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# Smart Card Encoder User Guide

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# Overview

## PC Connected RF Smart Card Reader/Encoder

Smart Encoder is the accompanying package to the Make Setup Card application. Make Setup Card creates cards with keys that is essential for Encoding cards in the Smart Encoder package.

Smart Encoder itself is a very versatile application that enables the user to write anything, in whatever format, and to whatever sectors they want.

This document goes through step by step the way to easily use the application to encode cards, and modify them again if necessary.

### How does it work?

The BT800 constantly transmits a fixed radio frequency (RF) signal, recognizable by the microchip on-board the smart card. When the card is held within 40mm of the encoder - the RF signal powers & communicates with the microchip.

### Features

Reads & Encodes **Contactless** Smart Cards  
High Security Triple DES Encryption  
RS232 Personal Computer Interface  
Slim-Low Profile Design  
Reads & Encodes 8K & 64K Bit Smart Cards  
Range of Windows-based Applications

### Basic System Requirements

PC - 486DX33 or greater

#### Memory:

8MB Ram (minimum)

#### Operating System:

WINDOWS 95, Windows 98, Windows NT, or Windows 2000.

### Software Description

- RF SmartCard interface for WIN 95 / WIN 98 / WIN NT / WIN 2000
- User configurable selection fields



## Specifications

Enclosure	Dimensions	Input Power
ABS Plastic	80mmx46mmx150mm	12 VDC plug pack
CPU	Memory	Transactions
Dallas 87C530 @ 33Mhz	1KB Static RAM 16KB ROM	70 msec
RF Protocol	Card R/W Distance	PC Comm's
Proprietary FR communications AM (with CRC error checking)	40 mm Maximum	RS232 async with in-built CRC
Operating Temperature	Relative Humidity	Vibration
-10°C to +55°C	to 99% non-condensing	Exceeds MIL-STD_810D requirements
Visual Feedback		
RED led – DC power good		

## Contactless Card

Contactless (RF) Smart Cards have attained widespread distribution in today's sophisticated lifestyle environment. They have developed from simple memory cards to complex security & I/D tokens, incorporating stored value.

Currently, Contactless Smart Cards have been gaining increasing use within wide spread applications, typically transportation and access control, combining stored value with non contact operation, these tokens are simple to use and operate. Contactless Cards are extremely fast with significant accuracy and inherent security. The nature of RF technology offers multi use with diverse functions, establishing themselves ahead of the competition.



## Advantages of Contactless Smart Cards

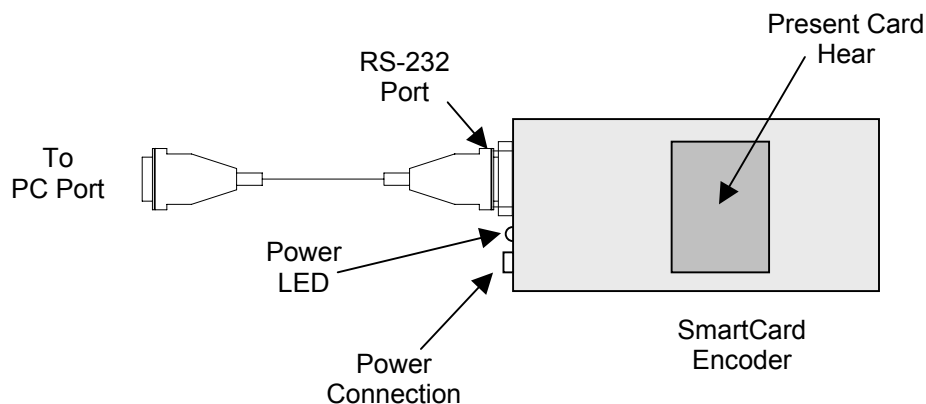
- Simple to operate and use
- Minimal transaction time
- Insensitive to moisture, dirt & dust
- Works independent of card presentation
- Long life span, 10 years data retention
- Reduces incidence of vandalism - no holes
- Maintenance free card reader - non contact
- 100% usable space on card surface



## Connecting Encoder

Plug the power supply into the encoder unit and the AC outlet. There is no power switch on the encoder once the power supply is plugged in, it will be on indicated by the red LED on the end of the encoder.

Connect the 9-pin DB RS-232 port of the encoder into one of your PC's RS-232 ports as shown below.



## Installing Software

After placing the install CD into the CD drive the install screen will automatically be displayed as shown below.



You may select to **Install** the software, read the **Read Me** file, or **Browse the CD**.

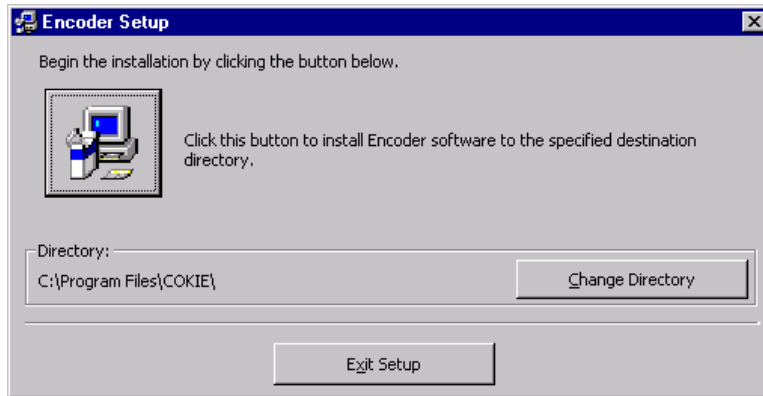
To install the software follow the steps listed next.

1. click on the word **Install** and the following screen is displayed.



Make sure you do not have any applications running on your system. If you do, click the **Exit Setup** button. After closing all applications start the installation process over again.

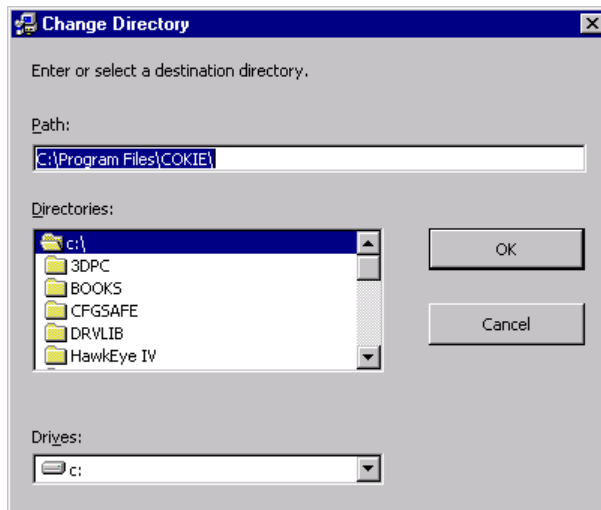
2. Click the **OK** button to continue.




The default directory is set for the C drive.

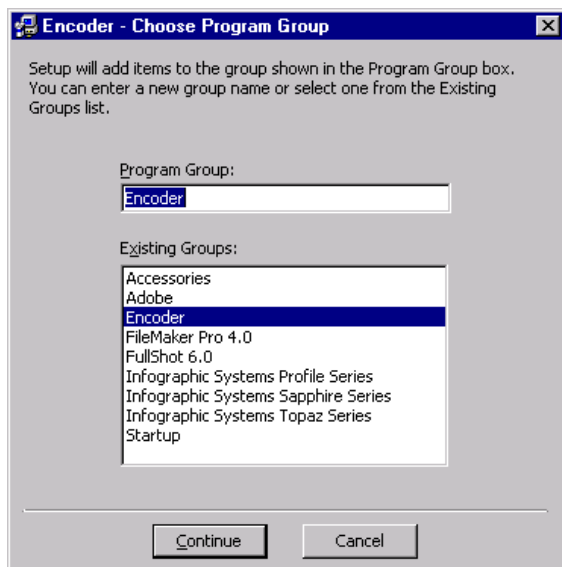
3. If you want to change the directory click the **Change Directory** button and the following screen is displayed.

If not skip to step 5.



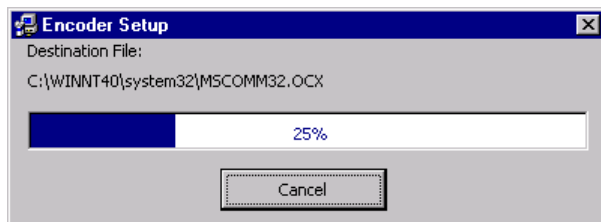
4. Select the desired directory and click the **OK** button.

5. Click the  button to install the encoder software and the following will be displayed.

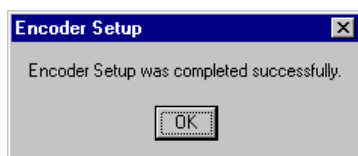


6. Click the **Continue** button.

The following screen with the grow bar will be displayed until all the files have been copied and setup on your PC's hard drive.



When all files have been setup the message **Encoder Setup was completed successfully** will be displayed.

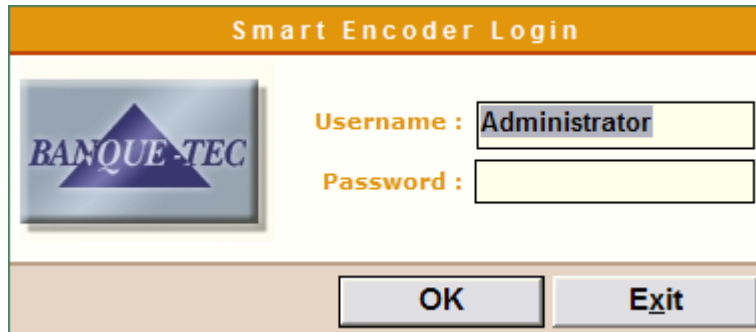


7. Click the **OK** button to complete the installation of the software.

The Smart Card Encoder software is now installed and ready to be started.

## Starting and Logging into the System

When you first start the software you will see the following screen.



This is the logon screen that you will see each time you start the software. You need to successfully log onto the system each time to use the application.

The default username is Administrator and password is Default. It is important to note that these are case-sensitive

Once successfully logged into the system, you can then proceed to perform the functions to encode cards.

If you do not wish to log into the software, and wish to exit right away, simply click the **Exit** button.

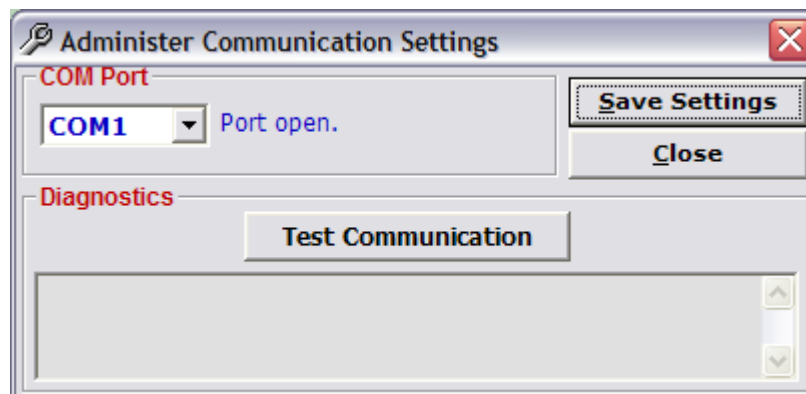
Once in the application you can leave at any point in time by going to the **File** menu and selecting the **Exit** option.

## Setting up Communications

Once in the system, you will need to make sure that the software is communicating with your encoder.

Firstly ensure that you encoder is connected to COM Port on your computer, and powered on.

Now go to the **Administer** menu and select the **Communication** option. The following screen will be displayed on the screen.



Once the screen is displayed, you can select the COM Port that you have connected the encoder to. This will ensure that the right one is being used for the communications.

When the COM Port is selected you can test the settings by pressing the **Test Communication** button.

Information will appear in the frame beneath this button, and will tell you whether communications were successful or not. Additionally to this, upon successful communication you should hear a beep from the encoder.

Once everything is communicating fine, you can store these settings to be automatically enabled the next time you enter the software, by pressing the **Save Settings** button.

To exit the screen at any time, simply press the **Close** button.

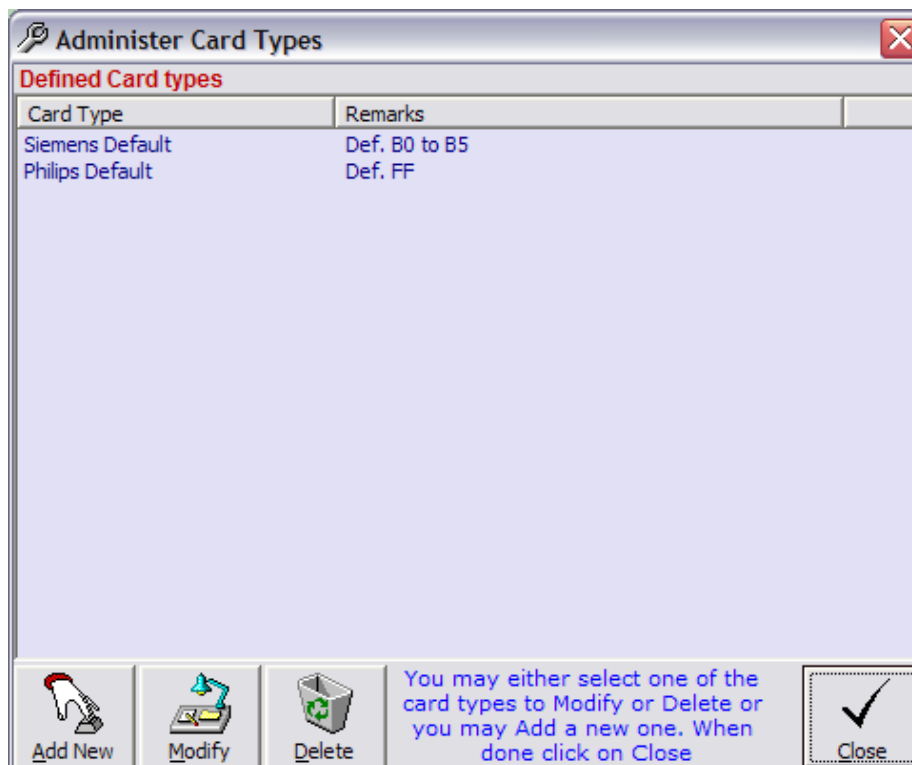
## Card Types

It is very important to know what default keys are on the default cards you will be encoding. Without this information you will not be able to write any data to the cards. From most manufacturers you will normally get one of two types of default keys, FF, or A0B0 keys.

The FF keys are found on Philips type cards, and the A0B0 keys are found on Siemens type cards.

When you install the software, you will find that these two card types are already installed into the system. But you do have the facility to create more default card types that uses any kind of base keys.

To add any new sort of card types to the system, go to the **Administer** menu and select the **Card Types** option. You will see the following screen.



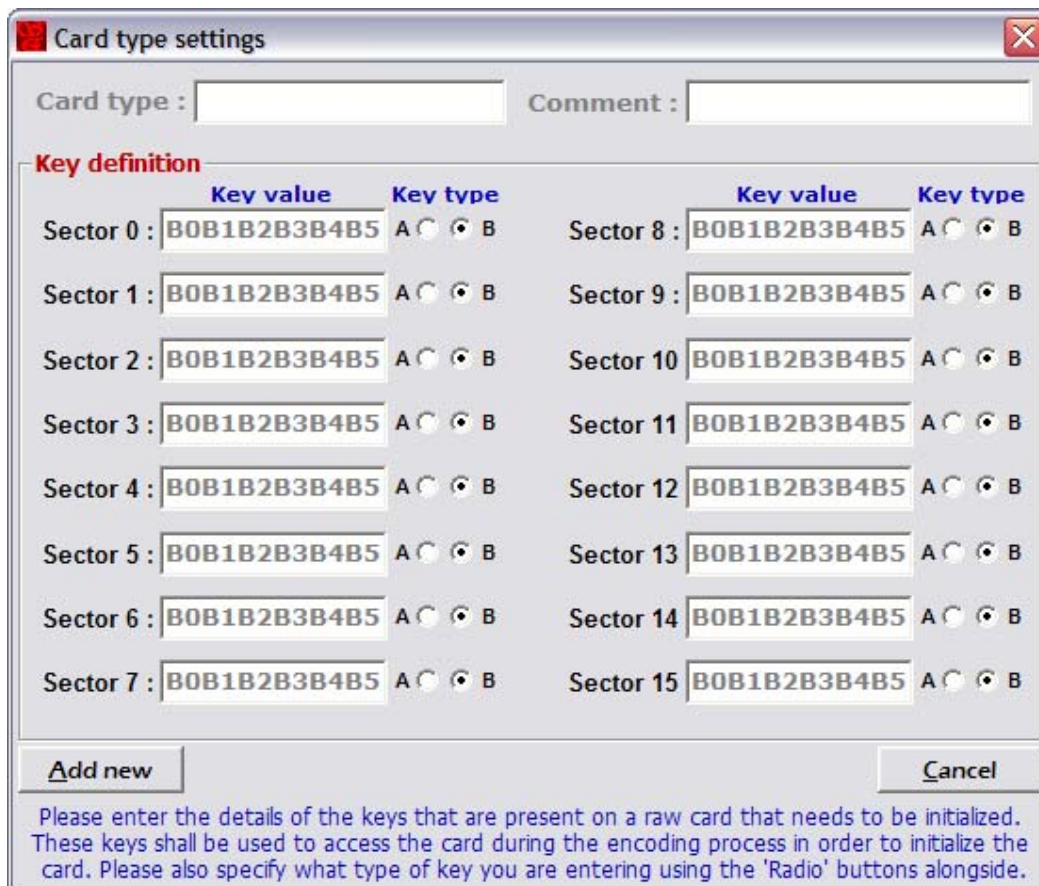
This screen shows all of the Card Types that have been created in the system; in this case Siemens Default and Philips Default.

At the bottom of the screen you will see a few buttons.

- **Close** – This will exit you out of the screen and take you back to the main window to allow you to select your next option.
- **Add New** – When selected you will be taken to a new screen. More details in Section 4.1.
- **Modify** – To use this option to change the keys of a card type that has already been created. Before pressing this button you are required to select a card type from the list.
- **Delete** – This is used when you wish to remove a card type from the system permanently. Before pressing this button you are required to select a card type from the list.

## Card Type

When you select the Add New or Modify options on the screen you will see the following screen. The only difference being that the Modify screen will load up the information already stored for the selected Card Type.



**Card type settings**

Card type :  Comment :

**Key definition**

	Key value	Key type		Key value	Key type
Sector 0 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 8 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 1 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 9 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 2 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 10 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 3 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 11 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 4 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 12 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 5 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 13 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 6 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 14 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>
Sector 7 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>	Sector 15 :	B0B1B2B3B4B5	A <input type="radio"/> B <input checked="" type="radio"/>

Please enter the details of the keys that are present on a raw card that needs to be initialized. These keys shall be used to access the card during the encoding process in order to initialize the card. Please also specify what type of key you are entering using the 'Radio' buttons alongside.

You are required to enter in a name for the Card Type that you are creating, as you need to identify it somehow.

Any comments you wish to add to the card type are optional.

You only need the A or B keys on the card, you do not need both to write to the card. It is standard to use the B keys for the card type.

Enter in the keys for each sector, select either A or B for each of them, and press the **Add New** button.

This information will be saved to the database as a new Card Type.

If you wish to exit out of this screen without saving the information, press the **Cancel** button.

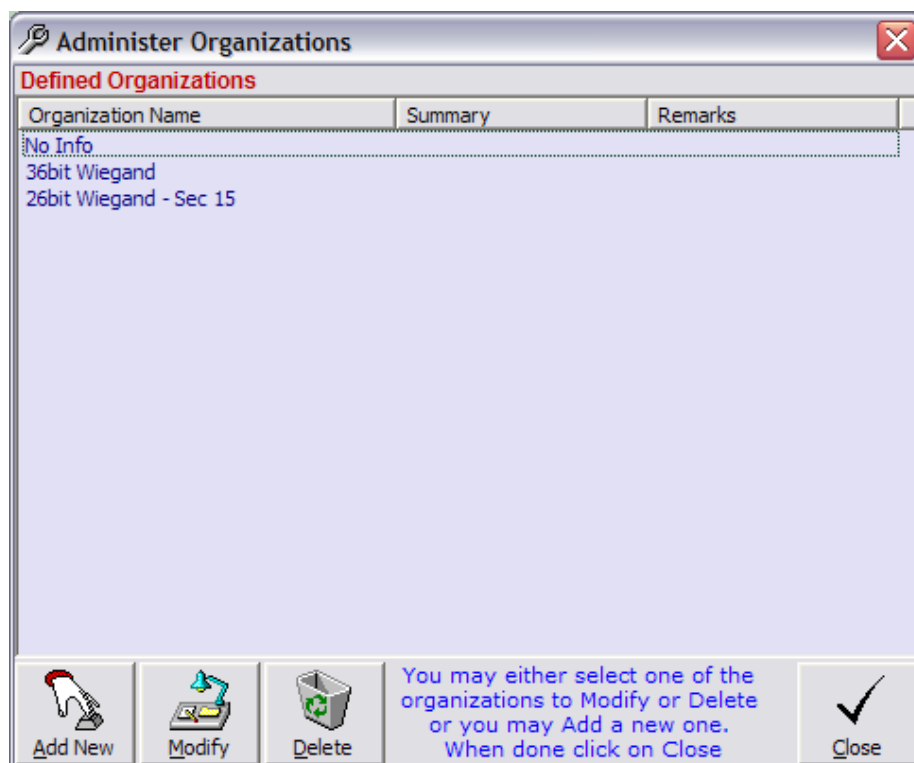
## Organization

Different organizations will require different information to be programmed onto their cards.

For this reason, there is the facility to select, which sectors you want to encode, if you wish to encode MAD and what format of Wiegand information is required for the site.

To set up organizational information, go to the **Administer** menu and select the **Organization** option.

The following screen will be displayed.



Any organizations that have been previously created through Smart Encoder will be seen in the list displayed.

There are four buttons displayed at the bottom of the screen.



- **Close** – This will exit out of the Organizations screen.
- **Add New** – This allows new Organizational information to be created. More information for this option can be found in Section 5.1
- **Modify** – This will bring up the information about the Organization selected so that changes can be made. Before pressing this button, you have to ensure that an Organization is selected from the list first.
- **Delete** – This will permanently remove an organization from the database. Before pressing this option, you will need to select the organization from the list to be removed.

## Add New Organizations

When you click on the Add New button at the Organization screen you will see the following one open up.

Each Organization needs a name to be identifiable.

There are also various parts to this screen, all of which have their functions.

### Initialize Card

Check this option box when you need to encode keys onto the card. This will overwrite the keys on the card, as long as you have set up your Card Types correctly.

You can select to encode all sectors, or just specific ones.

When the sector box is green, this means that the sector will be initialized.

Red means that the sector will be left with the keys already on the card.

## Encode MAD

Check this box to encode MAD to your card.

You have the choice then to write a MAD header if you wish, and also to select the sector you wish to encode the MAD on.

## Encode Wiegand

Check this box when Wiegand is to be written onto the card. Most sites will use this for access control, so it is important to know how this is done.

Once selected you need to choose what sector the Wiegand will be written to. You will notice that Sector 0 is not given as an option. This is due to the fact that important information, such as the card's serial number is stored here.

Once you have selected which sector the Wiegand will be written to from the drop down list, you can then specify what format it will be. To do this, press the **Define Format** button.

You will see the following screen.

**Choose Wiegand Format**

Select Wiegand Length: 26 bit

Left parity upto 13

1	2	3	4	5	6	7	8	9	10	11	12	13
E												

14	15	16	17	18	19	20	21	22	23	24	25	26
												O

Right parity from 14

**Summary** Done Cancel

Statistics		In Words	
Wiegand Length	26	Company code	0 bits , undefined.
Left Parity upto	13	Facility code	0 bits , undefined.
Right Parity from	14	Issue code	0 bits , undefined.
		Access code	0 bits , undefined.
		Unused	24 bits , continuous.

The first thing to do when in this screen is to select your Wiegand length. This can be done from the drop down list at the top of the screen.

The standard parity bits are set automatically for the Wiegand length, but these can be modified if the site specifications require it. Simply use the Left and Right parity drop down boxes to select where the bits start and end.

Now that you have got the basics, you need to set what the Wiegand bits mean.

There are four types of information that can go into Wiegand; Company Code, Facility Code, Issue Code and Access Code.

One by one, left click on each bit, as indicated by the number above a white square. Four options will come up each indicating the four options just described.

Simply click on the box that represents the information that you are trying to setup.

The Wiegand formation should match those as written in the organizations' specifications.

When you have ensured that the information is correct, click on the **Done** button. The information will be stored to the database for that organization.

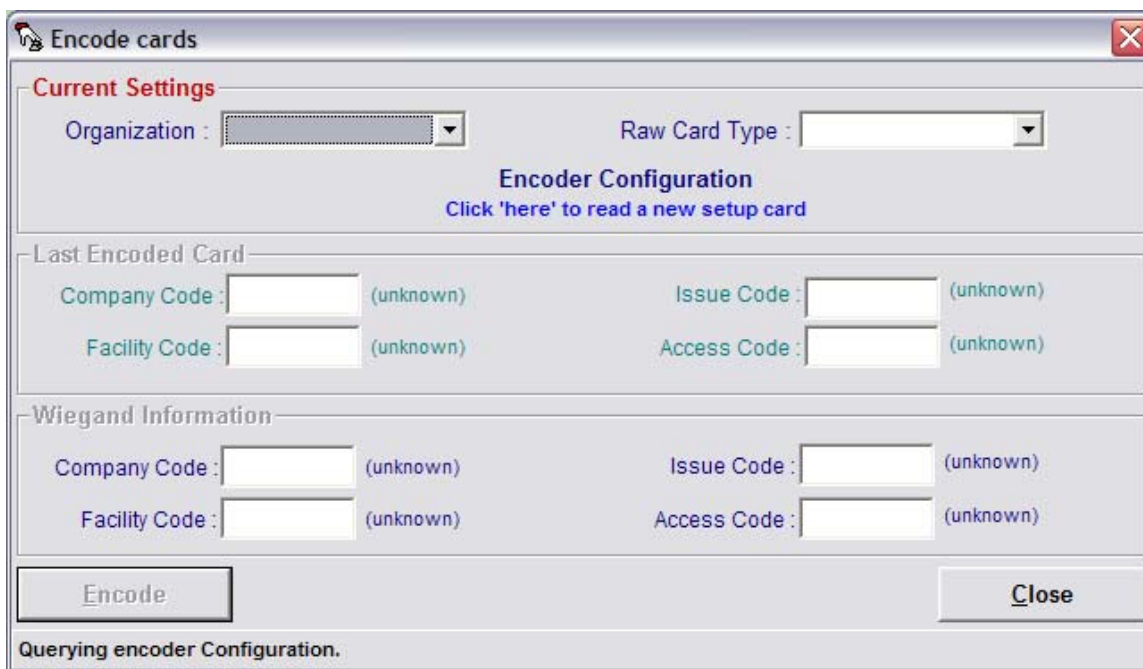
At any point that you wish to leave this screen, without saving information, click the **Close** button.

## Encode Cards

Once you have got the Card Types and Organizations created, you can now Encode cards for them.

**Note:** You also require a setup card as created through the Make Setup Card application, as mentioned in the introduction.

To open up the Encode screen, go to the **Cards** menu and select the **Encode** option. You will see the following screen.



**Encode cards**

**Current Settings**

Organization :  Raw Card Type :

**Encoder Configuration**

[Click 'here' to read a new setup card](#)

**Last Encoded Card**

Company Code :  (unknown) Issue Code :  (unknown)

Facility Code :  (unknown) Access Code :  (unknown)

**Wiegand Information**

Company Code :  (unknown) Issue Code :  (unknown)

Facility Code :  (unknown) Access Code :  (unknown)

Querying encoder Configuration.

There are three major sections to this screen.

### Current Settings

The Encode button will not be enabled until something has been selected for each of these three settings.

- Organization – This requires you to select an organization from the drop down list. The information that appears here will be exactly the same as what appears in the list

on the Organization screen. Simply select the organization that you wish to Encode cards for. This selection is critical as it is what determines which sectors will be initialized and what information actually gets written to the card.

- **Raw Card Type** – This allows you to select the type of cards that are being encoded. The information here is taken from the Card Type screen. Basically you will either be selecting Philips or Siemens default cards.
- **Encoder Configuration** – This one is a little bit different. This setting actually requires you to place the Setup Card (made through the Make Setup Card package) onto the Encoder. Once placed on the encoder you can click where it states “Click ‘here’ to read a new setup card”. You will know that it has been successful because the name from the setup card will appear in the Encoder Configuration position.

Now that all encoder configurations have been set up, you can begin to encode cards.

## Wiegand Information

These fields are where you enter in all of the relevant Wiegand information for the cards to be encoded.

If any fields are marked with (unknown) then you can ignore these, as nothing entered here will be written to the card anyway.

When the information has been entered into the fields, you simply place a blank smart card onto the encoder and press the **Encode** button.

The status bar at the bottom of the screen will inform you of whether or not the encoding was successful.

Another point to look for with successful encoding is the fact that the Access Code number will automatically be incremented.

You can continue to encode cards in this manner with whatever values (as long as they fall within the allocated bit range) you wish.

## Last Encoded Card

You will find that the fields here are exactly the same as what was found in the Wiegand Information section.

It simply informs the user of the last access number, etc that was encoded onto cards for this organization. Therefore none of the fields here are editable.

You can close the application and reopen it months later, and this information will be returned. Handy for keeping records of cards encoded for the site.

If you wish to exit the screen at any point in time, simply click on the **Close** button.

## Verify and Modify Encoded Cards

Once you have used the Encode screen to encode cards, you can use the Verify and Modify screen to check what is on the cards, and change the information if necessary.

To do this, go to the **Cards** menu and select the **Verify and Modify** option. You will see the following screen.

**Verify and Modify**

**Current Settings**

Organization :

**Encoder Configuration**  
Click 'here' to read a new setup card

**Last Encoded Card**

Company Code :  (unknown)      Issue Code :  (unknown)  
Facility Code :  (unknown)      Access Code :  (unknown)

**Wiegand Information**

Company Code :  (unknown)      Issue Code :  (unknown)  
Facility Code :  (unknown)      Access Code :  (unknown)

Querying encoder Configuration.

Once again, this screen has three settings, but the functionality is slightly different to what was seen on the Encode screen.

## Current Settings

If you wish to read the information on the card as it stands, you will need to select the Organization that was used to encode the card in the first place.

If you only wish to modify the cards without reading the data first, you can then select whichever organization you wish to use to write data to the card.

If the Wiegand settings do not match, then the encoder will not be able to read the information from the card.

You will also need to select the Setup Card (created through the Make Setup Card application) that was used to put the keys on the encoded card also.

As with the Encode screen, if the encoder is not yet configured, you will need to place the setup card onto the Encoder and then click on 'here' to read the configuration from the setup card.

Once these initial settings have been established, you can then begin to read and modify cards.

## Wiegand Information

There are two ways in which these fields are used, and that is related to the Read Card and Write to Card buttons shown on the screen.

- **Read Card** – To use this button, you need to ensure that the encoded card has already been placed on the encoder. Once done, click the Read Card button. All of the Wiegand information (as long as it matches the Wiegand settings set by the Organization selected) will be displayed into these fields. This is the easiest way to read the information on a card, if all you know is who it has been programmed for. No alteration is actually made to the Last Encoded fields.

- **Write to Card** – This button is used to modify the information on the card. This option requires you to enter in the required information into the Wiegand fields. Ensure that the card is placed onto the encoder and then press the **Write to Card** button. The data on the card will be modified. It is essential for the keys to match, otherwise the card will not be updated, and an error will be seen in the status bar at the bottom. Unlike the Encode screen, the access number will not be automatically incremented either.

## Last Encoded Card

This section works the same as the on the Encode screen. It won't change on this screen if you are simply reading cards.

If you are modifying cards, then the data here will change.

If you wish to exit the screen at any point in time, simply click on the **Close** button.

## Make Setup Card Encoder

### Introduction

Make Setup Card is a program that enables the user to create Setup Cards. Setup Cards are used to setup Banque Tec's 'Generic' readers.

The following document explains how the system operates, and how to perform various functions.

### Installation

The Make Setup Card Encoder comes with a CD with setup files. Uninstall any versions of Make Setup Card from your computer, if any are previously installed. This is done by going into Control Panel, choosing Add/Remove Programs and selecting Make Setup Card.

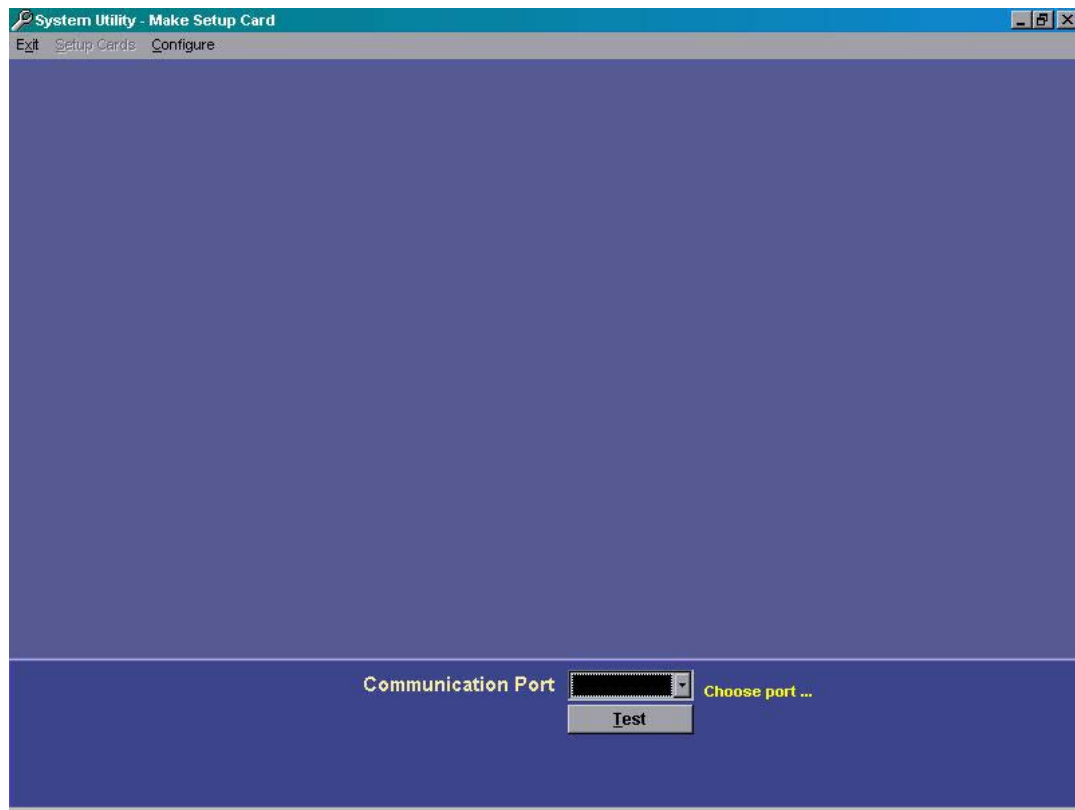
**NOTE:** In the case of an upgrade, all ecg files created with the previous version of Make Setup Card will need to be re-created.

Ensure that no programs are currently running on the PC. Insert Make Setup Card CD into PC and follow the prompts to install the software.

Use the Start menu and run the Make Setup Card Program.

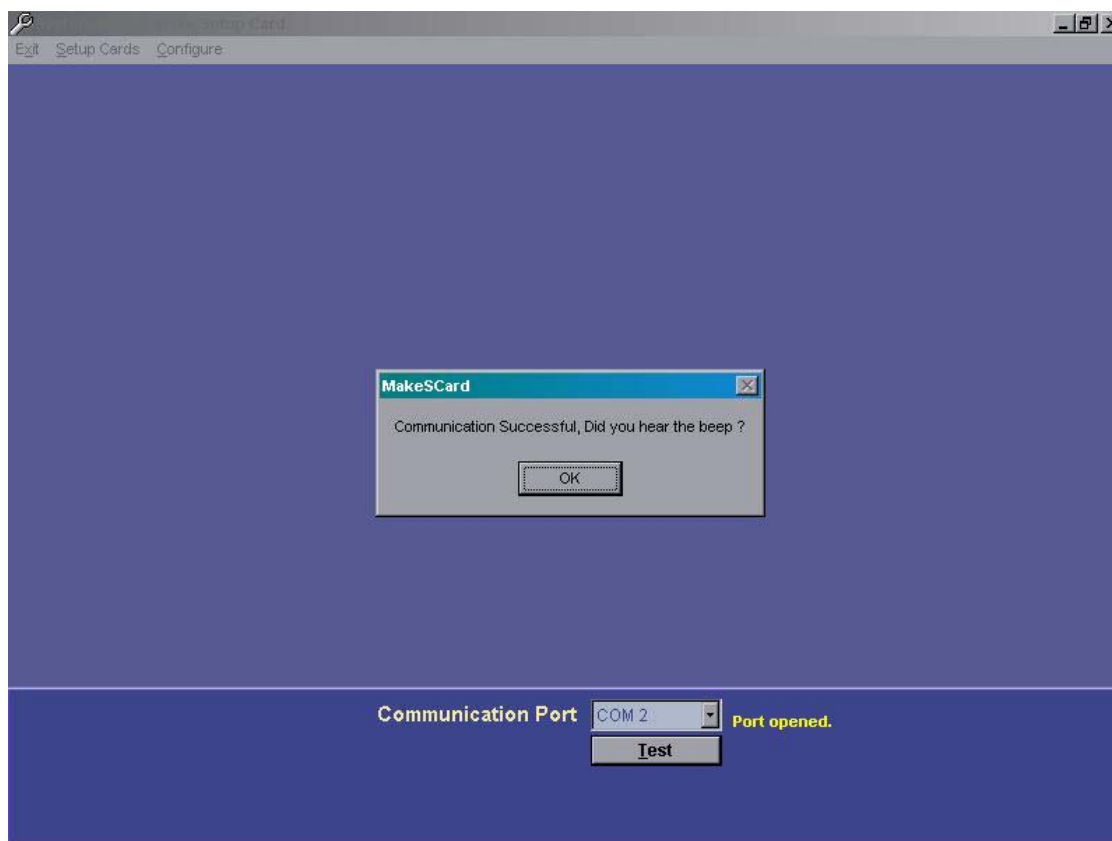
Start->Programs-> BanqueTec Software-> Make Setup Card

When running the application you will see the following screen:



Connect the Make Setup Card Encoder to the desired COM Port on the computer and select the COM Port. Ensure that the encoder is the correct one and that there is power connected to the encoder.

Select Test to test the communications between the reader and the computer.



The Make Setup Card program will ask for verification that a beep was heard from the encoder. If a beep was not heard then please exit the program and follow the instructions again.

## Configure Menu and ecg Files

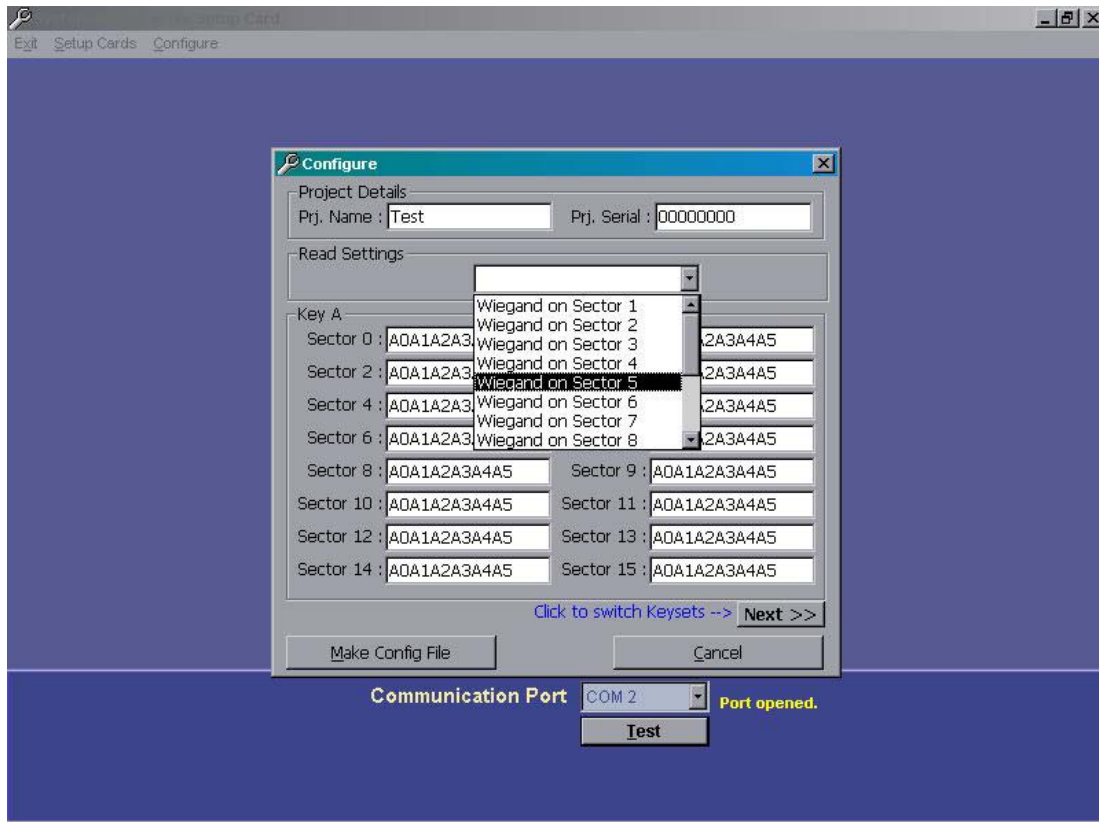
An ecg file is created using the Configure Menu. All customers with different Keys and even customers with different Wiegand requirements may need more than one ecg file.

Each ecg file contains information on all of Key A, Sectors 0 to 15, and Key B, Sectors 0 to 15. The ecg file also contains the Wiegand Read Sector. This is the Sector that is to contain the Wiegand information.

In the case of the Banque Tec Generic readers, the readers can be setup with a setup card to be specific to both Keys and Sector.

The Configure table is shown below.

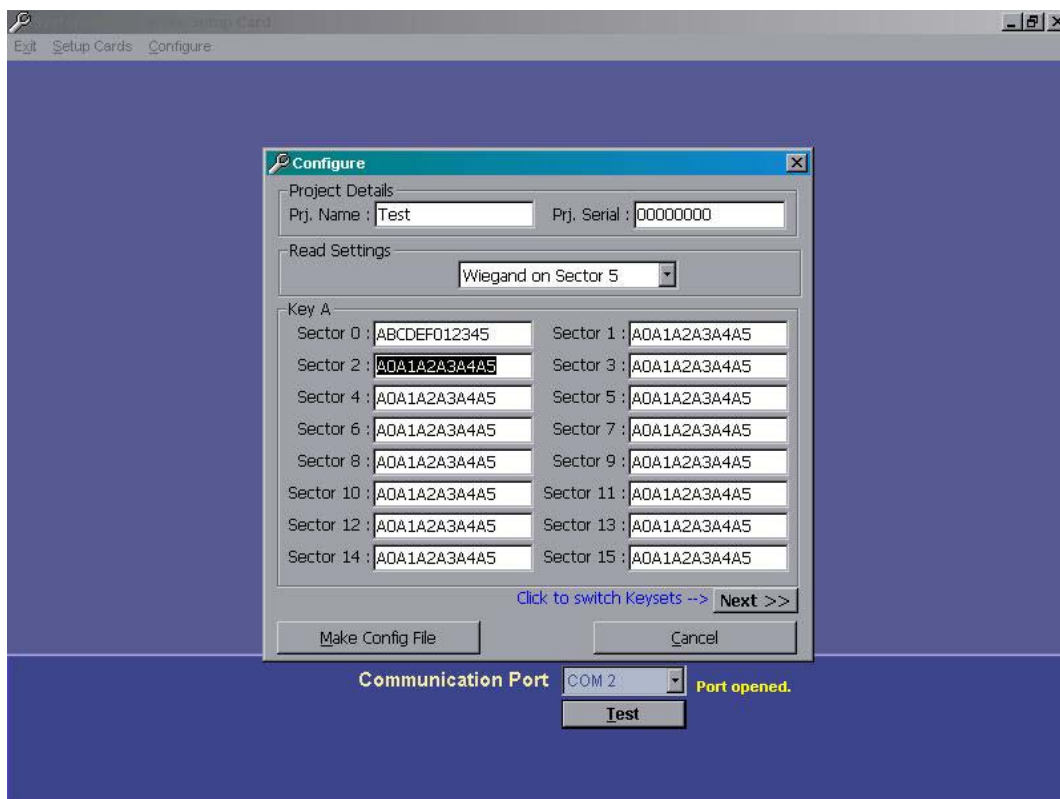




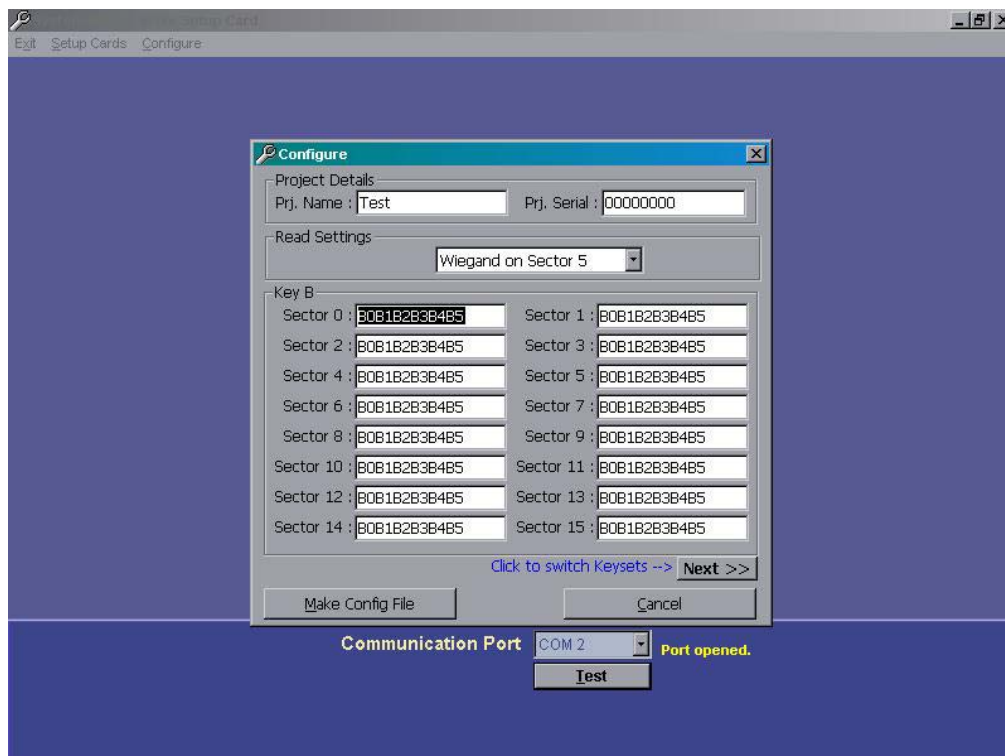
A project name should be entered to keep track of the ecg file created.

The Project Serial can be used in conjunction with Smart Encoder for control of smartcard creation. This is not needed for most operations and should be left at 00000000.

Select the Read Settings desired for the application as shown above.



Select and change all Keys to the desired security Keys.

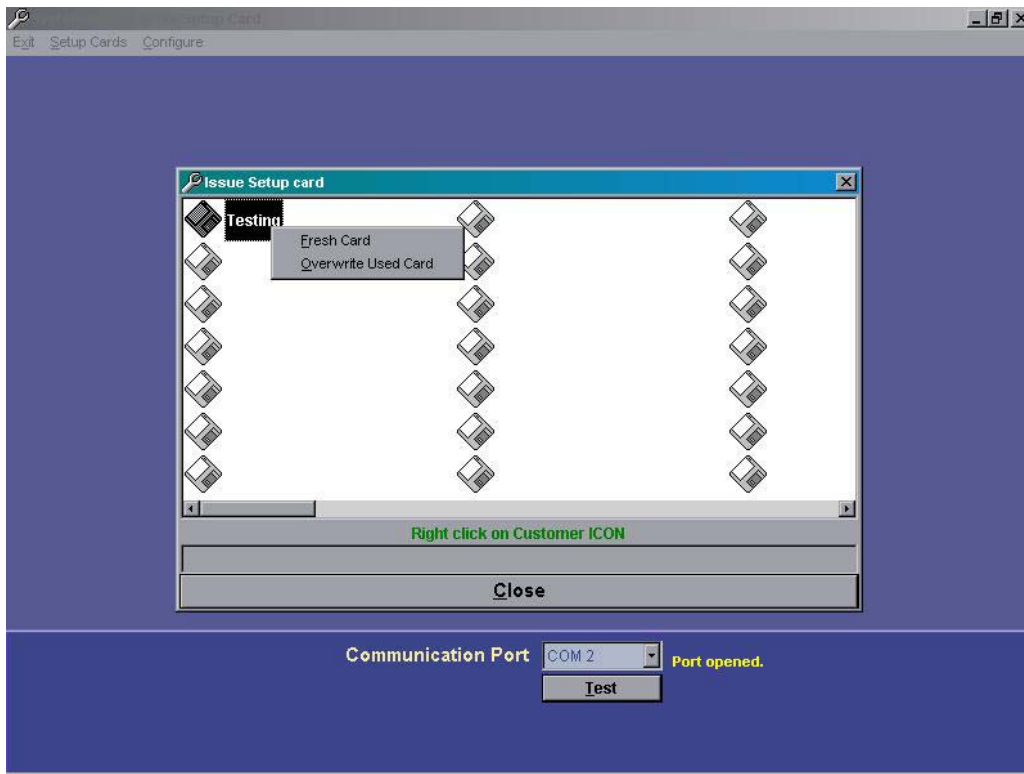


Remember to click Next and enter the Key B information.

After checking the information entered is correct, click on Make Config File. A scroll bar will be seen as the computer creates and encrypts the ecg file.

## Issuing Setup Cards

The following screen shows the ecg files displayed in graphic form. Note that on the screen dump all the names have been erased except for the Testing ecg file. Whatever name is given to the ecg file will show on this screen.



To select the ecg file to create a Setup Card, right click with the mouse button over the ecg file. There are 2 options that are prompted; Fresh Card and Overwrite Used Card.

## Fresh Card

A new smartcard with Phillips default Keys can be used in this option. Please note that Phillips default is FF...FF for ALL Sectors. A Siemens default new smartcard will not work with this option as they have Keys A0...A5 and B0...B5 respectively for Key A and Key B.

Place this smartcard onto the Make Setup Card Encoder and choose the Fresh Card option. A scroll bar will show and the Setup Card will be created.

Note: If there is an error message that states 'Unable to initialize Sector 0', then the smartcard used did not have Phillips default Keys or there is a problem with the setup of the encoder.

is not connected properly will card into the Cardholder Information fields.

## Overwrite Used Card

This option can be used to change an existing Setup Card. Place this smartcard onto the Make Setup Card Encoder and choose the Overwrite Used Card option. A scroll bar will show and the Setup Card will be created.

Note: If there is an error message that states 'Unable to write data', then the smartcard used is not an existing Setup Card, or there is a problem with the setup of the encoder.

## Version Control

Currently the latest version of the Make Setup Card files are:

<b><u>Setup Files</u></b>	<b><u>Date</u></b>
Setup.exe	18/06/98
Setup.lst	04/04/02
MakeSCard.cab	04/04/02

The Setup files were updated on the date above. They incorporate changes needed for software package. Note that the version of MakeSCard.exe within the Setup files is date stamped 04/04/02.

<b><u>exe Files</u></b>	<b><u>Date</u></b>
MakeSCard.exe	23/05/02

The exe File listed above was used to make the update for existing users easier as a simple exe file swap. All old versions of Make Setup Card needed to be updated last year.

# Trouble Shooting and Errors Codes

## ERROR CODES FOR BANQUETEC

Error Codes for **Set Up Card Encoder** (wrench icon), software date of executable 4/42002

Action: Click Set up Cards, Issue, right-mouse click setup card configuration name, select Fresh Card. Slight chirp is heard.

Message: **Unable to initialize sector 0**

Possible sources:

1. No card on platen.
2. Defective card on platen.
3. Attempting to program a used card as a new card.
4. Sector selected in Issue Setup Card configuration list, locked out or not available for write on card.
5. Card not positioned correctly on platen.
6. Card is not using Phillips transport keys (all FF).

Action: Click Set up Cards, Issue, right-mouse click setup card configuration name, select Overwrite Used Card. Slight chirp is heard.

Message: **Writing to card.....**

This happens for 1 or 2 seconds followed by **Unable to write data**

Possible sources:

1. No card on platen.
2. Defective card on platen.
3. Card not positioned correctly on platen.
4. Attempting to program a new card as used.
5. Card is using Siemens transport keys (must use Philips for new card; Siemens card ok if previously written)
6. Sector selected in Issue Setup Card configuration list locked out or not available for write

Action: Click on Test button

Message: MakeSCard message window which says: **Run-time error '8018': Operation is only valid when the port is open.** You click on OK and the program goes away.

Possible sources:

1. The com port was not selected.
2. The com port is not available for use by Setup software, ie the port is already in use by another program
3. Com port selected does not exist.

Action: Select a com port. Click on Test.

Result: Nothing happens. A few minutes later, a message box appears **Unable to communicate, check connection and settings.**

Possible sources:

1. Serial cable not connected properly at encoder box or pc
2. Serial cable defective.
3. Com port defective
4. Incorrect com port

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