RFID EAS

pcProx® Playback & pcProx® Writer

Configuration Utility
User Manual

Thank You!

Congratulations on the purchase of your pcProx® Playback and/or pcProx® Writer 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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The Basics

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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

While magnetic stripe technology is very inexpensive, it is prone to read problems from wear and dirt. Cards have a limited life as they scratch easily. Readers pick up dirt and oils that damage the read head.

RF IDeas contactless smart cards and readers operate at the allowed frequency of 13.56 MHz. This contactless technology uses RFID (radio frequency identification). The pcProx 13.56 MHz readers will fully support HID iCLASS and Phillips NXP MIFARE cards. The pcProx Card Manager utility is focused on allowing the cards to function not only for door access, but also for computer identification and access.

Contactless smart cards offer the user endless solutions. One of the struggles users have with smart cards is they often have to create specialized software applications in order to take advantage of the many features and capabilities. The pcProx Playback Starter Kit removes most of these barriers by providing a 'no-software' approach. In other words, this system allows you to configure data onto the cards so that the cards easily adapt to existing applications. The adaptation is possible since the pcProx Playback readers are capable of reading user specific information and keystrokes or RS-232 characters. The encoding phase (writing keystrokes or RS-232 characters and data to the card) is done via the Card Manager using either the pcProx Writer USB or pcProx Writer 232 read/write reader.

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).

ID Card Reader System

Output Formats

Keyboard Emulation

Card Data

ASCII Output

Raw Card Data
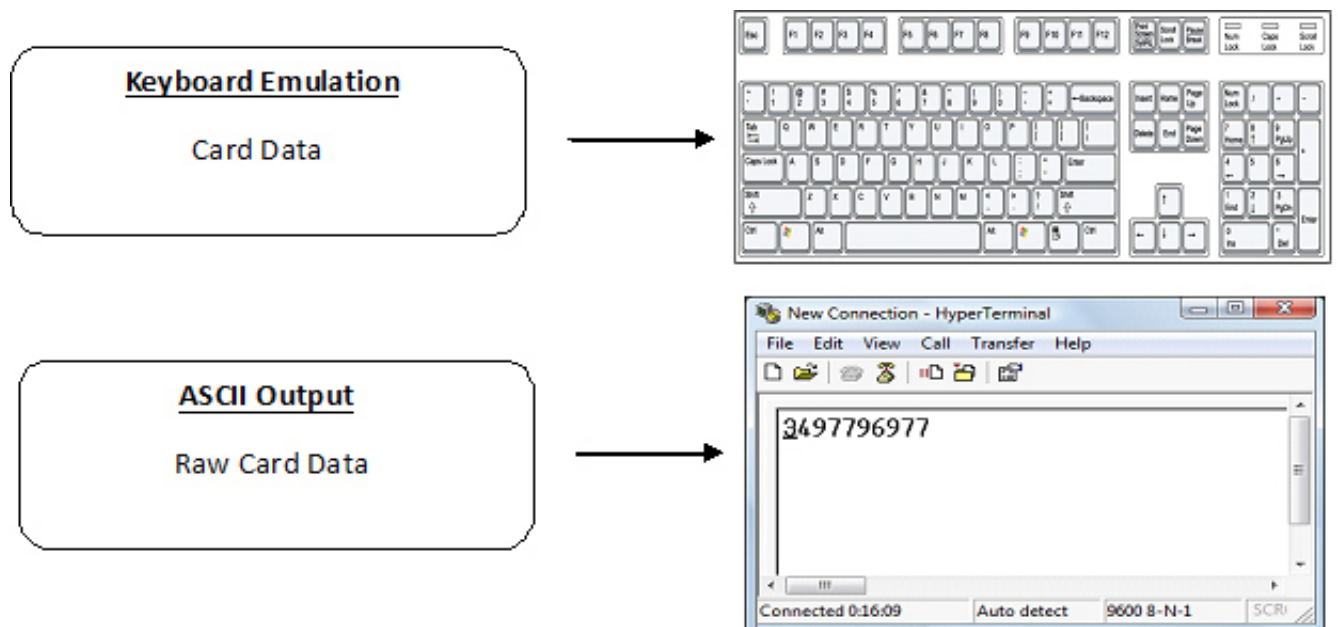
Credential Form Factors

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.

Adhesive Tag   Key Fob   Adjustable Watch

Wristband   Clamshell   Printable PVC

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.

Card Compatibility

Contactless iCLASS

There are three iCLASS memory choices as shown in the below table. Users can add keystrokes and credentials into any of the fields (pre-keystrokes, credential x, or post keystrokes) as all are saved the same way on the card.

> **Note**: Overwriting the boundaries of memory as dictated by the card choice is not permitted.

The below table illustrates the limits.
The actual byte count is shown in the Card Manager software in the field labeled **Size**.

Card Memory Configuration	Credential 1 Max Count	Credential 2 Max Count
2k bit 2 application	48 bytes	48 bytes
16k bit 2 application	48 bytes	1,800 bytes
16k bit 16 application	48 bytes	48 bytes

Contactless MIFARE Card Choices

There are two MIFARE contactless memory choices as shown below. You can actually put keystrokes and credentials into any of the fields (pre-keystrokes, credential x, or post keystrokes) as all are saved the same way on the card. You cannot overwrite the boundaries of memory as dictated by the card choice.

The below table illustrates the limits.

The actual byte count is shown in the Card Manager software in the field labeled **Size**.

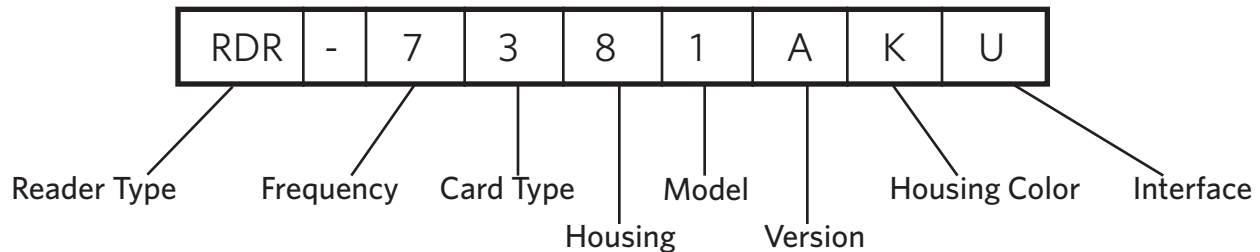| Card Memory Configuration	Credential 1 Max Count	Credential 2 Max Count
1K Bytes	3 Blocks 48bytes	3 Blocks 48bytes
4K Bytes	3 Blocks 48bytes	3 Blocks 48bytes

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, uppercase, hexadecimal).

Hardware

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 | - | 7 | 3 | 8 | 1 | A | K | U |

Reader Type   Frequency   Card Type   Model   Housing Color   Interface

Housing   Version

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).
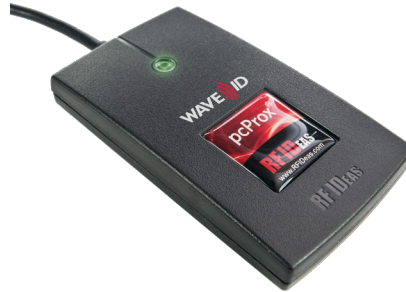
CONNECTORS

USB Keyboard

USB Virtual COM Port

DB-9 RS-232

Female Power

RJ45

PS/2 Power

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.

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.

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. 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 or USB 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.

Software

pcProx Card Manager Overview

pcProx Writer and Card Manager

The pcProx Card Manager, together with the pcProx Writer, allows you to store multiple user-centric data into different locations in the contactless smart card. You can write both user data and keystrokes (pcProx Playback USB), RS-232 ASCII characters (pcProx Playback 232), or Wiegand numeric data (pcProx Playback Wiegand) onto the card.

The keystrokes are useful in helping to launch applications and/or directing the user-centric data into the correct fields on the screen.

The RS-232 ASCII characters are useful for serial port driven solutions such as truck scales, time and attendance terminals, PLCs and other serial port devices requiring user-centric data.

The Wiegand numeric data is useful for security panel and other devices accepting Wiegand data.

pcProx Playback and Card Manager

The pcProx Playback reader is configurable using the pcProx Card Manager utility and is used for reading the card and deliver data. The pcProx Playback (USB/RS-232) reader can be configured to read specific locations on the card as well as provide keystrokes or ASCII characters surrounding the user-centric data. The pcProx Playback Wiegand must be pre-configured at the factory.

pcProx Playback USB
The pcProx Playback USB reader installs as a plug-n-play device and requires no drivers or software to be deployed. This is beneficial since there is no need to develop software, distribute or test software, modify or replace existing back end systems. Users will simply "write" the data required, as well as any keystrokes, into the contactless smart card, add additional keystroke delimiters into the pcProx Playback USB reader, and the solution is ready to deploy.

pcProx Playback RS-232
The pcProx Playback RS-232 reader installs as a standard serial port device and requires no drivers or software to be deployed. The output is delivered using COM port parameters at: 9600, n,8,1. There is no need to develop software, distribute or test software, modify or replace existing back end systems. Users will simply "write" the data required plus any RS-232 characters into the contactless smart card, add other additional characters, such as delimiters, into the pcProx Playback RS-232 reader, and the solution is ready to deploy.

pcProx Playback Wiegand
The pcProx Playback Wiegand reader installs as a Wiegand output device and requires no drivers or software to be deployed. The output is delivered using output lines Data 0/ Data 1 and the Wiegand protocol. There is no need to develop software, distribute or test software, modify or replace existing

back end systems. Users will simply "write" the numeric data into the contactless smart card and the solution is ready to deploy.

The pcProx Card Manager allows users to:

1. Organize user data into specific card memory locations. (See section labeled 'Card Organization Forms')

2. Decide if keystrokes or ASCII characters should be stored within the card, or stored within the pcProx Playback reader.

3. Write user data (credential, swipe card, or other identification information) along with any keystrokes or ASCII characters, to individual locations on a contactless card (when using the pcProx Writer).

4. Configure the pcProx Playback reader to use existing data (if your contactless cards have ASCII data that has been previously written) to output as desired.

5. Configure the pcProx Playback reader to access a desired location on a card.

   Note: If you have multiple applications, you will need to create individual pcProx Playback files (*.PLB) describing each of these locations (called Card Context). The Playback files are used to dynamically reconfigure the pcProx Playback reader to retrieve another application credential or identification set from the contactless smart card. To do this, you can use the 'Auto-Run' mode as command-line options and shortcuts such as: C:\Program Files\RF IDeas, Inc\RFID1356i\pcProxCardman.exe" magstripe.plb.

6. Create hot keys or batch files that can be used to launch the dynamic configuration together with the associated application.

The pcProx Playback reader is configured to retrieve the data at various locations within the card. It is therefore possible to write many different identification and security access requirements within the card. The reader can be configured to retrieve a specific section off the card. Since the Playback reader may be configured as needed (see 'Auto-Run Operation' section), you can use your card for multiple purposes at a desktop.

pcProx Card Manager Utility

Install the pcProx Card Manager by running the pcProxCardMgr.exe setup program. This will install the pcProx Card Manager software along with the necessary components as required by Windows. This application is supported under Windows 2000 and XP. Once installed, use the Windows "Start – All Programs" to locate and run the pcProx Card Manager Software application.

Connect Tab

The connect section is used to perform the initial connection between either RF IDeas' pcProx Writer, or one of HID's wall mount read/write RS-232 readers such as the RW400, and the pcProx Card Manager software. It is also used to describe the type of data you will be writing to the card: USB keystrokes or RS-232 /Wiegand characters. You may have the pcProx Playback USB reader attached to another USB port at the same time but no connection to the pcProx Playback reader is established under the Connect check boxes on this screen.
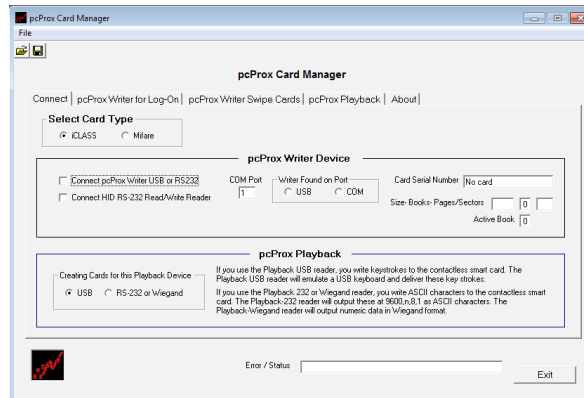
Connect pcProx Writer USB or RS-232

First, attach the pcProx Writer to your PCs (RS-232 or USB) port. The pcProx Writer's LED should be red.

Next, if using the RDR-7080AKU iCLASS compatible Writer, place either a 2k BDG-2000 or any of the 16k bit iCLASS (BDG-2001 or BDG-2002) cards on the top of the reader. If using the RDR-7580AKU MIFARE compatible Writer, place either a 1k or 4k MIFARE contactless card on the top of the reader.

> **Note:** It is important to lay the card completely across the face of the pcProx Writer during the encoding operation. Placing the card on an angle may inhibit the writing operation.

The Card Manager will automatically detect either the USB or RS-232 pcProx Writer reader by simply selecting the 'Connect to pcProx Writer USB or RS-232' checkbox.

Connect HID RS-232 Read/Write Reader

First, attach the HID read/write reader to your PC's RS-232 port and make sure the power adaptor is attached and the LED is red.

Next, place either a 2k BDG-2000 or any of the 16k bit iCLASS (BDG-2001 or BDG-2002) cards on the top of the reader.

For either method of connection made, the LED will light green for approximately 2 seconds and than go back to red. This is normal. If you remove the iCLASS card for 2-3 seconds, and replace it, the LED will return to green for 2 seconds.

| Commands	Description
Device Type	Shows which type of reader was found
Card Serial Number	Displays the contactless card's unique serial number
Size-Pages	This indicates the number of k-bits and pages for the card
Error Status	This field will show interim progress, success and errors.
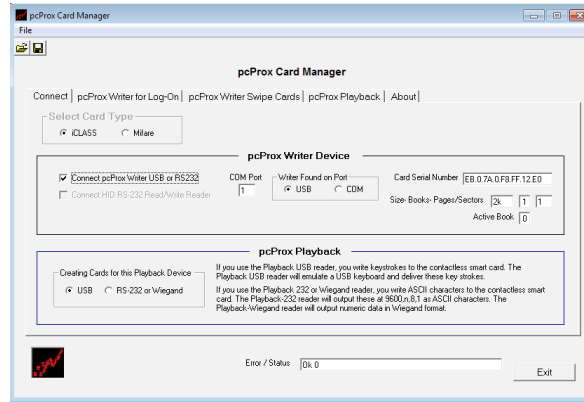
Connection to the utility with an iCLASS contactless smart card

Commands	Description
Reset RF	This button is used to reset the RFID portion of the reader. This may be useful if you are experiencing trouble writing to cards.
pcProx Playback Device USB or RS-232	Here is where you will describe what type of data is written to the cards: USB keystrokes or RS-232 characters.

If you plan to use the Playback USB reader, make note that the data is written as keystrokes to the contactless smart card. The Playback USB reader will emulate a USB keyboard and deliver these keystrokes.

If you plan to use the Playback RS-232 reader, make note that the data is written as RS-232 ASCII characters to the contactless smart card. The Playback RS-232 reader will output these at 9600,n,8,1 as ASCII characters.
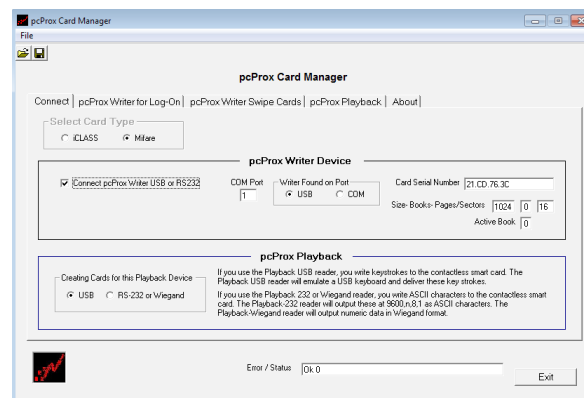

Connection to the utility with a MIFARE contactless smart card

pcProx Writer for Log-On Tab

For log-on applications, the 'form' is actually the log-on dialog fields (username and password). The keystrokes as simply used to land the cursor to the correct field (ctrl-Alt-Del, TAB etc.), prior to inserting the employee related data. In fact any application requiring employee specific information is a perfect candidate for using this system.

> **Note**: The pcProx Writer system is not limited to log-on applications. In fact if you using the Playback USB reader, you should think of Playback reader as a form filler – with the contactless smart card holding the keystrokes and the employee specific data.

For users of the Playback RS-232 you should think of the keystrokes as RS-232 characters. For example, in a serial port truck scale device, you may need to send a HEX 01 to initialize the device. Simply use the 'Special Keystrokes' and select the appropriate RS-232 required characters.
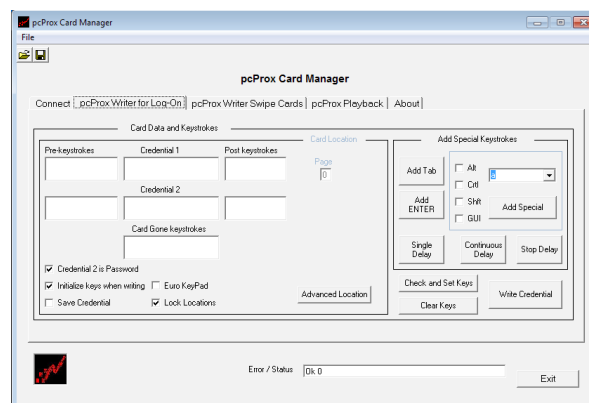
Create and Write Credentials

Access to all user data you write using pcProx Card Manager is secured by writing unique security keys to the card. If a card location (page, application area, block) has unique keys written to it by another application (i.e. biometric data), you will not be able to read or write to that location on the card (See the section labeled 'Memory Map' for details on card locations for each type of card).

If the location is available, or in use by the pcProx system, the Card Manager will be able to create and write keys to the card in order to secure the card's contents in the locations you are using. Other locations of the card are not modified.

Card Data and Keystrokes

This section holds the username and password credentials, as well as any additional keystrokes required by the application or operating system to deliver the credentials to the correct fields on the screen.

For example, in Windows XP a user would want to send a "GUI-L" as well as a "Alt-U" keystrokes first prior to typing in your username.

The "GUI-L" keystroke sequence (the windows key + 'L'), cause the PC to go into a locked state. This sequence is done first to prevent someone from trying to send your username and password sequence of keystrokes into another application, such as MS Word (for viewing and stealing). If the user is already in a logged off or locked stated, these keystrokes are simply discarded. If your PC is logged-on, the first thing that happens is to lock the machine – eliminating viewing possibilities.

The keystroke sequence, "Alt-U", places the cursor into the username field at logon. The "Alt-U" is a 'Special Keystroke' that is inserted using unique key codes as defined by the USB keyboard specification.

> **Note**: To insert the correct key codes for special keystrokes, use the 'Add Special Keystrokes' section. It is possible to put keystrokes and user data into any of the Credential and keystrokes fields.

Commands	Description
Pre-Keystrokes	This field holds the keystrokes that are to be sent prior to the user's 'Credential 1'. In the context of a typical log-on application, 'Credential 1' is commonly known as the Username. The 'Pre-Keystrokes' would be the sequence of keystrokes required to bring up the log-on dialog box. This sequence of keystrokes can be different for each application and operating system. For example Windows 2000 is Ctrl-Alt-Del, while the home edition of Windows XP uses the keystroke sequence Alt-U (to position the cursor into the Username field).
Credential 1	For a log-on application, this field is commonly known as the Username.
Post Keystrokes	This field holds the keystrokes that are to be sent after the user's 'Credential 1' is delivered. In the context of a typical log-on application, the cursor must be positioned into the password field by using a TAB keystroke.
Credential 2	For a log-on application, this field is commonly known as the Password.

Advanced Location

Location for Data on iCLASS Card: Page - Appl Area - Block
Depending on the contactless part number, your card will have a different number of pages and size (see Memory Map section). This area is automatically entered for you, however if you need to modify and place the data into different locations, you may modify these values. Be cautious not to overwrite blocks of data when modifying these values. As you add or remove keystrokes the starting block location for each Credential may change if a boundary is reached.

Location for Data on MIFARE Card: Sector
For MIFARE cards, each of the Credentials is allocated a complete Sector. A Sector consists of 3 blocks of 16 bytes – for a total of 48 bytes. We do not allow for writing in Sector '0' or the to the last Sector located on the card. Each keystroke requires 2 bytes, and each block holds up to 8 bytes – 4 keystrokes. Each Credential or Card Gone field requires a 2 byte termination character.

To test a card, simply reconfigure the Playback reader and test the card.

iCLASS Find Free Page

After pressing the Advanced Location button, this feature button is visible. The **Find Free Page** button performs a lookup for contactless cards with more than 1 page (16kbit /16 Appl Area), such as the BDG-2002. This will perform a search of all pages to find which ones are not secured with unique keys. The list will appear in the adjacent pull down box.

> **Note:** pcProx secured pages will not show up as free.

MIFARE Find Free Sector

This will provide a drop down list of all available Sectors on the card being read.

> **Note:** sectors already being used by pcProx Card Manager will show up as unavailable.

Card Gone Keystrokes

The Card Gone field holds the keystrokes to be delivered when the card is removed from the pcProx Playback reader. A typical Card Gone keystroke sequence would be to lock a workstation. Under Windows XP this is done by holding down 'GUI' (Windows key) and pressing 'L'.

> **Note**: This feature should be used with caution since it implies the user is being asked to leave their card on the reader. Since the contactless card often carries security information, it is dangerous to ask employees to leave a card on the reader since they are likely to forget the card. It therefore leaves open a security flaw since another user can easily obtain a card and impersonate the user. A much safer alternative is to use the RF IDeas pcProx Sonar (visit www.RFIDeas.com for more information on the Sonar)

Check and Set Keys

As mentioned earlier, the contactless smart card is shipped with default access keys from the factory. In order to secure an area of the card for a specific application, unique keys are used.

Once the keys are set, the card's contents for this particular Page and Application Area (or for MIFARE Sector) are not accessible without the proper key. It is possible that areas of your contactless card may be secured by another application. If you are unsure if the card is already being used by another application you should perform a 'Check and Set Keys' operation to verify the availability of the card. If this Page and Application Area (or Sector) is in use, you will see a message in the Error-Status field. If it is free, it will appear as now secure, as shown below.
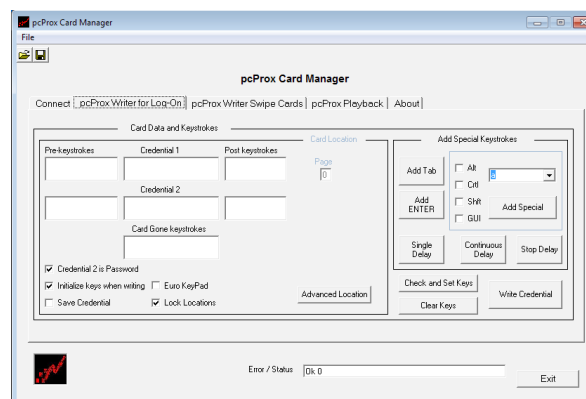
If you need to free the location for another application, simply use the 'Clear Keys' button. This will write the default keys to the card allowing others to use the card.

Clear Keys

You can free the page by pressing the 'Clear Card' button. This writes the default keys back to the card and frees this location for another application. When a Clear Card is issued, it is important to realize that the entire Application Area (1 or 2) for this Page is cleared including all blocks within this Application Area.

See the 'Memory Map' section for more details on card locations.

The below example shows that Page 0 has been cleared.
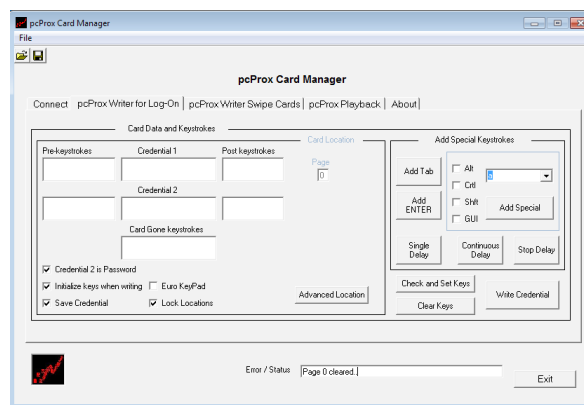
Writing Credentials

Once a card has been confirmed as available, the card can then be "written" to. The next step is to enter keystrokes and credentials that would normally be typed to perform the log-on to the operating system or application.

> **Note:** This section makes the assumption that you already have an established username/password credential that is in use with an application and/or operating system. There are two examples provided: a one-factor and a two-factor authentication. Following the examples is a discussion of how to increase the security using this technology.

The '**Card Data and Keystrokes**' section is broken into two primary sets of fields labeled Credential 1 and Credential 2. Each set is broken up into 3 fields: 'Pre keystrokes', 'Credential' and 'Post keystrokes. While you may enter data or keystrokes into any of the fields, it is organized this way to help you think in terms of getting the cursor into the correct field when delivering the credential to the field.

As a Log-On application you will use:
   • Credential 1 as the Username, and
   • Credential 2 as either a portion of the Password, or the entire Password.

By placing a portion of the Password into the field, and requiring the end user to fill in the balance of the Password, you have created a two-factor authentication system (something you have – i.e. the card, and something you know – i.e. the balance of the password). This has the benefit of protecting against lost/stolen badges. That being said, there is nothing that would stop you from putting the entire set of data into either (but not both) fields.

Once you have defined the keystrokes and credentials necessary, you are ready to perform a 'Write Credential' operation.

The default setup for the log-on credential allocates room on the card for 16 character usernames, passwords, as well as a couple of pre and post keystrokes for each credentials. The 16 characters are the Microsoft Windows limitation for user credentials. Should you need to override the defaults to expand or reduce this, you may do so by unlocking the 'Lock Locations' and pressing the 'Advanced Location'.

For iCLASS cards:
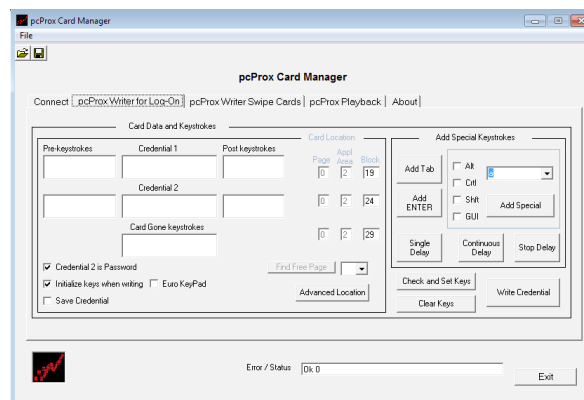
For MIFARE cards:
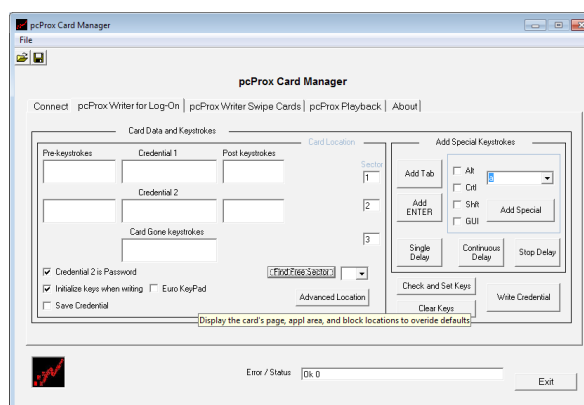
Euro KeyPad

This checkbox is used for those in European countries which have special Euro keypads in the keyboards. Checking this checkbox allows for the keycode translations when using these keyboards.

Lock Locations

This checkbox is used to lock down the block locations for the 'Credential 1', 'Credential 2', and 'Card Gone Keystrokes'. This is useful to maintain a consistent location for each of the credentials when making several cards that will be used by the same pcProx Playback reader. Unlocking this will cause the locations for each credential field to change depending on its length and actual number of keystroke required.

> **Note:** This is not available for MIFARE since each credential uses an entire Sector.

Delays

There may be times when a delay is required before the keystrokes are sent. There are three types of delays possible:

Single Delay
Pressing this button will allow you to insert a single delay (.01-16 seconds) before continuing with the keystrokes.

Continuous Delay
Pressing this button will allow you to insert a continuous delay (.01-16 seconds) that will be inserted after the next keystroke character, and each of the remaining keystrokes for the current 'Credential' or 'Card Gone' sequence.

Stop Delay
Discontinues the 'Continuous Delay' prior to the end of the 'Credential' or 'Card Gone' field being reached.

Other Features:
Speeding the Playback Output

The Playback is designed to wait 2-3 seconds after issuing Credential 2 keystrokes, before being able to turn the LED red and accepting the next card. If you need to creating faster card sequencing, you can eliminate this delay by placing all pre-, post-keystrokes and credentials (1 and 2) into the Credential 1 fields. This will not change the behavior in Windows since the entire keystroke sequence is played out.

Auto-Locking on 2nd Card Presentation

The Playback is designed to hold keystrokes that may be played back as pre- or post- keystrokes surrounding the credentials. It is possible to add a pre-keystroke in front of Credential 1 which can be used to auto-lock the workstation. For example, enter a GUI+L (Windows key is GUI) as the prekeystroke for Credential 1. If you quickly present the card and pull it away, only this keystroke sequence is played and the workstation is locked.

> **Note:** Please see the Playback Advanced Section of this User's Manual for additional details.

Example A: One-Factor Authentication

The examples provided here apply to both iCLASS and MIFARE cards/readers.

A user who needs to log-on to Windows XP: The Username is Admin, and the Password is UserPassword.

This user typically types (in terms of keystrokes):

GUI-L (first lock the machine to prevent viewing of the credentials if the PC is unlocked)
Alt-U (gets the cursor into the Username field)
Admin
**{TAB}** (key labeled 'Tab' on keyboard)
UserPassword
**{ENTER}** (key labeled 'Enter' on keyboard)

The concept is to get the 1st three lines into Credential 1, and the last two lines onto Credential 2.

Credential 1

To get the GUI-L keystroke sequence in the first 'Pre-Keystroke' field the cursor needs to be placed in this field. Next, the section labeled 'Add Special Keystrokes' will be used to create the 'GUI-L' keystroke. Check the checkbox labeled GUI (i.e. the GUI or Windows key from a standard keyboard), and choose the letter 'L' from the pull-own box. These two selections will together perform the 'GUI-L' keystroke – i.e. holding down the GUI key while pressing the 'L' key on the keyboard. Pressing the 'Add Special' button in this section once will deliver the proper hex keystroke code information to the 'Pre keystroke' field. You will be able to see the '%F80' entry into this field. You can easily start over by selecting (removing) the '%F80', and using the Delete key to remove it.
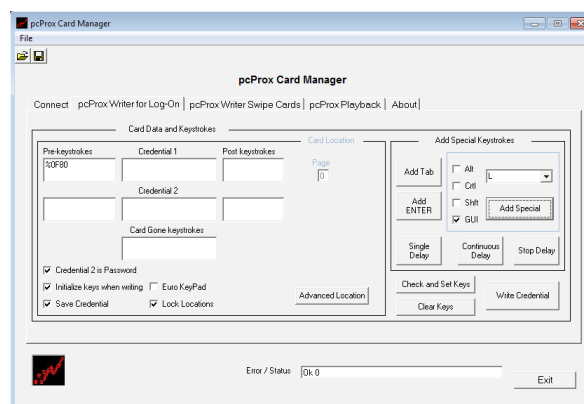

Similarly, the Alt-U keystroke sequence is the second 'Pre-Keystroke' item to go into this field. The cursor should already be in this field. To create the 'Alt-u' keystroke, check the checkbox labeled 'Alt' (i.e. the Alt key from a standard keyboard), and choose the letter 'u' from the pull-own box. These two selections will together perform the Alt-u keystroke – i.e. holding down the Alt key while pressing the 'u' key on the keyboard. Pressing the 'Add Special' button in this section once will deliver the proper hex keystroke code information to the 'Pre keystroke' field. You should see the following:
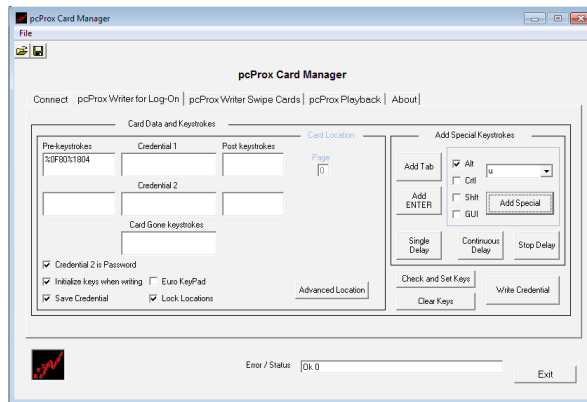
Next, the Username for this user are ready to be entered; i.e. '.Admin'.

To perform this, simply set the cursor down in the next field 'Credential 1' and type: Admin
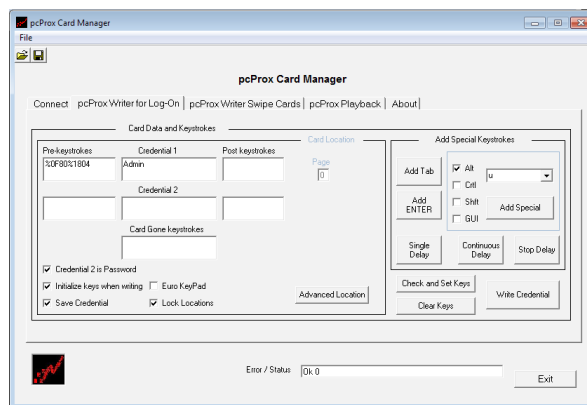
To complete the Credential 1 field, add the {TAB} keystroke.

The {TAB} keystroke is added to the 'Post keystrokes' field by placing the cursor into this field and pressing the 'Add Tab' button located in the 'Add Special Keystrokes' section.
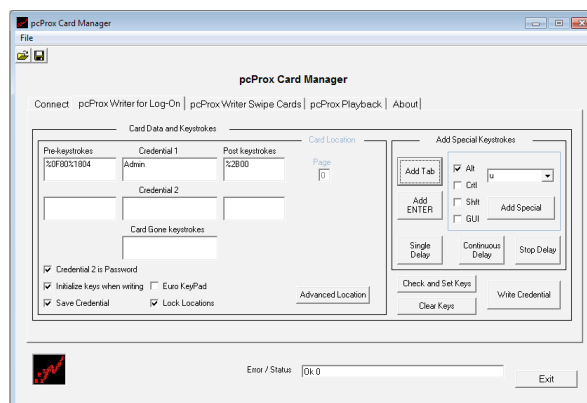
That's it, now Credential 1 is done! Credential 2 is now ready to be created – i.e. the Password.

<u>Credential 2</u>

Place the cursor into the Credential 2 field and type the Password 'UserPassword'

Since the Credential 2' checkbox is checked, the field fill-in character is the '*'. Deselecting this check box before filling in the field will allow you to view the actual password. This may be useful if the Credential field is not a password, but some other non-secure information.

Now, add the {ENTER] keystroke by placing the cursor into the 'Post Keystroke' field and using the 'Add Enter' button located beneath the 'Add Tab' button.

The resulting screen should look exactly like the following:
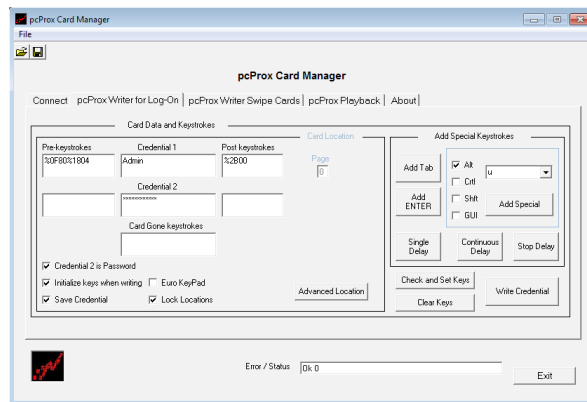
All that is left to do is to 'Write' the Credentials 1 and 2 to the contactless card sitting on the reader. This is done by pressing the 'Write Credential' button.

Example B: Two-Factor Authentication

The below example applies to a User who needs to log-on to Windows XP.

A user who needs to log-on to Windows XP: The Username is Admin, and the Password is UserPassword.

This user typically types (in terms of keystrokes):

GUI-L (first lock the machine to prevent viewing of the credentials if the PC is unlocked)
**Alt-U** (gets the cursor into the Username field)
Admin
**{TAB}** (key labeled 'Tab' on keyboard)
UserPass

The concept is to get the 1st three lines onto Credential 1, and the last two lines onto Credential 2.

Credential 1

To get the GUI-L keystroke sequence in the first 'Pre-Keystroke' field we have to first place our cursor in this field. Next, we will need to use the right-hand section of the section labeled 'Add Special Keystrokes'. To create the 'GUI-L' keystroke you need to check the checkbox labeled GUI (i.e. the GUI (or Windows) key from a standard keyboard), and choose the letter 'L' from the pull-own box. These two selections will together perform the 'GUI-L' keystroke – i.e. holding down the GUI key while pressing the 'L' key on the keyboard. Pressing the 'Add Special' button in this section once will deliver the proper hex keystroke code information to the 'Pre keystroke' field. You will be able to see the '%F80' entry into this field. You can easily start over by (removing) selecting the '%F80', and using the Delete key to remove it.
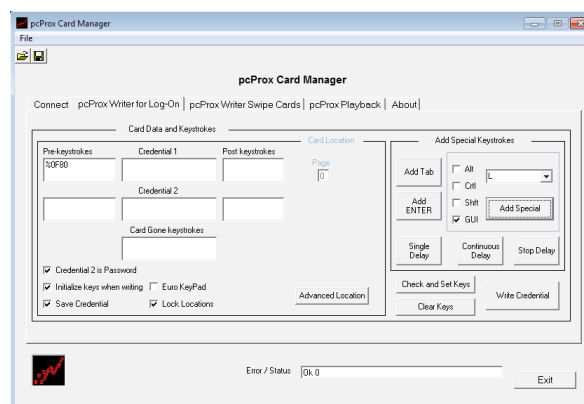
Similarly, the Alt-U keystroke sequence is the second 'Pre-Keystroke' item to go into this field. The cursor should already be in this field. To create the 'Alt-u' keystroke, check the checkbox labeled 'Alt' (i.e. the Alt key from a standard keyboard), and choose the letter 'u' from the pull-own box. These two selections will together perform the Alt-u keystroke – i.e. holding down the Alt key while pressing the 'u' key on the keyboard. Pressing the 'Add Special' button in this section once will deliver the proper hex keystroke code information to the 'Pre keystroke' field. You should see the following:
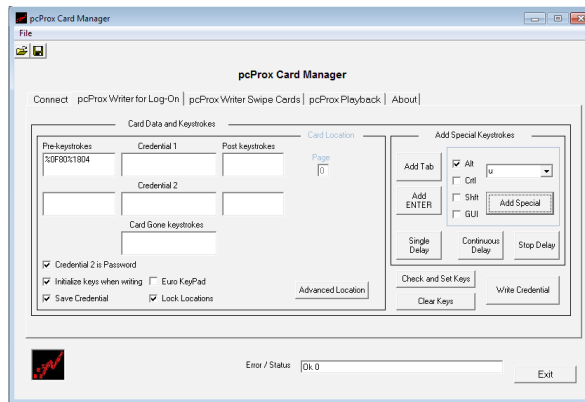
Next, the Username for this user are ready to be entered; i.e. '.Admin'.

Simply set the cursor down in the next field, 'Credential 1', and type: Admin
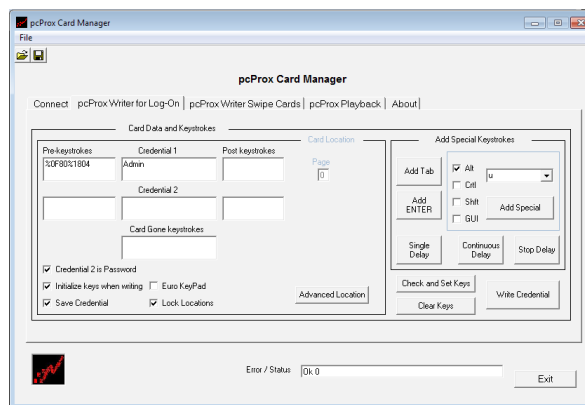
To complete the Credential 1 field, add the {TAB} keystroke.

The {TAB} keystroke is added to the 'Post keystrokes' field by placing the cursor into this field and pressing the 'Add Tab' button located in the 'Add Special Keystrokes' section.
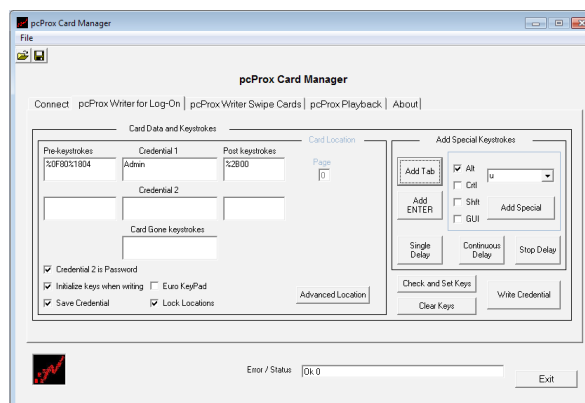
That's it, now Credential 1 is done! Credential 2 is now ready to be created – i.e. the UserPass.

Credential 2

Now place the cursor into the Credential 2 field and type the Password 'UserPass'

Since the Credential 2' checkbox is checked, the field fill-in character is the '*'. Deselecting this check box before filling in the field will allow you to view the actual password. This may be useful if the Credential field is not a password, but some other non-secure information.

The {ENTER} keystroke will not be added since the user will be completing the password entry, and providing the ENTER keystroke to complete the logon.

The resulting screen should look exactly like the following:

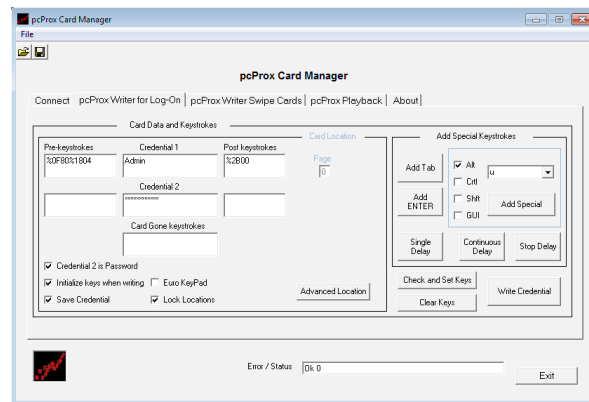All that is left to do is to 'Write' the Credentials 1 and 2 to the contactless card sitting on the reader. This is done by pressing the 'Write Credential' button.

Card Gone Keystrokes:
The 'Card Gone' field holds keystrokes to be delivered when the card is removed from the pcProx Playback reader.

> **Note**: This feature should be used with caution since it implies the user is being asked to leave their card on the reader. Since the contactless card often carries security information, it is dangerous to ask employees to leave a card on the reader since they are likely to forget the card. It therefore leaves open a security flaw since another user can easily obtain a card and impersonate the user. Two safer alternatives are:

> 1. Auto-Locking on 2nd Card Presentation
> You can setup the Playback reader to issue a locking keystroke sequence if the card is presented and removed quickly, the station will auto-lock. Please see the Playback Advanced Section of this User's Manual for additional details.

> 2. Use RF IDeas pcProx Sonar Presence Detector (see section describes this hands-free low cost alternative)

Typical 'Card Gone' Keystroke Sequence GUI-L (Windows XP lock command):

Place the cursor into the 'Card Gone' field, then add the Ctrl-Alt-Del keystroke sequence by using the 'Add Special Keystrokes' section located on the right hand side of the screen.

Check the GUI checkbox.

Next, use the pull-down box and type 'L' to locate the L keystroke in the pull-down box.

Once you highlight 'L', use the 'Add Special' button to insert the code into the 'Card Gone Keystrokes' field. The screen should look like:
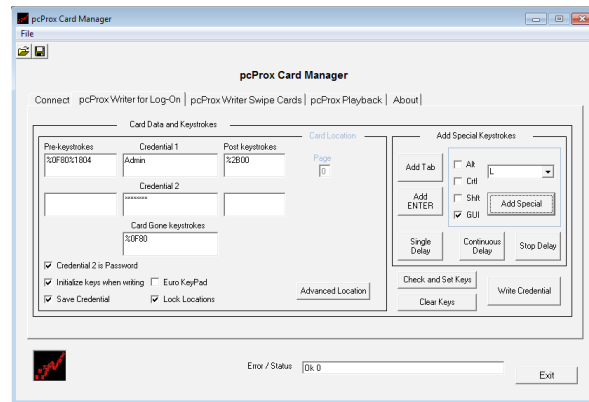
Finalize the operation by pressing the 'Write Credential' button. It will deliver the encoding sequences to the contactless card.

pcProx Writer for Swipe Cards Tab

While this Tab is labeled 'pcProx Writer for Swipe Cards', it is really for generic data usage. As in the previous Tab, you can freely enter keystrokes, or RS-232 characters for those using Playback 232, and user data into any of the 3 fields. All data will be written to the Page, Application Area, and Block location described above the fields.

If you choose a 16k/2 appl area (BDG-2001) card, you can easily store the log-on credential in one part of the card; hold the contents from a mag-stripe or bar code card in another area, and other user data in additional areas.

If you select the 'Initialize Keys', the Card manager will write the secure the location of the card specified.

If you do not select this checkbox, the Card Manager will assume you have already secured this location of the card and there will be no attempt to write keys to this location. An error will result if the keys were not written previously.
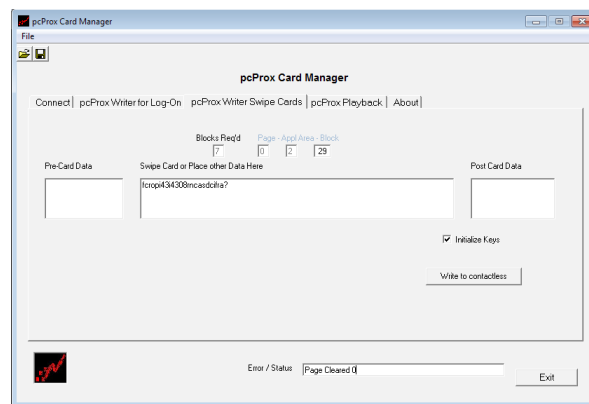
As in the Log-On Tab, you can modify the card location (Page, Appl Area, Blocks) – refer to the section labeled 'Memory Map'. Once you have the data inserted into the fields, you are ready to press the 'Write to Credential' button.

If you choose MIFARE cards, the screen will appear as below:
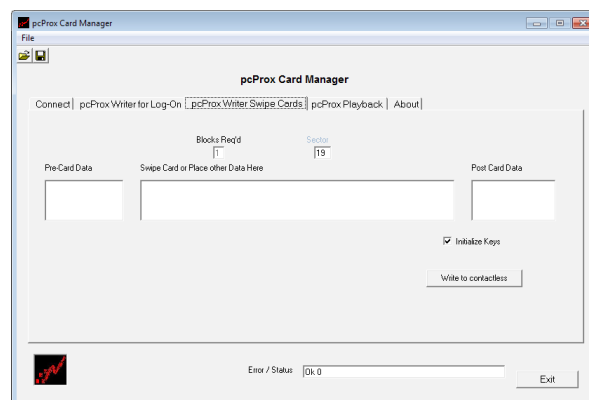
pcProx Playback Tab

The pcProx Playback USB device reads the user data placed in the contactless card and delivers these keystrokes to the location of the cursor on the screen. The pcProx Playback RS-232 device reads the user data placed in the contactless card and delivers these ASCII characters to serial port at 9600 baud, 8 data bits, 1 Stop bit, and no parity.

To use this section, you MUST have either pcProx Playback reader attached (USB or RS-232). Most USB ports and adaptors will support the pcProx Writer and pcProx Playback reader attached at the same time. For Playback 232, this application automatically searches COM ports 1-4. The LED will light up when attached provided there is enough power.

Support is provided for iCLASS and MIFARE Playback readers. In the Playback for MIFARE context, blocks are considered Sectors. There is no meaning for Pages, Application Areas or Books.

> **Note:** You must configure the proper locations (i.e. where you encoded the data in the card) into the pcProx Playback reader prior to using.
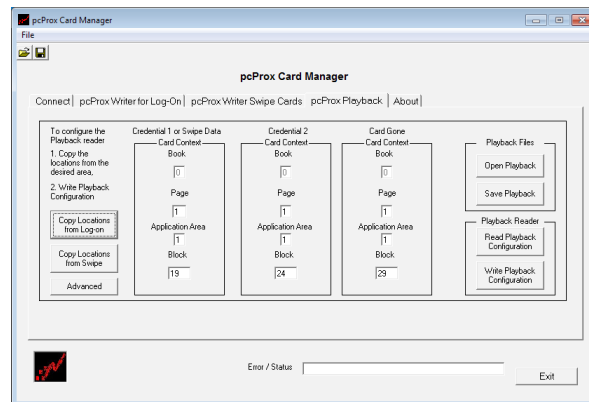
MIFARE
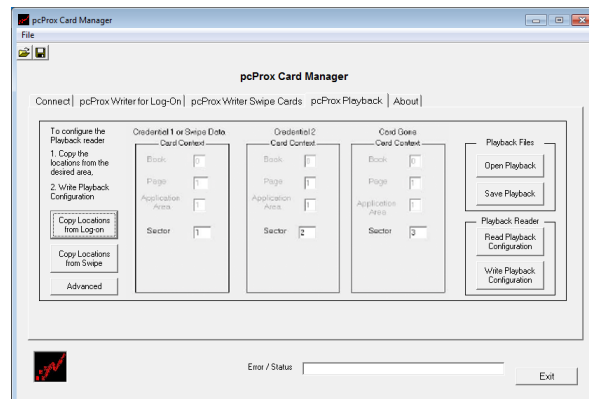
To be able to use the pcProx Playback reader, it must be configured. There are two ways to configure the pcProx Playback reader:

1. First, select one of the 'Copy Locations' buttons to obtain the correct card locations and fill in the fields (Page, Appl Area, and Blocks) on the pcProx Playback Tab screen. Next use the button 'Write Playback Configuration' to transfer these locations to the attached Playback reader.

OR

2. First, select one of the 'Copy Locations' buttons to obtain the correct card locations and fill the fields (Page, Appl Area, and Blocks) on the pcProx Playback Tab screen. Next, use the button 'Save Playback' to create and save a Playback file on your PC. This file is then used as a command line option to auto-configure the reader on-the-fly. See section labeled 'Auto-Run Operation' below.

The choices are described in detail below.

The pcProx Playback tab provides this functionality. The following are descriptions of the various buttons in this tab:

Card Context: Credential 1, 2 and Card Gone

pcProx Writer for Log-on Users: The three sets of Card Context are used to tell the Playback reader where to find the Credentials 1 and 2, and the Card Gone keystrokes.

Note: The Book field is a future option not available yet.

The card location (Page, Application Area, and Sector/Block fields) must be the same for the set of the Credential and Card Gone fields in the pcProx Writer for Log-on Tab and for the locations shown in the respective fields on this screen. The easiest way to make sure the fields are the same is to use the 'Copy Locations from Log-on' button (described below).

Once you have the all fields filled in with the correct choices, you can:

1. Use the 'Save Playback' button to save the contents as a file for later retrieval or for Auto-Run usage.

2. Use the 'Write Playback Configuration' button to write this configuration information into the Playback reader. After pressing this button, your Playback reader is now properly configured to read this area of the card.

pcProx Writer for Swipe Users: The first Card Context is used to tell the pcProx Playback reader where to find the swipe (or other type) user data.

Note: The Book field is a future option not available yet.

Copy Locations from Log-on
This button will copy all the card locations from the pcProx Writer for the Log-On Tab directly to the correct fields. After this operation, the reader is ready to be configured with these settings.

Copy Locations from Swipe
This button will copy all the card locations from the pcProx for Swipe Card Tab directly to the correct fields. After this operation, the reader is ready to be configured with these settings.

Advanced
This button will allow the user to configure more advanced features within the Playback reader. Most users will not need to modify these parameters.

Open Playback
This reads the specified Playback (PLB) file and loads all the Card Context fields.

Save Playback
This saves all the Card Context fields to the specified Playback (PLB) file.

Read Playback Configuration
This reads the attached pcProx Playback reader configuration and fills in all the Card Context fields.

Write Playback Configuration
This writes all the Card Context fields to the attached pcProx Playback reader.

Advanced

Since this application supports both Playback readers, USB and RS-232, consequently there are some features that are applicable to one or the other but not both (i.e. inter-key 'Press' time). As in previous sections of this user's guide, keystrokes or RS-232 characters are interchangeable and dependant on the selection made under the chosen Playback Device found in the 'Connect Tab'.

The Advanced button under the Playback Tab allows the user to set various keystroke timing parameters as well as Playback reader supplied keystrokes. This system allows the user to have the card of the Playback reader provide the 'pre-' and 'post-' credential keystrokes and CardGone keystrokes. A primary reason to have the Playback reader provide the keystrokes instead of the card would be due to multiple operating systems.
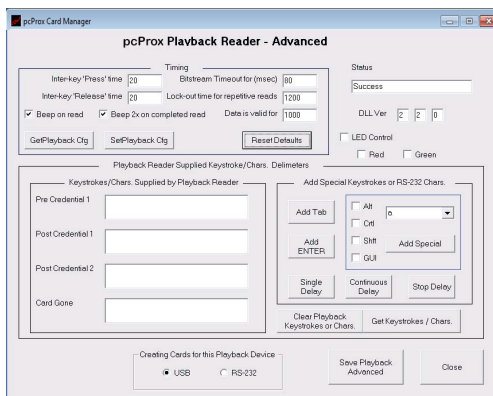
For example, to bring up a log-on dialog box may be different between Windows 98, Apple Macintosh, Windows 2000, and Windows XP. For this reason, it would require multiple memory locations within the card to have the same logon credentials interface with the correct keystrokes to each of the different operating systems.

It would be much easier and more efficient to program the Playback reader to supply the keystrokes surrounding the log-on credentials.
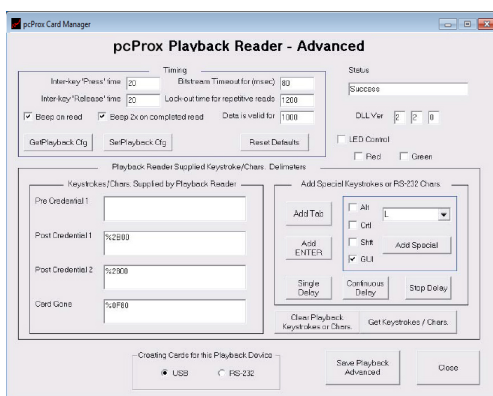
Since the Playback USB reader installs and appears as a USB keyboard to the operating system, many of the same keyboard parameters appear in the pcProx Playback reader.

All times are in msecs (i.e. 1000 msecs = 1 second)

Inter-Key 'Press' and 'Release' time: Are in msecs and refer to the time each keystroke is held down and released.

Bitstream Timeout: This is the delay time used before the card is read.

Lock-out Time for repetitive reads: This is the time used to wait before another card is read.

Data valid for: This is the time the last card's contents are valid for (msecs)

Reset Defaults: All values are set to factory defaults

Beep on Read: Beepers sounds when a supported contactless card is presented.

Note: This beep does not indicate it is programmed correctly, or configured to the correct page of memory within the card.

Beep 2x on Completed Read: This checkbox is only valid if Beep on Read (above) is checked. Once the programmed Playback data is completely read from the card, the reader will beep twice. This signals the user that the card may be pulled away from the reader.

Playback Reader Supplied Keystrokes/ Chars. Delimiters
The keystrokes (or RS-232 characters) are handled the same way as in the Writing Credential section described above.

Pre Credential 1
This field holds the keystrokes you need to have sent prior to the user's 'Credential 1'. In the context of a typically log-on application, 'Credential1' is commonly known as the Username. In this context the Pre-Keystrokes would be the sequence of keystrokes required to bring up the log-on dialog box. This sequence of keystrokes can be different for each application and operating system. For example Windows 2000 is Ctrl-Alt-Del, while the home edition of Windows XP is Alt-U (gets the cursor into the user field).

Using Pre Credential 1 for Auto-Locking on 2nd Card Presentation
It is possible to use this field to allow an employee to present their card and quickly pull this away for the purpose of locking the station. To use tis 2nd tap of the card concept, you simply insert a auto-locking keystroke sequence into this field. For example, enter a GUI+L (Windows key is GUI) as the pre-keystroke for Credential 1. If you quickly present the card and pull it away, only this keystroke sequence is played and the workstation is locked.

Post Credential 1
This field holds the keystrokes you need to have sent after the user's 'Credential 1' is delivered. In the context of a typically log-on application, you need to get the cursor into the password field by using a TAB keystroke.

Post Credential 2
This field holds the keystrokes you need to have sent after the user's 'Credential 2' is delivered. In the context of a typically log-on application, you need to get the cursor into the password field by using a TAB keystroke.

Card Gone Keystrokes
The Card Gone field holds keystrokes you would like to be delivered when the card is removed from the pcProx Playback reader. A typical Card Gone keystroke sequence would be to lock a workstation. Under Windows XP this is done by holding down 'Ctrl-Alt' and pressing 'Del', then pressing 'K'. Example B below will show how, using the Special Keystrokes section, this is placed into the Card Gone field.

Clear Playback Keystrokes
This clears all keystroke held by the Playback reader.

Get Playback Keystrokes
This button cause the application to re-read the Playback reader and retrieve the keystrokes.

Save Playback Advanced
This saves all parameters on the Advanced screen to the attached Playback reader.

About Tab

Here you can review the version and Memory Map of the contactless cards to see how the card layout is done.
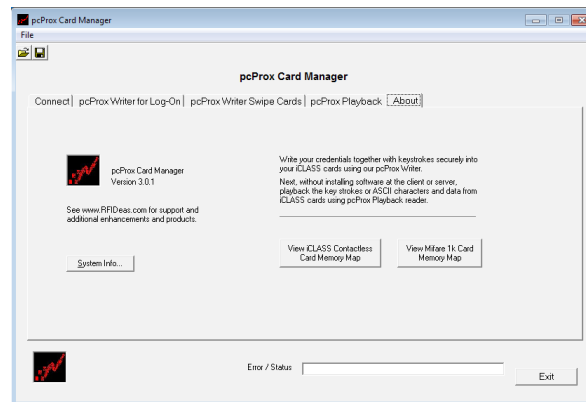
View Memory Map
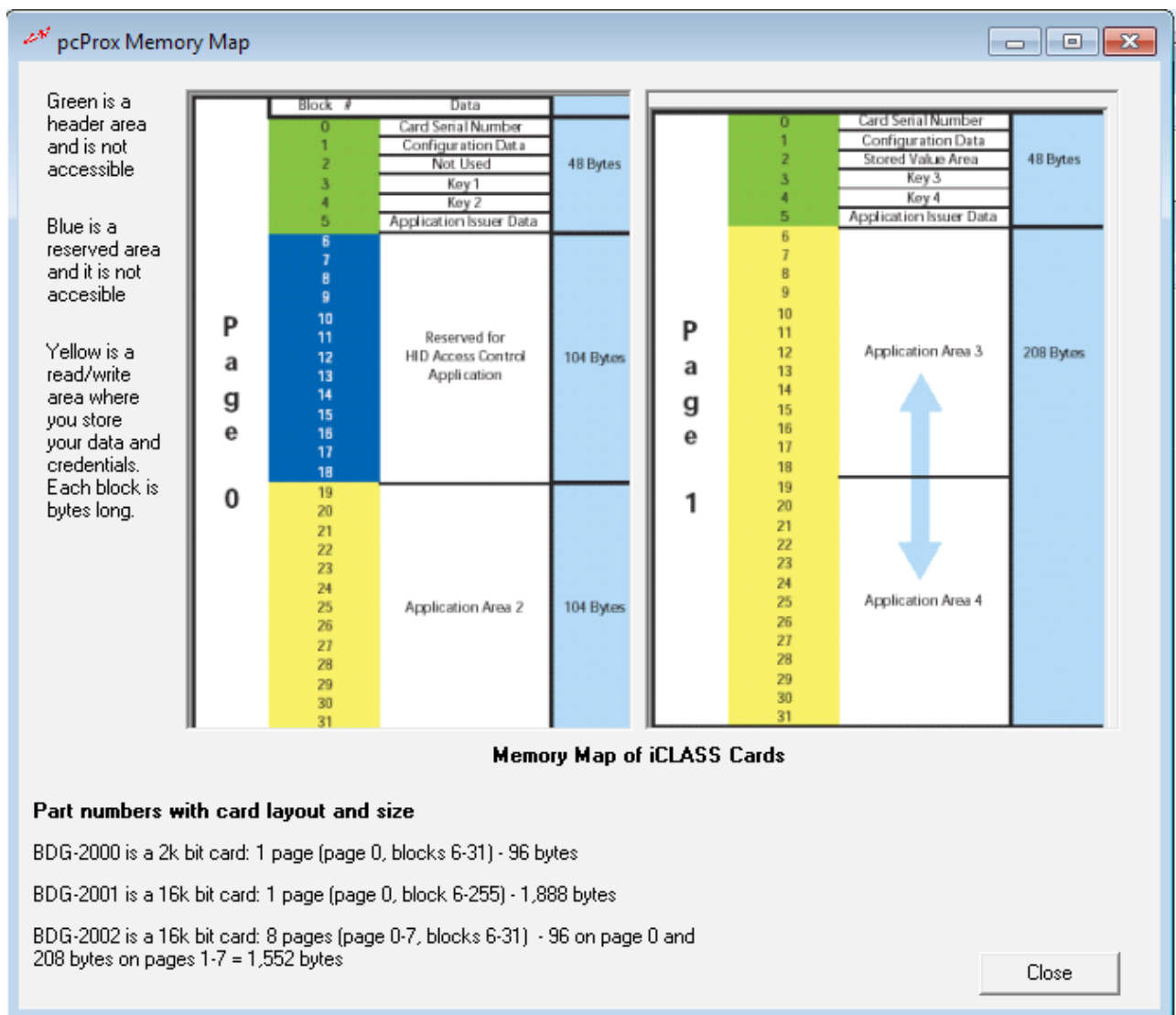
The following shows the memory map for the NXP MIFARE 1k and 4k card.
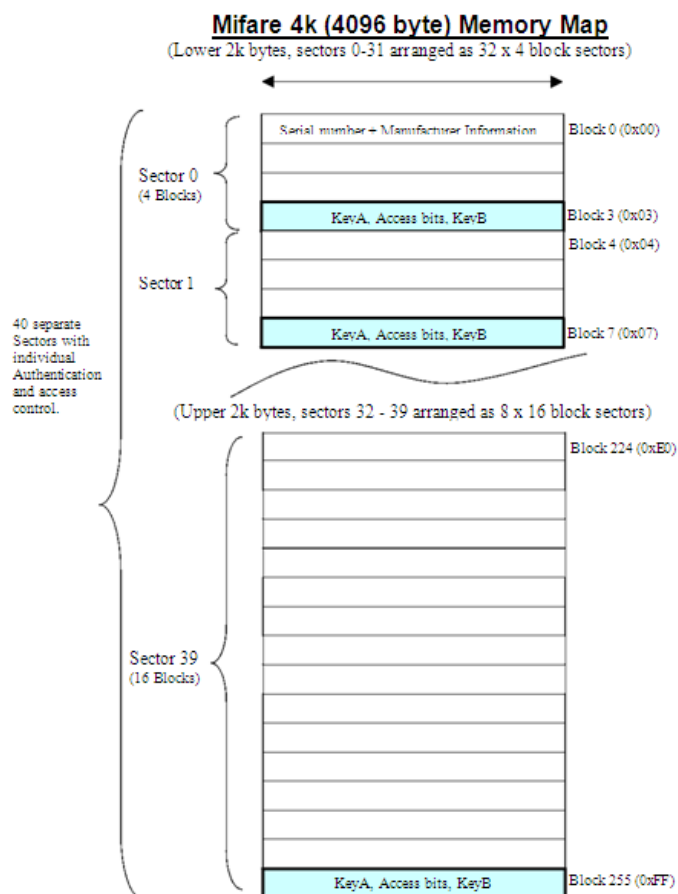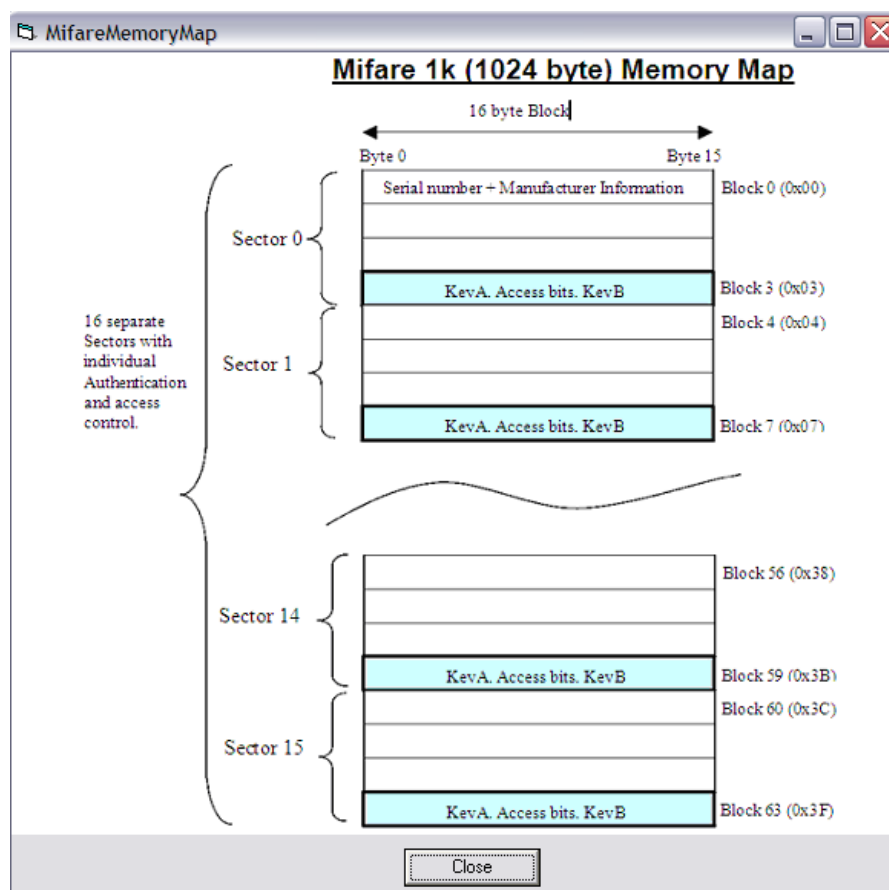
File Menu

There are several types of files maintained by the pcProx Card Manager. These file templates are useful in preparing additional cards, retrieving the contents of a card already written, or working with the Playback configuration.

Below is a screen shot showing the choices.
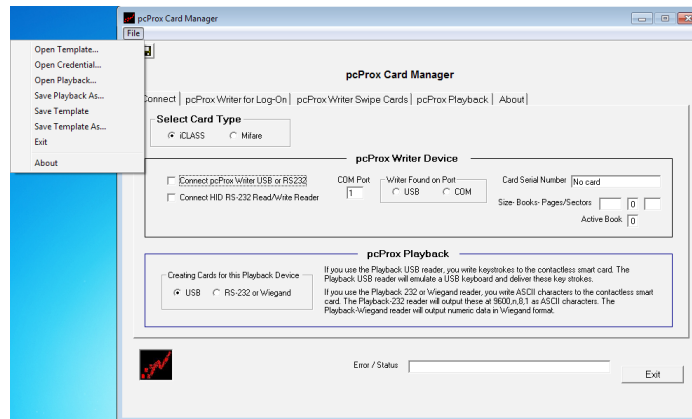
Template (*.crd) files hold the pre- and post keystrokes along with the Card Gone keystrokes. This is useful for setting up multiple cards that will have the same surrounding keystrokes (i.e. pre and post keystrokes).

Choices: Open Template, Save Template (uses Default.crd, Save Template As..)

Credential files – These (*.cdd) files are created if the 'Save Credential' checkbox is selected. The filename used is the 'Card Serial Number'. The credential files hold all contents and parameters in the pcProx for Log-On tab. This is useful to see what you wrote to a specific card.

Playback Files – The (*.plb) files hold the Card Context locations used by the Playback reader to retrieve data from specific locations on the card. These files are useful for creating on-the-fly configurations for the Playback reader (see Auto-Run section).

Auto-Run Operation

Overview
There are two auto-run operating modes available. One for dynamically configuring the pcProx Playback reader and the other for writing to cards and another for.

The Playback reader can be dynamically configured to read various card locations.

The card writing a batch of cards from a database can be automated by spawning an executable program with a command line optional file that contains the data needed to be written to the card.

Playback Auto-Run

In the Playback Auto-Run mode, the user specifies a configuration file (ex. Default.plb) using a "shortcut properties" link as defined in the Windows environment. This is useful when you need a method to automatically re-configure any of the device's features, such as the distance or keystrokes.

First, the user makes all desired pcProx Playback configuration settings (see pcProx Playback Tab).

Second, once the settings are defined, the user creates a (.PLB) by using the 'Save Playback As' selection under the File menu system, or the Save Playback button located in the pcProx Playback tab.

Third, the user needs to create a shortcut link and specify the (.PLB) configuration file in this link. Shortcut links can be created using the Windows Explorer, selecting the pcProxCardman.exe file and then using a right-click of the mouse. You will see a 'Create Shortcut' menu item.
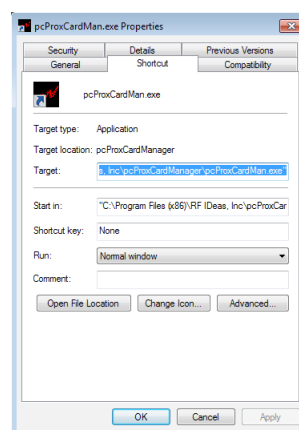
Fourth, once the shortcut is created, the 'Properties' need to be modified by adding the filename of the (.PLB) file after the quote in the target field as shown above (filename used is "C:\Program Files\RF IDeas, Inc\RFID1356i\pcProxCardman.exe" magstripe.plb).

Log-On to Web Sites

It is possible to apply the log-on credential to web sites as well. To do this you need to create a 'batch' file. Batch files are (*.bat) files that contain regular ASCII text characters that allow multiple programs to execute in sequence. They can be created using any text editor, such as Notepad.exe. Once

created, the shortcut property (see Auto-run example) can be used and/or the shortcut can be tied to a hotkey.

The following is an example that will configure the Playback reader prior to running a website using Microsoft Internet explorer:

The files test.bat and default.plb are both placed in c:\.

C:\Test.bat contents look like:

"C:\Program Files\RF IDeas, Inc\pcProx Writer\pcProxCardman.exe" default.plb
"C:\Program Files\Internet Explorer\iexplore.exe" http://www.rfideasstore.com/

This batch file will first configure the Playback reader with the file Default.plb, then load and run Explorer and go to the web site: http://www.rfideasstore.com/

Card Writing Auto-Run

In a similar fashion, the pcProxCardMan.exe application is used with a command line file option to perform the writing.

For example: "C:\Program Files\RF IDeas, Inc\RFID1356i\pcProxCardman.exe" JohnSmit.CDD) would write the JohnSmit.CDD file to the card placed on the pcProx Writer.

Below is a complete description of the file contents. Each field must be in ASCII TEXT format, and be on it own line in the file.

Line#	Description
1.	Pre-Keystrokes (for Credential 1)
2.	Credential 1
3.	Post-Keystrokes (for Credential 1)
4.	Pre-Keystrokes (for Credential 1)
5.	Credential 1
6.	Post-Keystrokes (for Credential 1)
7.	CardGone Keystrokes
8.	Page for Credential 1
9.	Page for Credential 2
10.	Page Card gone
11.	ApplArea for Credential 1
12.	ApplArea for Credential 2
13.	ApplArea Card gone
14.	StartBlock for Credential 1
15.	StartBlock for Credential 2
16.	StartBlock Card gone

You can leave lines in the file empty (i.e. place a blank line) for fields which require no entry. All lines should be enclosed in quotes " ". In all cases, the file must have 16 lines of text.

Here is an example of the file: writing test as credential 1, and 12345678 as credential 2. This is written to Page 1, Application Area 1, blocks 19 and 21.:

""
"test"
""
""
"12345678"
""
""
"1"
"1"
"1"
"1"
"1"
"1"
"19"
"21"
"23"

Increasing Security

Security Overview

Preventing Sharing Passwords, Viewing the Username and/or Password

For those concerned about a person being able to view their own credentials, or finding a badge and viewing another's credentials there is an easy solution. In the pre-keystrokes section of Credential 1, before all other 'pre-keystrokes', add the necessary keystrokes which lock the PC. For example under Windows XP, GUI+L is used to issue the locking command.

If the station is already locked, these keystrokes are ignored.
If the station is not locked, this initial set of keystrokes will lock the PC before any other keystrokes are sent.

Security Due to Lost/Stolen Cards
If there is concern for logon impersonation as a result of a lost or stolen contactless token, you may set up the usage as a two-factor authentication system.

A two-factor authentication system is made up of
    1. Something you have (the token), and
    2. Something you know (a PIN)

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

One-Factor
In a one-factor system, the user simply waves the contactless token. Therefore the token may be configured to add TAB keystrokes between the username and password data as well as an ENTER keystroke behind the data. This was illustrated in example A.

Two-Factor
In a two-factor system, only a portion of the password is encoded into the token. The user is required to enter the balance of the password (the PIN) after the token data is inserted into the field. The user then completes the entry with the ENTER keystroke. This was illustrated in example B.

The two-factor approach is especially useful when using a policy that insists on password construction rules or periodic changing of passwords

Password Change Rules
The issues the administrator will face include:

    Automatic Change Password: To increase security several companies have adopted a policy that requires users to change password every xx number of days. To keep this policy in place,

you will need to have user's password include both the data in the token as well as a user supplied PIN. The PIN is the portion that the user will change periodically.

Complex Passwords: To keep this policy in place, you will need to have users password include both the token data as well as a user supplied PIN. In this case, the token data may contain any alpha and upper/lower case letter constraints will be handled in the user supplied PIN portion of the password.

More difficult passwords can be constructed using password characters created using keypad created keystrokes such as: "ALT 002". To perform this you must use the numbers from the keypad. The keypad numbers are available from the pull-down special keys combo box – these are indicated as KP_0 through KP_9. Here is what these special keystroke characters may look like in a typical word processor such as MS Word or NotePad: 🔲🔲🔲🔲🔲 or ☻ ☺•♦☻•☺♦.

Single Sign-On

If you would like to log-on to several applications, i.e. single sign-on, here is an approach which may work for you.

	ID	Password	PIN
XP Log-On	Admin	UserPas	sword
Application 1	Admin	UserPas	app1
Application 2	Admin	UserPas	app2

iCLASS

iCLASS Card Management

Since you can put many applications onto a single card, planning and organization will prove to be helpful.

Below is a more complete view of the actual memory map for of the three offered:

iCLASS credentials:
- *iCLASS*, the most powerful read/write contactless smart card available today, features multiple memory sizes, form factor options, and configurations.
- All other application areas are open to developer read/write data applications.
- To learn more about the amount of memory used to store various applications, visit **www.hidcorp.com/iclass** and click on Memory Mapping.

2K bits (256 Bytes) *iCLASS* credentials:
- The 2K is a highly secure credential optimized for standard access control applications.
- Application Area 2 is limited to 104 Bytes of read/write data. The key that secures the data cannot be updated.

16K bits (2K Bytes) *iCLASS* credentials:
- The 16K is a highly modifiable, multi-application credential with enough memory area to store most common biometric templates.
- Application Area 2 of the 16K/2 credential allows for 1896 Bytes of read/write data, all of which can be accessed with a single authentication key.
- The 16K credential can be configured for either 2 or 16 application areas. Note: Once configured, the credential cannot be reconfigured.
- The configuration block (block 1) of pages 1 through 7 on a 16K/16 credential is modifiable. This allows for the additional configuration of the Application Limit on these pages.

MIFARE Card Management

MIFARE is a contactless smart card technology owned by Philips. The MIFARE technology is based on ISO 14443A operating at the 13.56 MHz frequency. MIFARE is a proven, reliable, and robust technology for contactless smart card with 250 million cards in the field. It is an open architecture platform that guarantees compatibility with current and future products. MIFARE has an established customer base with the broadest offering of suppliers providing multiple sources for cards and readers.

MIFARE Technical Specification

The MIFARE standard card is a 1K byte (8192 bits) with 16 sectors. The memory map of the sector is as follows: each sector has 64 bytes (512 bits); within each sector, there are 4 blocks. A block has 16 bytes (128 bit) of memory. Sector 0 is reserved for the MIFARE Application Directory commonly refers to as MAD. For this reason, the pcProx Card Manager does not allow selecting Sector '0'. The MAD defines the common data structures for card application directory entries; allowing terminal to identify the right card and the right memory within the card without the need to perform a comprehensive search through all of the card's sectors until the appropriate application is found. The MAD uses Application Identifiers (AID) pointing to the specific sector in which the data is stored and identifies the registered card application for that sector. For multiple applications on a single MIFARE card, there can be multiple AIDs programmed Sector 0x0 and 0x1 to identify all registered card applications. The AID is a unique 16-bit number that is assigned by Philips to the participating registered companies. RF IDeas leaves this up to the end user to register.

Each MIFARE card contains an integrated chip with a unique permanent identification (UID) burned-in during the manufacturing process. The UID is often referred to as the Card Serial Number (CSN); for MIFARE, it is a 32-bit randomly generated serial number. The card serial number is not encrypted and resides in Sector 0, Block 0 and cannot be overwritten. In each sector including the MAD, there is a set of 48-bit encryption keys: Key A (read) and Key B (write). The keys are used to protect the programmed data from being read or overwritten without authorization. Since each sector has its own pair of keys, the card can be used to store information from multiple vendors for separate applications and protecting their specific sector(s) with their respective keys.

Security

The MIFARE technology uses the three pass mutual authentication according to ISO 9798-2 to ensure the security of the card and reader data exchange. The three pass mutual authentication is used to authenticate the card and the data stored on the card. The three pass sequence encrypts the communication and the transfer of card data between the card and the reader.

The pcProx Card Manager establishes its own security keys. If you require to establish your own keys, another version of the pcProx Card Manager is available – please contact technical support.

Card Organization Forms

For BDG-2000 or BDG-2002 (page 0)

Page	Blocks	Application	Playback File
0	19		
0	20		
0	21		
0	22		
0	23		
0	24		
0	25		
0	26		
0	27		
0	28		
0	29		
0	30		
0	31		

For BDG-2002 page 1 to 7

Page	Blocks	Application	Playback File
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

For BDG-2001

Page	Blocks	Application	Playback File
0	6		
0	7		
0	8		
0	9		
0	10		
0	11		
0	12		
0	13		
0	14		
0	15		
0	16		
0	17		
0	18		
0	19		
0	20		
0	21		
0	22		
0	23		
0	24		
0	25		
0	26		
0	27		
0	28		
0	29		
0	30		
0	31		
0	32		
0	33		
0	34		
0	35		
0	36		
0	37		
0	38		
0	39		
0	40		
0	41		

Page	Blocks	Application	Playback File
0	42		
0	43		
0	44		
0	45		
0	46		
0	47		
0	48		
0	49		
0	50		
0	...		
0	255		

For MIFARE 1k

Sector	Application	Playback File
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Auto-Locking the Workstation

To increase security when the user steps away, you can use a screen saver, but this could be a problem since:

1. Timing issues- Too Short - It can be problematic because if a user becomes pre-occupied with something else, without leaving the station, the computer will lock. Users grow tired of this since it can cause them to enter their password more than necessary.

2. Timing issues- Too Long - If set too long, there is no security, someone can come up within a minute or two of you leaving and jump onto the open system.

To improve the security, the best solution is to use the pcProx Sonar. This is a presence detector that usually mounts to the top lip of the monitor. It sends either the walk-up or walk-away keystrokes every time the user steps into or out of the perimeter zone.

What is Sonar Proximity Detection?
This is an ultra-sonic proximity detector functioning as a USB keyboard. The primary purpose is for detecting users stepping away from an un-locked (log-in active) computer terminal they have, and issuing keystrokes to lock or log-off the session to the computer.

Now when you walk away from your system, you will benefit from a hands-free means of locking your computer.

1.7 x 1.7 inches

How Does the System Work?
The concept of the pcProx Sonar is easy. The unit incorporates a sophisticated ultrasonic sensor to detect the presence of the user. Your computer simply 'thinks' that the pcProx Sonar is a USB keyboard that is attached to your system. The device sends programmable keystrokes to lock your computer when you leave the workspace. It's that simple. No more unattended and unlocked computers. The unit will lock the system for the user and will be done hands-free!

The objective is to detect two events. The most important is the detection of a user leaving the defined work zone of the computer. When the pcProx Sonar detects that the user has left the work zone, the unit sends the keystrokes necessary to lock the system.

For example, when Windows 2000 users leave their workstations, they would normally hit the "CTL-ALT-DEL-Enter" key sequence to lock their systems. With the pcProx Sonar attached, the "CTL-ALT-DEL-Enter" keystrokes are automatically sent for the user.

The second event is when you return to your work zone. The pcProx Sonar can now detect this event and send some preparatory keystrokes for you.

For example, on return to their computer, Windows 2000 users must hit the "CTL-ALT-DEL" key sequence to prepare the computer for the password entry. Again, with the pcProx Sonar attached, it will now send those keystrokes for you.

Who Can Benefit Using the System?
Any company, institution, or hospital using passwords, biometrics or any form of computer access control that needs to secure stations without reliance on users of cumbersome time-outs.

Tips & Troubleshooting 7

Troubleshooting

If your system is not working it could be for one of the following reasons:

No USB Device Attached

1. Check to be sure the pcProx Writer (RDR-7080, BSE-RFID1356i-U or BSE-RFID1356i-232) or pcProx Playback (PN: RDR-7075, RDR-7185) unit is plugged into the USB port. When the PC is on and no card is being read, you will see the LED is red. A valid contactless card will cause the LED to turn green for 1-2 seconds.

2. Verify you have the correct model and the software configuration screen agrees with the reader attached.

3. If trouble continues, unplug the pcProx unit, use the Control Panel's Add/Remove Hardware to remove 'General USB Device', and reboot the PC. When your system is started, re-attach the reader and the OS should re-install the Windows driver automatically.

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.

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Applicable Patents: RF IDeas pcProx Plus card readers supporting HID formats retain US Patent No. 5,952,935 and U.S. Patent No. 7,439,862.

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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 13.56MHz)
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: M9MRFID1356i100 (13.56 MHz Playback & Writer)

FCC ID: M9MBUPCPROXH100 (HID RS-232 model)
FCC ID: M9MBUPCPROXA100 (AWID)
FCC ID: M9MPCPROXP100 (Pyramid)
FCC ID: M9MRDR7P71 (FIPS 201 13.56MHz)
FCC ID: M9MRDR7L81 (Legic 13.56MHz)
FCC ID: M9MRDR7580 (iCLASS MIFARE and Other 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)

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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.

Index

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