ScreenCheck

BADGEMAKER 7

SC Mifare Plug-In

· ID DESIGN · MANAGE · PRINT SYSTEM ·

www.screencheck.com

SCREEN CHECK

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Introduction to Mifare

MIFARE is based on the International Standard ISO/IEC 14443 Type A.

MIFARE is used for contactless smart card systems. MIFARE typically has a maximum read and write distance of 10cm. It is highly secure and reliable as there are no moving parts and no battery involved in the operation of MIFARE.

MIFARE 1k features

- MIFARE 1k has a storing capacity of 1 KB of information (768 Bytes).
- Unique serial number of 4 Bytes
- 2 x 48 bit keys per sector for key hierarchy.
- Data Retention is around 10 years.
- 16 sectors (*or tracks*), each sector contains 4 blocks,
- 3 user blocks (*block 0 to 2*) and one key block (*block 3*)
- Sector 0 block 0 cannot be used (*contains manufactory data*)
- Sector 0 block 1 and 2 can be used for the MAD.
- Each block contains 16 bytes.

MIFARE 4k features

- MIFARE 4k has a storing capacity of 4 KB of information (3480 Bytes).
- Unique serial number of 4 Bytes.
- 2 x 48 bit keys per sector for key hierarchy.
- Data Retention is around 10 years.
- 40 sectors (*or tracks*).
- The first 32 sectors contain 4 blocks,
- 3 user blocks (*block 0 to 2*) and one key block (*block 3*)
- Sector 0 block 0 cannot be used (*contains manufactory data*)
- Sector 0 block 1 and 2 can be used for the MAD for sector 1 to 15.
- In case MAD is used, sector 16 block 0 to 2 contain the MAD
- information for sector 16 to 39.
- The last 8 sectors contain 16 blocks,
- 15 user blocks (*block 0 to 14*) and one key block (*block 15*).
- Block 0 key is for block 0 to 4
- Block 1 key is for block 5 to 9
- Block 2 key is for block 10 to 14
- Block 3 key is for block 15, which is the key block.
- Each block contains 16 bytes.

Installing SC Mifare

Inventory Checklist

- Mifare Reader, stand-alone or built-in a printer.
- A Serial cable to connect the reader to your computer, (*not for Zebra-Gemplus solution*).
- KeyCard (*chipcard*), containing the Mifare Keys, or Keyfile in the mifare directory.
- If the Keys are stored on a Card select SCR331Chipcard reader for the KeyCard.
- SC Mifare Software.

This software can be used for:

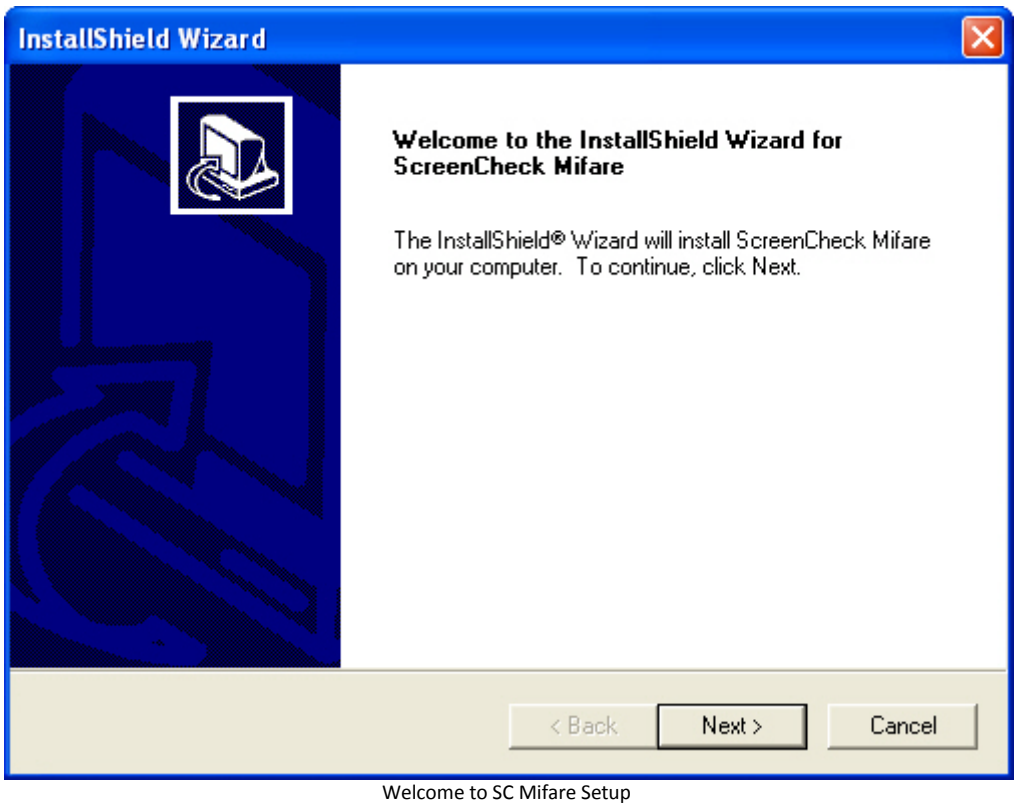
- **Classic Mifare 1k**
- **Classic Mifare 4k**

Installing SC Mifare

It is recommended to close all your applications before installing new software.

Select from a CD installation menu **Encoding** click on **SC Mifare** or run **SCMifare.exe** from (*the root\fscommand of*) the CD.

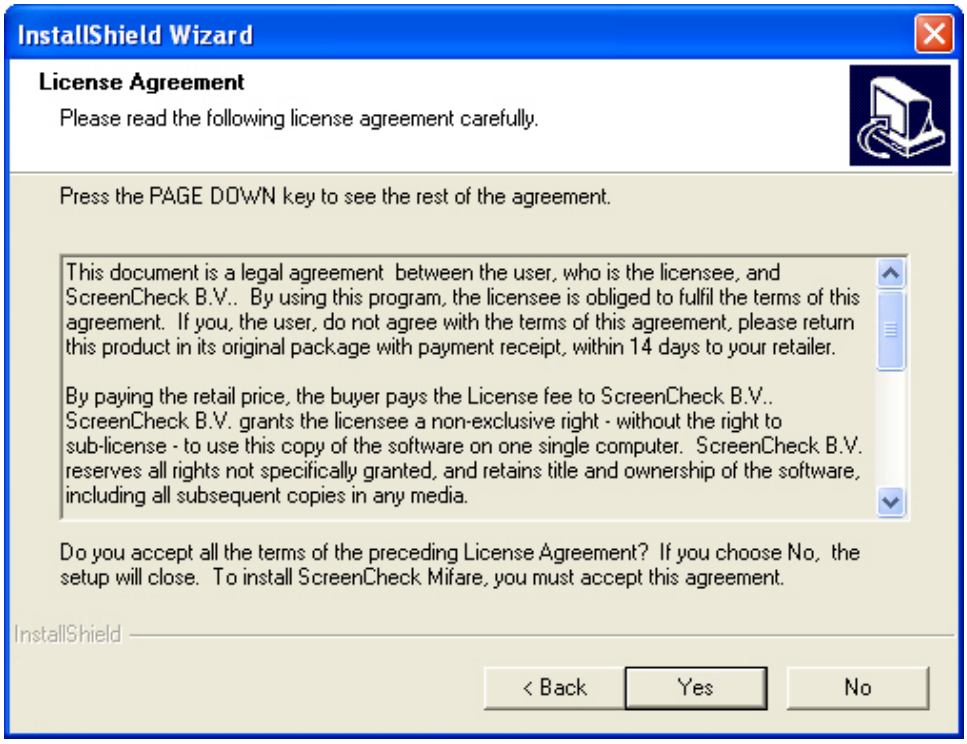
The Install Shield wizard will begin which will guide you through the Installation.



Welcome to SC Mifare Setup

Click **Next** to proceed.

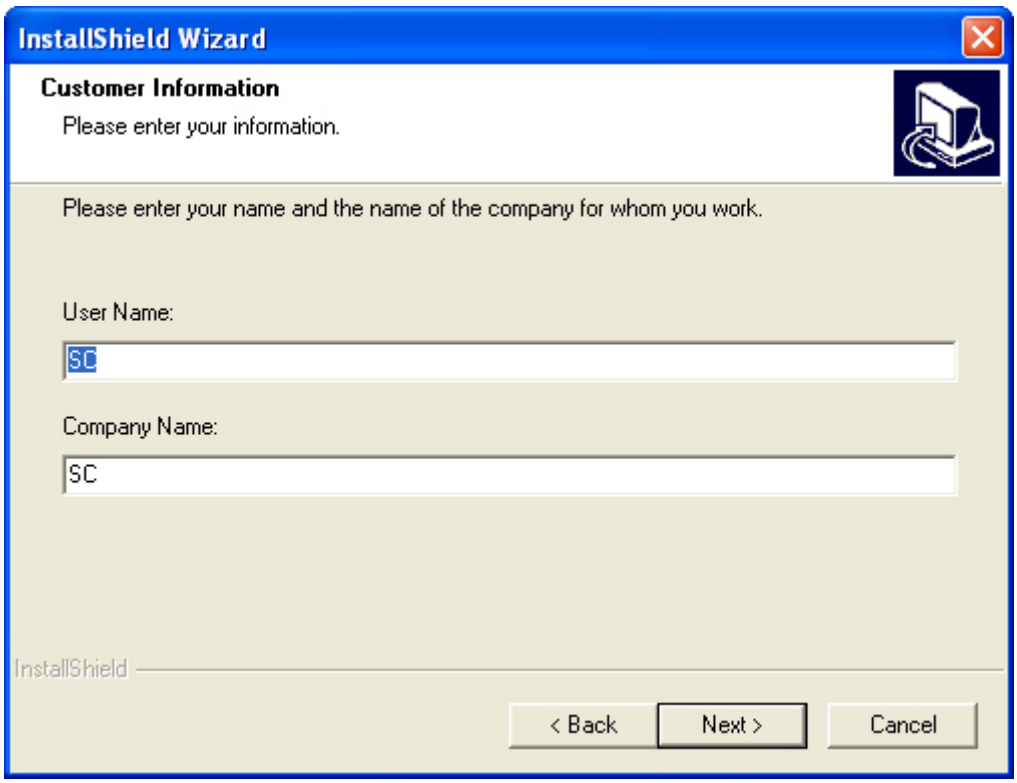
You must accept the license agreement to install the product.



License Agreement

Click **Yes** to proceed.

Enter a **User Name** and a **Company Name**, this information is necessary to register the Mifare software.

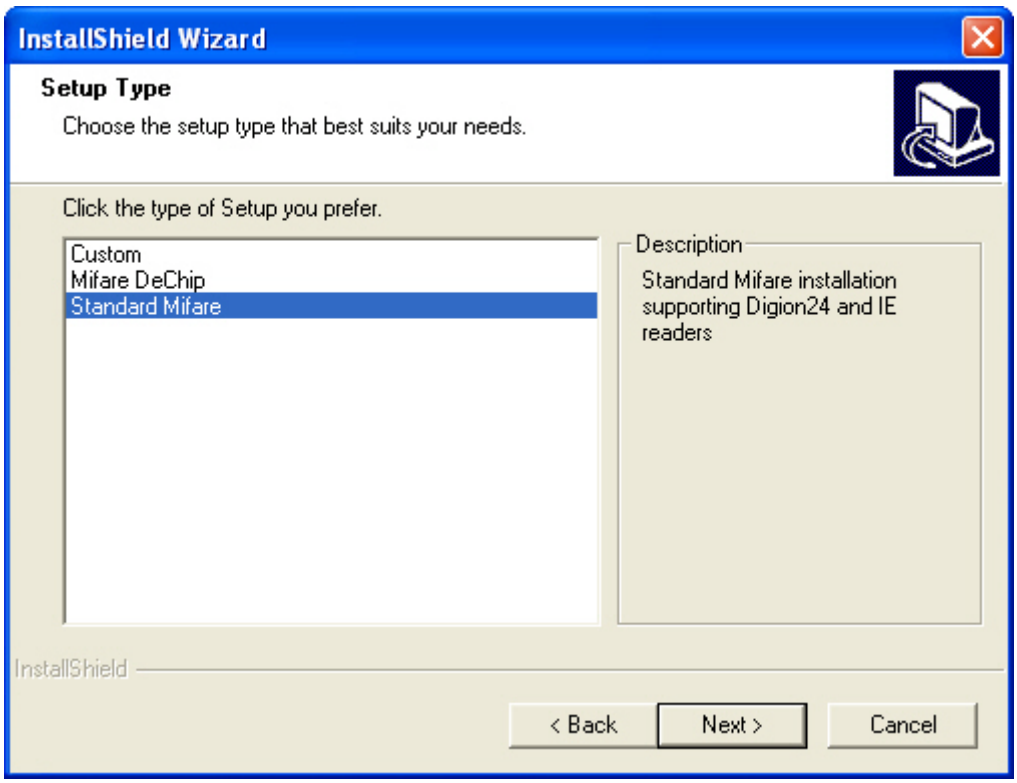


Customer Information

Click **Next** to proceed.

In the next wizard user you can choose between three different installation options:

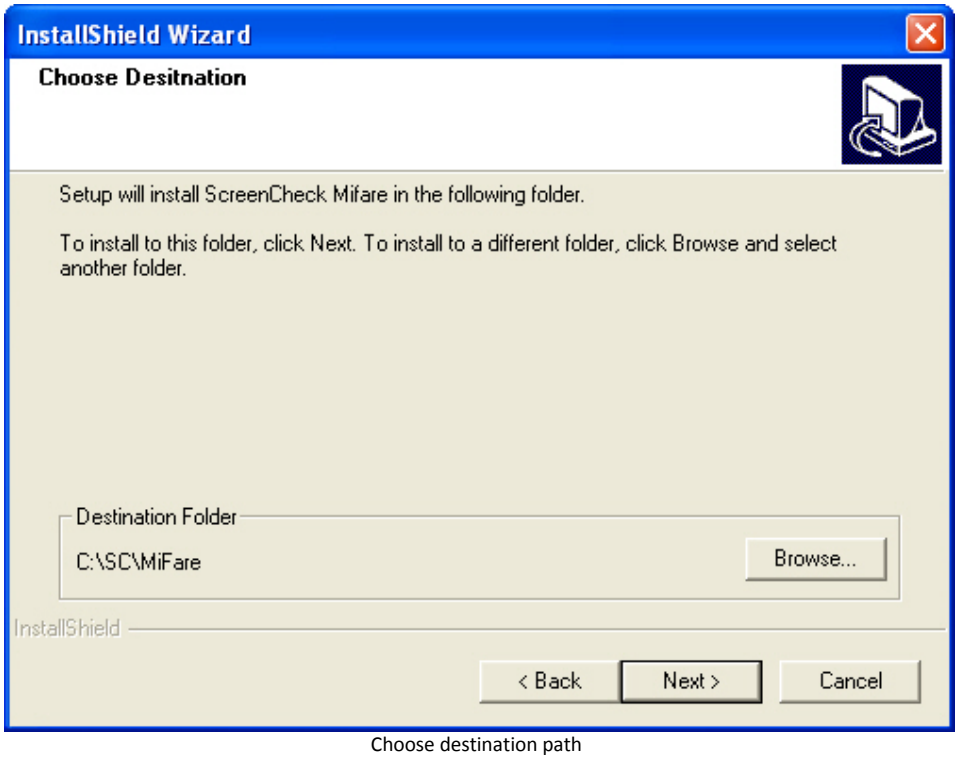
- **Custom** (*custom installation*)
- **Mifare DeChip** (*custom install for Cards&More*)
- **Standard Mifare** (*standard installation for Digion24,GemPlus and IE readers*)



Setup Type

By default Standard Mifare is selected, click **Next** to proceed.

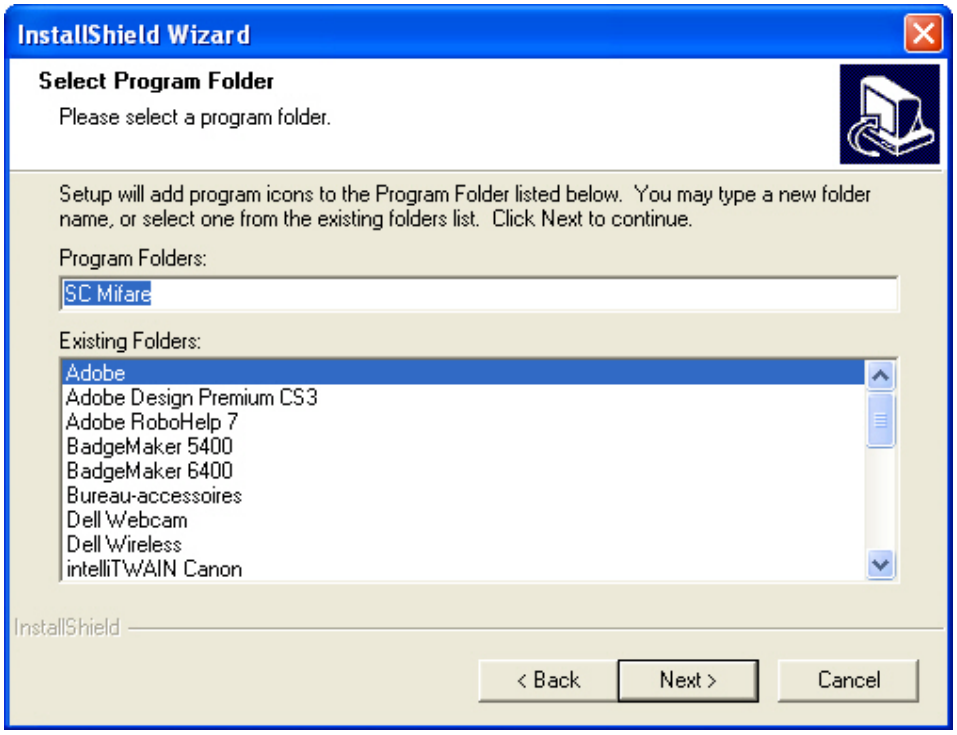
Choose a destination.



Choose destination path

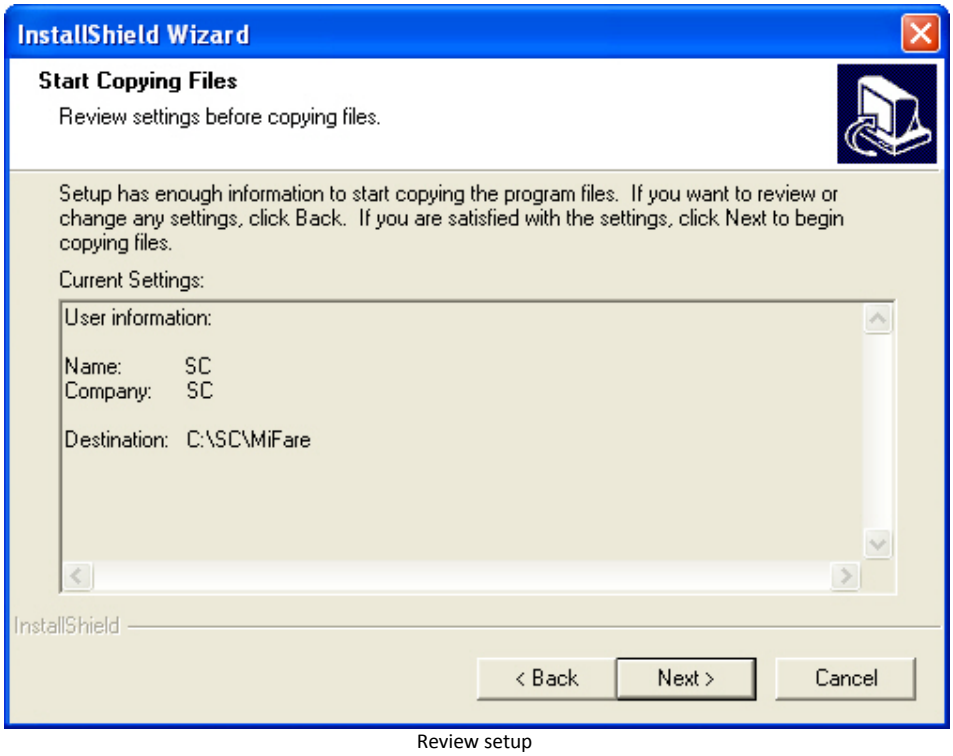
The default path is **C:\SC\Mifare**, click **Browse** to select another destination.

Click **Next** to proceed.



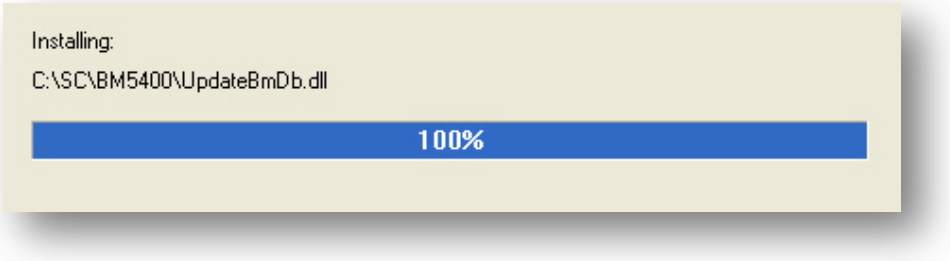
Select Program Folder

Select a program folder. We advise to leave this default. Click **Next** to proceed.
If any changes are to be made before installing click **Back**, if satisfied with the settings click **Next** to begin installing files.



Review setup

Click **Next** to begin installing files onto the computer.

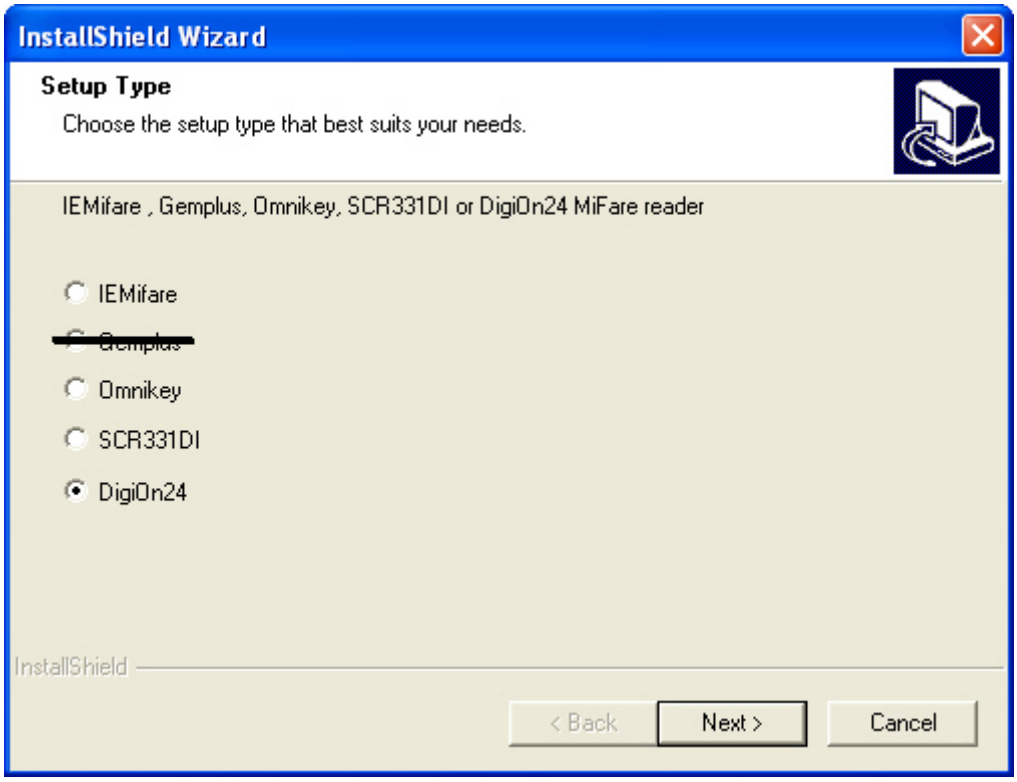


To be able to print and encode cards user need to select a reader and a printer type you will be using.

In the next dialog you must select which reader will be used in conjunction with the SC Mifare plug-in.

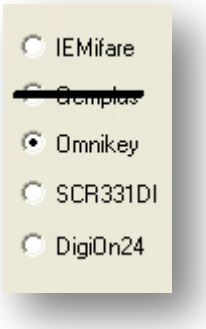
Choose from the following:

- **IEMifare**
- **Omnikey**
- **SCR31DI**
- **DigiOn24**

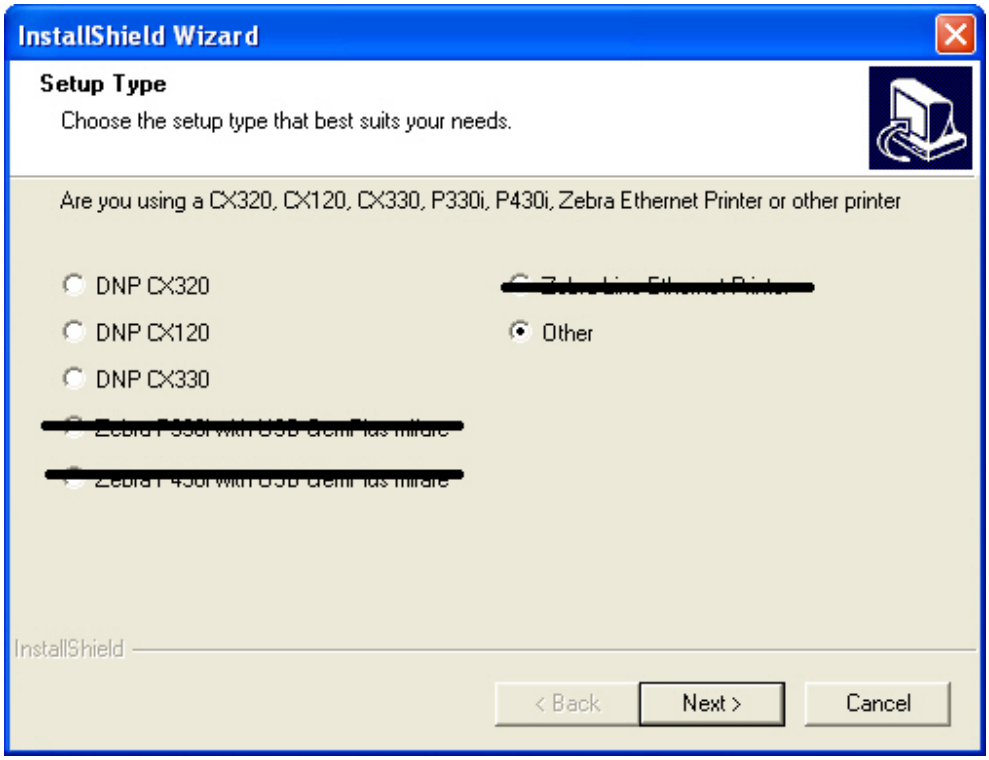


Select type of reader

For example if you are using an Omnikey reader you must select Omnikey as shown below.



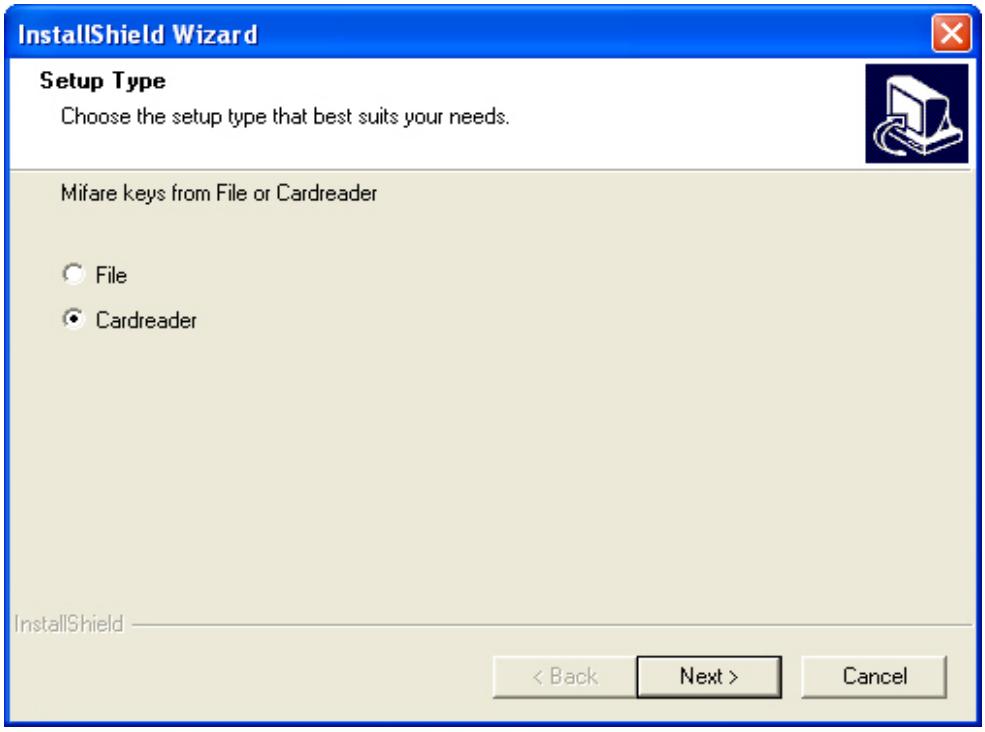
In the next dialog you must select which reader will be used in conjunction with the SC Mifare plug-in.



Choose from the following:

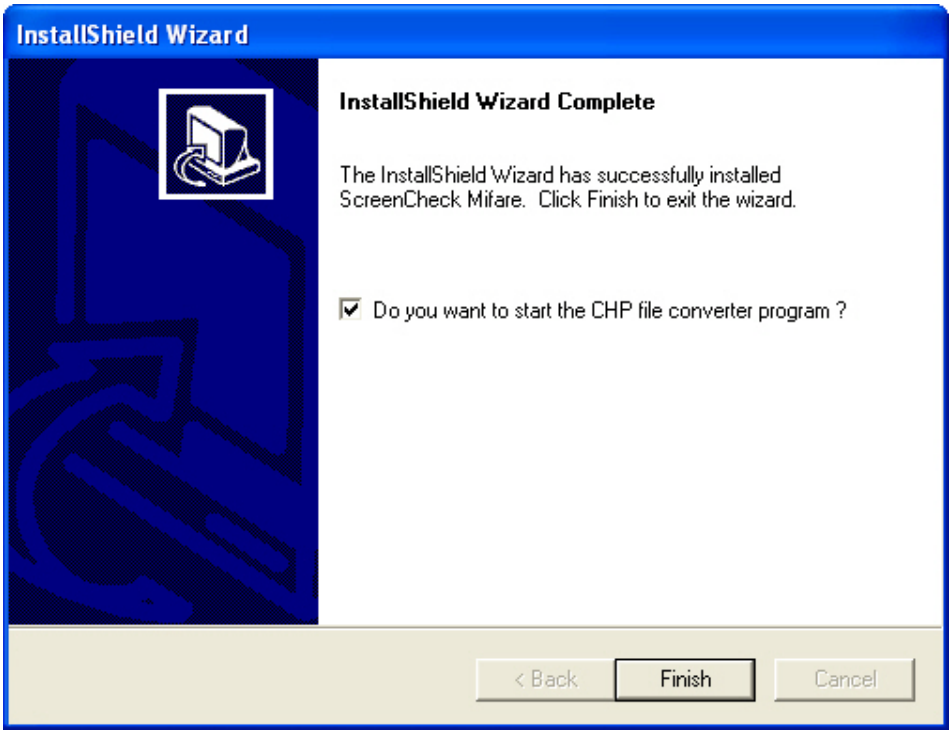
- **DNP CX320**
- **DNP CX120**
- **DNP CX330**
- **Other**

Select a printer from the list or choose **Other** and click **Next** to proceed.

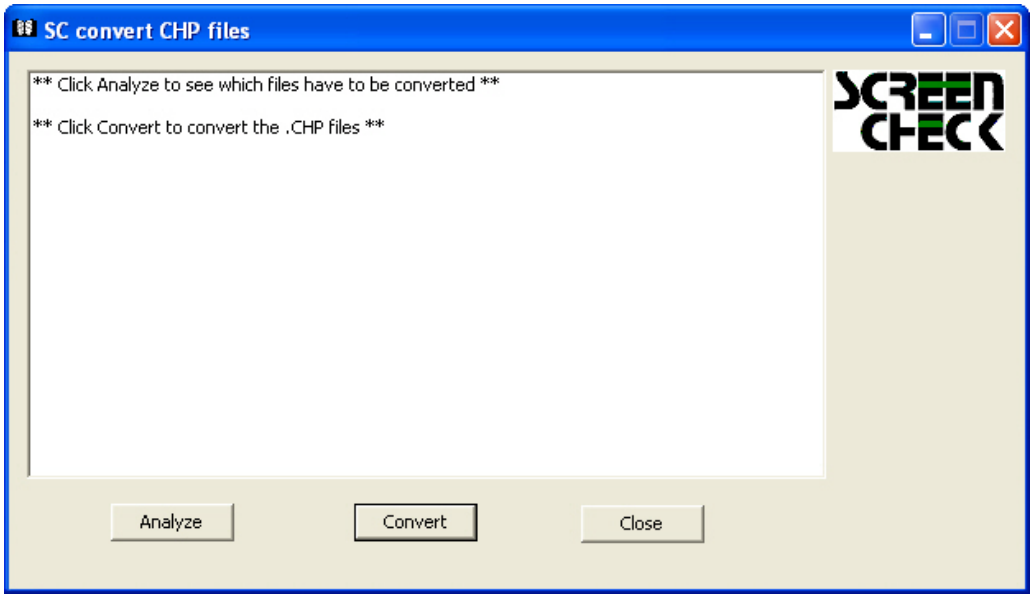


Select if you are obtaining Mifare keys from a file or card. Click **Next** to proceed.

If you have an installation of BadgeMaker version 6.1 or earlier then you must follow the next step to convert existing **CHP** files (*encoding information files*).



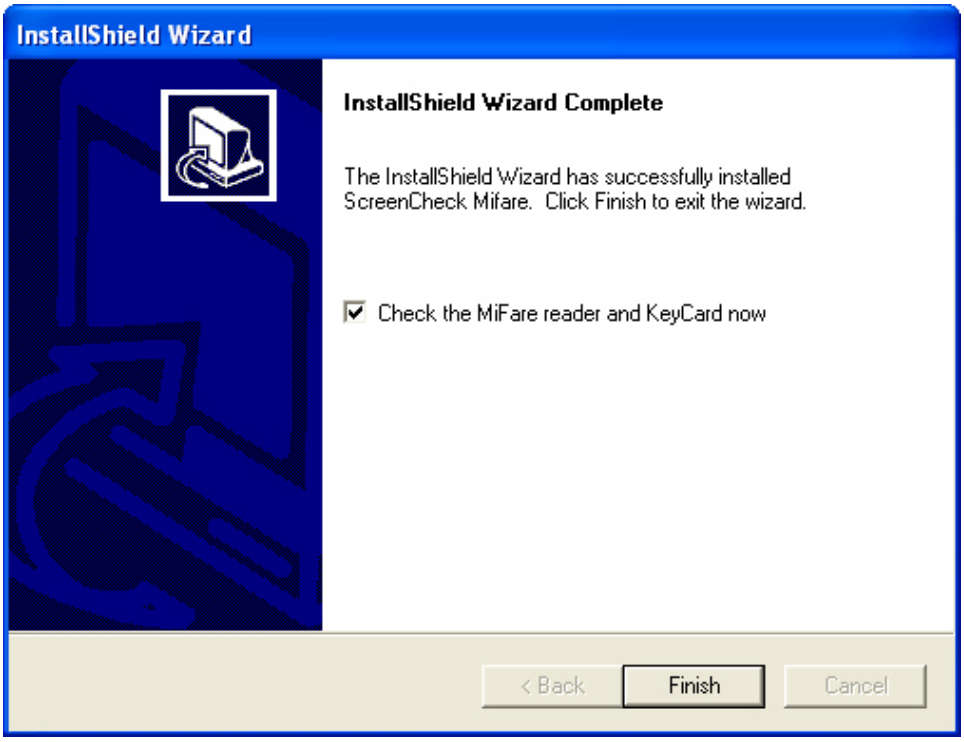
After clicking **Finish** the screen below will appear.



Click analyze to check if there are CHP files on user computer that need to be converted.

When there are files to convert click on **Convert**.

When there are no files to convert click on analyze to check again or close to close the screen.

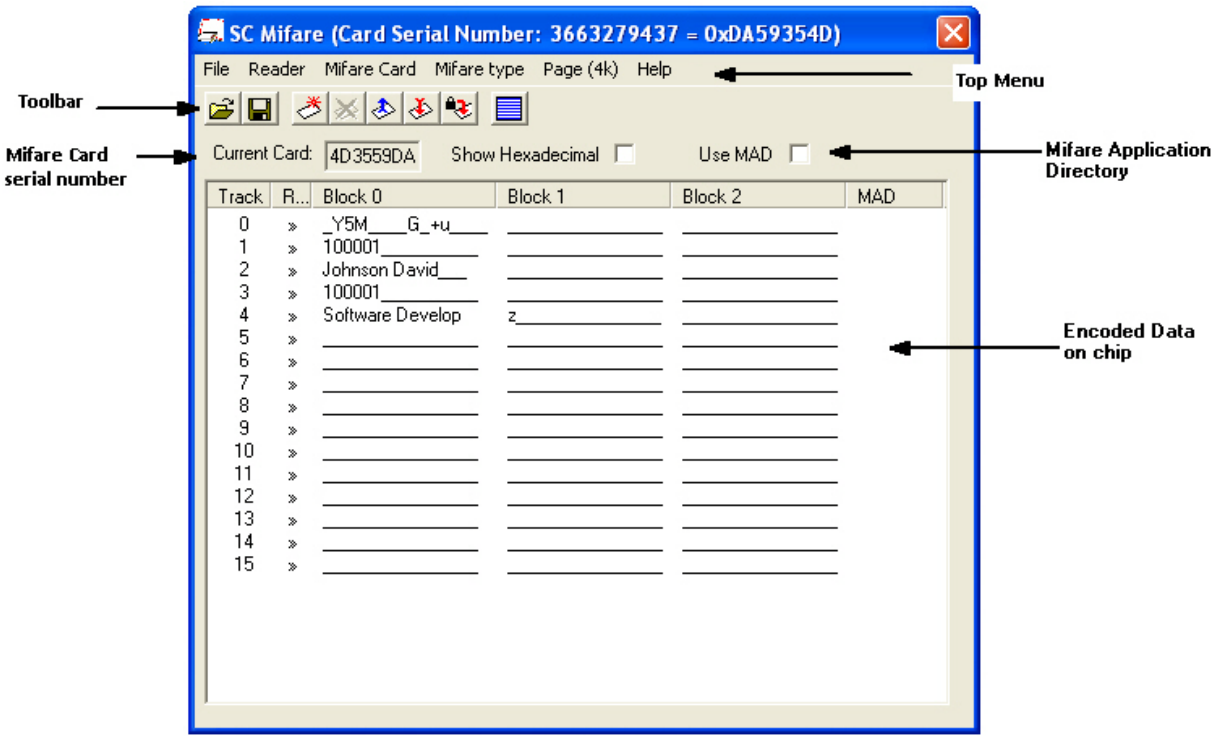


Select **Check the Mifare reader and KeyCard now** will test connection to the reader and keys to be used let the box checked and then click on **Finish**.

If there are no errors the following dialog will be presented.

System test success

SC Mifare

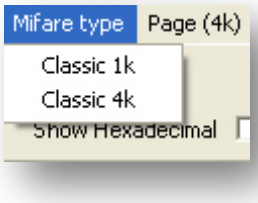


SC Mifare GUI

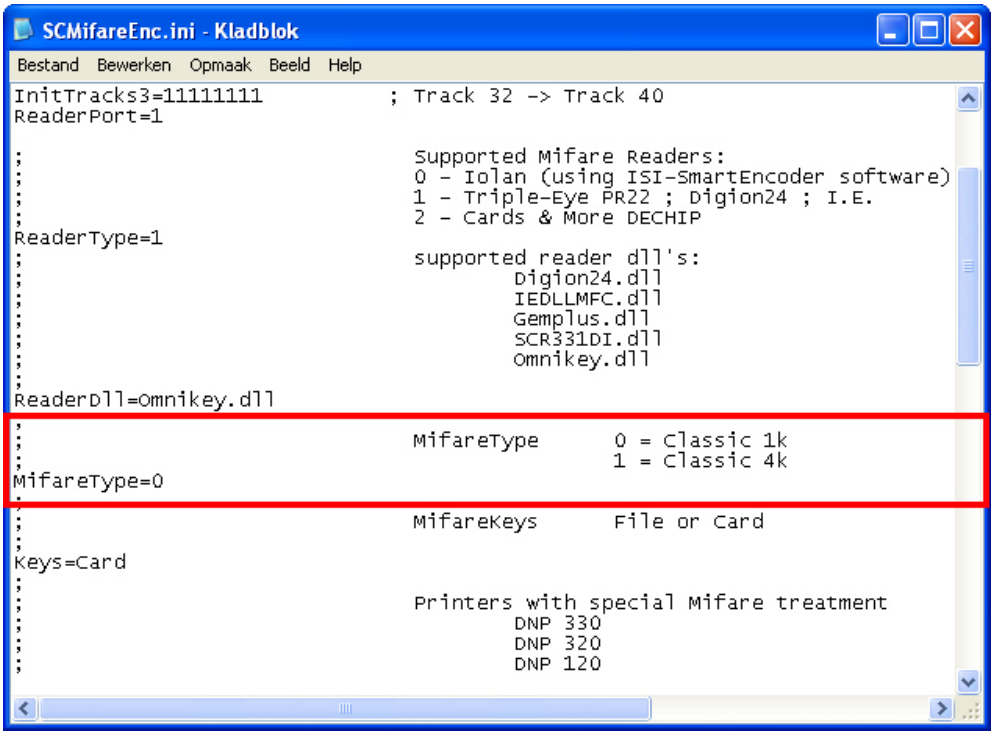
Selecting Mifare 1k or 4k

When creating a Mifare layout, the choice can be made between a **Mifare 1k** or **4k** type. This only is applicable to the standalone Mifare application.

For the standalone program the setting can be made in the program: From the top menu select **Mifare type** and click **1K** or **4K**.



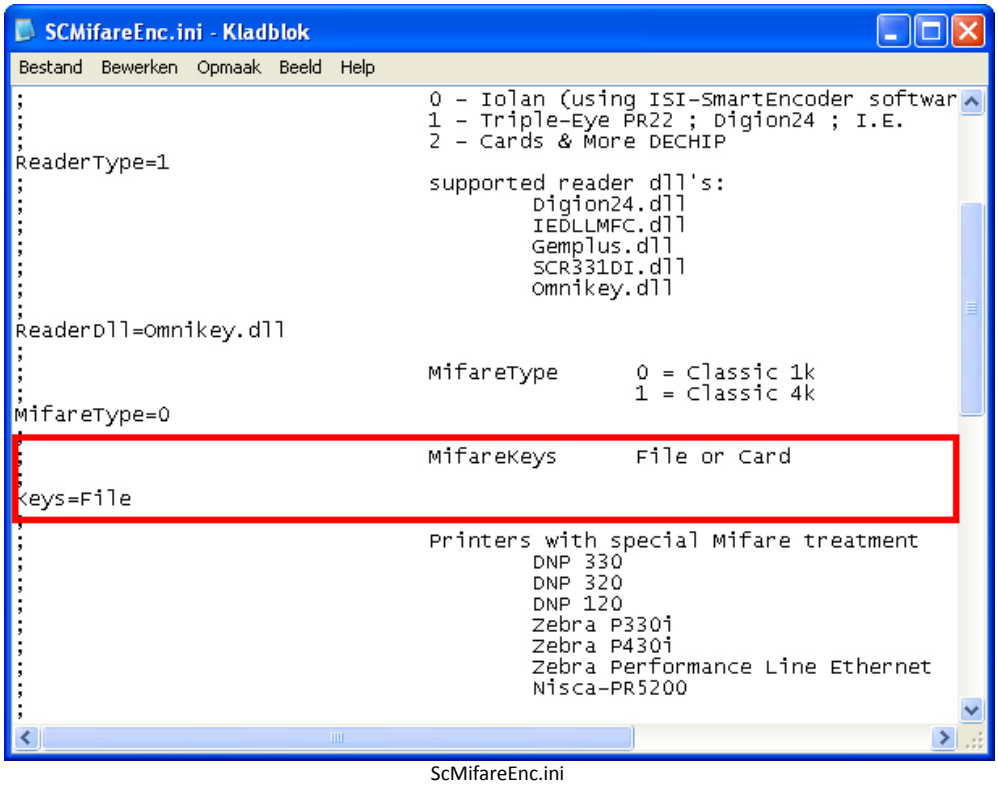
This is done with a setting in the **ScMifareEnc.ini** file located in the **C:\SC\Mifare** directory this entry is: "**MifareType= 0**" for a Classic 1k card or "**Keys = Card**" (under the header [**Mifare**]).



The chosen selection will be stored in the **ScMifareEnc.ini** file. When the program is restarted, this will be collected, so the last made selection is valid again.

Selecting Keys from card or file

This is done with a setting in the **ScMifareEnc.ini** file located in the **C:\SC\Mifare** directory this entry is: "**Keys= File**" or "**Keys = Card**" (under the header [**Mifare**]).



ScMifareEnc.ini

Working with KeyFiles

A KeyFile containing **Public-key 2** is installed in the SCMifare directory, so you can start encoding.

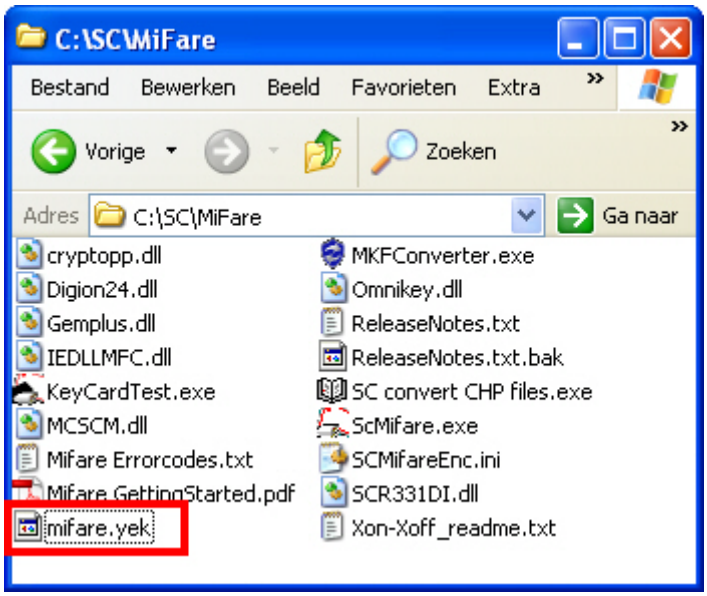
If you want to create your own keys, you can start the program **ScKeyFileMifare.exe** (*Key-File generator*). The default logon password **1A1B1C1D1E1F**. To change your password, click **Change Password** and follow the on screen instructions.

Public keys 1 and 2 can be generated by selecting the Public key 1 or 2 button.

By double clicking a track row, you are presented with a dialog to fill in your own keys and access conditions for the track. If you do not have specific keys required you can also choose **Init Random**.

If the keys displayed are correct you can write them to the keyfile with the **Write keyfile** button, then you have to type an **8** character key which is used to encrypt your keyfile. There is also a possibility to read the current keyfile, to be able to do this you must provide the **8 character encryption key** which was provided when the key file was written.

The generated keyfile is located in the **C:\SC\Mifare** directory and is called **mifare.yek**.



Mifare.yek

If you want to use a second keyfile you can rename the existing **mifare.yek** and then generate a new one.

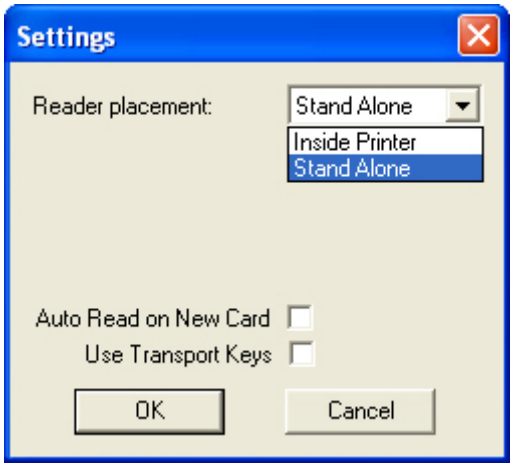
Working with Keycard

Connect a card reader to the PC and use the keycards supplied by ScreenCheck.

Using the **KeyCardTest.exe** verify that both Mifare and Card reader are properly connected and are functioning.

SC Mifare Settings

Use the SC Mifare plug-in application to setup the Mifare reader;
Identify the Reader placement using **Reader>Settings**.



Select either **Stand Alone** or **Inside Printer**.

Setup Key Usage

Track Init KeySet: These are the keys shipped with your Mifare cards which the operator must specify in order to initially gain access. These are stored in the 3rd block of a track.

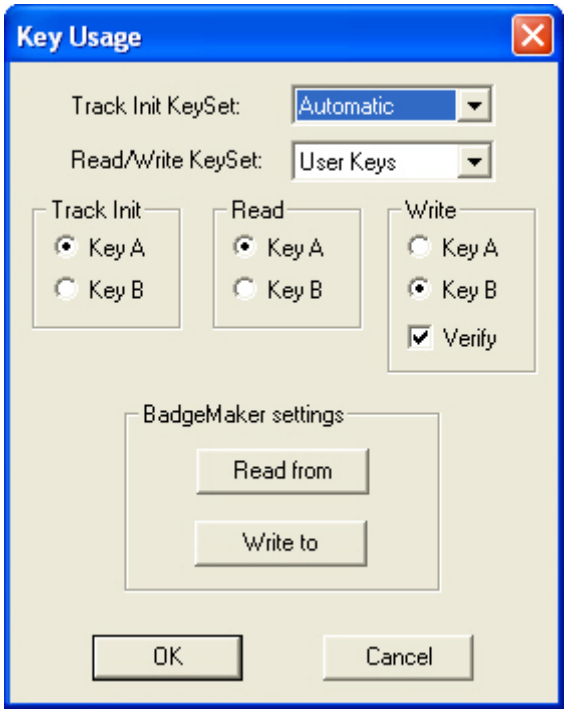
Read/Write KeySet: These are the keys you will specify to replace the default stored keys (*specified in Track Init Keyset*) in the card.

Example

User Keys will replace **Public Keys 2** as shown below.

If both **Track Init KeySet** and **Read/Write KeySet** are configured as the same same than no initialization will occur.

Setting **Track Init KeySet** to **Automatic** is recommended as shown below.

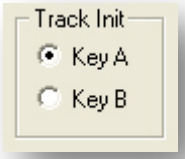


Key Usage

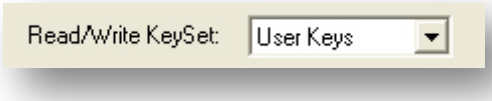
Set **Track Init KeySet** to keys that are shipped with the empty cards. Select from the following **Keysets**:

- **Public Keys 1 (A0…A6)**
- **Public Keys 2 (FF…FF)**
- **User Keys**
- **Automatic**

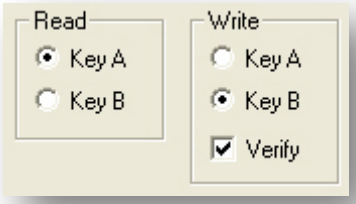
Set **Track Init** to **Key A** (this should work in most cases).



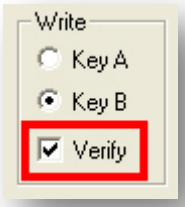
Set **Read/Write KeySet** to **User Keys** if you have customized your own keys or **Public Keys 1** or **2** (a copy of the KeyCard).



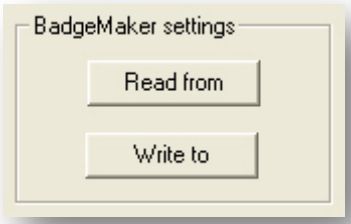
Configure **Read** and **Write** to **Key A** or **Key B** as required by the User Keys.



Enable/Check **Verify** if you want to verify each write action (recommended).



When all settings are correct, click **Write to** (*test*) ensuring BadgeMaker will use these settings.

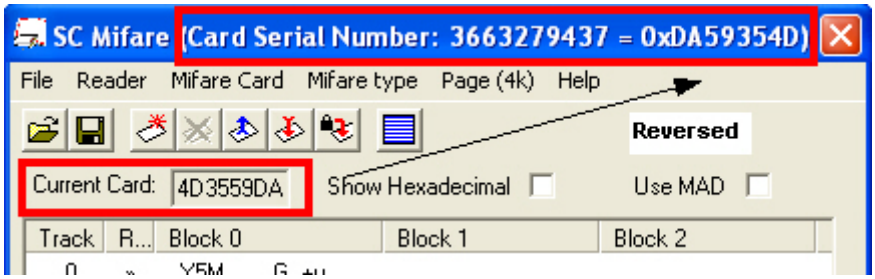


Testing with a Stand Alone reader

Select **New Card** from the toolbar, or from the SC Mifare menu select **Mifare Card** and click **New Card**.

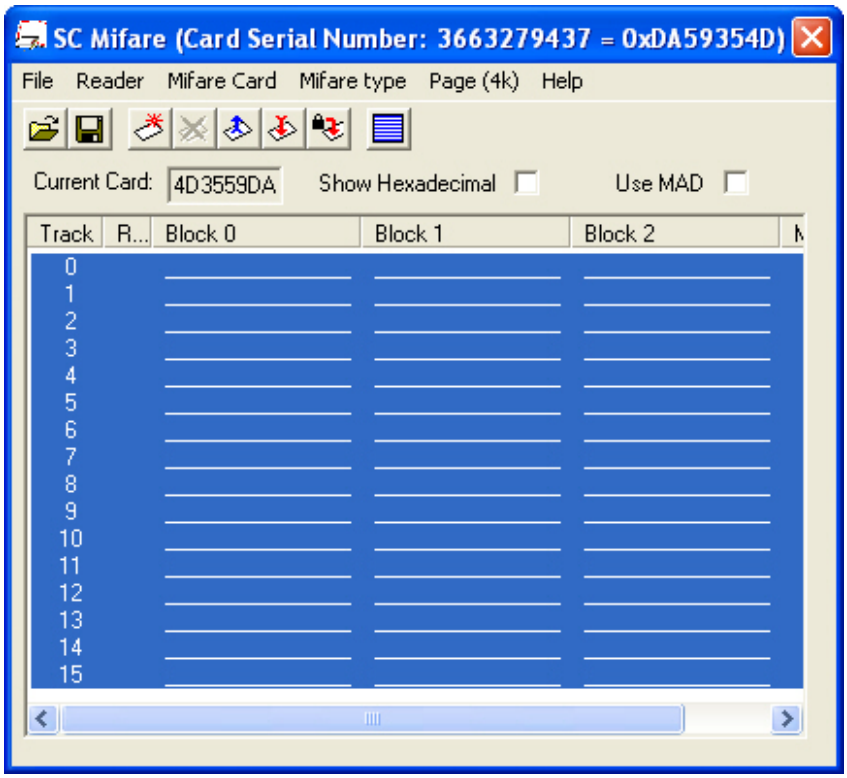
Place a Mifare Card on the reader.

The **Card Serial Number** will be displayed on the screen.



Mifare serial number

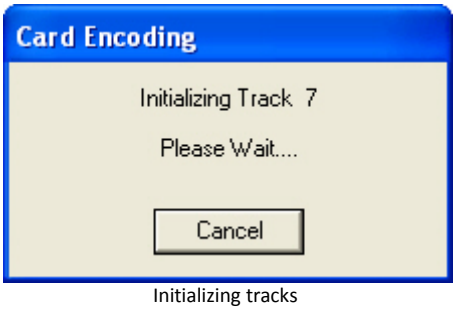
Click **Select All** from the toolbar, or from the **Mifare Card menu** click **Select All**.



Select All tracks

Select **Initialize** from the toolbar, or from the **Mifare Card menu**. A counter will show the progress while the tracks are initialized.

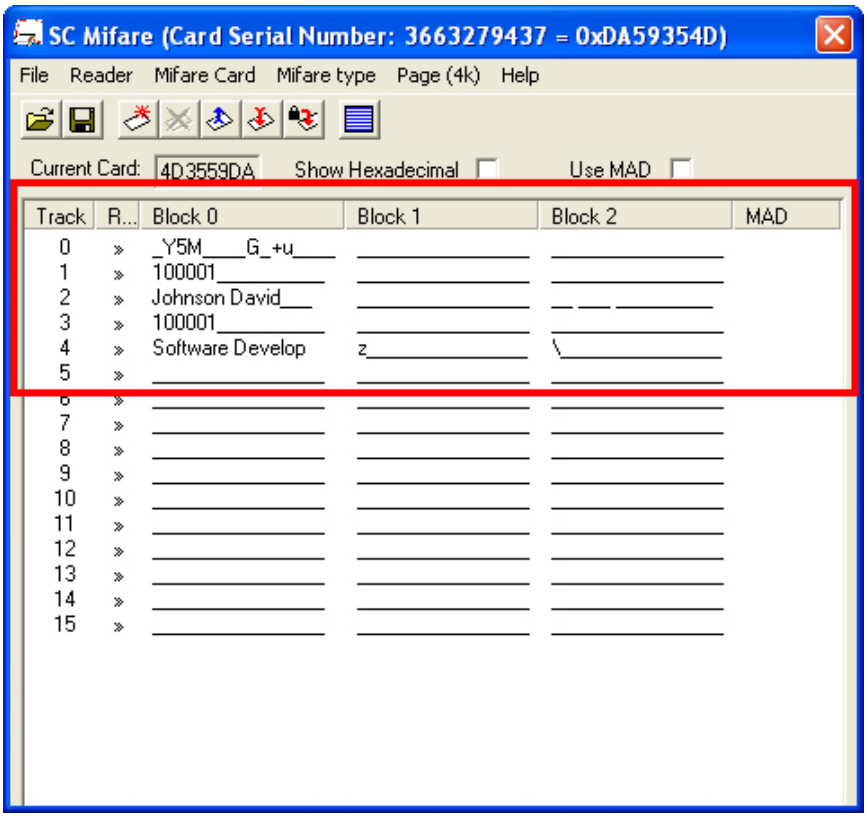
Use Initialize only if needed or required to change the keys in the mifare card. If the keys stored in the card are the same as the selected/configured read/write keys, this action is not necessary.



Initializing tracks

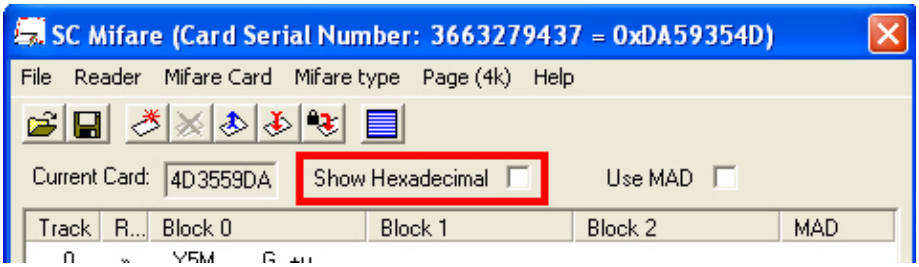
Select **Read** from the toolbar, or from the **Mifare Card menu**. A counter will show the progress while the tracks are read.

The read information is displayed on the screen.



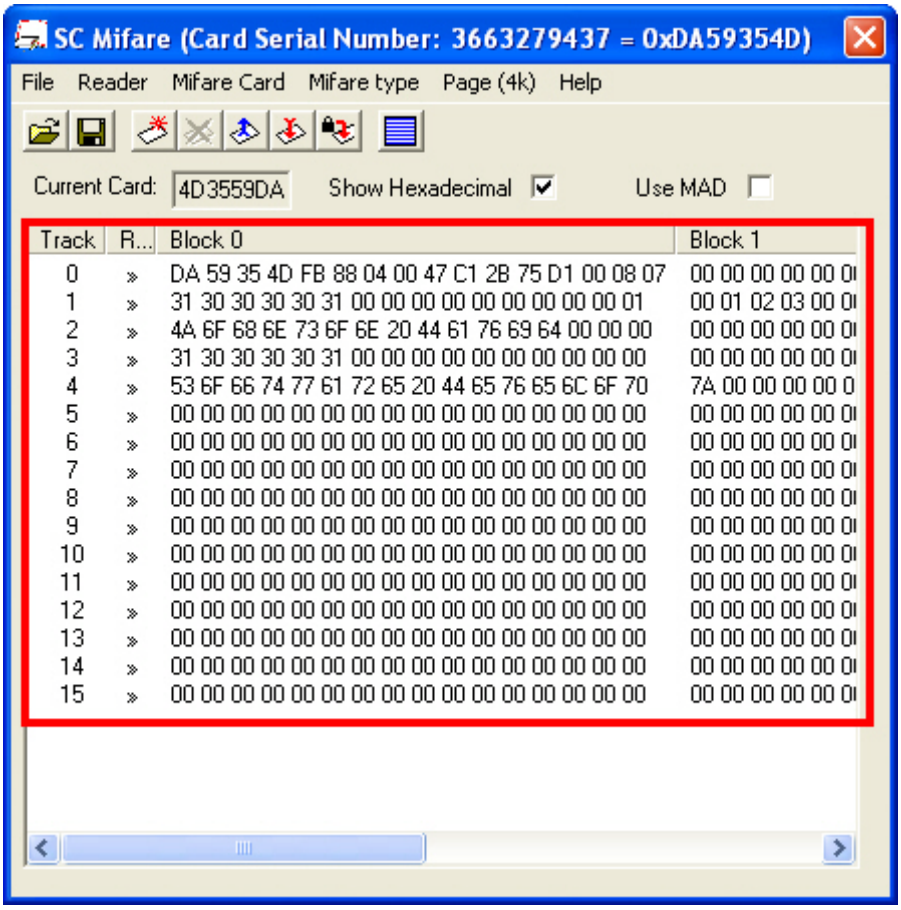
Track Information

To view the data in Hexadecimal format, check **Show Hexadecimal**.



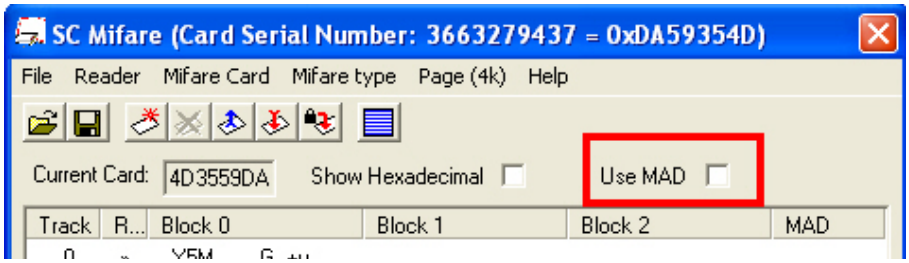
Show in hexadecimal format

The read information is displayed on the screen in hexadecimal format.



Show Hexadecimal

To view data configured in conjunction with MAD, **Mifare Application Directory**, check **Use MAD**.



Use MAD

Testing Mifare with a Stand Alone Reader

Select **New Card** from the toolbar , or from the **Mifare Card menu** click **New Card**.

Place a Mifare Card on the reader.

The Card Serial Number will be displayed on the screen.

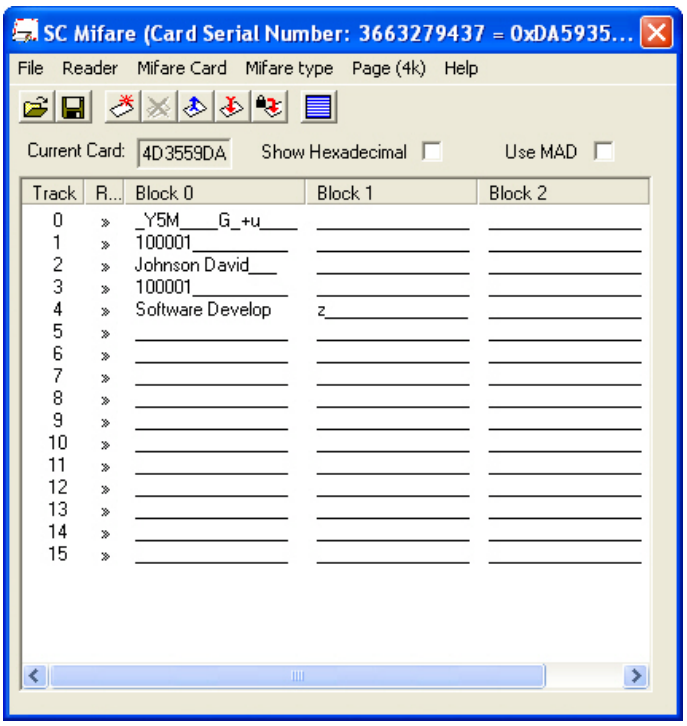
Click **Select all** from the toolbar , or from the **Mifare Card menu** click **Select All**.

Select **Initialize** from the toolbar, or from the **Mifare Card menu** click **Initialize**. A counter will show the progress while the tracks are being initialized.

Use Initialize only if needed or required to change the keys in the mifare card. If the keys stored in the card are the same as the selected/configured read/write keys, this action is not necessary.

Select **Read** from the toolbar, or the from **Mifare Card menu** click **Read**. A counter will show the progress while the tracks are read.

The read information from the card is displayed on the screen. To view the data in Hexadecimal format, check **Show Hexadecimal**, and enlarge the window.



Results

Testing Mifare with a Reader inside a Printer

Place a Mifare Card into the Card Hopper.

Select **New Card** from the toolbar, or from the **Mifare Card menu** click **New Card**.

The card is then fed into the reader.

The Card Serial Number will be displayed on the screen.

Click **Select all** from the toolbar, or from the **Mifare Card menu** click **Select All**.

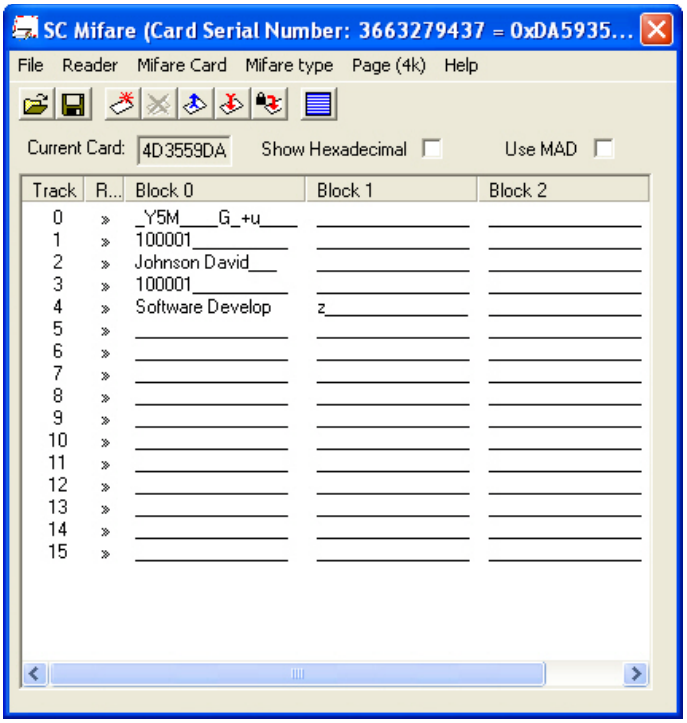
Select **New Card** from the toolbar, or from the **Mifare Card menu** click **New Card**. The card is moved to the encode position inside the printer which then can be read by the onboard reader.

Select **Initialize** from the toolbar , or from the **Mifare Card menu** click **Initialize**. A counter will show the progress while the tracks are being initialized. Initializing the card will replace old keys with newer keys, this occurs in the 3rd block of a track.

Data can now be written onto the track of choice. Select **Write** from the toolbar to write data to a track .

Select **Read** from the toolbar , or the from **Mifare Card menu** click **Read**. A counter will show the progress while the tracks are read.

The read information from the card is displayed on the screen. To view the data in Hexadecimal format, check **Show Hexadecimal**, and enlarge the window.



Results