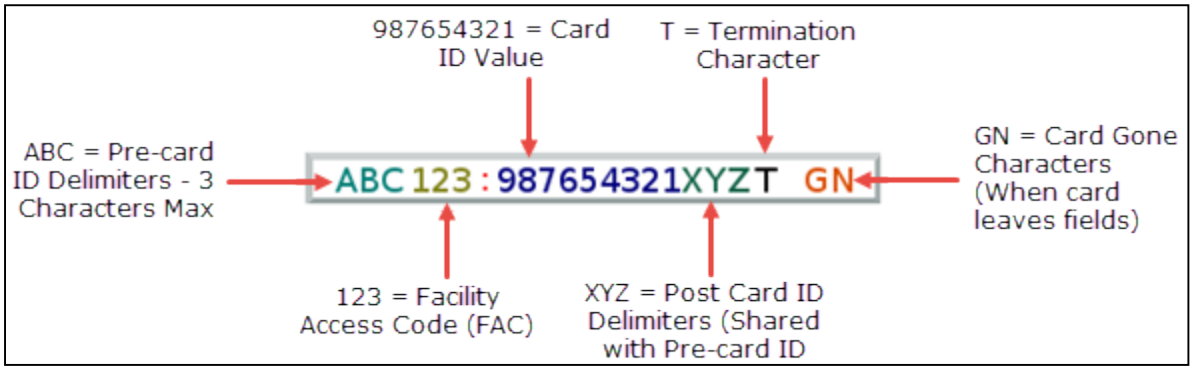

Image 64: Data Characters

Image 46 illustrates the various characters that can be displayed upon a card detection by a connected device.

The number portions of the diagram are values that are displayed from a card.

The letter portions of the character diagram are values that are formatted by the user through the utility and are keystroked from the device.

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.

Send FAC (Facility Access Code): Allows for option to display the FAC code.

Send FAC as Hexadecimal Number: Sends FAC as a hex number. The default is set to output as a decimal.

Send ID: Enables output of the ID portion of the card data.

> When the Send ID option is checked, the defined ID field bit counts that are entered will be used. When it is unchecked, all non-parity bits are used.

Send ID as Hexadecimal Number: Sends ID as a hex number. The default is set to output as a decimal.

ID Field Bit Count: Sets the number of bits in the ID field from 0 to 80.

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

FAC Digits: The FAC out is set to a length of digits between 0 and 32. Zero's are added to the front (of the FAC portion) of the data to create a specific length.

ID Digits: The ID out is set to a length of digits between 0 and 32. Zero's 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: Reads cards with the specified BIT Count. BIT Count can be set from 1 to 255.

Display Hex in Lowercase: Displays hex in lowercase format.

> The Send FAC as Hexadecimal or Send ID as Hexadecimal must first be selected before Display Hex in Lowercase option can be provided.

Use Numeric Keypad: Defines which keypad will be used (whether across the top or with keypad).

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.

Non- Reverse Wiegand Bits: 37C3E80 = 11011111000011111010000000

Reverse Wiegand Bits: 5F0FB = 00000001011111000011111011

Invert Wiegand Bits: Inverts each bit.

Emulate ProxPro-Append Serial Checksum: This option is only for serial devices. 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.

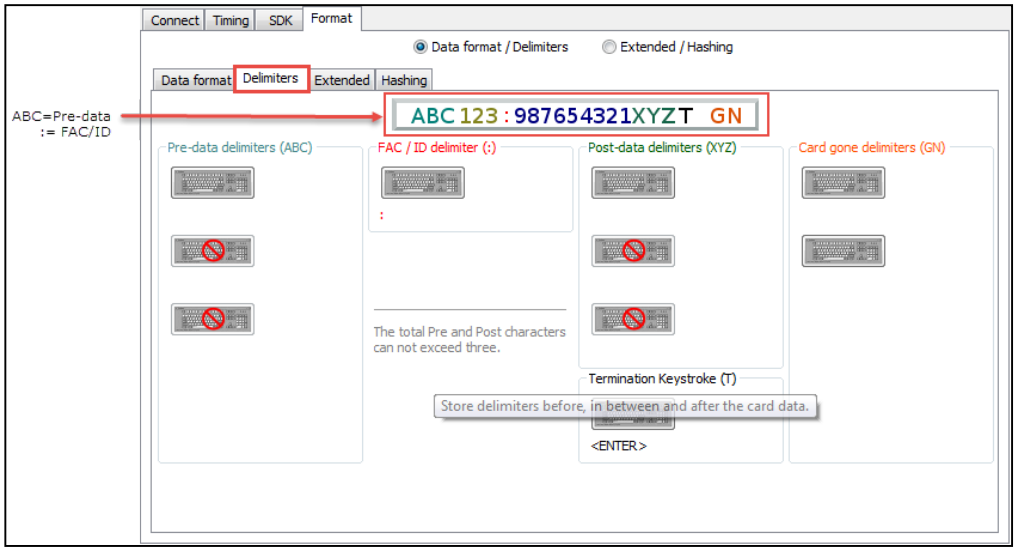

Image 65: Delimiters Tab

Only 3 pre and post delimiters total can be configured. If 3 pre-delimiters are set, no post delimiters can be set.

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.

Image 66: 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

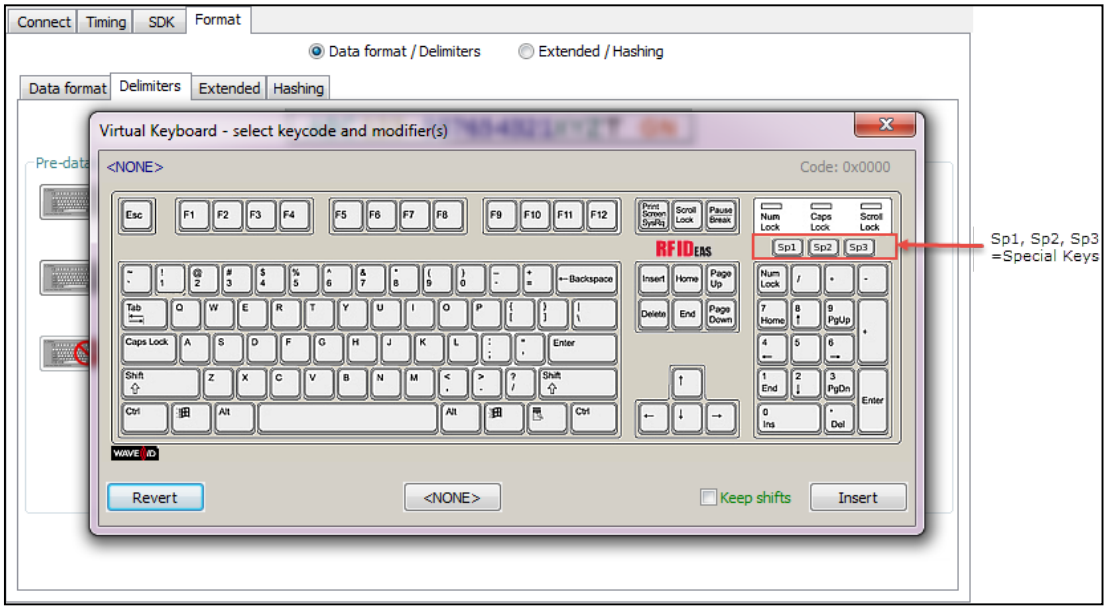

Image 67: Delimiter Keyboard

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

- **Left Click**: Selects desired delimiter (key).
- **Left Double Click**: Selects desired key and auto insert (the Insert button will also insert the key).
- **Right Click**: Toggles between keeping the left Shift on or off.

The selected delimiter keys will highlight and appear in the top left corner that is initially labelled <NONE>. Once a chosen delimiter is inserted, the virtual keyboard will close.

- **Revert**: Takes user back to previously inserted delimiter choice.
- **<None>:** Deletes any selected/inserted delimiter.
- **Insert**: Applies selected delimiter to be used.

Depending on the type of device connected (i.e. serial, USB, etc.), certain keys may be defaulted to highlight upon opening the keyboard. To deselect, simply toggle between your desired delimiter key.

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 labeled as **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.

Special keys don't function for pcProx and pcProx Plus readers with extended feature.

Extended Tab

This tab allows manipulation of all fields. For pcProx & pcProx Plus readers with extended feature, 31 delimiter keystrokes can precede its displayed data. Typically the last field will not be displayed, but will instead have separators to terminate or signal the end of card data.

The reader processes and displays the fields in the order of the green (enabled) buttons from top to bottom. The Blue button is the selected field; the Red buttons are the disabled fields. Each field can be configured to have delimiters and display card data. Each field is defined as a starting bit and number of bits.

The most common FIPS201 formats are 64, 75, and 200 bit and 26-bit standard format are predefined for you. These set the starting bit and number of bits and display type (hex or decimal) for each field. The displayed number can have fixed length (i.e. padded with zeros).

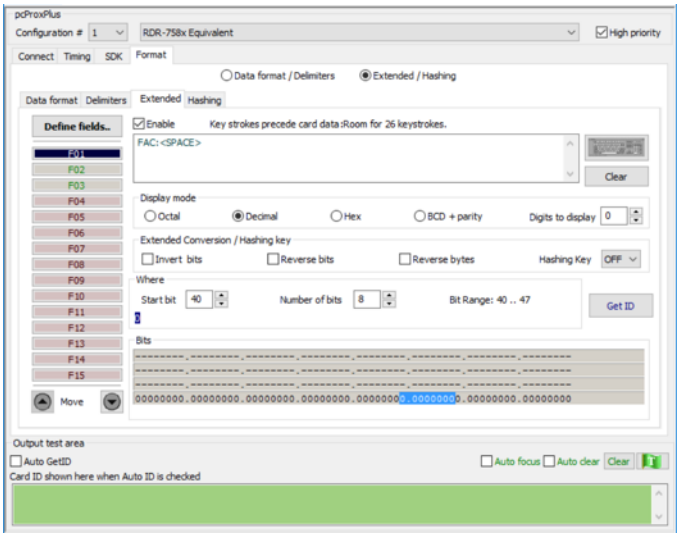

Image 68: Extended Tab

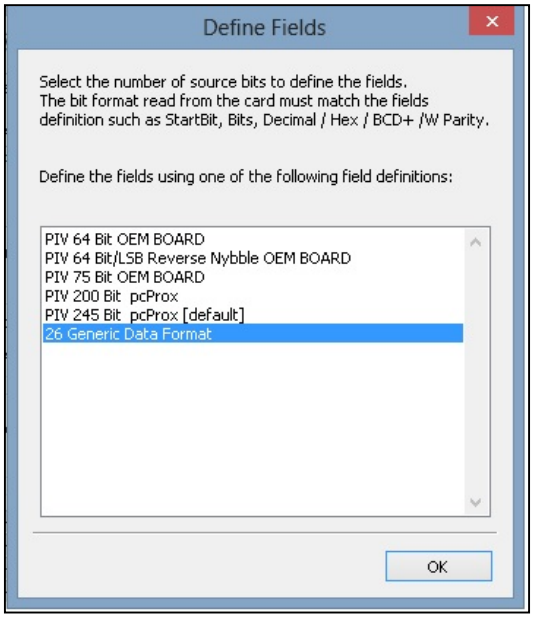

Image 69: Define Fields

Functions	Descriptions
Define Fields	Click to select the number of source bits to define the fields. The correct type must be selected to allow for all card bits to be manipulated.
Enable	Check to enable the highlighted field. This allows the delimiters to be output and the corresponding card field to be processed and output. All green fields are enabled. All red fields are disabled.
Keyboard	Click to select key delimiters that are stored in the device's flash memory that precede card data output.
Clear	Click to clear keystrokes preceding the card data.
Decimal	Click to display the card field in decimal format.
Hex	Click to display the card field as a base 16 number in uppercase HEX 0 – 9 and A – F.
BCD/Parity	Displays the card data in binary coded decimal, where each 5 bits represent 1, 2, 4, 8, and parity. FASCN data is always odd parity. It's a mutually exclusive display mode. No other conversion is applicable afterwards.
Octal	Enables Octal output for the selected field. It's not a mutually exclusive display mode, so Wiegand and Hashing key conversion will also be applicable. The Octal mode is available for pcProx Plus reader with extended feature only.
Invert Bits	Invert bits. Zero becomes 1 and One becomes 0.
Reverse Bits	Reverse the bits from the card.
Reverse Bytes	Reverse the Wiegand data bytes from the card. The settings on the Extended tab perform the same functionality as the Data Format tab in Standard mode. The Reverse bytes, Reverse bits, and the Invert bits are disabled and greyed out when the pcProx readers with extended feature in octal mode.

Hashing Key	Selects hashing key to use for encrypting the selected field. The Hashing Key selection box allows the user to select the key they wish to use for encrypting the selected field. The options are “Off, “A” or “B”. The Hashing key is only available to pcProx and pcProx Plus readers with extended feature and operating in extended mode.
GetID	Click to display the binary bit pattern captured from the card.
Start Bit	Enter a number to define the left most significant starting bit for the field.
Bits	Enter the number of bits to add to the Start Bit to define the range of bits in the field.
Digits	This is the number of digits that will display in a selected field.
Up	Click to move the highlighted field up one position.
Down	Click to move the highlighted field down one position.

Field operators are performed in a specific order that can have a significant impact on the final conversion. If more than one field operator is selected, this is the order in which the functions are executed.
Reverse Bits ⇨ Reverse Bytes ⇨ Invert Bits ⇨ Hashing algorithm.

Bits Window

This window displays the bit ranges for each of the enabled fields on the card.

For FIPS201 reader each field may have from 0 – 15 key strokes, but for pcProx Plus reader with extended feature each field may have 0-31 key strokes.

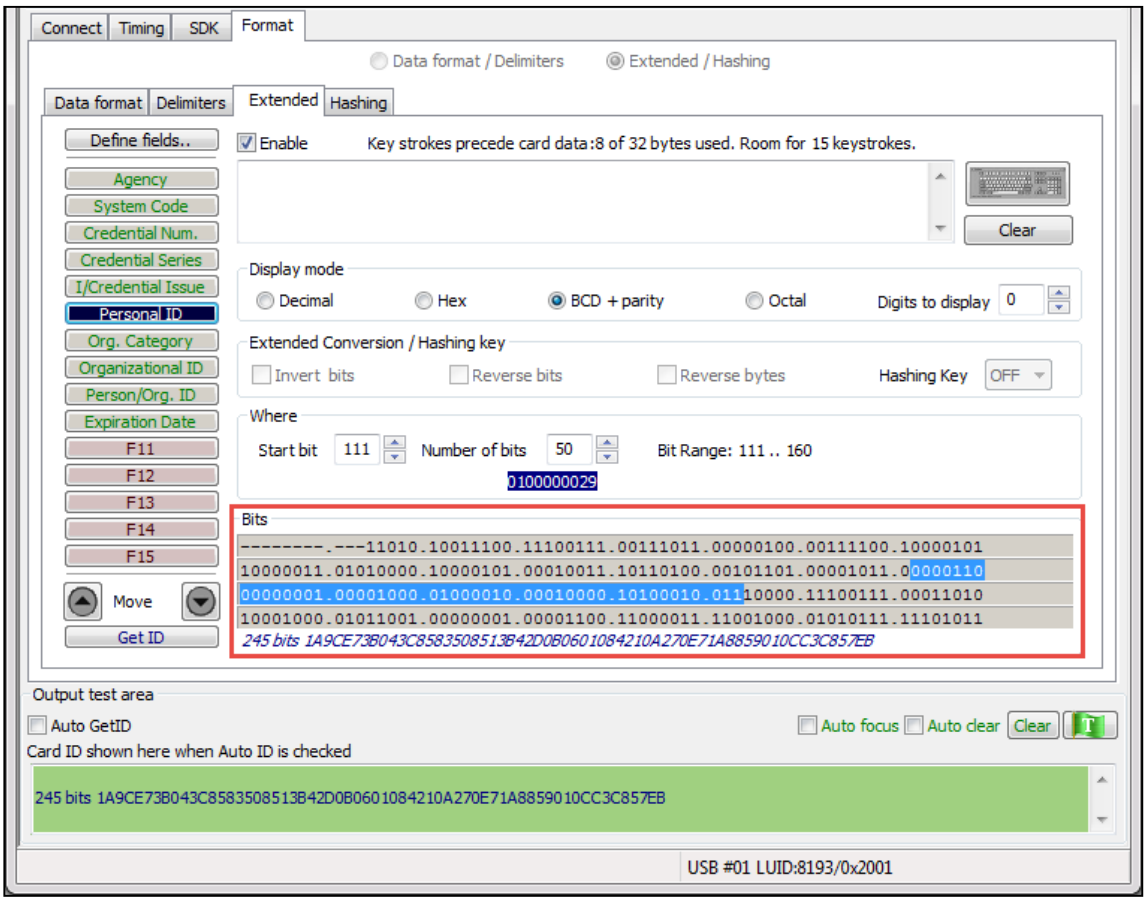

Image 70: Output Example

In the example *Image 70*, the Personal ID starts at bit 111, and is 50 bits long.The Bit Range is 111 .. 160 and the card bit pattern is highlighted. This output format is displayed in binary coded decimal with parity (BCD with parity). This is the 245 bit configuration. If any additional keystrokes were entered to precede the card data, click Clear to remove them.

The status message displays the number of bytes used and the remaining number of available keystrokes. The amount is determined by the reader's memory size. In the example the "Keystrokes: 0 of 32 bytes used. Room for 15 keystrokes." Each field has a 15 keystroke limit. This may be reduced because all the fields share 92 bytes of the extended device memory.

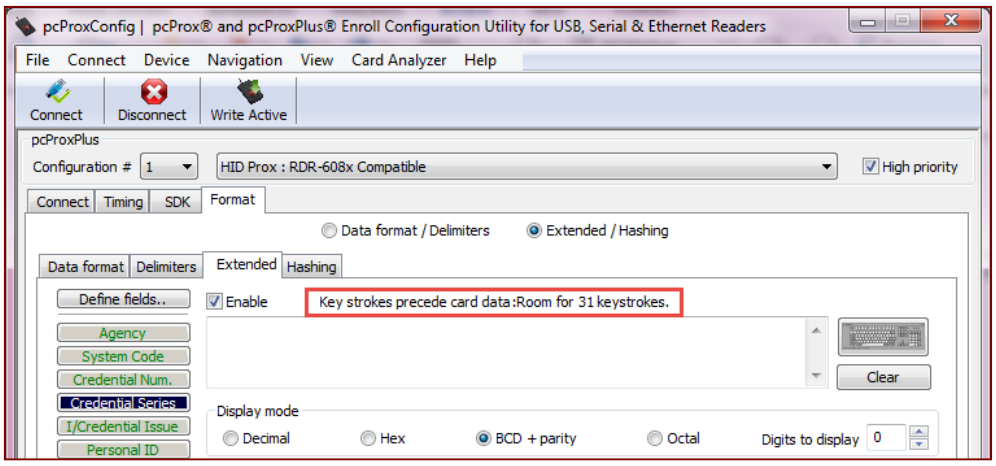

Image 71: 31 Keystroke Limit

In case of pcProx Plus reader with extended feature, each field has a 31 keystroke limit. This may be reduced because all the fields share 122 bytes of the extended device memory.

GetID

Click GetID and scan the card to display the output format of the FIPS 201 and proximity card and the interpretation display of the card data. Click GetID to define the fields to set up the device.

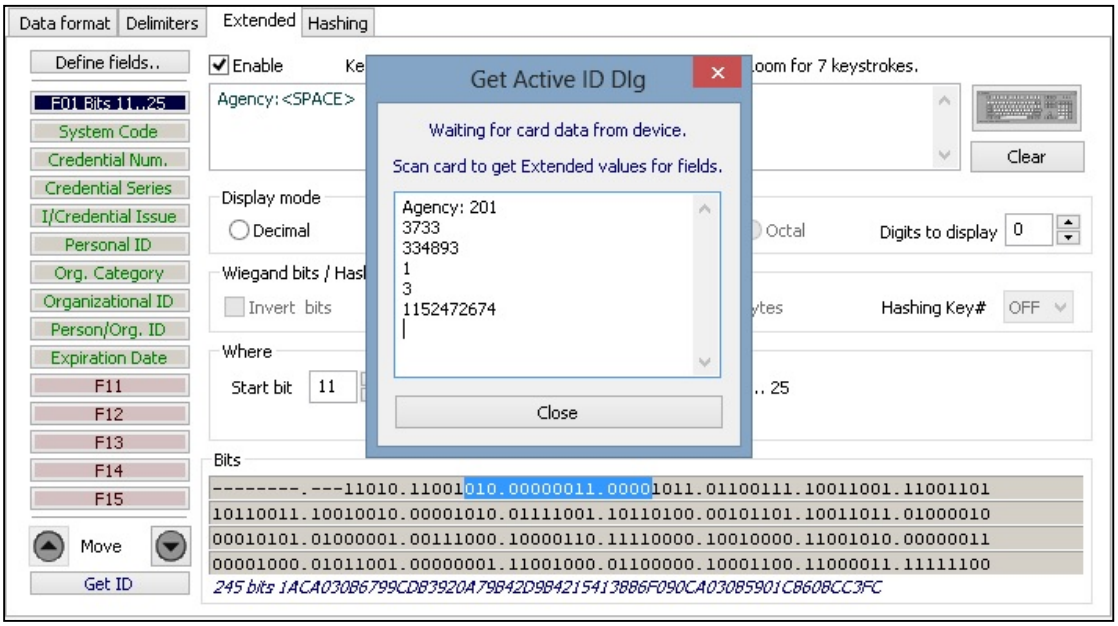

Image 72: Get Active ID Dialogue Box Example

In this example *Image 72*, The Agency data starts at bit 11, and is 15 bits long. The location of the agency data is highlighted in the binary bit pattern. The Bit Range is 11 ... 25.

The actual card data displays in blue below the binary bit pattern layout. The interpretation of the card data displays in red in the text field. The card data in blue will always be the same. The card data in red changes based on configuration settings flashed to the device.

Click Clear to delete the red card data in the text field. A confirmation message will display.

The **Start Bit** changes the actual location of the selected field on the binary bit pattern.

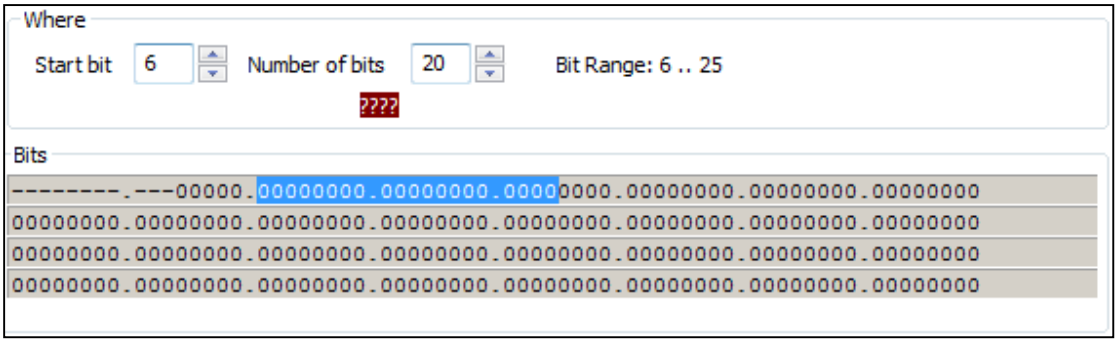

Image 73: Start Bit Example

The '????' that display below the Number of bits field indicate the BCD parity is incorrect. Verify the correct field is selected.

Change Fields Configuration

Click on the appropriate field button and uncheck Enable to remove field data from being displayed. In the example below, the Agency, Personal ID, and Expiration Date fields have been removed. Additional function keys display to configure more fields.

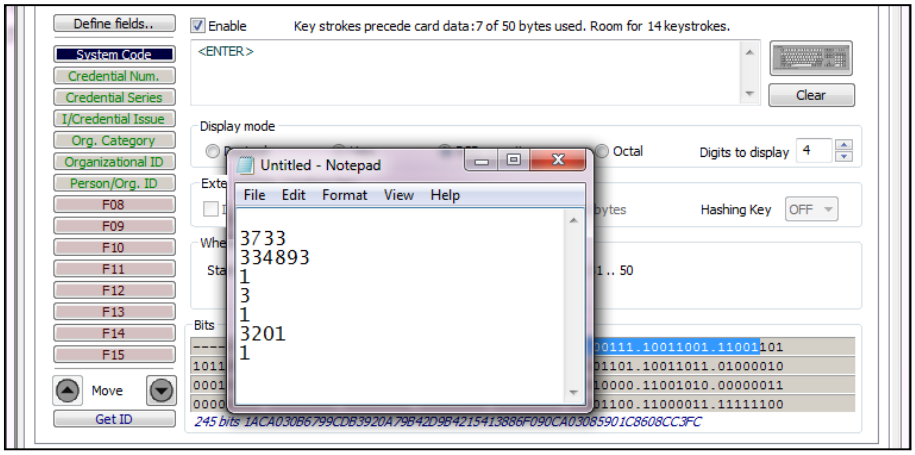

Image 74: Change Fields Configuration Example

Assign Preceding Keystrokes

If **Enable** is checked for a field, specific keystrokes can be assigned to precede card data output.

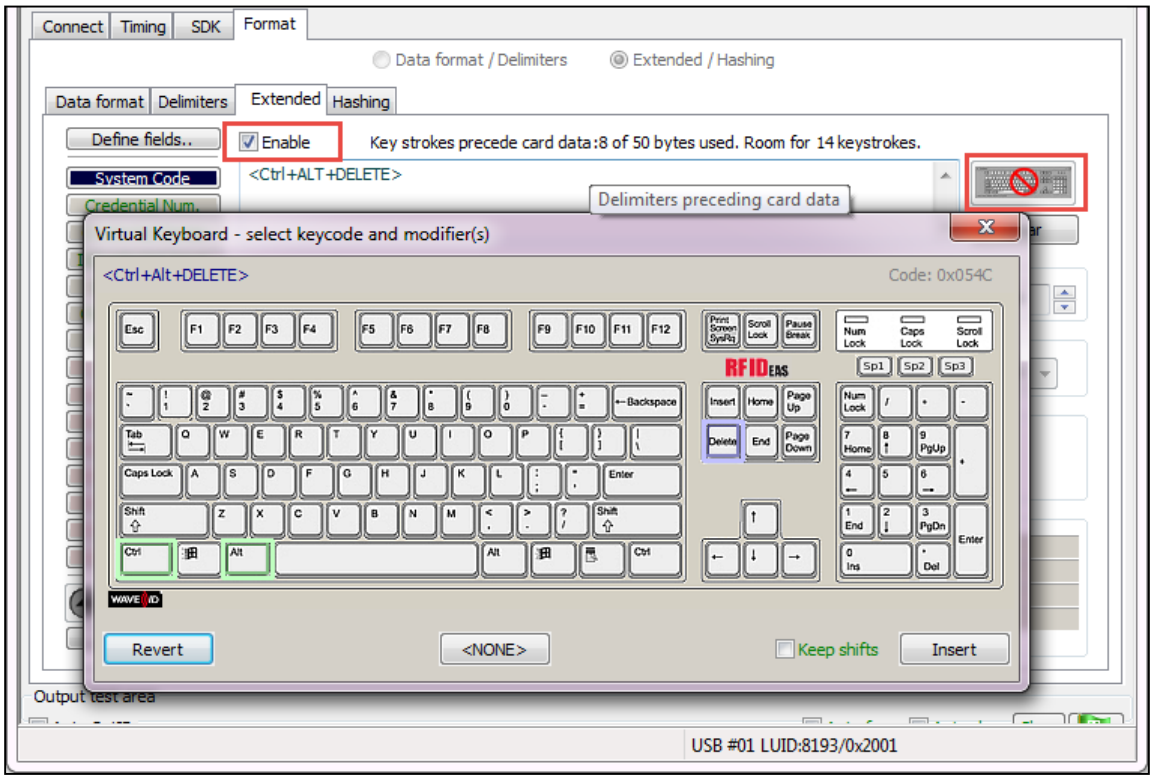

Image 75: Enable Field Example

The Scan Code output for the key selected displays above the list of keys.

Click **Clear** to remove all preceding keystrokes as appropriate.

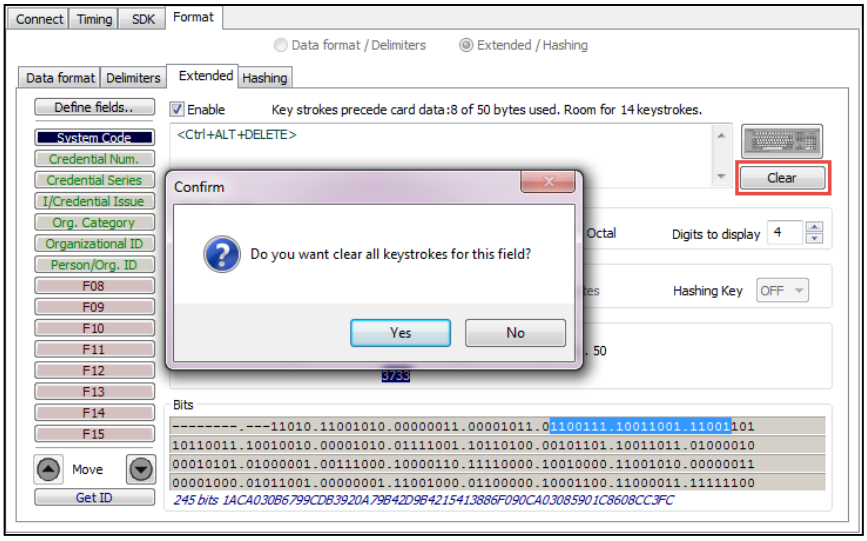

Image 76: Removing Preceding Keystrokes

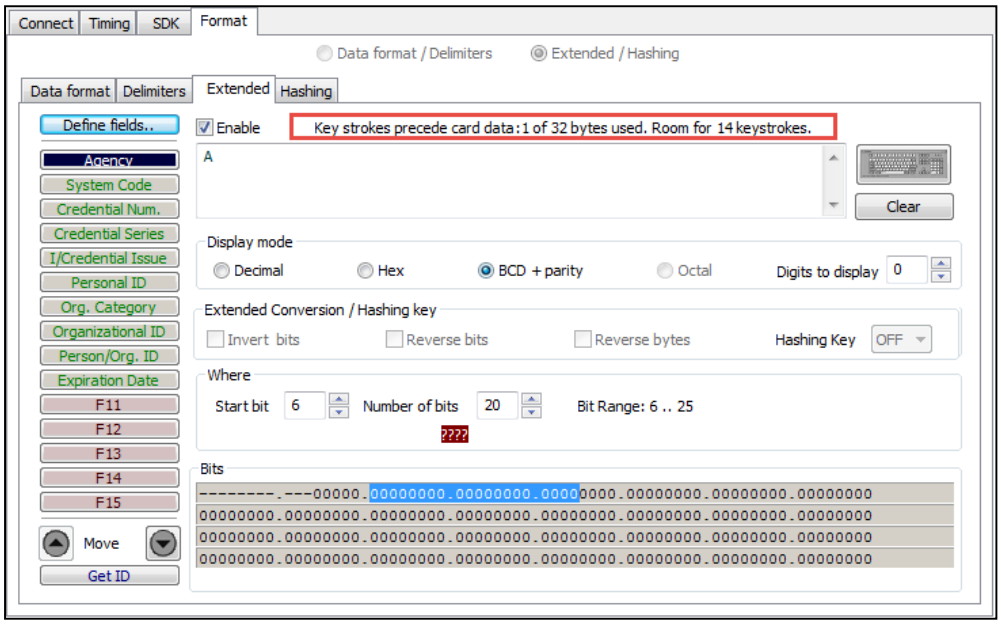

Image 77: Single Keystroke Example

Each single keystroke entered to precede card data equals 1 byte of memory for FIPS201 devices, and serial pcProx Plus devices with the extended feature.

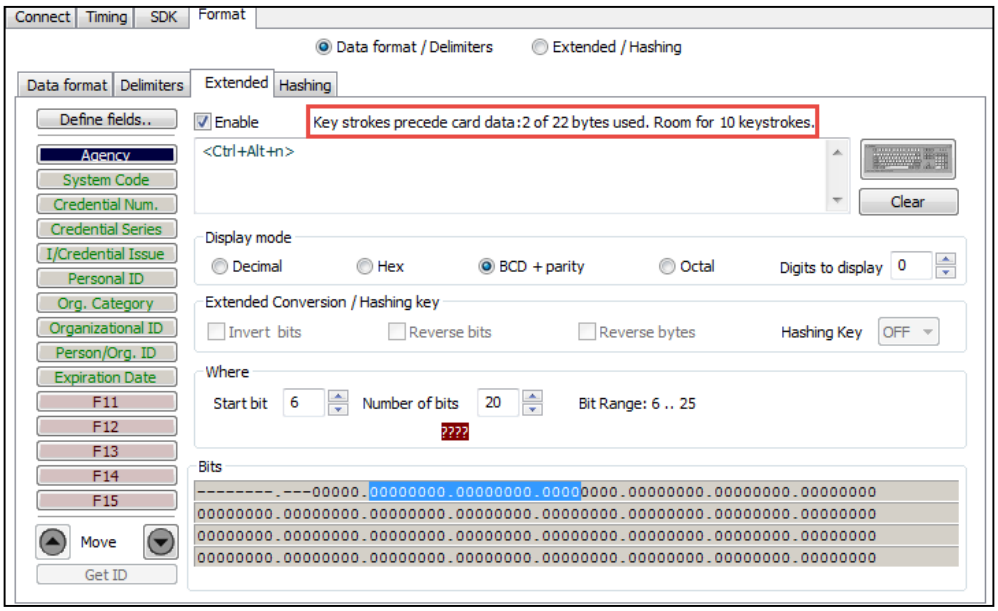

Image 78: Special Character Keystroke Example

If any special character Left control, Left GUI, Left Alt, Right control, Right GUI, Right Alt, Right Shift except for ‘Left Shift’ is selected with a keystroke, this equals 2 bytes of memory for FIPS201 USB devices.

Every keystroke entered to precede card data equals 2 bytes of memory for pcProx Plus USB devices with extended feature.

If all the keystrokes have been assigned to the fields, the following message displayed below will appear:

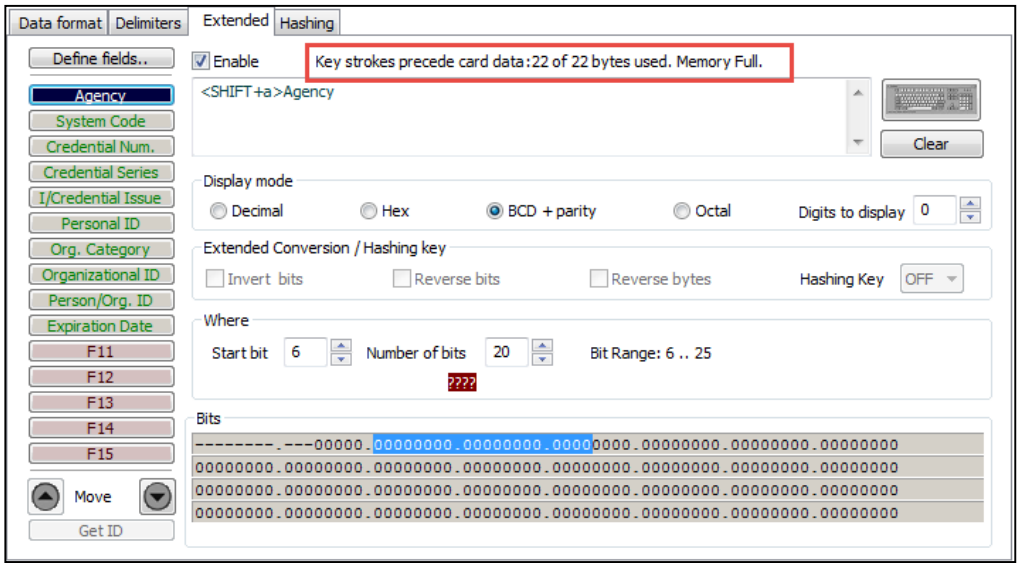

Image 79: Key Stroke Memory Full

Depending on the active document/window, additional functionality can be assigned to a field. For example, if the card data is read in Notepad, Print dialogue can be opened.

Select the FAC field. Click the keyboard icon. Check Left Control and Click P. Click Insert.

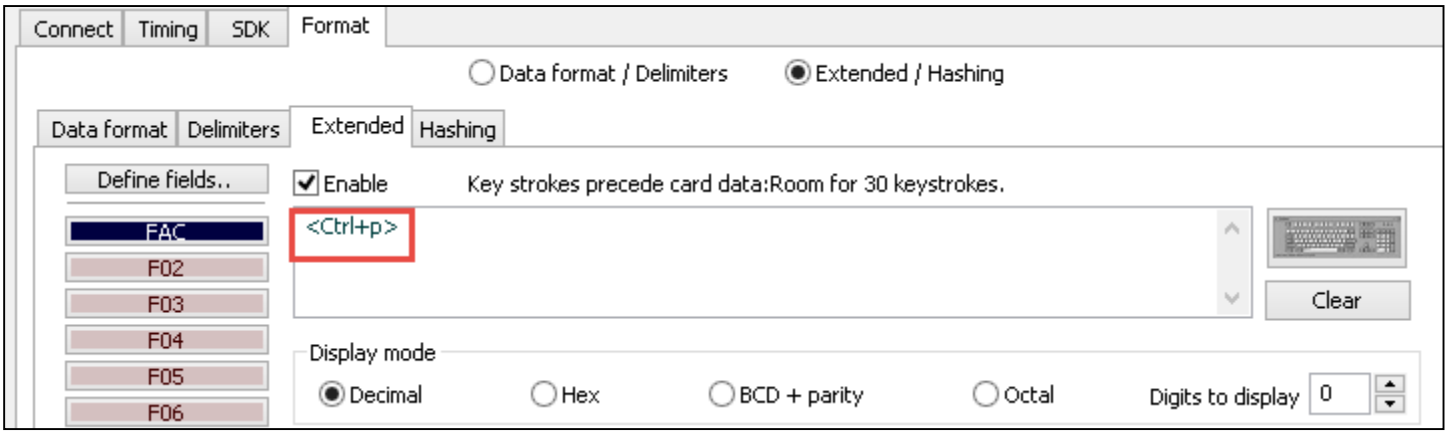

Image 80: Print Feature

Click Flash to write this configuration to flash memory. Verify the active window is Notepad. Scan the card. The Print dialogue function works when the card is read.

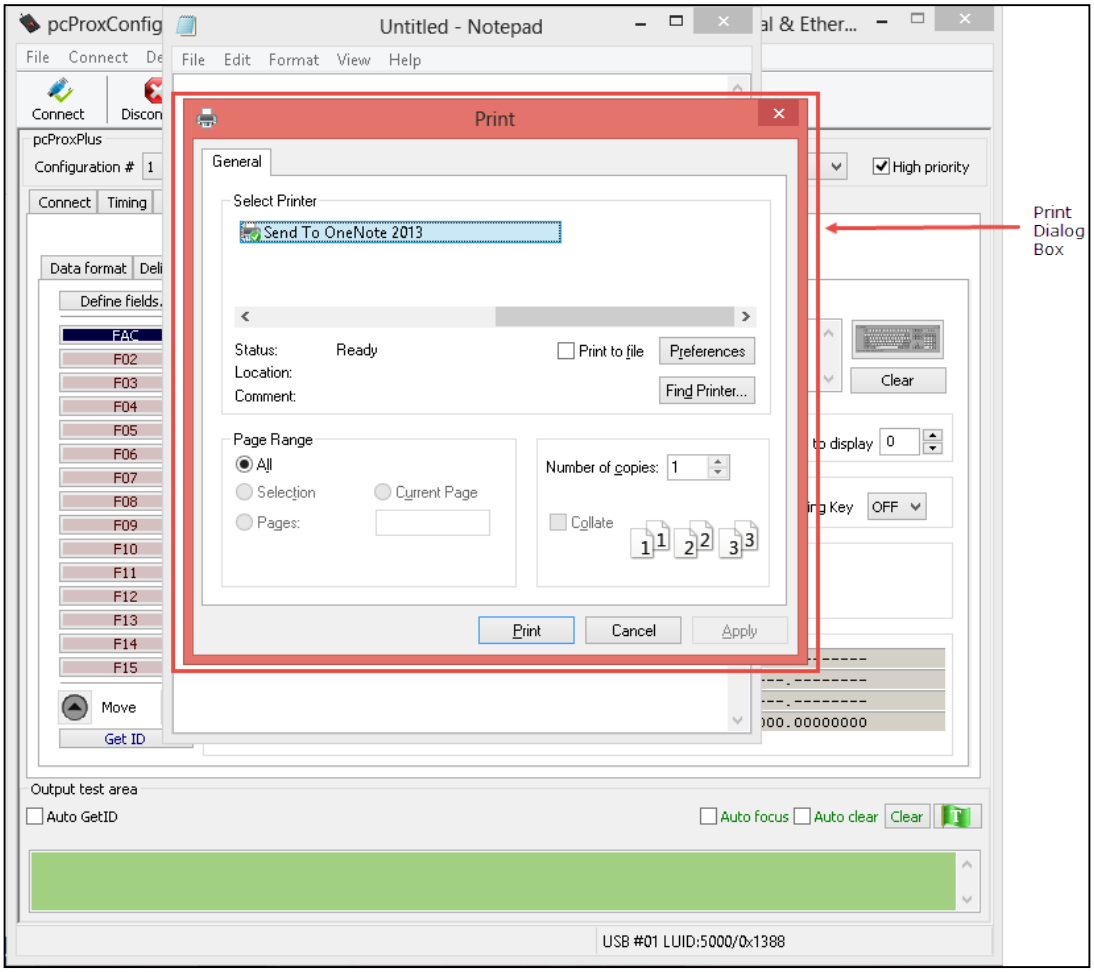

Image 81: Print Dialogue Box

FIPS201 Reader Configuration

To configure Reader for FIPS201 card:

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

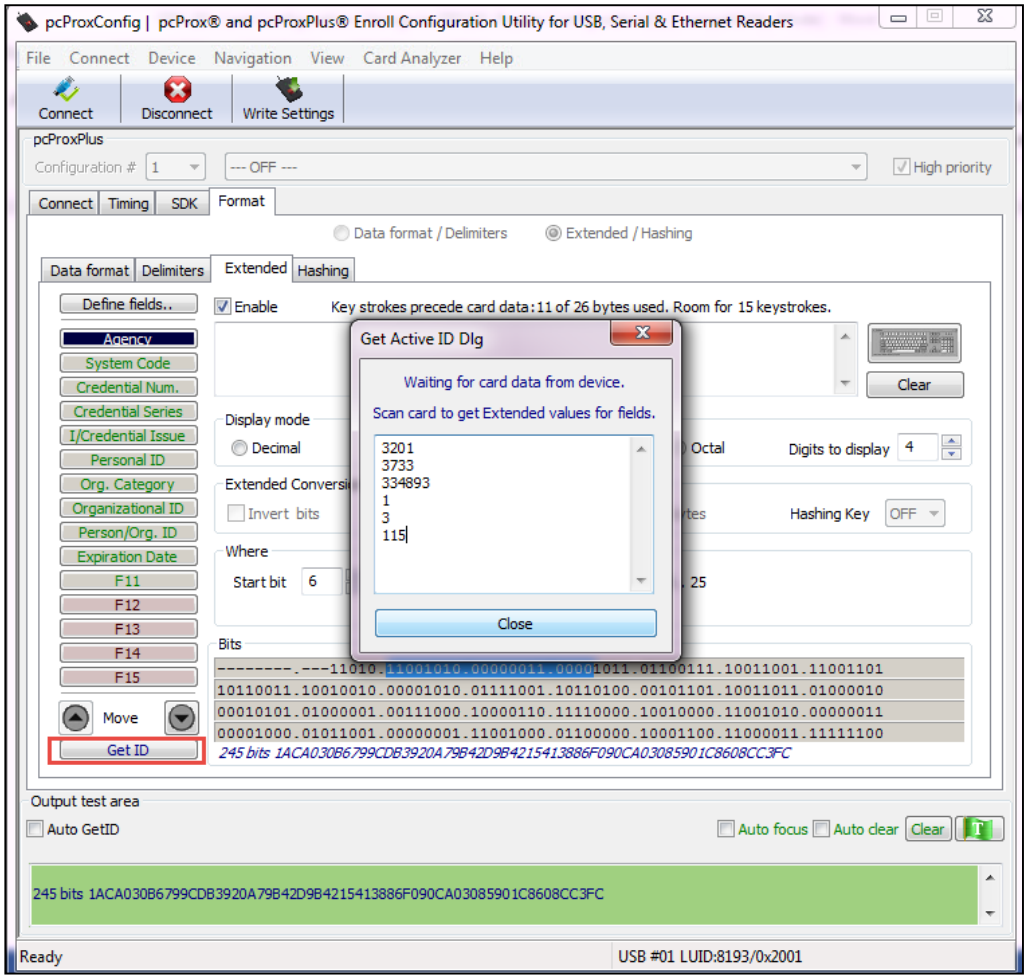

Image 82: Get Active ID Dialogue Box

2. Define the fields to match the specific output. There are 6 predefined configurations for FIPS201 cards.

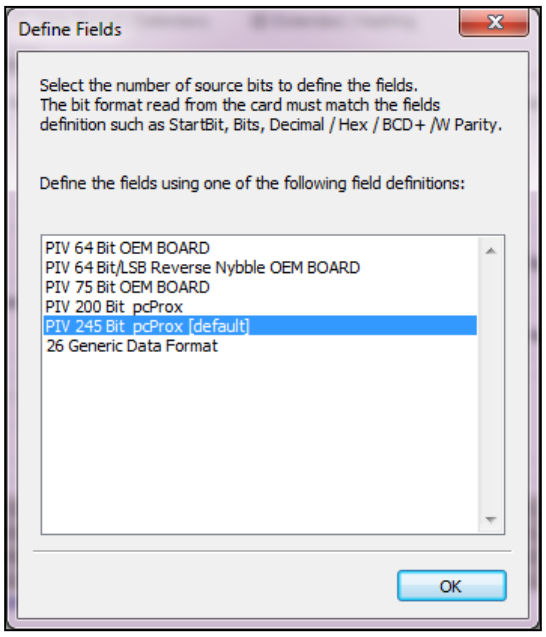

Image 83: Define Fields Dialogue Box

3. Configure any additional fields as appropriate.

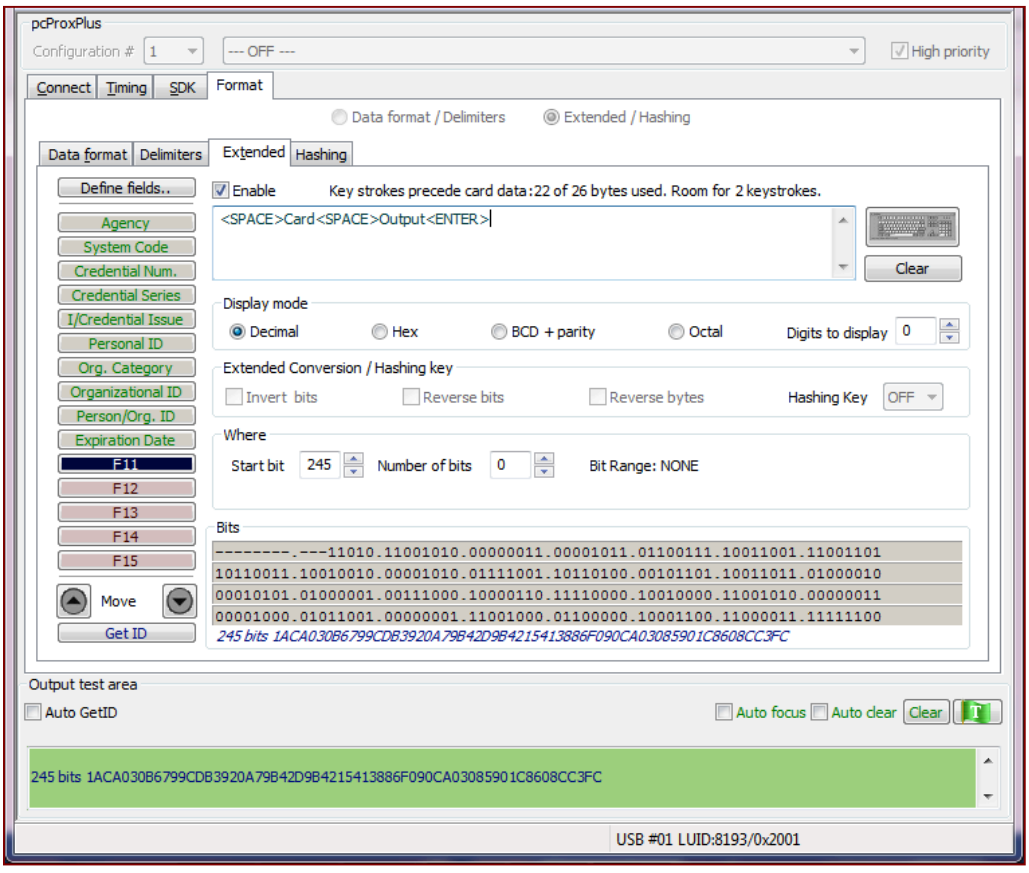

Image 84: Configuration of Additional Fields

4. Save the configuration to memory.

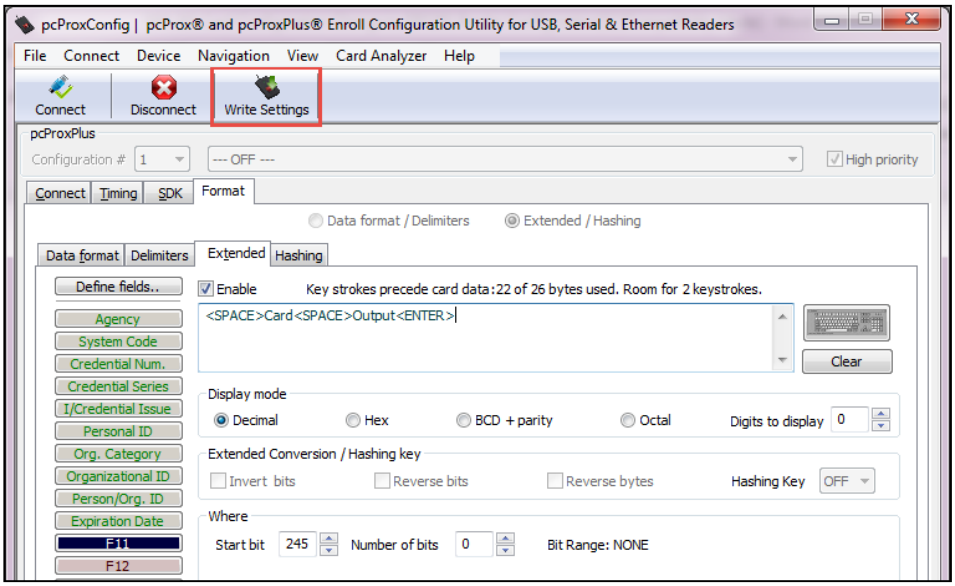

Image 85: Saving Configuration to Memory

The Bits Window displays:

- Start bit location
- Number of bits for a specific field
- Number of digits for the field
- Location of the field within the 245 bit range

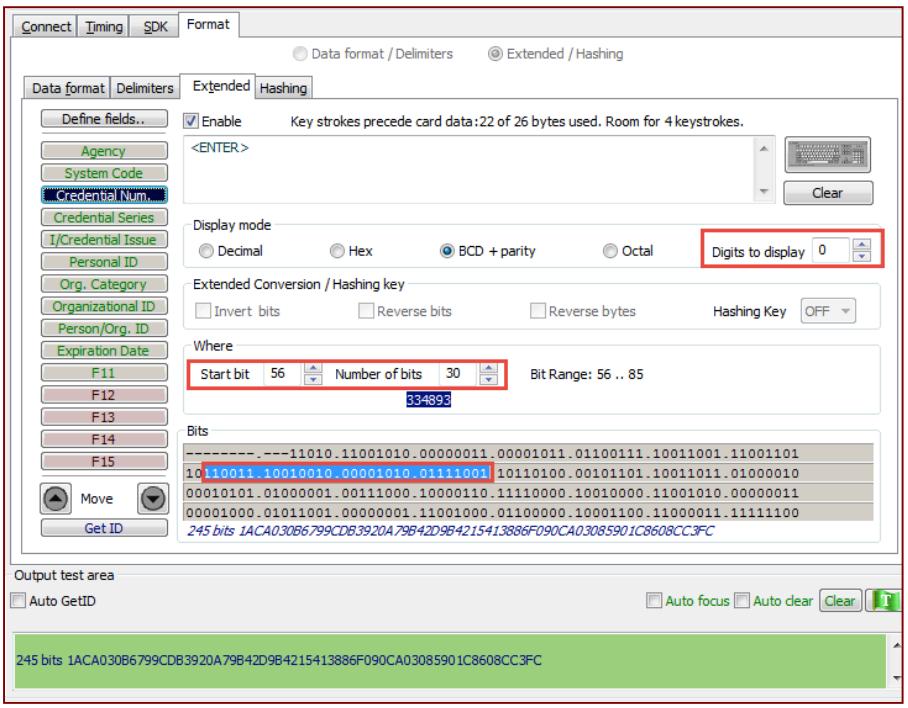

Image 86: Bits Window

Configuring the Reader in Extended Mode

1. Connect to the reader using the available communication port supported by your reader and press the “Connect” Button (A).

2. Select the Extended/Hashing radial button and press the “Write Active” button (C).

3. Select the “Extended” tab (D), all fields on this tab are active for the pcProx Plus with the Extended feature.

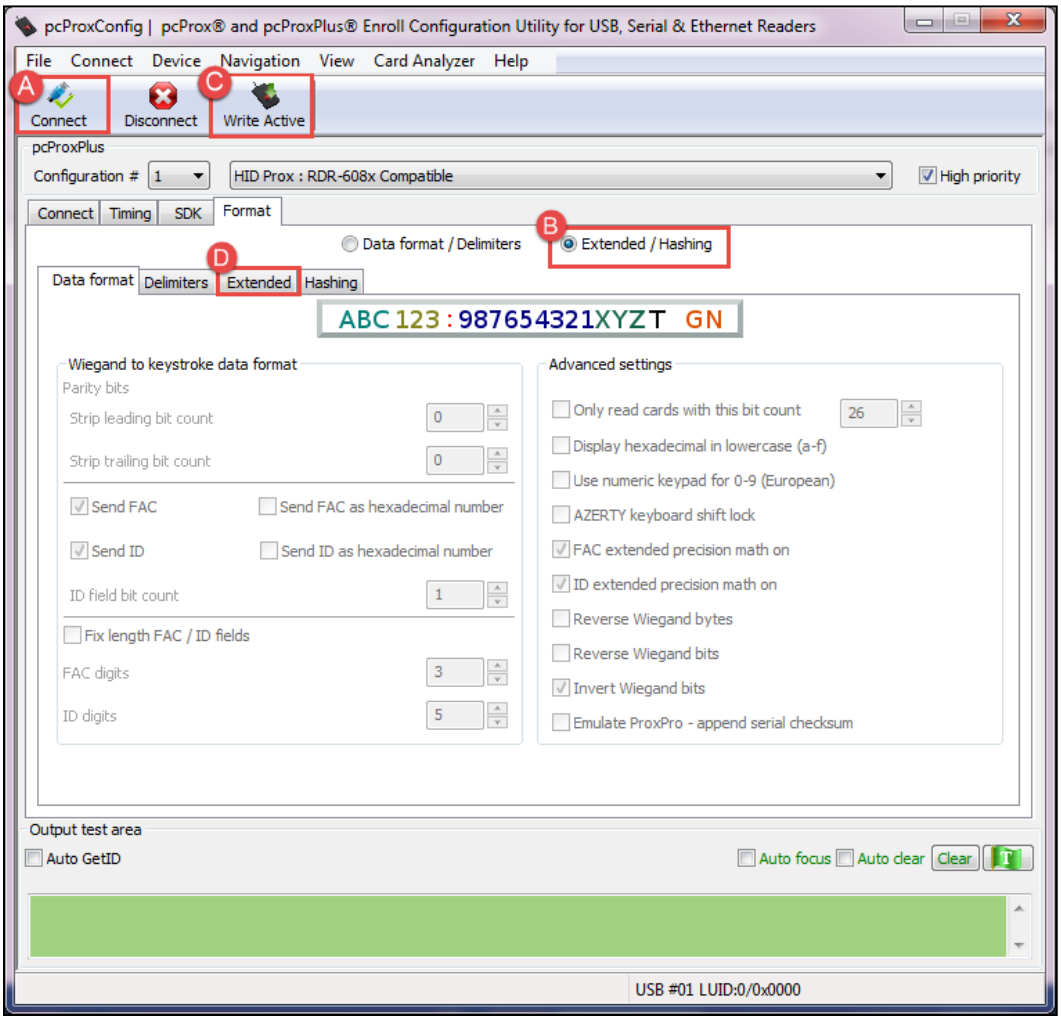

Image 87: Configuring the Reader in Extended Mode

Determining the Card Size

1. Press “GETID” (A) and wait for the “GetActive ID” dialogue box to appear.
2. Place the curser in the dialogue box (B) and present the card to the reader.
3. The default field setting values will appear in the dialogue box (B) and automatically close.
4. Now the application is configured using the default settings determined by the card size.

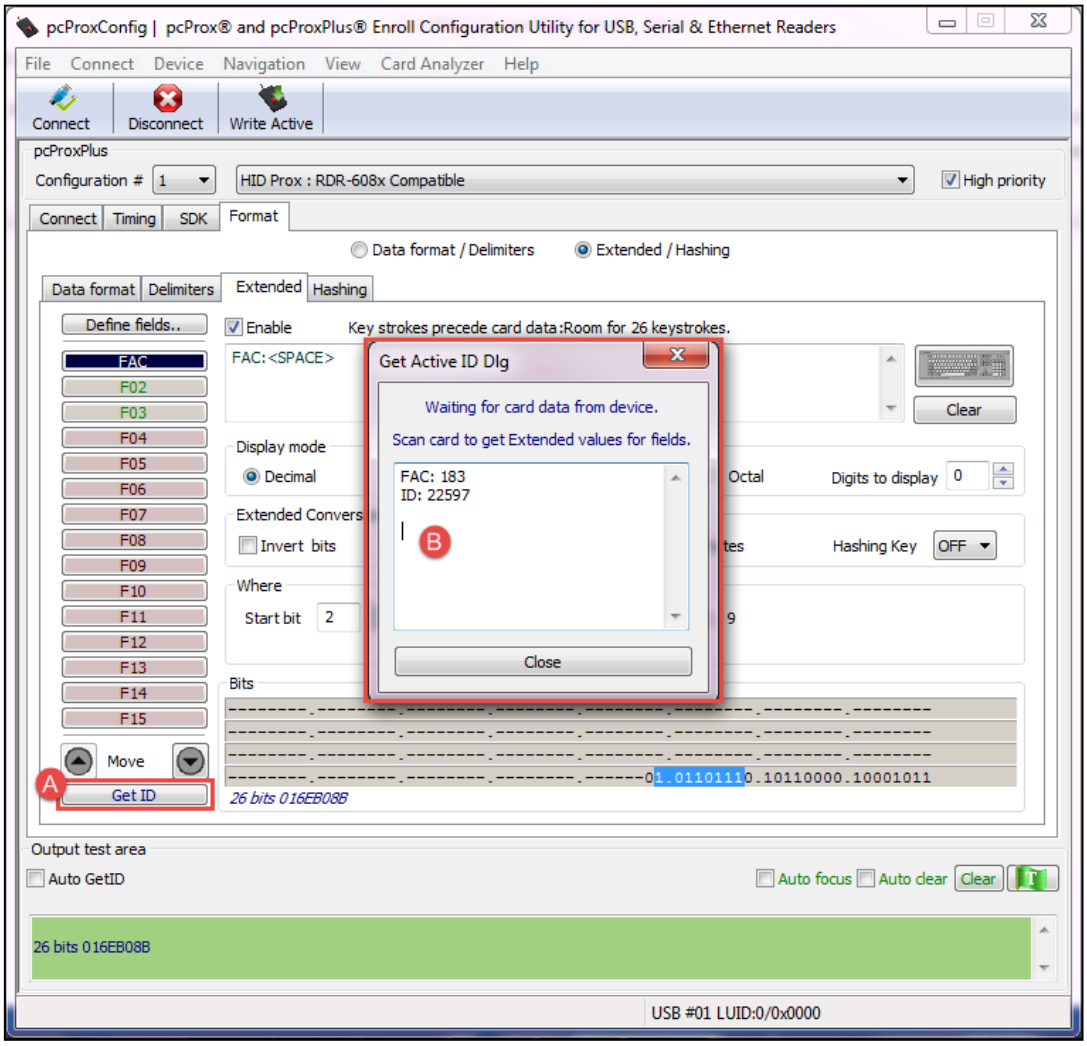

Image 88: Determining the Card Size

Selecting the Bits to Use for the Facility Code (FAC) Field

1. In this example field 1 “FAC” is used as the field for our facility code. In the “Where” box, the “Start bit” (A) field is used to determine the facilitiy code start position.

2. The size or number of bits used for the facility code are determined by the “Number of bits” field (B).

3. The bit box (C) displays the selected bits in blue.

4. The blue data box (D) contains the value of the selected bits.

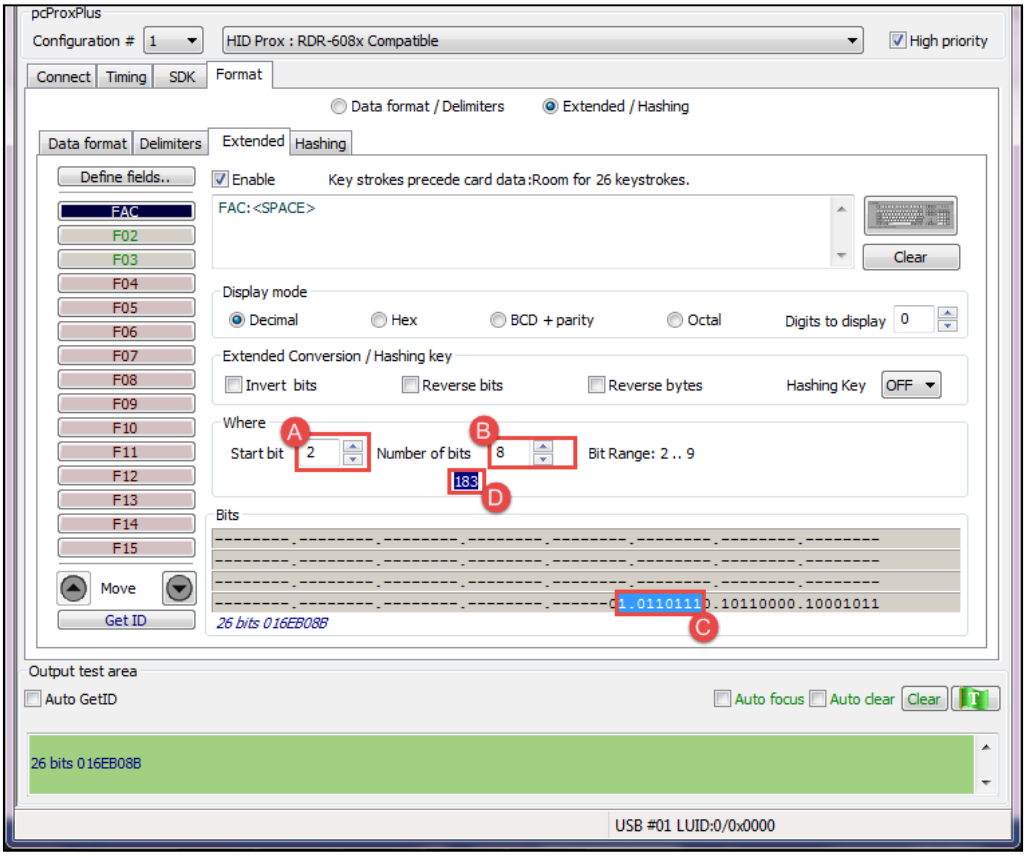

Image 89: *Selecting the Bits to Use for the Facility Code (FAC) Field*

Selecting the Bits to Use for the Card ID Field

1. In this example field 2 “ID” (A) is used as the field for card ID. In the “Where” box, the “Start bit” (B) field is used to determine the ID start position.
2. The size or number of bits used for the ID are determined by the “Number of bits” field (C).
3. The bit box (D) displays the value of the selected bits in blue.
4. The blue data box (E) contains the value of the selected bits.
5. Press the “Write Active” button to store the new settings in the reader.

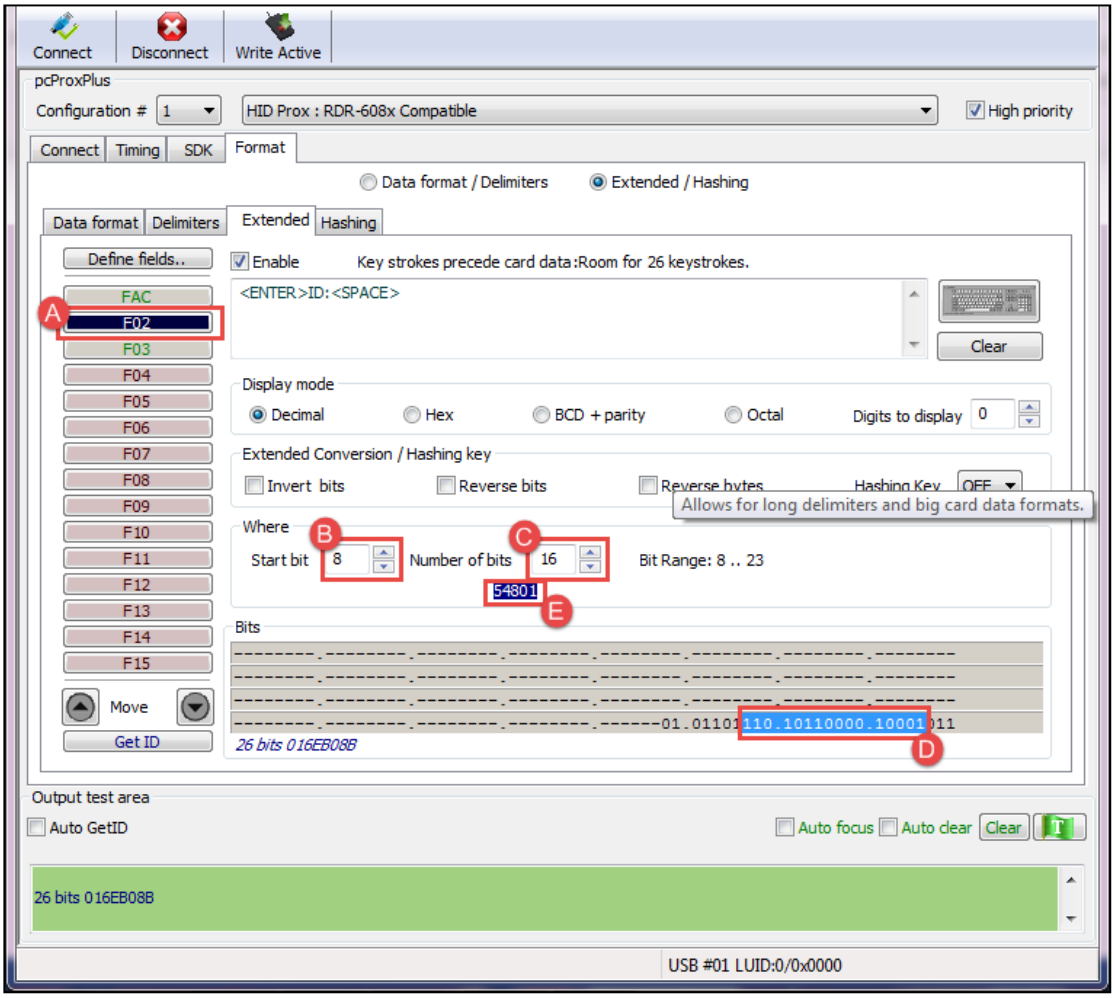

Image 90: *Selecting the Bits to Use for the Card ID Field*

Verify the Reader Settings

1. Open Notepad and place the curser inside the editor (A).
2. Present the card to the reader and verify the values match the selected bits for fields 1 and 2.

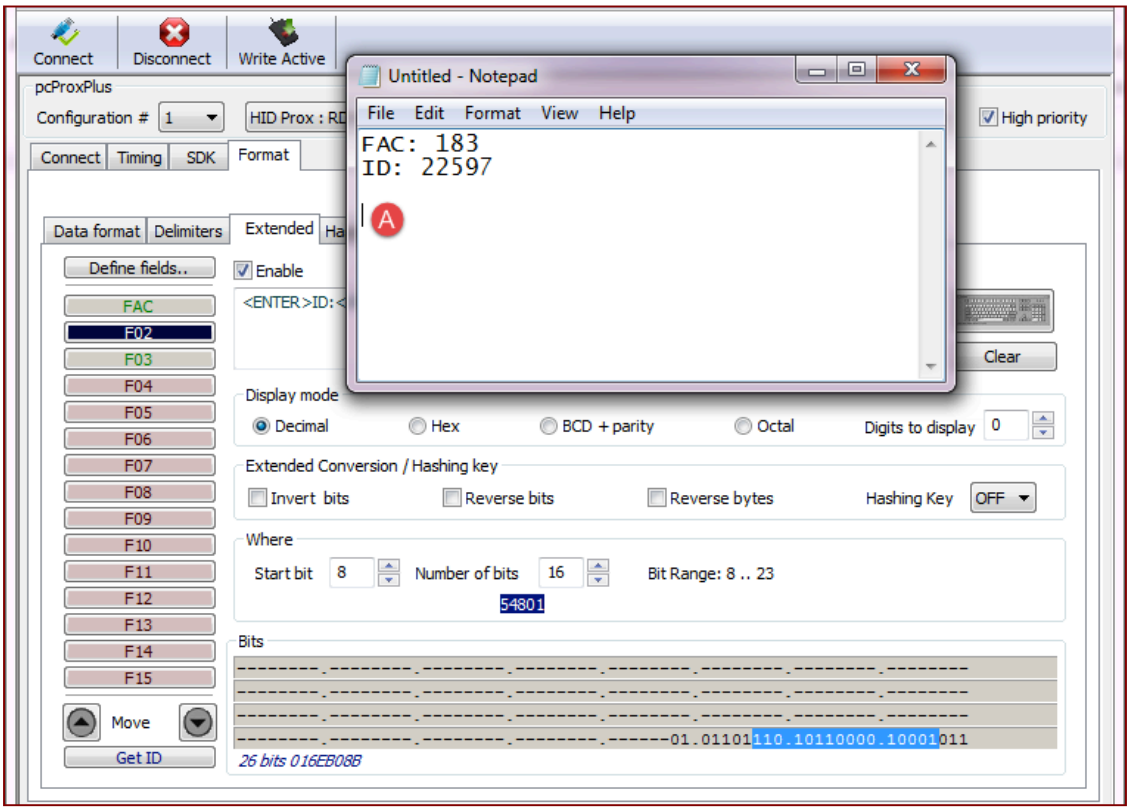

Image 91: Verifying the Reader Settings

Determining the Card Format

It is important to be able to determine the format of the card data in order to locate the ID and FAC bits. Cards come in many bit formats. It is necessary to determine any Leading and Trailing parity bits and exactly how the ID and FAC are configured. This data must be correctly interpreted to properly read card data.

Card data format in binary is typically: parity + FAC + ID + parity. There can be leading or trailing zeros to many parity bits.

In this example the card is 26bit number is 00.00.00.00.00.6C.7C.DB.

Enter the above hexadecimal number into the Windows calculator and use the programmer mode to find the binary equivalent.

MSB LSB

00011011000111110011011011

00110110001111100110101

(FAC54) (ID15981)

Enter the decimal number you believe is on the card into the Windows calculator and use the programmer mode to find the binary equivalent. In the example above, a FAC of 54 and ID of 15981 were known values.

The leading parity bits are the most significant. The trailing parity bits are least significant.

Hashing Tab

Hashing tab is used to write two configurable 16-byte Hash Keys to the device's flash memory. These Hashing keys can be selected using Hashing Key drop down box available on the Extended tab to enable hashing for the selected defined field. It protects user's login information from unauthorized changes.

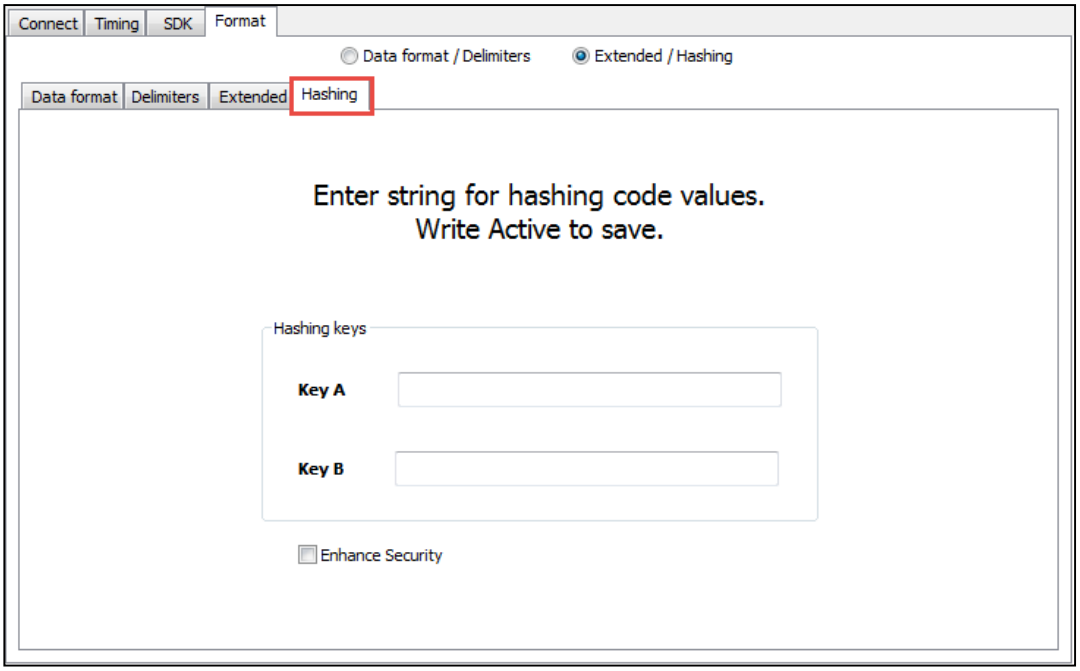

Image 92: Hashing Tab

Only the pcProx and pcProx Plus with extended feature supports the hashing feature.

Function	Definition
Key A	First 16 byte hash key.
Key B	Second 16 byte hash key.
Enhance Security	Enables security flag within device's memory.

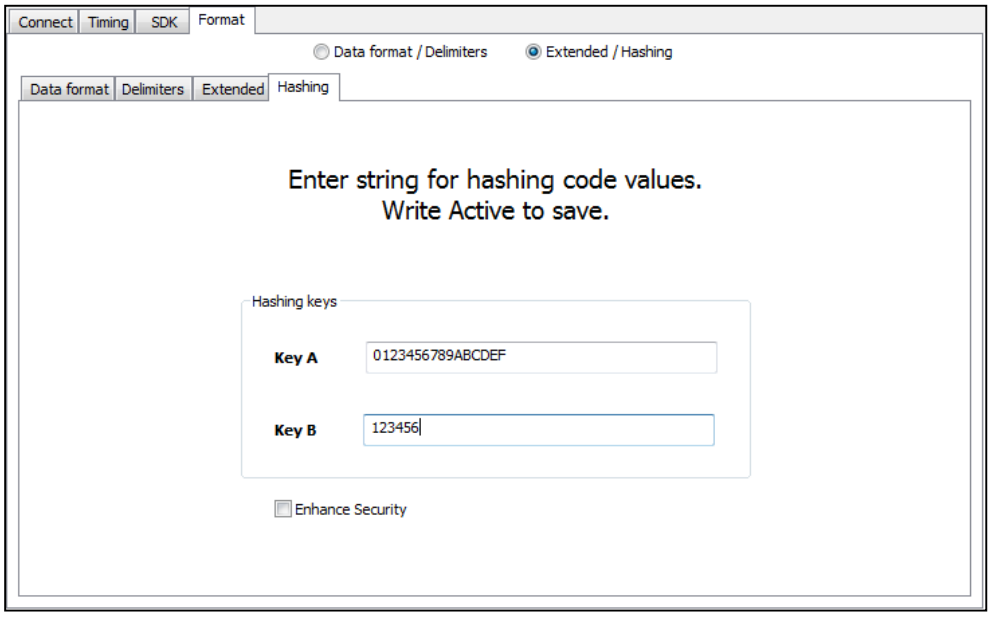

Image 93: Hashing Code Values

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

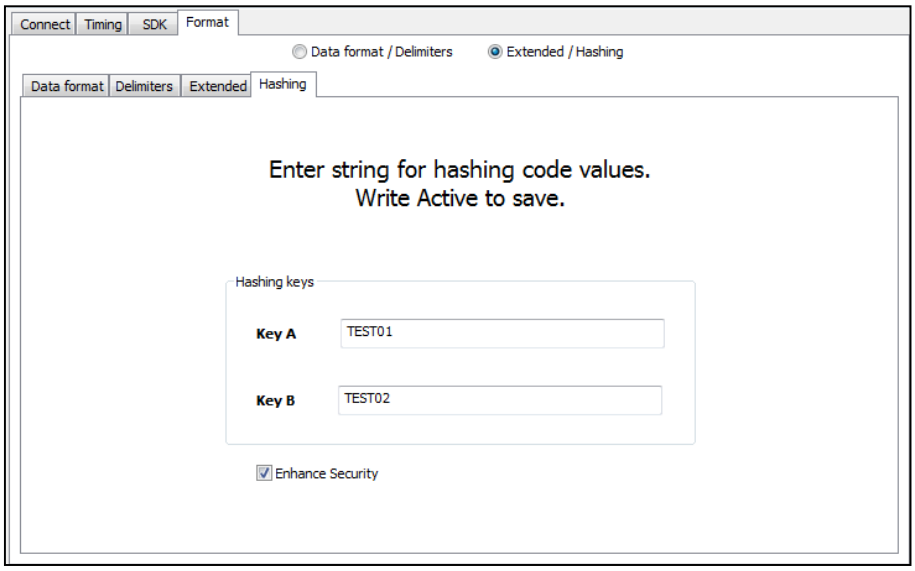

Image 94: Enhance Security Enable Box

The Enhance security feature enables the security flag within the reader's memory. Entering the Hashing key or keys, checking the Enhance Security enable box, and pressing Write Active enables the Enhance Security feature. The user can enter keys or enable the security function separately.

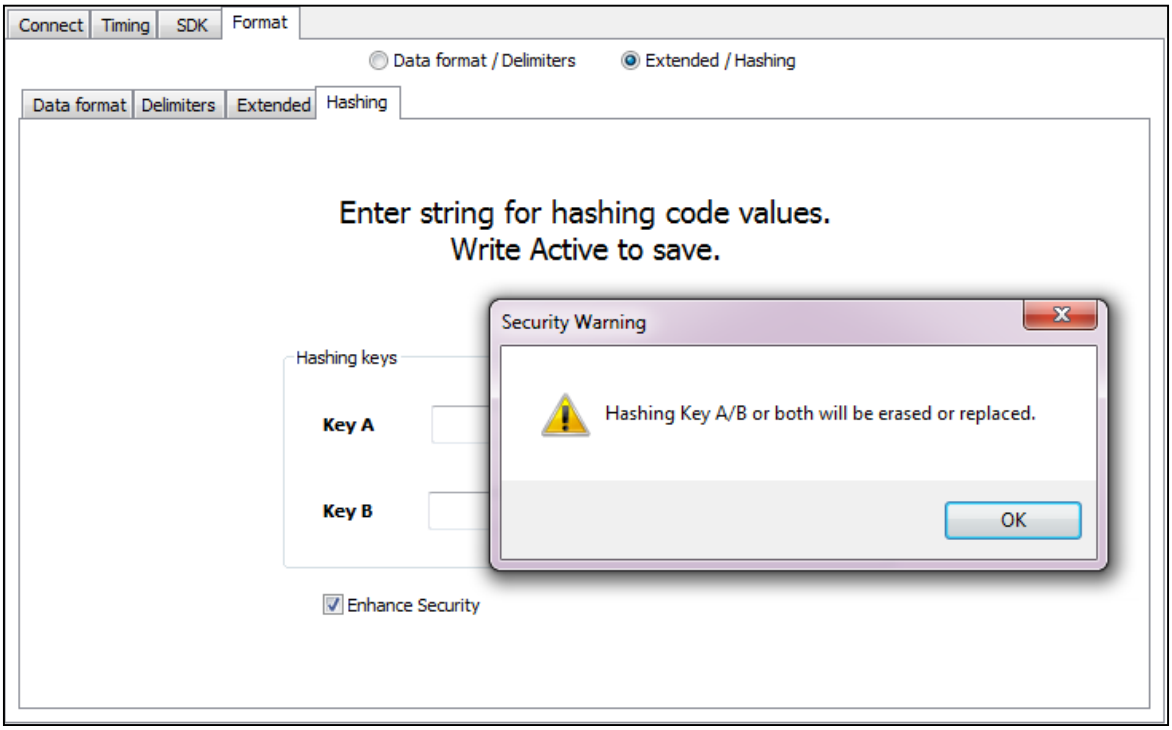

Image 95: Write Active Warning

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 Active" button after the security bit is set will cause the application to reset the Hashing keys and write the new configuration. A warning pop-up window will appear.

The user can change the extended fields without resetting the Hashing keys, when the device 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.

Secure Tab

If the reader supports DES/2K3DES/3K3DES/AES EV1 Secure technology, then the Secure TAB will be enabled and provides a way to enter Secure Encryption card keys into the Reader to support MIFARE® DESFire® EV1 cards. To read encrypted data stored in a field in 13.56 MHz cards, the reader needs additional decoding information such as a 16-byte card key and supporting configuration settings. The GUI example below shows the necessary settings to complete an EV1 Secure write.

After the configuration parameters requirements are gathered, enter the settings in their appropriate fields and then click on “Send Security Configuration” to configure the reader. Please be aware that each Secure Key is set according to the reader configuration so you can have unique secure settings for each reader configuration.

> Regarding the Format TAB functions, the DATA format / Delimiters and Extended / Hashing functions have no effect on reader performance or data output.

To validate card operations, scan the EV1 Secure card and note data in the green output box below.

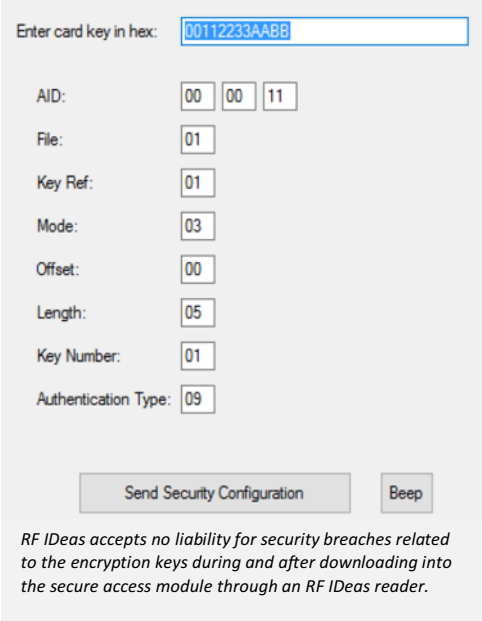

Image 96: Secure Tab

Card Key	16 Byte Card Key (Hex)
Application ID	Application and File Number point to a field on the card
File Number	Card File Pointer
Key Reference	Which key the reader should use, can store multiple keys
Encryption Mode	Choice of: 00 - Plain, 01 - MAC, 03 - Encrypted
Offset	Offset within file to start reading
Length	Bytes in field to read
Key Number	Which key the card should use
Authentication Type	Choice of: 02 - 2K3DES, 04 - 3K3DES, 09 - AES128

Bluetooth® Low Energy Technology

Certain RF IDeas readers support Bluetooth low energy technology capability that will automatically activate the Bluetooth tab for intuitive RF control. The essence of this control is to independently enable or disable Bluetooth RF Radio and/or RFID RF circuitry and these settings are volatile (not stored). The reader will power up with Bluetooth module off and Radios powered ON.

From here you can select the following states:

BLE OFF / RADIO OFF
BLE OFF / RADIO ON
BLE ON / RADIO OFF
BLE ON / RADIO ON
BLE RADIO TOGGLE (i.e. Bluetooth ON / RFID OFF, Bluetooth OFF / RFID ON)

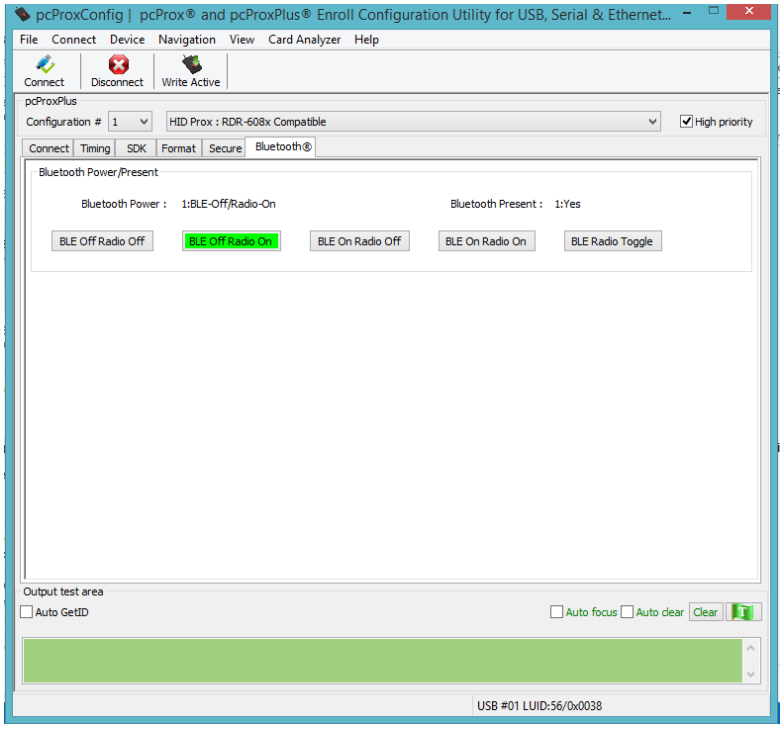

Image 97: Bluetooth Low Energy Technology

Chapter 4.Tips and Troubleshooting

4.1 Troubleshooting

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

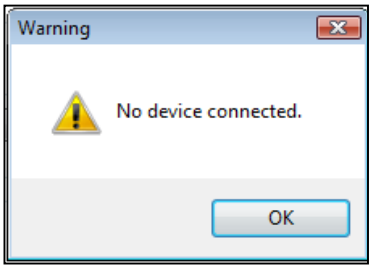

Image 98: No Device Connected

1. Check to be sure the device 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.

2. 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 device.

3. Verify the correct model and the software configuration screen agrees with the device attached.

4. Verify the port agrees with the workstation connector.

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

Change the release time to 1000 on the Timing tab for USB keystrokes to slow down the device. Open Notepad or Word and swipe a card to display the card data to see the actions of any non-printable symbols.

If the device does not read the card, contact the card manufacturer/vendor to verify that the card type is compatible with the device model.

4.2 Precautions

Do not mount the device directly on a metal surface. This could interfere with the RF signal and the operation of the device.

The device may not recognize valid cards in the presence of high RF fields. If current readings are erratic, take the following step:

Move the equipment from any known transmitters nearby.

Contact Technical Support at (866) 439 - 4884 for more information.

4.3 Before You Call Technical Support

Please make sure you've identified your reader model and credential type being used. Have this information ready so that your call will be routed to the correct specialist.

For Assistance:

Phone: (847) 870 -1723
Email: TechSupport@RFIDeas.com

4.4 Talking To the Technician

Provide the reader model and credential type being used to the Technical Support Specialist. Explain your problem to the specialist.

Be prepared to provide the following information:

- Error messages displayed on the computer.
- What you were doing when the problem occurred.
- What steps you have taken to resolve the problem, including results from each steps.

Listen and follow the steps provided by the specialist. Let the specialist know what happens when you perform the steps.

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FCC Compliance Statement

FCC ID: M9MPCPROXHUSB100 (HID USB Model)
FCC ID: M9MPCPROXM101 (Indala Model)
FCC ID: M9MRDR6X8X (Kantech, Indala, Casi-Rusco)
FCC ID: M9MPCPROXC101 (Casi-Rusco Model)
FCC ID: M9MRFID1856I100 (MIFARE/iCLASS Models)
FCC ID: M9MRDR7580 (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7581 (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7081AKE (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR8XX8U (Plus combo Model)
FCC ID: M9MRDR8058X (Multi-protocol Combo Model)
FCC ID: M9M758XCCL (MIFARE and Contact Model)
FCC ID: M9MRDR80081 (Plus SIO Combo Model)
FCC ID: M9MRDR60DX (125kHz USB Dongle Model)
FCC ID: M9MOEM805NX (Multi-protocol Combo Model)
FCC ID: M9MSB758X (Mifare 13.56MHz)
FCC ID: M9MLC6T8X (132 kHz USB Model)
FCC ID: M9MLC608XU0 (125 kHz Virtual Com Model)
FCC ID: M9MLC6X8X (Multi-protocol 125kHz)
FCC ID: M9MLC805X (Multi-protocol Combo Model)
FCC ID: M9MHP8058X (Multi-protocol Combo Model)
FCC ID: M9MLC7X11U (13.56MHz USB Model)
FCC ID: M9MBUPCPROXH100 (HID RS-232 Model)
FCC ID: M9MBUPCPROXA100 (AWID)
FCC ID: M9MPCPROXP100 (Pyramid)
FCC ID: M9MRDR7081 (iCLASS Module based)
FCC ID: M9MRDR7P71 (FIPS 201 13.56MHz)
FCC ID: M9MRDR7L81 (Legic 13.56MHz)
FCC ID: M9MRDR7081AKF (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR75DX (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR758X (iCLASS MIFARE and Other 13.56 MHz)
FCC ID: M9M8058XCCL (Multi-protocol and Contact Model)
FCC ID: M9M7580CCL (MIFARE and Contact Model)
FCC ID: M9MRDR70EX (13.56MHz Express Model)
FCC ID: M9MLC608X (125KHz USB Model
FCC ID: M9MSB708X (iCLASS 13.56MHz)
FCC ID: M9MSB6X8X (Multi-protocol 125kHz)
FCC ID: M9MLC60DX (125 KHz USB Model)
FCC ID: M9MLC758X (13.56 MHz USB Model)
FCC ID: M9MLC6X11U (125 kHz USB Model)
FCC ID: M9MLC8058U (Multi-protocol Combo Model)
FCC ID: M9MLC8008XU (Multi-protocol Combo Model)

"Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by RF IDeas might cause harmful interference and void the FCC authorization to operate this product.

Note: This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This product complies with FCC OET Bulletin 65 radiation exposure limits set forth for an uncontrolled environment.

The reader may not recognize value cards in the presence of high RF fields. If the current reading is erratic, the user shall take the following step: Move the equipment from any known transmitters nearby. For more information contact Tech Support at (866) 439 - 4884.

Complies with
IMDA Standards
DA103548

Index

Appendix

Standard 26-Bit Format Structure

There are several bits constructed together that comprise of data sent from the proximity card to the device. There are numerous bit formats and lengths for proximity cards. The most popular is a 26-bit card format. The typical layout for this format is 24 bits of usable information as the first and last are parity bits to ensure data integrity.

The 26-bit format consists of 256 possible facility codes. Within each facility code there is a total of 65,535 unique card numbers.

The standard 26-bit Wiegand format is H10301. It is binary encoded data. The format consists of 2 parity bits, 8-bit facility code (F) and 16-bit card number fields (B). This format displays below:

PFFFFFFFFBBBBBBBBBBBBBBBP
EXXXXXXXXXXXX.....
.....XXXXXXXXXXX

XO

Bit Coding
P = Parity
O = Odd Parity
E = Even Parity
X = Parity Mask
F = Facility Code, range = 0 to 255
B = Card Number, range = 0 to 65,535

In general, the 26-bit format is the industry standard format. Primary benefits of this include:

- Open format
- Convenient to order
- Universal access control panel acceptance

The sale of this format is not limited to any one company yet the range of card numbers available in this format is limited. There is a potential for card numbers to be duplicated.

Please go to www.RFIDeas.com and follow the **Support ⇨ Learning Center ⇨ Proximity Card Formats** link for more details. The card manufacturer may also have additional details about the card format.

Use the pcProx Device 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. Some examples are shown below. Please see RF IDeas pcProx 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 device 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 device 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 device 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 re-produce, while configuring the data. These additional characters are labeled as Sp1, Sp2, and Sp3 on the Delimiters Tab menu selections.

Other Products & Accessories

Software Developer's Kit
Allows independent developer's to use their application to read proximity access badge Read ID data of more than 1 billion cards in the field

PVC Label Proximity Card
Credit card size with paper release liner, 500 cards per box

Proximity Cards, Labels, Key Fobs
Complete selection of various manufacturers proximity cards, labels and key fobs. Marked with data code and ID number, available in several Wiegand formats

pcProx Read/Write Contactless
Reads and writes directly to the smart cards

pcProx Writer and Playback
Desktop read-only for iCLASS and NXP and smart cards

pcProx Playback Starter Kit
Plays back card sector data in ASCII or keystrokes

pcProx Sonar
Presence detector configured as a keyboard

PS/2 to USB Power Tap
Powers a USB RF IDeas device from a PS/2 port

Mounting Brackets
Further adjust the standard mounting of the device angle

RF IDeas

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