pcProx® Plus, pcProx® Enroll & Wiegand Converter

Configuration Utility
User Manual

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 a 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

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Glossary Of Terms

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 proximity card and badge reader available in self-contained electronic modules for easy system integration.

pcProx Contactless: The registered RF IDeas brand name given to all 13.56 MHz contactless card reader products.

pcProx Proximity: The registered RF IDeas brand name given to all 125 kHz proximity reader products.

Proximity: The low frequency 125 kHz RFID technology.

SDK: Software Developer's Kit. Software Developer's Kits from RF IDeas provide the high level command capabilities to integrate software applications to our devices.

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The Basics

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

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.

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).

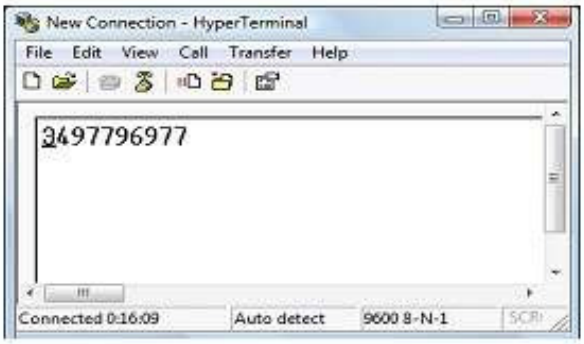
Output Formats

Keyboard Emulation

Card Data

ASCII Output

Raw Card Data



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.

The below illustrates some of the various form factors available.

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 or User Identification, can be encoded as data on the card when a security key is needed.

Manufacturer/Vendor Card Compatibility

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

Reader Configuration Purposes

The method of encoding data on a card and transmitting data to the reader differs accordingly to each technology involved. The reader itself is not aware of the makeup of the card data format or access privileges for the cardholder. This information is only accessible through the configuration process of the reader utilizing the supplied software.

The reader is very flexible and may need to be configured in order to present an exact desired output for the user, such as, singling out FAC or ID, obtaining a desired base (i.e. decimal, lowercase, upper-case, hexadecimal).

Differences Between pcProx Plus Reader 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 two cards of your choice among 35 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, which is either 125 kHz proximity or 13.56 MHz contactless.

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.

RDR - 6 3 8 1 A K U

Reader Type | Frequency | Card Type | Model | Housing | Version | Housing Color | Interface

Reader Type: The reader type distinguishes between standard reader, OEM, converter, mag-stripe, or a kit.

Frequency: RF IDeas' access control readers are available in low-frequency 125 kHz (proximity) or high-frequency 13.56 MHz (contactless).

Card Type: The card type allows for the selection of over 35 different card types for reader compatibility (Please visit www.RFIDeas.com, choose a product and locate the Part Numbers tab for specific device part numbers associated to card types).

Housing: This option provides the user to select the form factor housing for the desired reader. The housings include; desktop, wall mount, USB dongle, PCMCIA, bare board, ExpressCard, or custom. (For more on form factors, please visit www.RFIDeas.com)

Model: The model selection corresponds to the type of reader, whether it is a standard, writer (13.56 MHz contactless only), playback (13.56 MHz contactless only), SDK, or analyzer.

Version: The version refers to the selection of either our standard or custom build.

Housing Color: The color category simply allows for the selection of either our black or pearl housings. (Applies only to desktop and wall mount housings)

Interface: This option specifies the type of connection for the reader (i.e. USB, RS-232, PCMCIA, etc).

T

CONNECTORS

USB

Serial

Ethernet

PCMCIA

PS/2 Power

ExpressCard

OUTPUT

or

RS-232 Data

0.012345679012

USB Readers and Wiegand Converters

The pcProx USB keystroke device operates in two primary modes:

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

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

Note: The pcProx ExpressCard operates as a USB reader.

RS-232 Readers and Converters

The RS-232, Ethernet, or virtual COM port device operates in two primary 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.

Once the configuration settings are correctly configured and written to flash memory, the device can immediately be deployed.

Note: The pcProx PCMCIA operates as an RS-232 reader.

Minimum System Requirements

	Minimum System Requirements
HARDWARE	Pentium class PC
MEMORY	32 MB RAM
DISK	25 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®, Server 2003®, Server 2008®, Linux, Macintosh®. Can be used for keystroke applications

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

Reader Set-Up Basics

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

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

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

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.

LED Beeper

The desktop, USB dongle, wall mount, and bare board (OEM) model readers are all equipped with a light up LED on the front cover. The LED is configurable through the utility software (See LED and Beeper functions in the Software section) to allow the device to produce a beep upon light up of the LED when a credential is detected by the reader.

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.

In contrast to the pcProx Enroll readers, for which only one configuration can be programmed into the reader, the utility allows the pcProx Plus configuration process to create two separate configurations for users.

Utility Overview

Icon Toolbar
(pg.19)

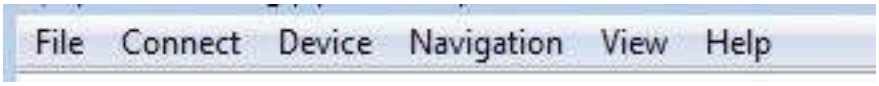
Menu Toolbar
(pg. 14)

pcProx Plus
Configuration
Area
(pg.18)

Standard
Configuration
Area
(pg.18)

Output Test
Area

Menu Tool Bar



The Menu Tool Bar contains all the basic configuration options for the utility.

File

The file menu lists the options for Opening .Hwg and Saving .Hwg files.

Open .Hwg/.Hwg+ File: Opens either a .Hwg or .Hwg+ file. A .Hwg or .Hwg+ file contains all the configuration settings for the reader. The utility comes with sample .Hwg/.Hwg+ files.

Save to .Hwg+ File: Saves the configuration settings to the reader.

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

Exit: Exits out of the entire utility

Connect

The connect menu provides options for device to utility connections.

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

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

Auto Connect to Ethernet on Startup: Utility option to search for ethernet connections on startup.

Why use the Auto Connect feature? The utlity's auto connect features allow users to have an easy auto connect through a specified port on startup.

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

Why use the Connect feature? The utlity's general connect option gives users the ability to connect their device to the utility, without the user needing to identify the devices actual interface connection. This feature cycles through all available ports until a device is found.

Note: For further information on the connect option, see the connect portion of the Icon Toolbar section on page 19 of this manual.

(Connect--Cont.)

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

Why use the Connect to feature? The connect to feature allows the utility to connect to a device through the specified port upon selection. This is especially helpful when users are switching out and changing devices with different connections.

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

Note: For further information on the disconnect option, see the disconnect portion of the Icon Toolbar section on page 21 of this manual.

Device Menu

The device menu lists the options for resetting, writing to, and reading the device's data memory. 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 configuration reader device.

Single Configuration Readers:

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

Read Settings: Displays the current connected device configuration

Write Settings: Writes the current configuration settings to the connected device

Note: For more information on the Write Settings option, see the Write Settings/Write Active portion of the Icon Toolbar section on page 21 of this manual.

pcProx Plus - 2 Configuration Reader:

Reset to Defaults: Resets all configuration parameters to defaults. Defaults are set as HID Prox and RDR-758x Equivalent (covers 5 different card types; HID iCLASS CSN, ISO 14443A CSN, ISO 15693A CSN, MIFARE CSN, MIFARE DESFire CSN)

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

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

(Device Menu--Cont.)

pcProx Plus - 2 Configuration Reader:

Read Active: Reads the current configuration. Active settings are what allow the device to function.

Write Active: Writes the current configuration to active settings.

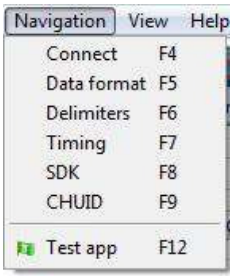
Note: For more information on the Write Active option, see the Write Settings/Write Active portion of the Icon Toolbar section on page 21 of this manual.

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

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 tab.



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.

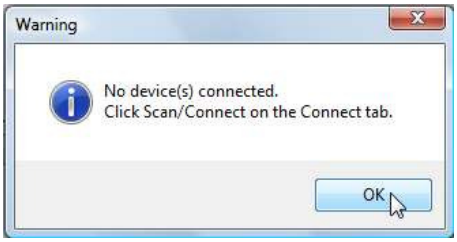
Note: Tooltip balloons appear automatically, or pop up, when the user pauses the mouse pointer over a tool or some other UI element. The tooltip appears near the pointer and disappears when the user moves the pointer away from the tool, or simply waits for a few seconds. The tooltip displays descriptive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

(View Menu--Cont.)

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 the Icon Toolbar section on page 19 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.



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.

Note: 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 warning are detected.

Note: 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.

Help Menu

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

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

Note: 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.

Check Website for Software Updates: Clicking this option will take users to a location on the RF IDeas software updates portion of the website, and will detect what version of the pcProxConfig utility is currently in use. Any updates that are available will be listed for easy user download.

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.

Icon Tool Bar

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

Clicking the Connect icon button commands the utility to search for a device through all available 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.

Note: 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.

Device List
Pull-down Menu

Device Model
Number

(Connect--Cont.)

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.

Status Bar

Disconnect

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 available 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. Additionally, the status bar will display a “Disconnected” message.

Status Bar
Message

Write Settings/Write Active

The Write Settings icon button prompts the utility to write the current defined configuration settings to the device. Since the writing options differ between a single configuration device and a two configuration device (pcProx Plus), the Write Settings icon will change depending on whether a single or two configuration device is connected. When a two configuration device is connected, the icon text will change to read “Write Active,” as seen below.

pcProx Plus Configuration

This section is only available to configure selections when a two configuration device (pcProx Plus) is connected to the utility.

Note: When a single configuration device is connected to the utility, the pcProx Plus Configuration area is grayed out (as seen below) and selections within this area are not possible.

The pcProx Plus Configuration area allows for users to set-up two different configurations for their device. The configurations could be either one 125 kHz and one 13.56 MHz, or two 125 kHz and two 13.56 MHz. The configurations can also be of the same card type. The device is set with two default configuration settings, the HID Prox and RDR-758x Equivalent (covers 5 different card types; HID iCLASS CSN, ISO 14443A CSN, ISO 15693A CSN, MIFARE CSN, MIFARE DESFire CSN).

Note: If configuring the system 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.

Configuration #
(Number)

High Priority

Card Type
Drop-Down

<u>Configuration # (Number)</u>: This option provides the ability to switch between configurations. Users can set and edit settings for two separate configurations quickly and easily.

<u>Card Type Drop-Down Menu</u>: As stated above, the device is set with two default configuration settings, the HID Prox and RDR-758x Equivalent. This drop-down menu lets users choose the desired card type for their own configuration settings. Each configuration has the ability to have separate card types.

<u>High Priority</u>: 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 13.56MHz/125kHz cards as well as single-technology cards, and one of those is preferred over the other.

The High Priority bit increases the time it takes to read the card. When the High priority bit is set, the reader will try to read that card type 10 times before switching to the other configuration.

Standard Configuration

This Standard Configuration area provides all the options and details necessary to configure a connected device.

Serial: RS-232 and Virtual COM

USB

Ethernet

Connect Tab

The connect tab offers the 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.

Note: 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, physical COM port devices, virtual COM port devices, including USB, 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 thru 8.

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

Note: Serial devices may slow when scanning a wide port range.

(Connect Tab--Cont.)

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

Port Option: Allows for changing the port location. Xport port location needs to match this number

Note: 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: Lists the devices that the utility is actively connected to.

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

Note: Remember, not all USB interface connections do not necessarily logically connect through 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.

CONNECTORS

USB

Serial

Ethernet

PCMCIA

PS/2 Power

ExpressCard

Output Test Area

Auto GetID

Auto Focus

Auto Clear

Test Button

Clear

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 every 500msec and displays the results directly under the checkbox, as seen below.

Card Data

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

> Note: 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 auto selects all text in the Output Test Area, so that new keystrokes output by the device will replace old text.

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 users own application to view the readers keystrokes. It opens any keystroking capturing program (i.e. notepad, wordpad etc).

Status Bar

The status bar (below the Test Area) displays various messages to alert the user of what the utility is doing, as well as connections and disconnections between the utility a device.

Status Bar

Data Format Tab

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

987654321 = Card ID Value

T = Termination Character

ABC = Pre-Card ID Delimeters- 3 Characters Max

GN = Card Gone Characters (When card leaves fields)

123 = Fa Access Code (FAC)

XYZ = Post Card ID Delimeters (Shared with Pre-Card ID)

The above diagram 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: Will send FAC as a hex number. The default is set to output as a decimal.

Send ID: This selection keystrokes out the ID portion of the card data.

> Note: When checked uses the defined ID field bit count bits. When unchecked uses all non parity bits.

Send ID as Hexadecimal Number: Will send 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: This option will make the FAC and ID a fixed length

FAC Digits: This will alter the FAC output by forcing a set length of digits, between 0 to 32, to be displayed.

ID Digits: This will alter the ID output by forcing a set length of digits, between 0 to 32, to be displayed.

Advanced Settings

Only Read Cards With This Bit Count: Select this option to filter out cards that are not the specified bit number. The bit number is specified in the box to the right and can range from 2 to 255 bits.

Display Hex in Lowercase: Will display hex in lowercase format.

> Note: The Send FAC as Hexadecimal or Send ID as Hexadecimal must first be selected before this option can be provided.

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

AZERTY Keyboard Shift Lock: This selection will output the data as if it were being output from an AZERTY keyboard.

(Data Format Tab--Cont.)

FAC Extended Precision Math On: Interprets the FAC data from a card to allow for the proper amount of bits to provide appropriate info.

ID Extended Precision Math On: Interprets the ID data from a card to allow for the proper amount of bits to provide appropriate info.

Reverse Wiegand Bytes: Reverses data in byte chunks (8 bits = 1 byte)

Reverse Wiegand Bits: Reverses each bit

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 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

Use this tab to configure pre and post data delimiters. A delimiter can also be set between the ID and FAC card data.

Click the appropriate keyboard icon to select the appropriate corresponding delimiters.

ABC = Pre-Data

: = FAC/ID

Note: 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.

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.

Sp1, Sp2, Sp3 =
Special Keys

Delimeter Keyboard

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

Left Click : To select desired delimter (key)
Left Double Click: To select 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 delimter keys will highlight and appear in the top left corner that is initially labeled <NONE>. Once a chosen delimter is inserted, the virtual keyboard will close.

Revert: Takes user back to previously inserted delimeter choice
<None>: Deletes any selected/inserted delimter
Insert: Applies selected delimter to be used

Note: Depending on the type of device connected (i.e. serial, FIPS201, 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, 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 re-produce, while configuring the data. These additional characters are labeled as Sp1, Sp2, and Sp3 on the delimeters Virtual Keyboard (For more information on Password Security see page 54). The Sp1, Sp2, and Sp3 keys are used only for keystroking environments to send unprintable characters to a specified application.

Timing Tab

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

Card Data Hold Time: This option allows for users to determine in msec'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).

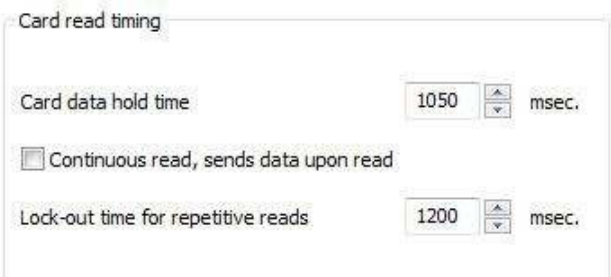
The timing options can range from 50 to 9950 min/max (50msec increments only) and the default is set to 1000.

Note: 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.

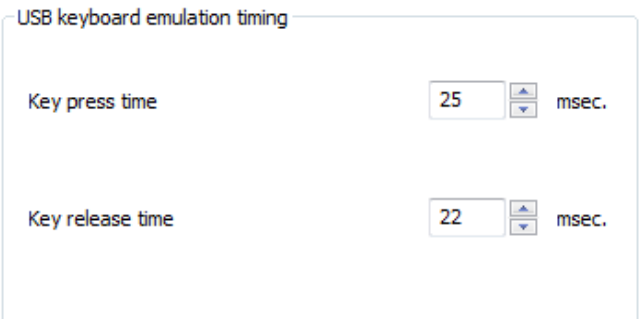
Lock-Out Time for Repetitive Reads: The time that it takes the reader to read another card. Must be equal to or greater than the hold time and is only done in 50msec increments.

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



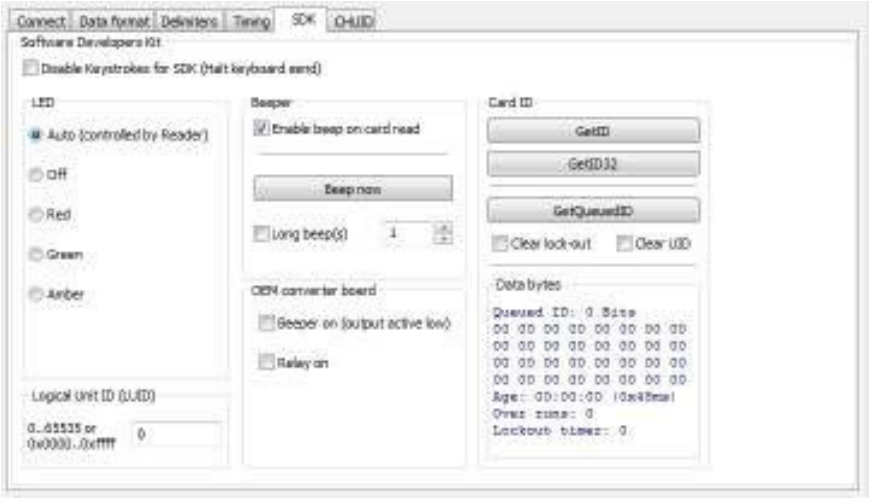
Key Press Time: The length of time the key is held down. The minimum value is 0. The maximum is 640. The default is 20.

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



SDK Tab

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



Software Developers Kit

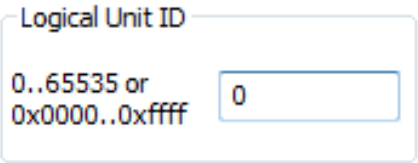
Function	Description
Disable Keystrokes for SDK (Halt Keyboard Send)	Check to disable keystroking. When keystroking or unsolicited serial out is disabled, all card data must be read via the SDK functions.

LED

The LED section allows users to control the LED light actions on the device to provide users info regarding the card data.

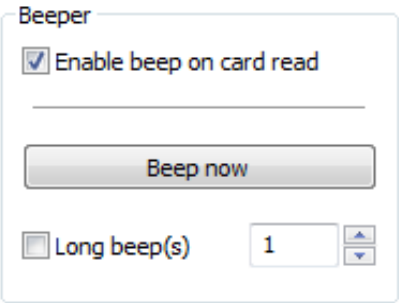
Function	Description
Auto	Select this to make the device set the LED color.
Off	Select this to set the LED to off
Red	Select this to set the LED color to red.
Green	Select this to set the LED color to green.
Amber	Select this to set the color to amber.

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



Beeper

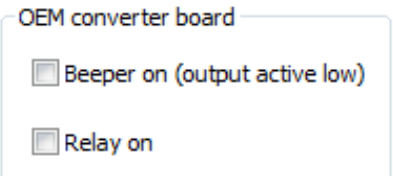
Function	Description
Enable Beep on Card Read	Check this to set the device to beep when a card is read.
Beep Now	Press to listen to the beep the reader will provide when in use.
Long Beep(s)	Check the box to configure a long beep of 375 msec. By default the beep is set to a short beep of 125 msec. 2 long beeps or 5 short beeps are allowed only



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

OEM Converter Board

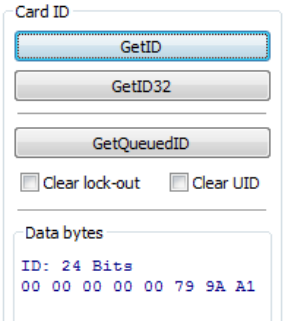
Function	Description
Beeper On (Output Active Low)	Check this to turn the device beeper on.
Relay On	Check this to activate the OEM board.



Card ID

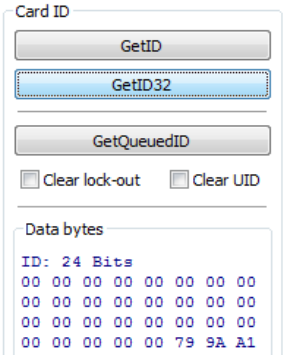
Function	Description
GETID	Click while scanning a card over the device. The ID displays under the button. This returns 64 bits maximum.
GETID (32)	Click while scanning a card over the device. The ID displays under the button. This returns 255 bits maximum.
GetQueuedID	Click to display the last card data 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 clearUID is set, the card and the over run counters will be cleared for the next read. If clearHold is set, the reader will be ready to read another card immediately.

GETID Data Display

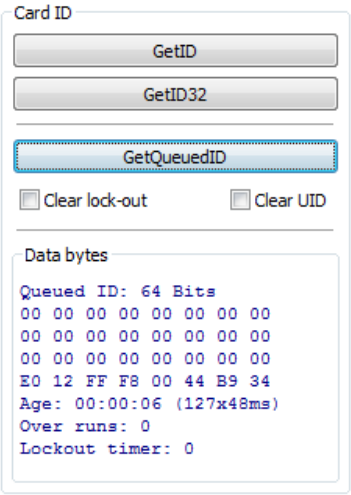


The Most Significant Byte is first – 79.
The Least Significant Byte is last – A1.

GETID(32) Data Display



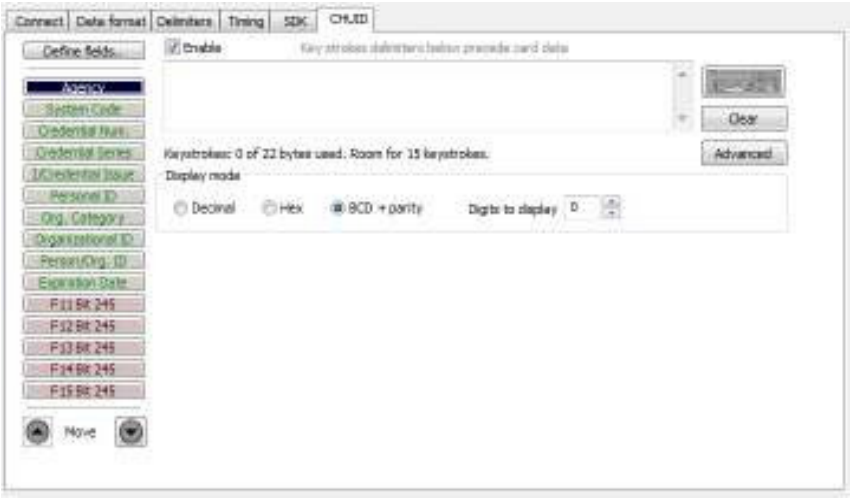
GetQueuedID Data Display



HH:MM:SS displays – 00:00:06

CHUID Tab

This tab allows manipulation of all fields on the Federal Information Processing Standard (FIPS) 201, or proximity cards. Use the red buttons to configure additional fields. The fields can be moved to change the order displayed in the binary bit pattern display.



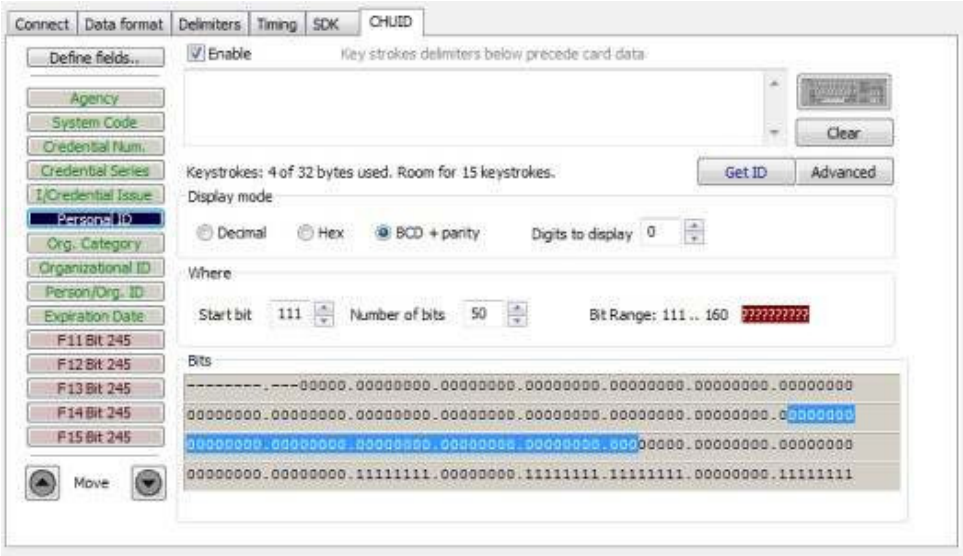
Function	Description
Define Fields	Click to select the number of source bits to define the fields. The correct type must be selected to allow for all card bits to be manipulated.
Enable	Check to enable the highlighted field. This allows the delimiters to be output and the corresponding card field to 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. Each field may have from 0 – 14 key strokes.
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 w/ 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.

Function	Description
Advanced	Click to display the binary bit pattern.
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.

Advanced Button

This displays the bit ranges of the card.

Click each field button to display the location of the card binary data. In the example below, the Personal ID starts at bit 111, is 50 bits long, and is 10 digits. 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.

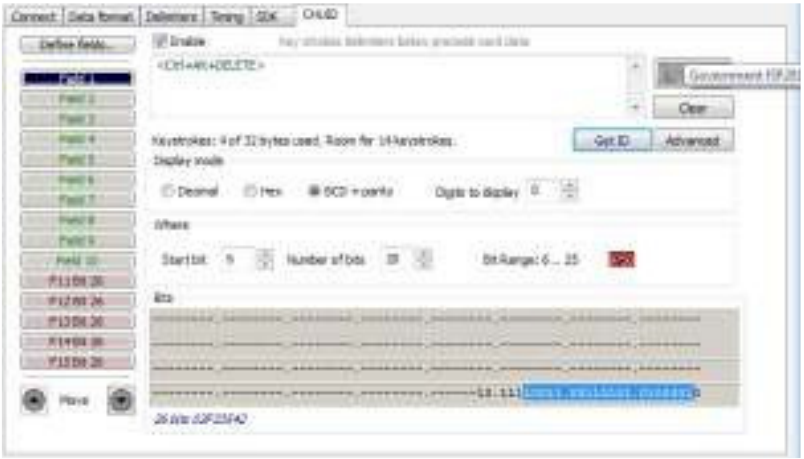


Note: The message that displays the number of bytes used and how much room for keystrokes above the Advanced button is determined by the device's flash memory. In this example the configuration is: "Keystrokes: 8 of 32 bytes used. Room for 14 keystrokes." Every field is 15 keystrokes maximum. All fields share 96 bytes.

The Bit Range that displays to the left of the binary bit pattern is the Start Bit field total + the Bits field total – 1.

Get ID

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.

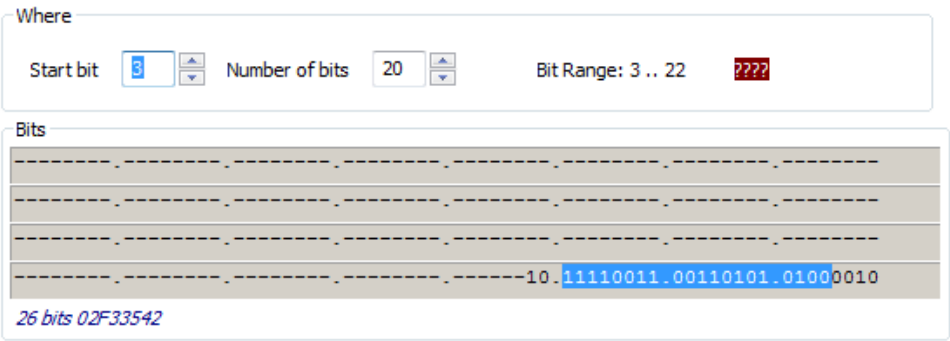


In this example, The Agency data starts at bit 11, is 16 bits long, and is 5 digits. The location of the agency data is highlighted in the binary bit pattern. The Bit Range is 6 .. 25.

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.

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

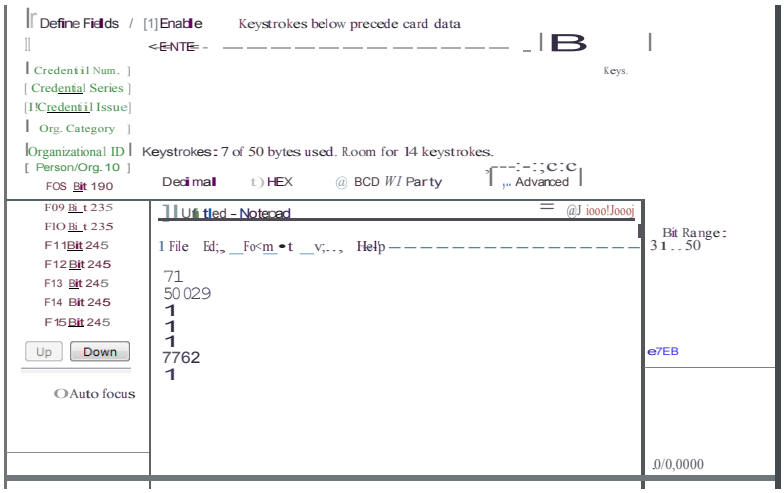
The Start Bit changes the actual location of the selected field on the binary bit pattern.



Note: The '????' that display to the right of the Digits 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, PersonaliD, and Expiration Date fields have been removed. Additional function keys display to configure more fields.



Assign Preceding Keystrokes

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

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

Click Clear to remove all preceding keystrokes as appropriate.

Each single keystroke entered to precede card data equals1 byte of memory.

Connect Data format Delimiters Timing SDK CHU D

Define fields.. Enable Keystrokesdelimitersbelow precede card data

SystemCode
credential...,,
OedenbaiSeries
I/OedenIlal!ssue
Personal ID
o-g. Category
OroarlzaOOnal ID
Petson}Org.ID
Expiration Date

F13Bit245

Keystrokes: 4 of 26 bytes used. Room for 14 keystrokes.

Advanced

Display mode

Dedmal Hlex @ BCD +parity Digits to display 0

Where

Start bit — —— Number of bits

Virtual Keyboard - select keycode and modif er(s)

Code: 0}1)004

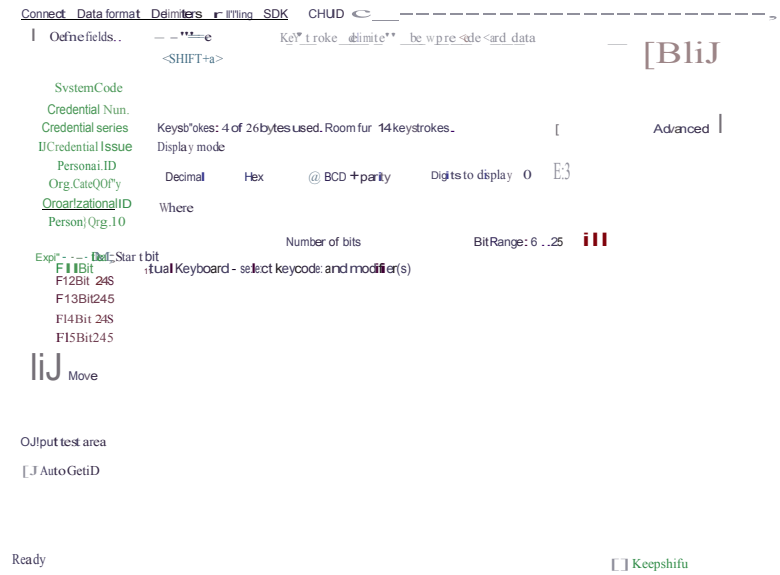
Move

Output test area

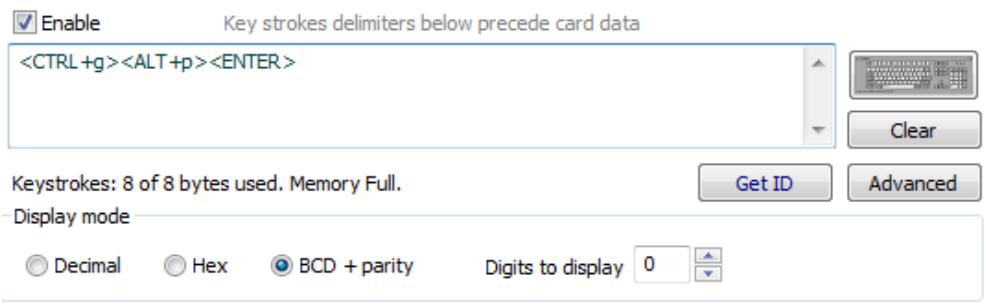
AutoGetID

Ready

If any special character is selected with a keystroke, this equals 2 bytes of memory.



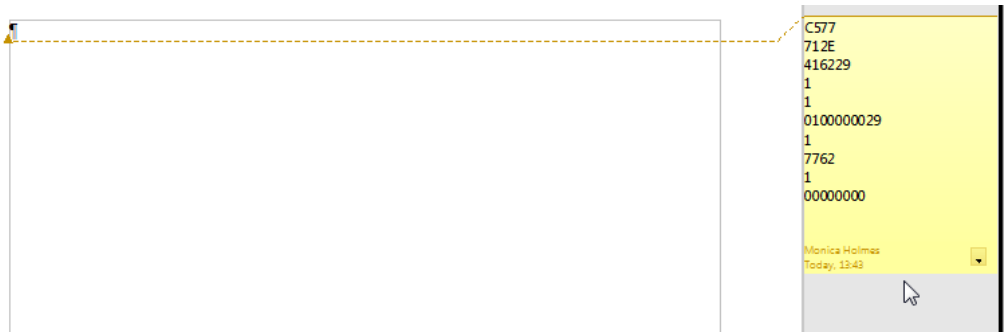
If all the keystrokes have been assigned to the fields, the following message displays:



Depending on the active document/window, additional functionality can be assigned to a field. For example, if the card data is read in OpenOffice, the Note feature can also be assigned.

Select the appropriate field. Click the keyboard icon. Check Left Control. Check Left Alt. Click n. Click Insert. Click Flash to write this configuration to flash memory. Verify the active window is OpenOffice. Scan the card. The Notes function opens when the card is read.

The value assigned to the function key in the active document/window determines the output.



Note: This configuration utility creates a ComSpecPort.txt file and saves to the default directory. This file can be opened and deleted at will.

FIPS 201 Card Configuration

In order to configure a FIPS 201 card:

- Click Advanced to display the card data in the binary bit pattern to determine bit length and format
- Click GetID and present the card to the reader
- Define the fields to match the specific output
- Configure any additional fields as appropriate
- Flash the configuration to memory

The Advanced button 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

ASCII Command Protocol

4

ASCII Overview

ASCII Command Protocol (ACP) allows the user to talk directly to the device without a DLL or special application. The serial Prox communicates using ASCII commands. Printable ASCII commands at 9600 baud, no parity 1 stop bit, and no echo, can be sent to the device.

> Note: USB devices that are virtual COM port do not need the baud rate set. The input is buffered by the device and executed when a carriage return (CR) or line feed line feed (LF) is typed. The unit then parses the command and performs the operation, and displays the results or error code. "\r\nRF IDeas>" where \r represents a CR and \n represents a LF that displays on the command line.
>
> All commands begin with the prefix rfid: and end with a Return key, CR or LF.

Determine the COM Port

<u>Windows</u>
Use device manager to display the COM ports. Open the serial COM port. If it is a CDC virtual port, open the newly installed device that was created.

<u>Linux</u>
Most Linux distributions include Minicom. Download putty (www.putty.org) to communicate with the serial device if Minicom is not available.

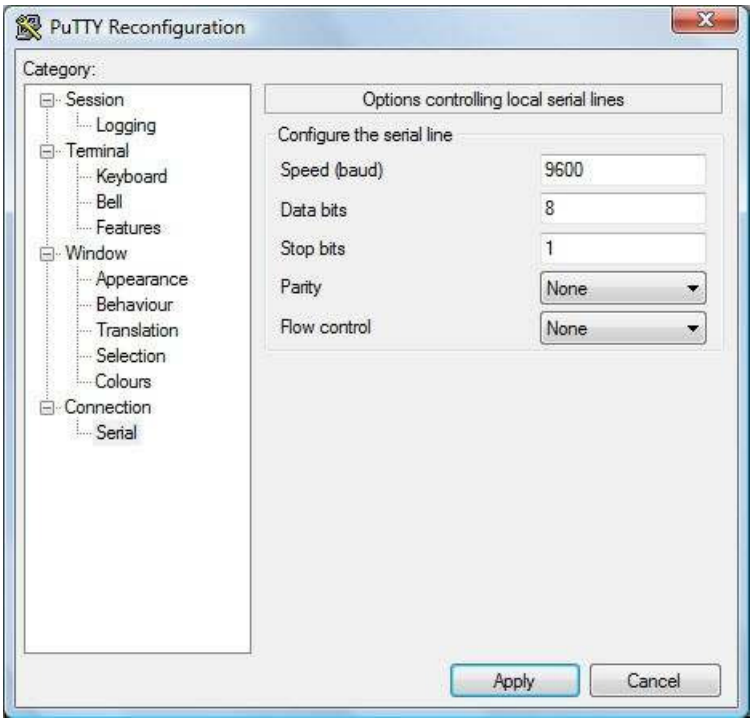
After the USB CDC device is enumerated on the Linux machine a device of either /dev/ttyACM0 or /dev/ttyACM1 is found in the /dev/directory. Minicom users may have to create a symbolic link from /dev/ttyACM0 to /dev/modem using the command ln -s /dev//tty/ACMO /dev/modem or ln -s /dev/ttyACM1 /dev/modem.

<u>Mac OS X</u>
The /dev/cu.usbmodemfa211 device is found on a Mac OS X . Use putty to communicate with this device.

Connect Serial Communications Program

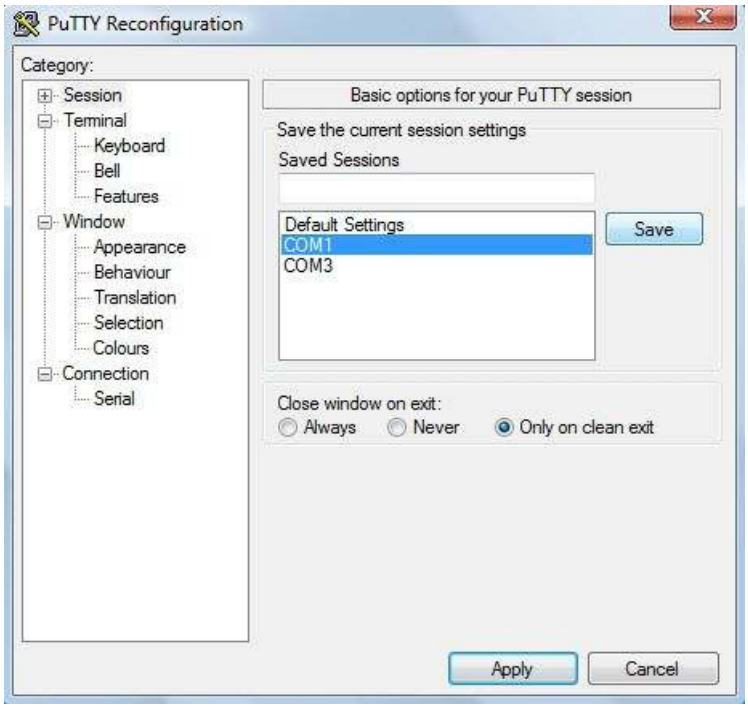
Open putty.exe. Click Connection a Serial and set the Speed (baud) to 9600, Data bits to 8, Stop bits to 1, and Parity to None. Flow control is not needed as there is no software or hardware handshaking.

Click Session.



Note: Use Hyper Terminal instead of putty with the XP operating system.

Highlight the appropriate session. Click Save. Click Apply.



Putty opens. Type rfid:help and press Enter. The Help command output displays. The complete list of Help command output is found in this section of the Configuration User Manual.

Command Structure

Commands are not case sensitive. Characters assigned to variables are case sensitive.

- All commands begin with a prefix string followed by one or more token strings with a period delimiter character between multiple tokens.
- Functions must end with a CR or LF.
- Variables can be assigned a value with an equal sign followed by the value or queried with a question mark.
- Any control characters other than CR, LF, and backspace terminate the command.
- The Escape key cancels a command.

The general syntax is:

PREFIX TOKEN { DELIMITER TOKEN } { { =Value} | {?} }
The prefix string is rfid:

Command structure falls into one of three groups:

1. Perform a function.
2. Assign a variable.
3. Query a variable.

Perform a Function

A function performs an operation that may or may not display any results. A function may not be queried. An example of a function is to write the variable settings to flash memory using rfid:cfg.write CR.

Certain functions that display a value or series of values display the string between curly braces for easy parsing. For example, the rfid:qid function output displays:

{0x00BB,1,0x0000,80;0x000000801CD1931B2F14}

Assign a Variable

There are three types of variables:

1. Boolean
2. Integer
3. Character

<u>Examples of Boolean Assignments</u>

rfid:op.beep=0
rfid:op.beep=true
rfid:op.beep=False
rfid:op.beep=F

<u>Examples o f Integer Assignment</u>

rfid:out.led=0003
rfid:out.led=3

Note: Some integer values require a 16 bit hexadecimal entry.
For Example: pcProx Plus card types: rfid:cfg.card.type=0xFFFF

<u>Examples of Character Assignment</u>

rfid:Delim.Chr.fac=':' CR
rfid:Delim.Chr.fac='x3a' CR

Query a Variable

Query a single variable to display its current value.

- Booleans display as true or false.
- Integers display as 0..255 with leading zero suppression.
- Characters display as single quoted printable ASCII characters in the range 0x20..0x7E.
- Values from 0x00 .. 0x1F and 0x7F..0xFF will be with a leading backslash lowercase x and the two digit upper case hex number.
- The output of the variable displays between curly braces.

For example: RF IDeas>rfid:out.led?
{3}

Variables are set and stored in RAM and are lost when the utility is closed. Use the cfg.write function to write the RAM configuration to flash memory. Use the cfg.read function to read the flash memory.

Help Command

Help displays the commands followed by its data type and expected syntax. The table below displays the Help command output. The functions display in blue.

HELP COMMAND OUTPUT

rfid:beep.now
‡ rfid:cfg
‡ rfid:cfg.card.hipri
‡ rfid:cfg.card.list (Function)
‡ rfid:cfg.card.type
rfid:cfg.read (Funtion)
rfid:cfg.reset (Function)
rfid:cfg.write (Function)
rfid:chr.1
rfid:chr.2
rfid:chr.3
rfid:chr.count.lead
rfid:chr.count.trail
rfid:chr.eol
rfid:chr.fac
rfid:chr.gone.1
rfid:chr.gone.2
rfid:cmd.echo
rfid:cmd.prompt
rfid:dev.luid
rfid:dev.part (Function)
rfid:dev.ver (Function)
rfid:disp.64bit
rfid:disp.fac.64bit
rfid:disp.fac.digits
rfid:disp.fac.hex
rfid:disp.fac.send
rfid:disp.fac.strip
rfid:disp.hex.lower
rfid:disp.id.digits
rfid:disp.id.hex
rfid:help (Funtion)
rfid:op.beep
rfid:op.cont
rfid:op.sdk
rfid:out.led
rfid:qid (Function)
rfid:qid.hold
rfid:qid.id
rfid:qid.id.hold
rfid:time.hold
rfid:var (Function)
rfid:wieg.id.bits
rfid:wieg.inv.bits
rfid:wieg.qual
rfid:wieg.qual.bits
rfid:wieg.rev.bits
rfid:wieg.rev.bytes
rfid:wieg.strip.lead.bits
rfid:wieg.strip.trail.bits

‡ Applies only to the pcProx Plus

Help Command Summary

Command	Data Type	R, W, R/W	Definition
rfid:beep.now	INT	W	Sounds the beeper immediately up to 5 short beeps or 2 long beeps. beep.now variables: 1 – single short beep 2 – two short beeps 3 – three short beeps 4 – four short beeps 5 – five short beeps 101 – single long beep 102 – two long beeps

Command	Data Type	R, W, R/W	Definition
rfid:cfg (‡ pcProx Plus only)	INT	R/W	The pcProx Plus reader has multiple configurations. Each configuration has the settings associated with a card type. When a configuration is changed, all other related settings reflect that configuration number. Example: To set configuration #1 to keystroke out the card ID preceded by #1/ the following commands would be entered: rfid:cfg=1 fid:char.count.lead=3 rfid:char.count.lead=0 rfid:char.1='#' rfid:char.2='1' rfid:char.3='/' To then set configuration #2 to precede it's card ID with #2/ the following commands would be entered: rfid:cfg=2 fid:char.count.lead=3 rfid:char.count.lead=0 rfid:char.1='#' rfid:char.2='2' rfid:char.3='/'
rfid:cfg.card.hipri (‡ pcProx Plus only)	BOOL	R/W	Enable priority card read. IF True, current configuration is given priority over the alternate configuration
rfid:cfg.card.list (‡ pcProx Plus only)	Function		View list of supported card types and their hexadecimal entries for the rfid.cfg.card.type command.
rfid:cfg.card.type (‡ pcProx Plus only)	INT (hex)	R/W	Verify or Set Card type for current configuration in RAM as 16 bit INT (0x0000..0xFFFF) Note: 0x0000 is off
rfid:cfg.read	Function		Read the flash memory settings in to RAM.
rfid:cfg.reset	Function		Reset the flash memory to the factory defaults.
rfid:cfg.write	Function		Write the variables from RAM in to flash memory.
rfid:chr.1	CHAR	R/W	1st card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D) u
rfid:chr.2	CHAR	R/W	2nd card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D) u
rfid:chr.3	CHAR	R/W	3rd card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D) u
rfid:chr.count.lead	INT	R/W	Verify or Set the leading character count (0 to 3) u

Command	Data Type	R, W, R/W	Definition
rfid:chr.count.trail	INT	R/W	Verify or Set the trailing character count (0 to 3) u
rfid:chr.eol	CHAR	R/W	Verify or set end of line termination character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:chr.fac	CHAR	R/W	Verify or set separating character between the facility code and ID data(A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D) Ex: 123 ; 456789
rfid:chr.gone.1	CHAR	R/W	1st character sent when card is removed (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:chr.gone.2	CHAR	R/W	2nd character sent when card is removed (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:cmd.echo	BOOL	R/W	IF True, enable echo of user input and use of backspace key
rfid:cmd.prompt	BOOL	R/W	IF True, enable RF IDeas command prompt
rfid:dev.luid	INT (hex)	R/W	Verify or set the logical unique identifier as 16 bit INT (0x0000..0xFFFF)
rfid:dev.part	Function		Read the device part number
rfid:dev.ver	Function		Read firmware version (major . minor . variant)
rfid:disp.64bit	BOOL	R/W	IF True, use 64 bit math on ID data
rfid:disp.fac.64bit	BOOL	R/W	IF True, use 64 bit math on facility code data
rfid:disp.fac.digits	INT	R/W	Verify or set Length of facility code output (up to 25 digits)
rfid:disp.fac.hex	BOOL	R/W	IF True, enable facility code output as hex
rfid:disp.fac.send	BOOL	R/W	Enable output of facility code
rfid:disp.fac.strip	BOOL	R/W	Set to True to separate ID and FAC. False processes ID and FAC together.
rfid:disp.hex.lower	BOOL	R/W	IF True, hex ID data is output in lowercase
rfid:disp.id.digits	BOOL	R/W	Verify or Set ID data length (0 to 25 digits) Note: If value is shorter than actual Id length the left most significant digits will be truncated
rfid:disp.id.hex	BOOL	R/W	IF True, enable ID data output as hex
rfid:help	Function		View menu of commands, summary of output types and variable options
rfid:op.beep	BOOL	R/W	Beeper output control True=beep, False=silent
rfid:op.cont	BOOL	R/W	Continuous read mode True=continuous output, False=single output of credential data
rfid:op.sdk	BOOL	R/W	IF True, enable Quiet mode. (IE: Credential data is not displayed) Note: data can still be retrieved using function rfid:qid.
rfid:out.led	INT	R/W	LED output control 0=off, 1=red, 2=green, 3=Amber (Immediate out w\o write) 255=Automatic control by reader (requires write to flash) red on standby, green when credential is read

Command	Data Type	R, W, R/W	Definition
rfid:qid	Function		Reads current queued ID data EXAMPLE Output String: {0x1000,2,0x0000,80;0x000000801DD1910B2F04} ---Note the use of commas and semicolons-- FORMAT of Output String: {AGE,OVERRUN,LOCKOUT,BITCOUNT;ID} AGE (New: Age (in hex) of last card read as a multiple of 48ms. Value stops at 0xFFFF. Use qid.id function to clear the age counter. As shown: the card was read 4,096 (0x1000 hex) x .048 = 196.608 seconds ago or 3 minutes and 16 seconds. OVERRUN counter (Values: 0 through 255): number of times buffer has been over written with new data without content transfer. LOCKOUT: Time (in multiples of 48ms) remaining until another card can be read. BIT COUNT bit length of card data (26 to 255). As shown: The ID contains 80 bits. ID: Card data in hexadecimal. As shown: Card is 80 bits and is 0x000000801DD1910B2F04.
rfid:qid.hold	Function		Read the card data and reset lockout timer. Once the function is called, a new card can be read immediately after without waiting for the lock out time period to expire.
rfid:qid.id	Function		Reads the card data, clears the age, overrun, and bit count after function is called.
rfid:qid.id.hold	Function		Combined functions of rfid:qid.hold and rfid:qid.id
rfid:time.hold	INT	R/W	Verify or set current data hold time setting in multiples of 48ms. (0 - 200) Also controls duration of Green LED during Auto mode.
rfid:var	Function		Outputs current command variables in ram (Similar to a .HWG file.) Output can be captured, edited and written back into the device. Note: To prevent an input buffer overflow, delay each character by several milliseconds.
rfid:wieg.id.bits	INT	R/W	Verify or set card data output bit count (0- 255)
rfid:wieg.inv.bits	BOOL	R/W	IF True, Invert card data output bits (1 to 0, 0 to 1)
rfid:wieg.qual	BOOL	R/W	IF True, use wiegand qualifier to verify card bit count

rfid:wieg.qual.bits	INT	R/W	Wiegand Qualifier: Number of bits (0 - 255) card data must have to be acknowledged as a read
rfid:wieg.rev.bits	BOOL	R/W	IF True, reverse bits of credential output lsb to msb
rfid:wieg.rev.bytes	BOOL	R/W	IF True, reverse the bytes of credential output LSB to MSB
rfid:wieg.strip.lead.bits	INT	R/W	Leading parity bit count to be stripped from credential data (options: 0 = none, 1 to 142 bits)
rfid:wieg.strip.trail.bits	INT	R/W	Trailing parity bit count to be stripped from credential data (options: 0 = none, 1 to 142 bits)

Key:
R = read only command
W = Write only command
R/W = Command can be read for its current value or written with a new value.
Note: Value changes are stored in RAM till rfid:cfg.write is used to store the value in to Flash.

uThese three commands identify the delimiter characters that can display. Three characters may be divided up as pre and/or post delimiters. The rfid:count.lead command identifies how many of the three characters (chr.1 .. chr.3) display before the card data. For example, if rfid:count.lead is set to 1, only one character displays before the card data and chr.2 and chr.3 can be set as post delimiters. Then rfid:count.trail can have a value of 0, 1, or 2. If rfid:count.lead is 2, chr.1 and chr.2 are set as leading delimiters. Then, only chr.3 can be set as a trailing delimiter. However they are used, the same character location cannot be used for both leading and trailing delimiter.

Variable Command

The var command displays all variables. The command output can be captured and played back into the device. There must be a delay of several milliseconds after each character or the pcProx serial input buffer overflows.

```
rfid:beep.now
rfid:cfg=1
rfid:cfg.card.hipri=True
rfid:cfg.card.type=0xEF04
rfid:chr.1
rfid:chr.2
rfid:chr.3
rfid:chr.count.lead=0
rfid:chr.count.trail=0
rfid:chr.eol='\x0D'
rfid:chr.fac='\x00'
rfid:chr.gone.1='\x00'
rfid:chr.gone.2='\x00'
rfid:cmd.echo=True
rfid:cmd.prompt=True
rfid:dev.luid=0x0000
rfid:disp.64bit=False
rfid:disp.fac.64bit=False
rfid:disp.fac.digits=0
rfid:disp.fac.hex=False
rfid:disp.fac.send=False
rfid:disp.fac.strip=True
rfid:disp.hex.lower=
rfid:disp.id.digits=0
rfid:disp.id.hex=False
rfid:op.beep=True
rfid:op.cont=False
rfid:op.sdk=False
rfid:out.led=255
rfid:time.hold=20
rfid:wieg.id.bits=16
rfid:wieg.inv.bits=True
rfid:wieg.qual=False
rfid:wieg.qual.bits=26
rfid:wieg.rev.bits=False
rfid:wieg.rev.bytes=False
rfid:wieg.strip.lead.bits=1
rfid:wieg.strip.trail.bits=1
```

These five variables work together to display leading and trailing (pre and post) card data delimiters.

1. rfid:chr.1='\x00'
2. rfid:chr.2='\x00'
3. rfid:chr.3='\x00'
4. rfid:chr.count.lead=0
5. rfid:chr.count.trail=0

The first three commands identify the pre delimiter characters that can display. Three characters may be divided up as pre and/or post delimiters. Count.lead identifies how many of the three characters (chr.1 .. chr.3) display before the card data. For example, if count.lead is set to 1, only one character displays before the card data and chr.2 and chr.3 can be set as post delimiters. Then count.trail can have a value of 0, 1, or 2. If count.lead is 2, chr.1 and chr.2 are set as leading delimiters. Then only chr.3 can be set as a trailing delimiter. The same character can not be used for both a leading and trailing delimiter.

rfid:cfg=1

The pcProx Plus reader has multiple configurations. Each has the settings associated with a card type. When the configuration is changed, all other related settings reflect that configuration number.

Example: To set configuration #1 to keystroke out card ID preceded by #1/ the following would be entered.

```
rfid:cfg=1
fid:char.count.lead=3
rfid:char.count.lead=0
rfid:char.1='#'
rfid:char.2='1'
rfid:char.3='/'
```

And now set configuration #2 to precede it's card ID with #2/

```
rfid:cfg=2
fid:char.count.lead=3
rfid:char.count.lead=0
rfid:char.1='#'
rfid:char.2='2'
rfid:char.3='/'
```

rfid:chr.eol='\x0D'

This command sends the End Of Line (EOL) character at the end of the card data. Typically a carriage return (CR) (0x0D) is used.

rfid:chr.fac=':'

This command sets a delimiter between the FAC and card data.

rfid:chr.gone.1='\x0A' and rfid:chr.gone.2='@'

These commands prompt the device to send the characters 'x0A' and '@' when the ID card is removed if they are not '00'.

rfid:cmd.echo=True

This command echoes user input when true and controls if backspace sends a space, backspace, space to erase the last character typed. If false, it is turned off for computer control. This value can be written to flash memory using cfg.write. It defaults to true on cfg.reset.

rfid:cmd.prompt=True
This command displays the prompt when true. If false, the prompt does not display. This value can be written to flash memory using cfg.write. It defaults to true on cfg.reset.

rfid:dev.luid=0x1234
This command sets the logical unit ID. A user-defined 2 byte value to identify this unit.

rfid:disp.64bit=False
This command uses 64 bit math to computer 64 bit decimal digits. This should always be kept on. If true, it uses 64 bit math.

rfid:disp.fac.digits=3
This command truncates or sets the FAC display leading zero.

rfid:disp.fac.hex=False
This command sends the FAC code in hex when true. If false, the FAC code is sent in decimal.

rfid:disp.fac.send=False
This command sends the FAC code if true. If false, the FAC code does not display.

rfid:disp.fac.strip=False
This command separates the FAC from the card data when true so it can be independently formatted for display. If false, the FAC code is not separated from the card data.

rfid:disp.id.digits=16
This command sets the digits so the left most significant digits will be truncated. For example, if the card data is 1234 and id.digits=3, then only 234 displays. If the card data = 8 formats the display width by truncating digits or adding leading zeros.

rfid:disp.id.hex=False
Displays the card data as hexadecimal when true. If false, card data displays as a decimal.

rfid:op.beep=True
This command sets the device to beep on a successful card read when true. If false, the device will not beep even if the card is successfully read.

rfid:op.cont=False
This command sets the device to continuously read when true. It tells the device to read the same card data over and over while the card is on the device. If false, the device only sends card data once.

rfid:op.sdk=False
This command stops the device from displaying the card data when true, so the qid or SDK API call must be used to get the card data. When true the device will send the data via keystrokes or serial depending on device type/model.

rfid:out.beep=False
This command makes the device beep when true. If false, the device will not beep. This is only available on OEM converter boards.

rfid:out.led=255
This command sets the variable and also sets the output LED color in RAM. Use cf.write to write this change to flash memory to persist across power cycles.

LED Value	Description
0	OFF
1	RED
2	GREEN
3	AMBER
4..254	Reserved
255	Controlled by the device

rfid.out.relay= True
This command sets the output driver to ON (active low) when true. This is only available on OEM converter boards.

rfid:time.hold=20
This command sets how long in 48ms ticks the data is held for the active ID. This also controls how long the device keeps the LED green in 48 msec ticks. The default time is 20 * 0.048 = 0.960 seconds.

Note: The qid.hold resets the internal timer this value initializes.

rfid:time.lo=24
This command sets how long in 48ms ticks the card device has to wait for no card in the RF field to begin accepting new card data. This prevents the same card data from being read over and over. If op.cont is true this value has no effect. The default time is 24 * 0.048 = 1.15 seconds.

Note: The qid.hold resets the internal timer this value initializes, so that a new card can be read assoon as the data is transferred to the host computer.

rfid:wieg.id.bits=80
This command sets byte reversal and also defines the FAC bit size.

rfid:wieg.inv.bits=True
This command sets all ones to become zero in the Wiegand data. If false, all zeros are set to become a one.

rfid:wieg.qual=False
This command sets card reading filter to off. If true, card reading filter is on. This is related to the next command, .qual.bits=80.

rfid:wieg.qual.bits=80
This command sets the device to read only cards with this many bits. All other size cards are filtered out.

rfid:wieg.rev.bits=False
This command does not reverse all bits. If true, the least significant bits are swapped with the most significant bits.

rfid:wieg.rev.bytes=False
This command does not reverse all the bytes in the id.bits size field. If true, all bytes are reversed.

rfid:wieg.strip.lead.bits=1
This command strips 0 .. 15 bits from the most significant bits.

rfid:wieg.strip.trail.bits=1
This command strips 0 .. 15 bits from the least significant bits.

ACP Error Codes

ACP Errors	Descriptions
Error#1	Illegal Command. Will return “Try “rfid:help”. Possible Wrong or missing prefix “rfid:”
Error#2	Input buffer overrun. Too many characters received without CR or LF
Error#3	Illegal Operation. - Variable assigned to function or variable used as function
Error#4	Range Error. Value assigned to variable exceeds limit (EX: 257 for 255 limit)

Troubleshooting

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

1. Check to be sure the device is plugged into the USB or RS-232 port. When the workstation is on and no card is being read, the LED is red. A valid proximity card causes the LED to turn green, provided the configuration is not set to only read certain bit lengths.

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, unplug it, remove 'General USB Device' using Windows 'Control Panel' a '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.

Frequently Asked Questions

What types of credentials will your desktop and OEM products work with?

Our products work with virtually all 125 kHz proximity and 13.56 MHz contactless cards in the industry today. The charts below can assist you in determining what RF IDeas products will work with your particular credential. You can reference the RDR part number on our website to get the name of the particular product or you can simply email us at sales@RFIDeas.com with the number and we will contact you.

Solutions for Identification:

Card Manufacturer	Markings	RF IDeas PN see legend
HID Prox 125kHz	HID	RDR-6081AKU
HID iCLASS 13.56MHz	HID iCLASS	RDR-7x81AKU *0-ID; 5-CSN low cost*
Casi-Rusco Prox		RDR-6281AKU
Indala Prox	INDALA	RDR-6381AKU-XXXXX *custom*
Pyramid Prox		RDR-6471AKU
Kantech Prox	ioProx	RDR-6781AKU
AWID Prox	AWID	RDR-6981AKU
EM 410x HiTag Deister*	None or	RDR-6E81AKU-XXXXX *custom*
Keri Prox	KERI	RDR-6K81AKU
NexWatch Prox	NexKey	RDR-6N81AKU
G-Prox*	G-Prox	RDR-6G81AKU
MIFARE & ISO 14443a	None	RDR-7581AKU
LEGIC	LEGIC	RDR-7L81AKU

Solutions for Integrators:

Card Manufacturer	Markings	RF IDeas PN see legend
HID Prox 125kHz	HID	RDR-6081AKU
HID iCLASS 13.56MHz	HID iCLASS	RDR-7x81AKU *0-ID; 5-CSN low cost*
Casi-Rusco Prox		RDR-6281AKU
Indala Prox	INDALA	RDR-6381AKU-XXXXX *custom*
Pyramid Prox		RDR-6471AKU
Kantech Prox	ioProx	RDR-6781AKU
AWID Prox	AWID	RDR-6981AKU
EM 410x HiTag Deister*	None or	RDR-6E81AKU-XXXXX *custom*
Keri Prox	KERI	RDR-6K81AKU
NexWatch Prox	NexKey	RDR-6N81AKU
G-Prox*	G-Prox	RDR-6G81AKU
MIFARE & ISO 14443a	None	RDR-7581AKU
LEGIC	LEGIC	RDR-7L81AKU

When I present my card to the pcProx Enrollment reader the number displayed is not the number printed on my card or the same number my access control system displays, why?

Check with your supplier for the card format information, since there are some credentials that require a custom format reader. You may possess one of these types of credentials. The pcProx Enrollment readers may need to be configured to output the required credential number,

i.e. FAC, ID or CSN using the pcProx Enroll Configuration Utility for USB and RS-232 readers. You can download our configuration program free of charge by cutting and pasting this path into you web browser http://www.rfideas.com/Software/pcProxConfig.exe. Once downloaded please review the User's Manual for configuration instructions. If you have any questions please contact RF IDeas technical support.

What software application can I use to view the ASCII output card data from a RDR-6081AKF or RDR-6081AKE?

Since these readers use a virtual COM port, the pcProx Enroll Configuration Utility for USB and RS-232 readers can be used to configure your reader, copy and paste the following path into your web browser and download to your computer.
http://www.rfideas.com/Software/pcProxConfig.exe Once downloaded and installed you can use it to configure the readers and view the output data. HyperTerminal or ProComm Plus can also be helpful in viewing card data.

What configuration utility do I use to configure the pcProx 125 kHz Enroll, pcProx 13.56 MHz Enroll and Wiegand products?

The products above may or may not require configuration depending on the badge or card type you are using. If you do need to configure them we have a free download. The Configuration Utility for USB and RS-232 readers can be found at
http://www.rfideas.com/Software/pcProxConfig.exe

What configuration utility do I use to configure the RDR-7P71AKx FIPS 201 reader?

There is currently a beta version called pcProxPlusConfig-Beta.exe for configuring your FIPS 201 reader. Copy and paste the following link into your web browser and the beta version will automatically begin to download
http://www.rfideas.com/Software/pcProxPlusConfig-Beta.exe. Please note that this program is a special utility to configure our FIPS 201/long format devices only.

Do you have RFID solutions for long read range?
Yes, we have several products that can track a vehicle up to 33 feet and traveling as fast as 120 miles per hour. Go to our website at www.RFIDeas.com, and select products and select the long-range tab for more information.

How can I use a proximity card for logon?

One of the fastest growing areas in contactless and proximity technology is what is known as single sign on or SSO for short. We have technology solutions that can assist you in converting your current building access badge into a multifunctional badge for use inside the building. The conversion will enable you to log in and out of a computer, punch you into the time clock,

control multi functional printers and much more. Contact our sales office at 1-866-439-4884 Toll Free to find out more.

Can I use your product for tracking meeting registration and training attendance?

Yes. Our products can be used to track training attendance and meeting registration. Contact our sales office at 1-866-439-4884 Toll Free to find out more on how our products can be used for meeting registration, training attendance and many other applications.

Why must I poll the USB card reader?

The nature of USB is not event driven per se, it operates on a host/client protocol that during enumeration asks the host to poll at a specific rate. As a keyboard we are polled by the OS every 10msec, the same speed your keyboard and mouse is. We use feature report packets to configure the readers. We also communicate to the DLL API through Feature Reports for HID devices. The AK0 units that are RS-232 or CDC can speak English with using the ASCII COMMAND PROTOCOL such as “rfid:help” in Hyper Terminal or putty. We recommend you poll the units every 250msec for the card id, except for AK0 unit and this with a QueuedID, as the reader will report the age of the card id up to 52 minutes. Without the SDK the units can send unsolicited card id when the card is in the rf field. These appear as USB keystrokes or Serial data for RS-232 and CDC models. Take a look at the pcProx manuals it may help you get a better idea of the AK0 protocol. The HID is a proprietary binary protocol, where as the AK0 units are open protocol.

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.

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:

Ph: 847.870.1723
E: TechSupport@RFIDeas.com

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.

END-USER LICENSE AGREEMENT

LICENSE AGREEMENT

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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: M9MRDR7081 (iCLASS Module based)
FCC ID: M9MRDR7581 (iCLASS MIFARE and Other 13.56 MHz)
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: M9MLC8058X (Multi-protocol Combo model)
FCC ID: M9MHP8058X (Multi-protocol Combo model)
FCC ID: M9MBUPCPROXH100 (HID RS-232 model)
FCC ID: M9MBUPCPROXA100 (AWID)
FCC ID: M9MPCPROXP100 (Pyramid)
FCC ID: M9MRDR7P71 (FIPS 201 13.56 MHz)
FCC ID: M9MRDR7L81 (Legic 13.56 MHz)
FCC ID: M9MRDR7580 (iCLASS MIFARE and Other 13.56 MHz)
FCC ID: M9MRDR7081AKF (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR75DX (iCLASS MIFARE and Other 13.56 MHz)
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 (13.56 MHz Express Model)
FCC ID: M9MLC608X (125 kHz USB Model)
FCC ID: M9MSB708X (iCLASS 13.56 MHz)
FCC ID: M9MSB6X8X (Multi-protocol 125 kHz)
FCC ID: M9MLC60DX (125 kHz USB Model)
FCC ID: M9MLC758X (13.56 MHz USB Model)
FCC ID: M9MLC6X11U (125kHz USB Model)
FCC ID: M9MLC8058XU (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.

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Appendix

Standard 26 Bit Format Structure

There are several bits constructed together that comprise 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 255 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.....
.....XXXXXXXXXXXXO

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 a Learning Center a 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 go 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 delimeters 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

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