

CardExchange® Help

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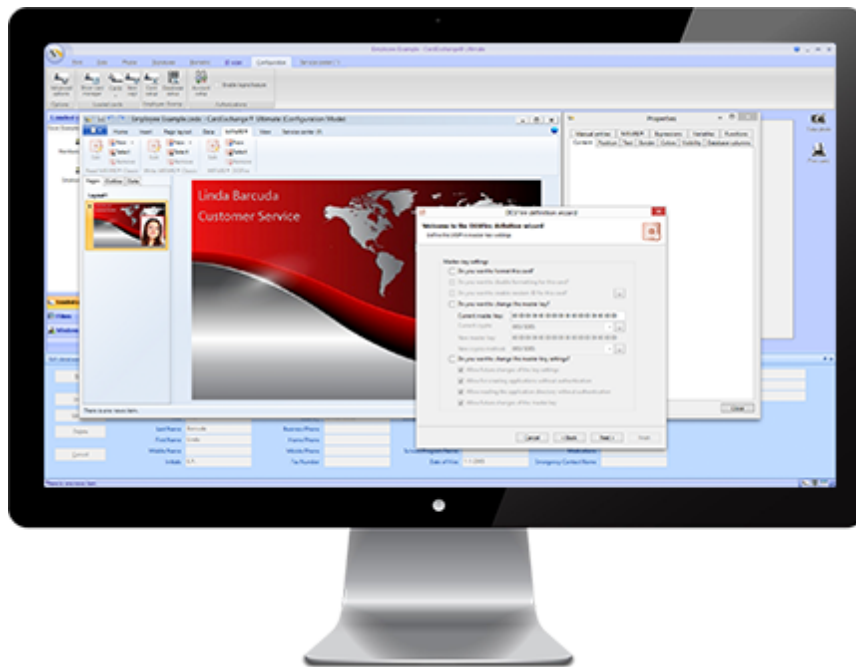
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1 Welcome



And thank you for using CardExchange® for producing your cards! We appreciate your business!

CardExchange® offers a multiple card-template interface that allows you to produce cards in just a couple of clicks. Our CardExchange® Card Production application is 8 years + in the market offering you an solution containing all our experience and knowledge available for secure production of your cards!

We strive to innovate by offering market leading solutions. Now with the release of the 9th generation of CardExchange®, we offer the complete new Service Center section. This section offers you all the tools you need to create, produce, deploy your cards. When needing support, this is the place to be. Always wondering how to get fasted support, in the Service Center you can find all the information from your CardExchange® reseller including his web address. In the Service Center CardExchange®, your Reseller, the Manufacture, etc., we all keep you posted with important information about your software and hardware.

Also new in CardExchange® 9 is support for Biometric devices and ID scanners. The print engine is completely rebuild and now supports GDI+ printing. This all results in a fantastic printing quality and a faster startup time with an increase of more then 50%!

We are also introducing a new addition to the CardExchange® family...CardExchange® GO Edition. Now offered as our new entry level edition, the GO Edition comes with an internal database which enables better protection and management of your stored data. We have redesigned the entire main interface and updated all the icons to enhance ease-of-use and improved intuitiveness.

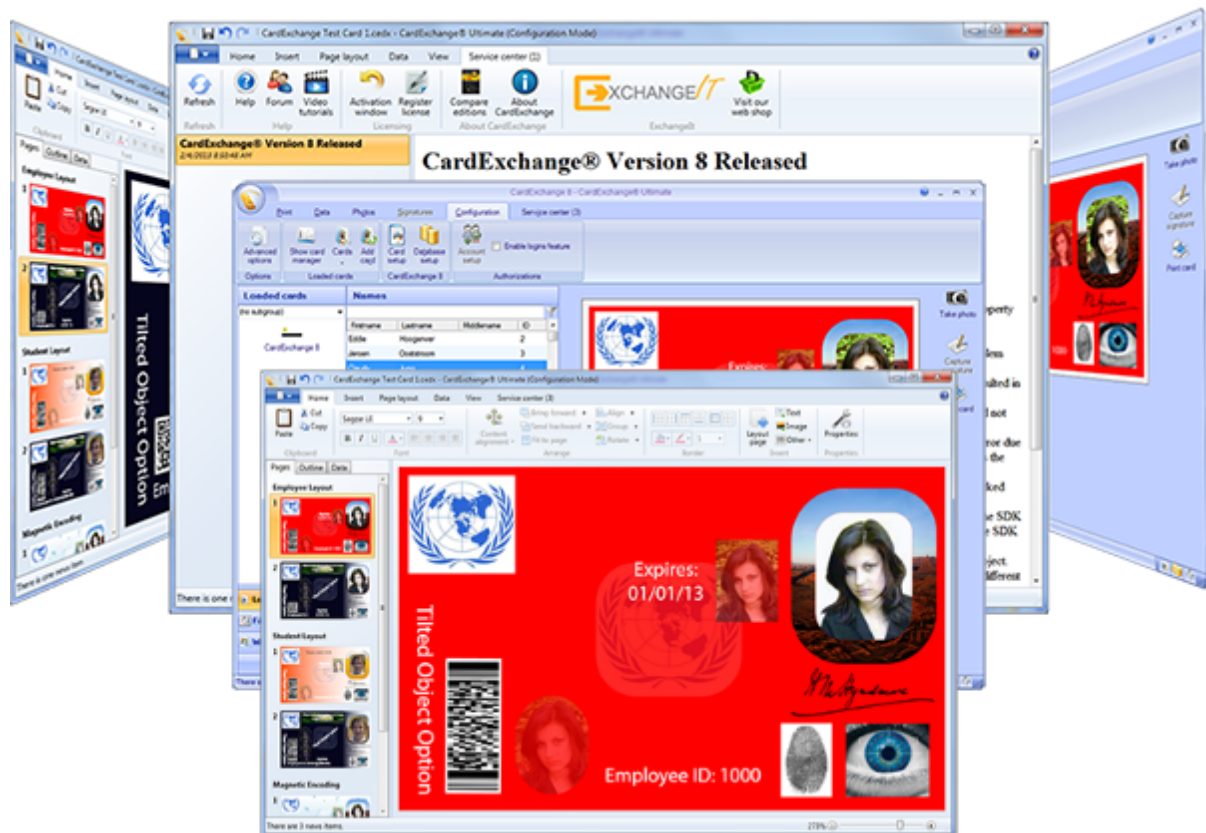
But that is not all...

Get access to our huge collection of ["How-To"](#) videos on our website offered in English and Spanish. Join our CardExchange® community by visiting our [online end-users forum](#) where you can find quickly answers to your questions, post questions, etc. Compare the functionality of your edition with the functionality of other available editions, etc. Find all you need to know in the [Using Service Center](#) section of this help file and be amazed what is been offered!

Receive FREE lifetime version upgrades (not available for CardExchange® Small Business Server editions) by simply registering your CardExchange® license. For more information, please see the [Getting Started](#) section of this help file.

It's not just about software; it's about the experience!™

1.1 Version 8 Users



If you are running version 8, please click on the button below and you will be directed to the latest online help file. A lot of things have change with CardExchange® 9 and functionality described in the version 9 help file can diver from the version 8 one.

[CLICK HERE TO VIEW THE VERSION 8 HELP FILE](#)

2 Overview

CardExchange® is offered as a Single License and as a Multi License Small Business Server Solution.

Our Standard Single License Solutions are available in four different editions:



Go



PREMIUM



PROFESSIONAL



ULTIMATE

Starting with the Go edition offering an internal database which enables better protection and management of your stored data. The Professional edition offers real database power with connections to multiple database servers, native connections, etc., ending with the top of the line, our Ultimate Edition offering inline MIFARE® Classic and MIFARE® DESFire EV1 encoding. All CardExchange® standard single license editions offer inline Magnetic Encoding functionality. Compare all our editions on our website by [CLICKING HERE!](#)

Our Small Business Server, Multi License, Editions are also offered in five different flavors:



PREMIUM



PROFESSIONAL



ULTIMATE



DISPATCHER



PRINT SERVER

Starting from the Premium with MS Access connections, our Small Business Server Editions offers you the powerful option to manage your licenses from a central location of your network. No more local licenses that need to be activated, no more need of using license dongles on local computers, just one location that holds your licenses. But it also offers the power of Central Data Management. All your card-templates, database connections, etc., managed by one administrator, user, computer, etc. The days of multiplying all your configurations are over!

But that is not all!

In combination with the Dispatcher and Print Server Editions, you will be able to create complete service bureau print farm solutions including load balancing printing. Send all your print jobs to the Dispatcher and/or directly to the Print Servers... It is all in your hands with the CardExchange® Small Business, Multi License, Solutions.

For more information about our CardExchange® Small Business Editions, please visit our website by [CLICKING HERE!](#) Or take a look at all available and offered functionality by [CLICKING HERE!](#)

3 FAQ

This page contains a selection of our most common and frequently asked questions...

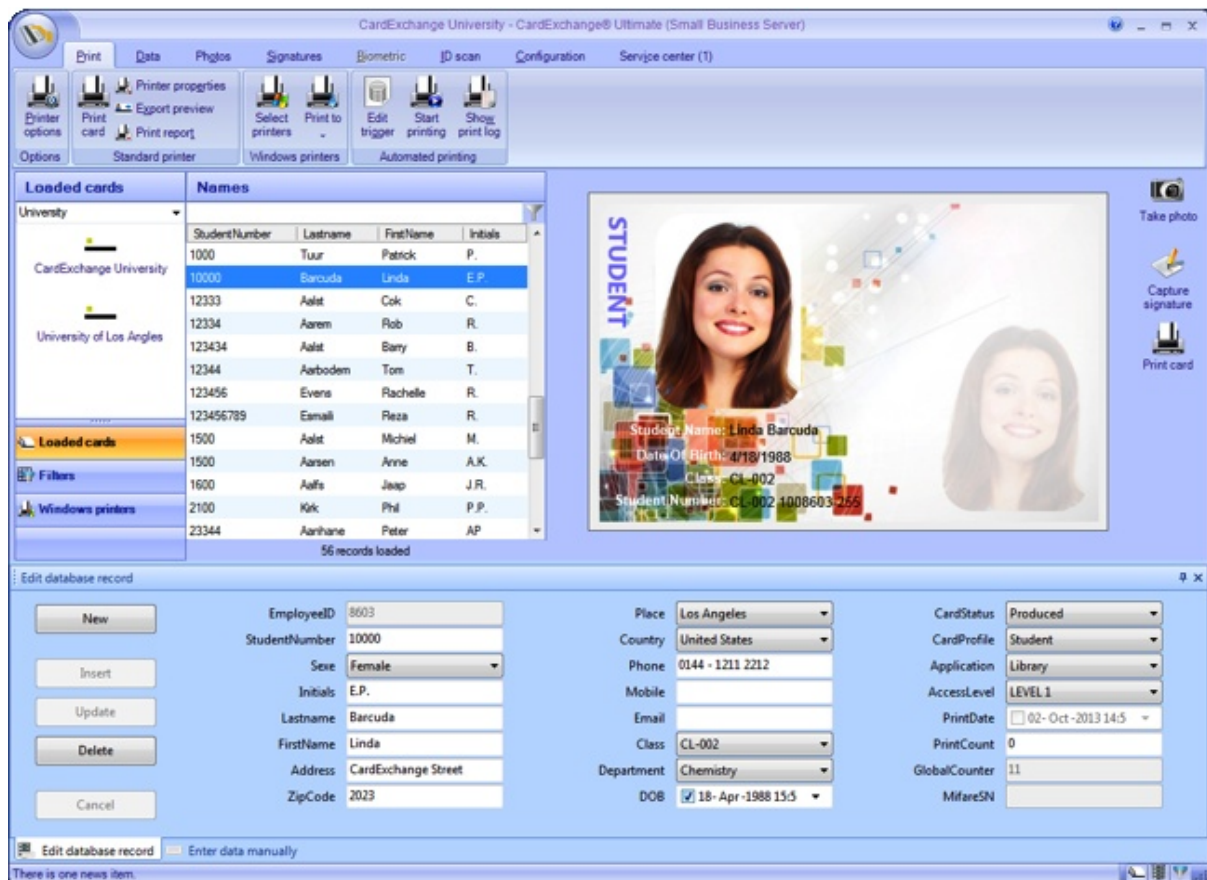
- [How can I activate a CardExchange® license?](#)
- [What should I do if activation fails?](#)
- [How can I move my CardExchange® installation to another computer?](#)
- [How can I create a new card with the user-guided wizard?](#)
- [How can I create a new card without the user-guided wizard?](#)
- [How can I connect to an Excel database?](#)
- [How can I show to Photos on my card layout?](#)
- [How can I store ID photos in the database?](#)
- [How can I use signature pads?](#)
- [Which Photo Cameras are supported by CardExchange®?](#)
- [Which Signature Pads are supported by CardExchange®?](#)
- [Can I use finger-print devices with CardExchange®?](#)
- [How can I show a variable image on the card layout?](#)
- [How can I print multiple records on a single card?](#)
- [How can I print multiple layouts with a single database connection?](#)
- [How can I configure magnetic encoding?](#)
- [How can I link to multiple databases?](#)
- [How can I integrate non-standard functionality \(plug-ins\)?](#)
- [How can I protect CardExchange® with user names and passwords?](#)
- [How can I find answers to specific questions about CardExchange® \(forum\)?](#)
- [Using GDI+ printing technology when printing results are poor.](#)
- [How to use Biometric with CardExchange®.](#)
- [How to use ID scanners with CardExchange®.](#)

4 Getting Started

To get started with CardExchange, it is important to get familiarized with the interface. It is important to know that CardExchange basically is a combination of two disciplines:

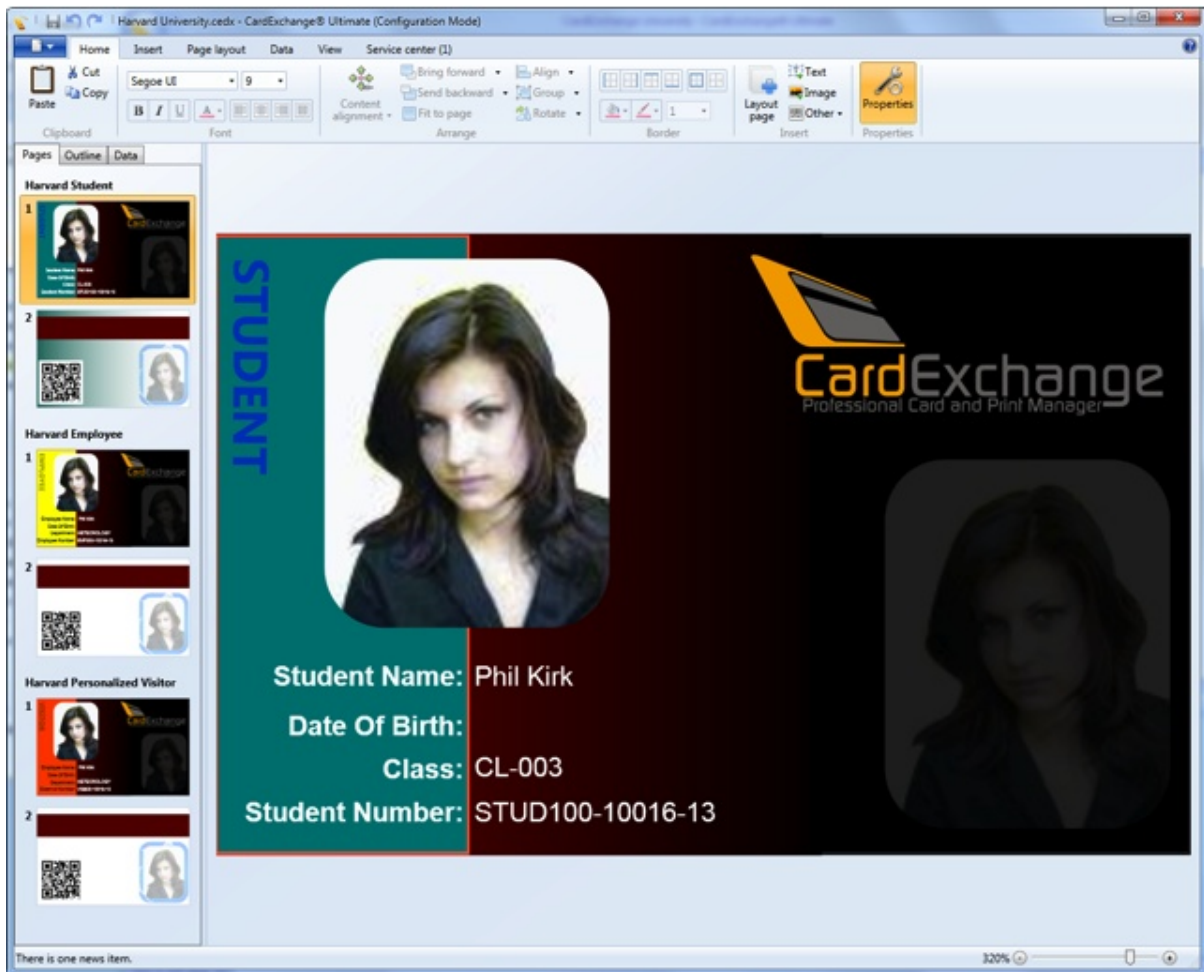
- The Main Interface offering the multiple card-template interface and data-editing, etc.
- and the Configuration Interface, the Designer.

Most of the times you will be working from out of the main interface



In a very convenient way it offers you the possibility to select your card-templates at the left side followed by selecting the record that needs to be printed, take a picture or scan a signature on the right side, followed by the print command.

The configuration of this all is done directly via the Configuration Interface, the Designer



In the same setup as the main interface, from the left side you see all the available card-layout(s) and card-pages with all the available tools organized in different sections via the ribbon bar.

As we recognize that most people are used to work with Microsoft Office products, our CardExchange® products are also designed accordingly. Not to make our lives easier, but yours! Everybody that can work with Microsoft PowerPoint or Word, will have no problems finding his way in CardExchange®!

4.1 About this Help File



In this help file we will explain all available functionality of our CardExchange® Single

License and CardExchange® Small Business Multi License Editions.

The help assumes that CardExchange® is installed on your system. If CardExchange® is not installed on your system, please do so first.

Please be aware that there are two different installation procedures for Single License Editions and Small Business Multi License Editions.

These Quick Install Manuals are available on our website as online help and as PDF Manual:

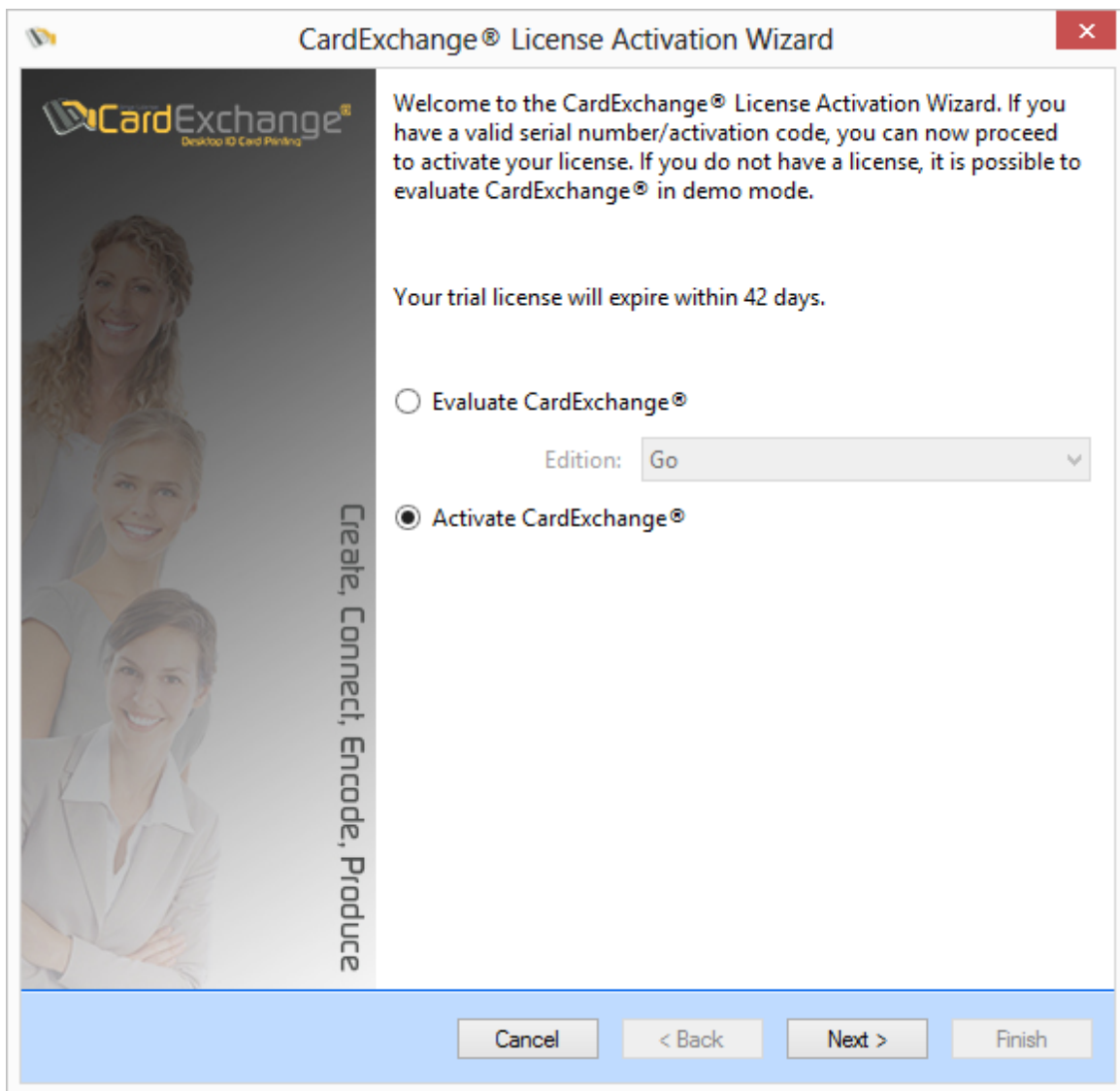
- [CLICK HERE](#) to view the CardExchange® Install Manual
- [CLICK HERE](#) to view the CardExchange® Small Business Server Install Manual

Our Help files are additional to our online end-user forums. Our forums are always leading if it comes to explained functionality of CardExchange®. We prefer you use this forum as much as possible as it not only can help you, but also other CardExchange® users all over the world.

Visit and register on our forum today by [CLICKING HERE!](#)

4.2 Our Trial Edition

Our CardExchange® Trial Version offers you unlimited access to all available functionality within our editions for an unlimited period of time. When you have installed CardExchange® for the first time, just select "Evaluate CardExchange®" and select the edition that you want to try out.



We offer the possibility to try out our Go, Premium, Professional, and Ultimate edition. For information about the offered functionality per edition, check out our [Overview](#) section in this Help File.



When you have made your selection from the drop down menu, simply click on Finish to start your trial and use all functionality offered. The only limitation of the Trial is that it prints DEMO on the card. The nice part is, when you have configured, designed, connect to databases, etc., and you like our CardExchange® application, you simply purchase a license, activate it, and you keep on working. Nothing needs to be redone!

Activating your Trial or your new installation is explained in our [Activation and Registration](#) section of this Help file.

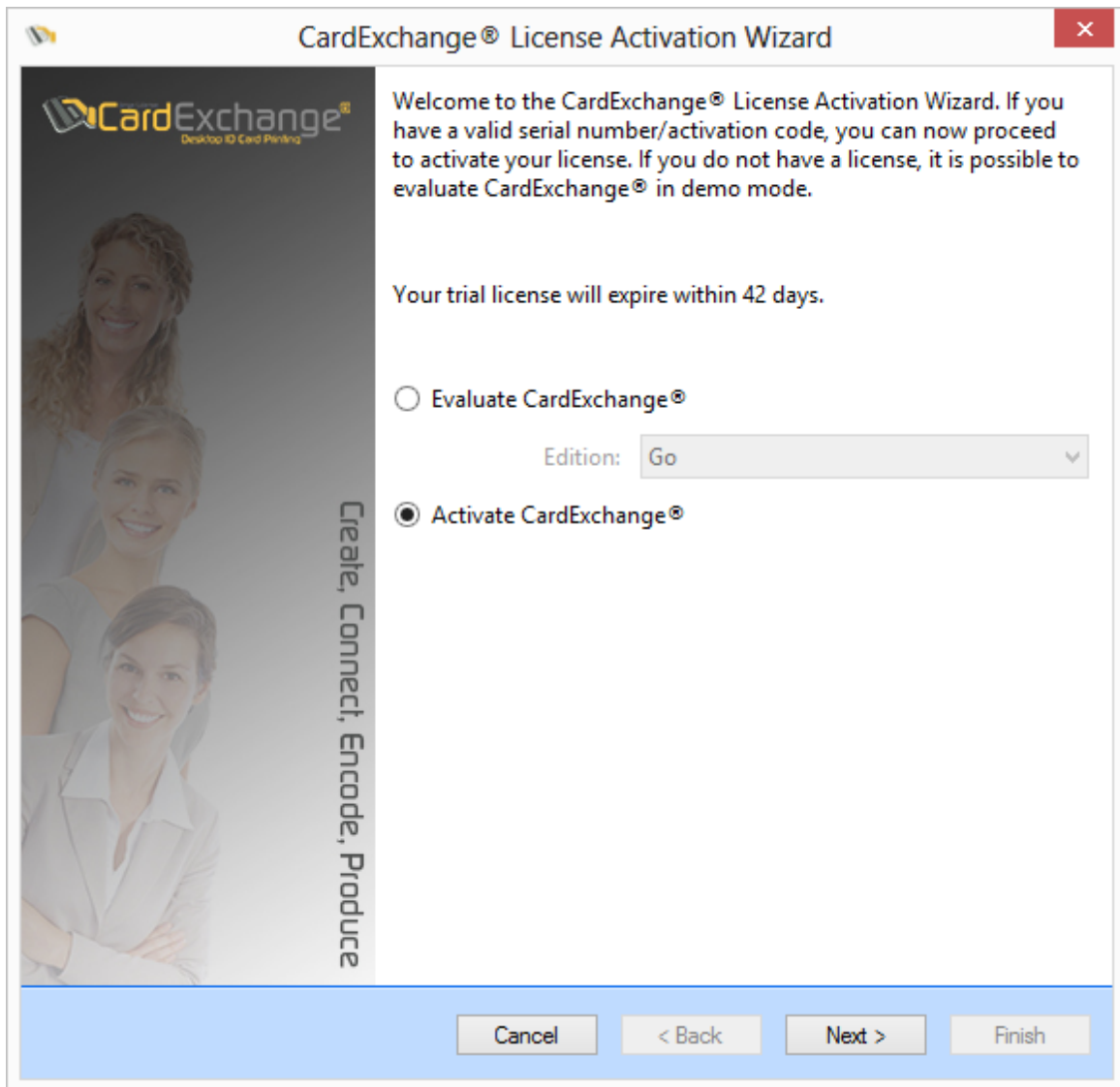
4.3 Activation and Registration

***IMPORTANT!** This is activation and registration process does not apply to our Small Business Multi License Edition Product! Please view our Small Business Server Edition Install Manual for instructions.*

When you have used our Trial version and you want to use it, or you directly purchased our CardExchange® application via one of our resellers, you will have to activate the application. To activate CardExchange® you need to have a **Serial Number** and **Activation Code**.

The serial number is a five (5) digit number and looks like 23144. The activation code is a 24 digit number and looks like 017DF-116DA-1ABA4-DDF80-CF05F-32D99-371F.

Activating your license is very easy to do. Just start your new installed CardExchange® application or start your Trial Edition.



Select the "Activate CardExchange®" option and click on the Next button.

CardExchange® License Activation Wizard

Welcome to the CardExchange® License Activation Wizard. In this wizard you will be able to activate and register your CardExchange® license. By registering your license you make sure that you are being informed about updates and new releases.

Please provide your serial number and activation code in the fields below. If you have received an activation file (*.AUT) or an activated license file (*.LIC), click on the advanced button and select your file.

Serial number:
38187

Activation code:
2334D-53535-66AD6-1626F-33322-989FA-FB12

Machine ID:
10-40794

Advanced >>

IMPORTANT! Your license can only be activated on a single computer. Do not activate your license on a computer that is only used for testing. The demo version offers all CardExchange® functionality free for 42 days.

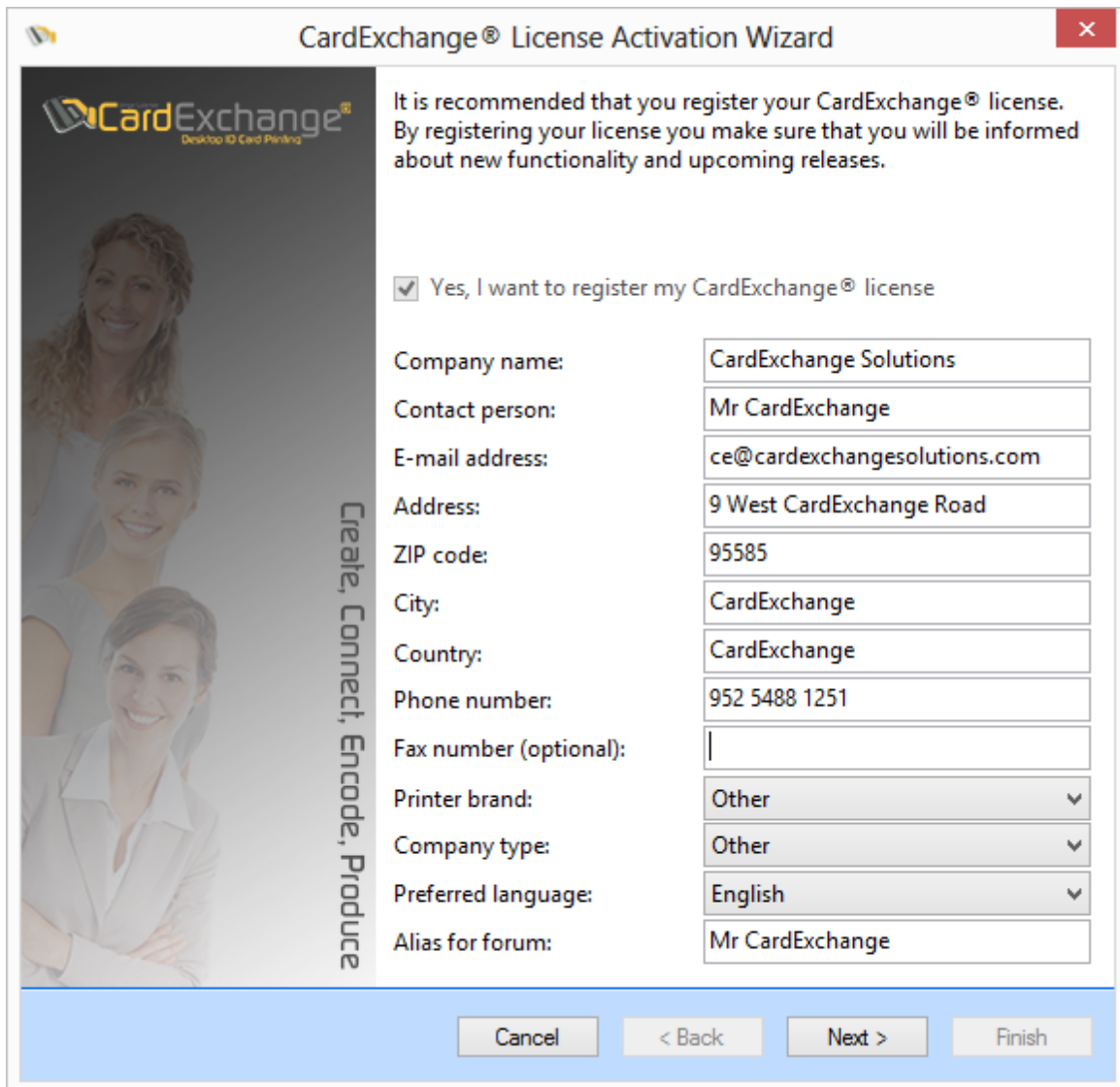
Cancel < Back Activate Finish

Enter your **serial number** and **activation code**.

The Machine ID is unique for each computer that CardExchange® is installed on and is used for activating the license and identify your computer by our licensing system. The Machine ID is generated based on your internal computer hardware. If activation fails because you have, for example, no internet connection on your computer, your license can also be activated directly via our website but to activate your license via our website, you need to have this unique Machine ID. For more information about activating your license, please view our [Video Section](#) on our website where you can find helpful videos about installing and activating CardExchange®.

When you have entered your license information, you click on Activate to start the Activation process.

At the moment the activation process starts, you can start registering your license. Registering your license offers a lot of benefits. It offers access to our End-User Help Forum, it informs you about new releases and updates, etc. But that is not all... when you register your CardExchange® license, you will receive FREE lifetime version upgrades!



The screenshot shows a software window titled "CardExchange® License Activation Wizard". On the left, there is a vertical banner with the CardExchange logo and the text "Create, Connect, Encode, Produce" next to a photo of three smiling women. The main area contains a message: "It is recommended that you register your CardExchange® license. By registering your license you make sure that you will be informed about new functionality and upcoming releases." Below this is a checked checkbox: "Yes, I want to register my CardExchange® license". The form fields are as follows:

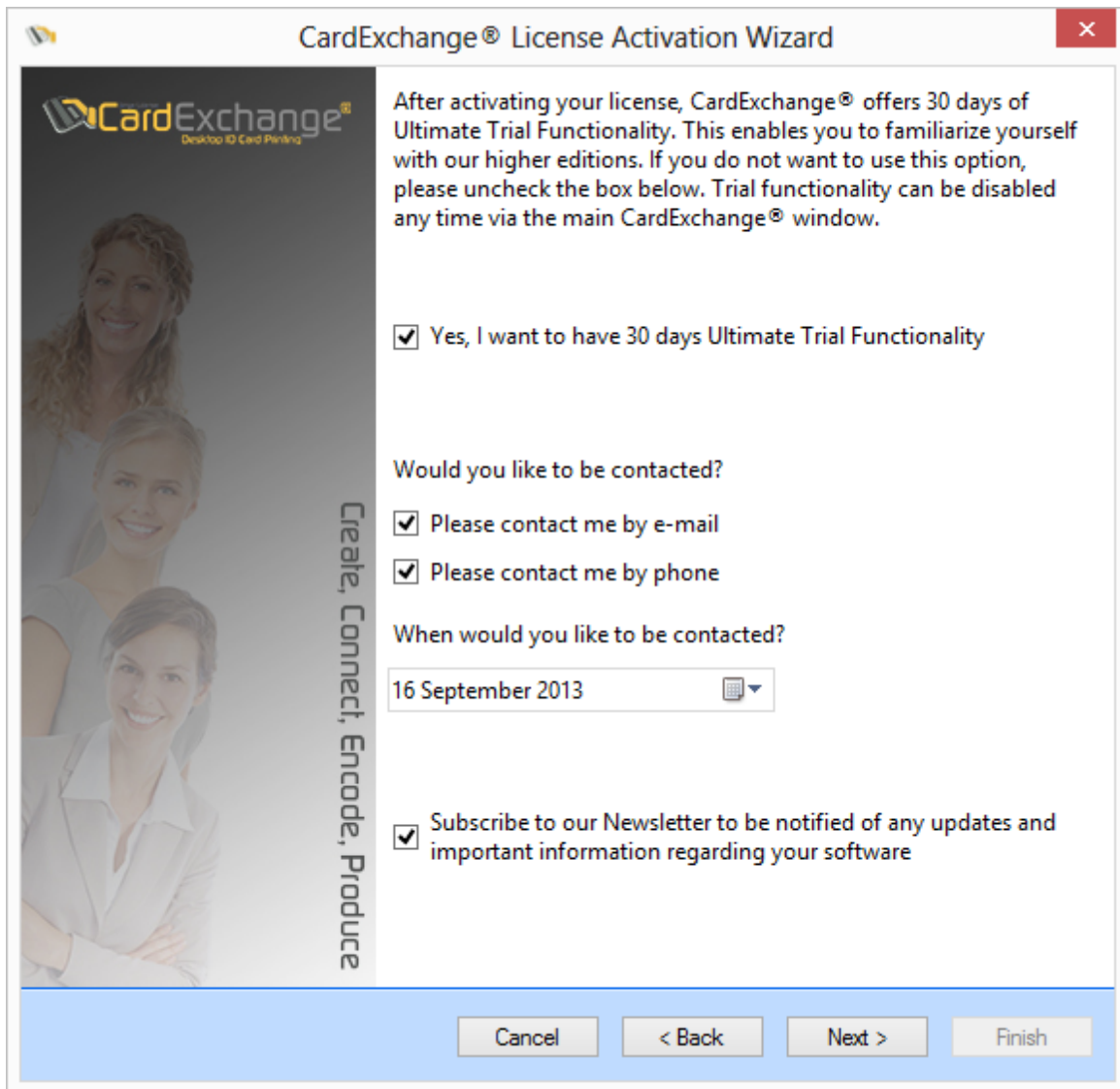
Company name:	CardExchange Solutions
Contact person:	Mr CardExchange
E-mail address:	ce@cardexchangesolutions.com
Address:	9 West CardExchange Road
ZIP code:	95585
City:	CardExchange
Country:	CardExchange
Phone number:	952 5488 1251
Fax number (optional):	
Printer brand:	Other
Company type:	Other
Preferred language:	English
Alias for forum:	Mr CardExchange

At the bottom of the window are four buttons: "Cancel", "< Back", "Next >", and "Finish".

In the registration page you can enter all your company and contact information. The fax number is optional, all other fields are required. Select the printer brand you are using, the type of company, and in which language you prefer to communicate. Last but not least, provide an Alias for our End-User Forum. Standard your alias is the same name as the name of the contact person, but you can change this to something else if you do not want to have your name shown in the forum with your post.

IMPORTANT! Your provided information will never be commercially sold and will only be used by ExchangeIt and your reseller to provide you with important information about your software and hardware!

When you have provided all information, click Next to proceed to the next page of the registration.



The screenshot shows a window titled "CardExchange® License Activation Wizard" with a close button in the top right corner. On the left side, there is a vertical banner with the CardExchange logo and the text "Desktop ID Card Printing" and "Create, Connect, Encode, Produce" next to a photo of three smiling women. The main content area contains the following text and options:

After activating your license, CardExchange® offers 30 days of Ultimate Trial Functionality. This enables you to familiarize yourself with our higher editions. If you do not want to use this option, please uncheck the box below. Trial functionality can be disabled any time via the main CardExchange® window.

Yes, I want to have 30 days Ultimate Trial Functionality

Would you like to be contacted?

Please contact me by e-mail

Please contact me by phone

When would you like to be contacted?

16 September 2013

Subscribe to our Newsletter to be notified of any updates and important information regarding your software

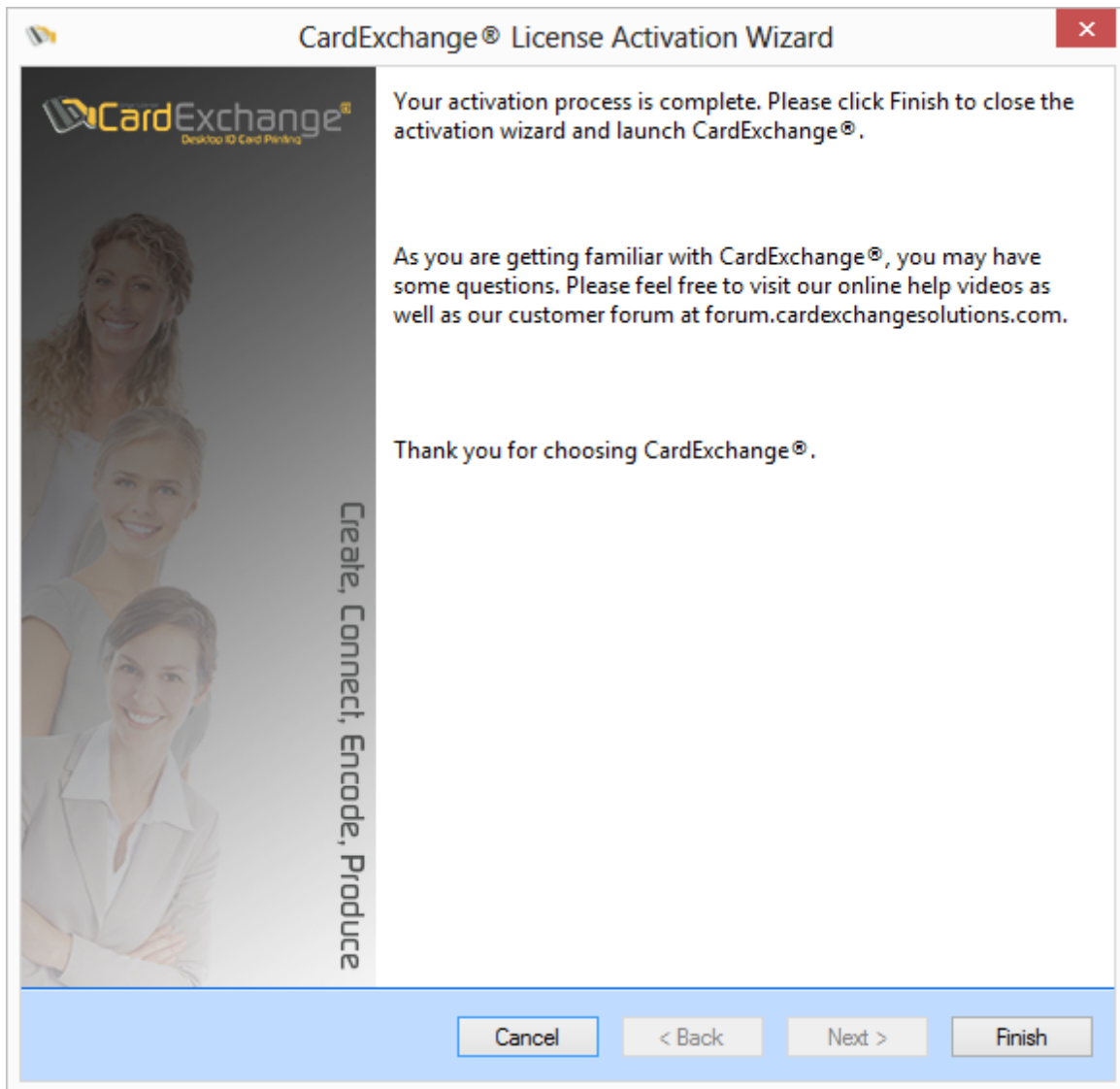
At the bottom of the window, there are four buttons: "Cancel", "< Back", "Next >", and "Finish".

In this page of the registration process you can first indicate if you want to use 30 days of all functionality available in CardExchange®, the Ultimate edition. This can be handy if you have, for example, received a Designer in the box. Selecting this 30 days trial will offer you an insight to available functionality to determine which edition fits your situation best before buying. All trial functionality will be clearly indicated as TRIAL.

If you would like to be contacted, just select how and when, and your reseller will contact you on the preferred date selected.

Last but not least, subscribing to our newsletter offers you information specific for your software and hardware that you are using.

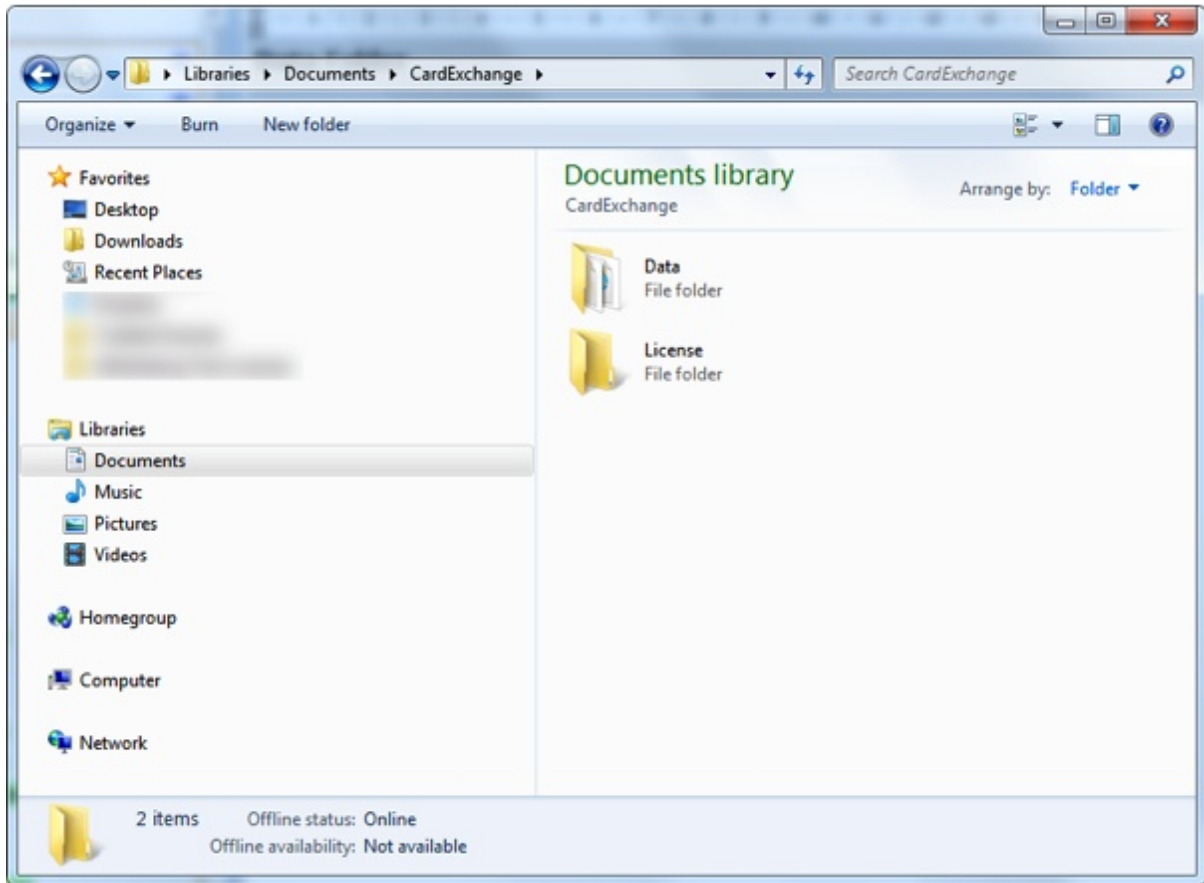
Click Next to proceed to the Final page of the registration process.



During the registration process, your CardExchange® license has been activated. Click on Finish to finalize the activation and registration and start CardExchange®.

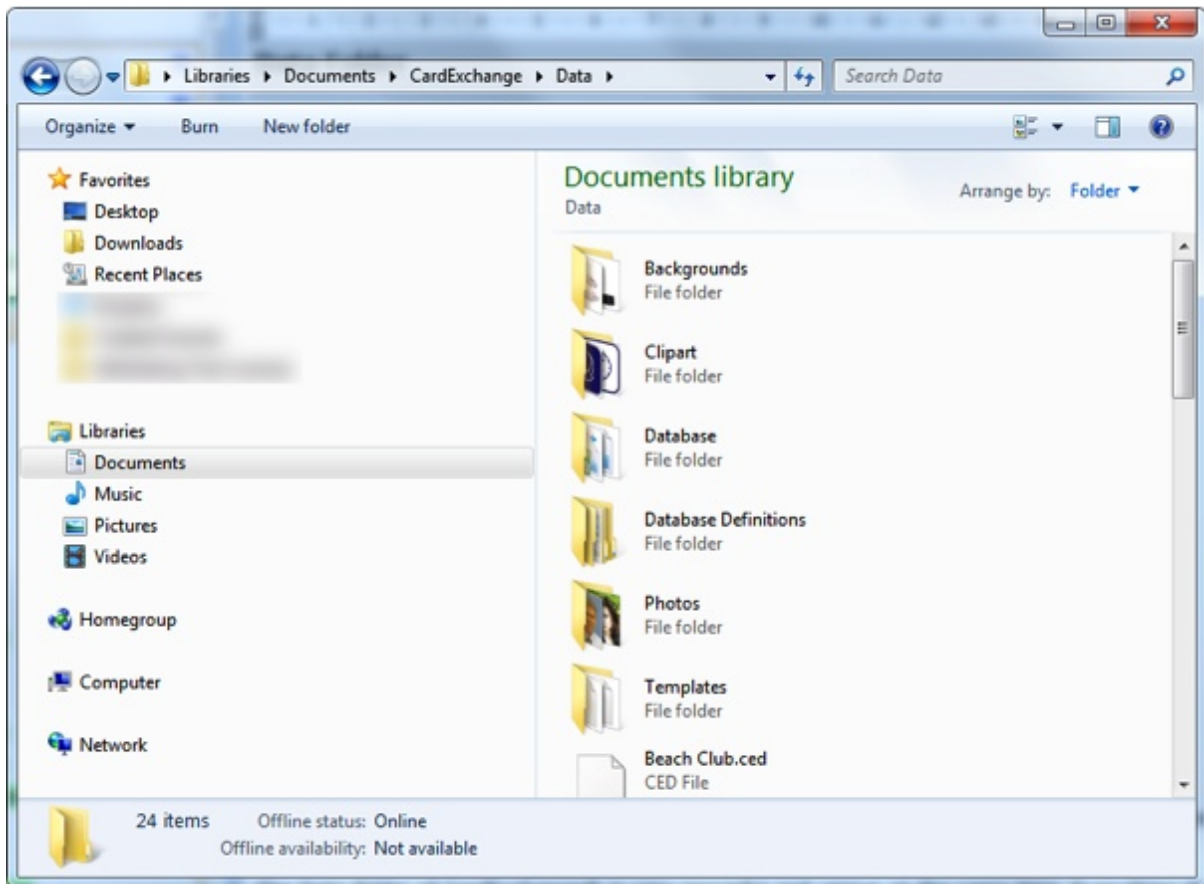
For more information about updating your registration, please visit our ["Update Your Registration Info"](#) section of this Help file. Want to upgrade your license to a higher edition, please visit our ["Upgrade Your License"](#) section of this Help file.

4.4 Data Folder



During the installation of CardExchange® you are asked to select a location for your Data folder. By default this folder is installed in your Documents folder under CardExchange.

The Data folder of CardExchange® is very powerful and unique at the same time. Everything that you design like templates, database connections, encoding files, etc., all these files are stored in the Data folder of CardExchange®.



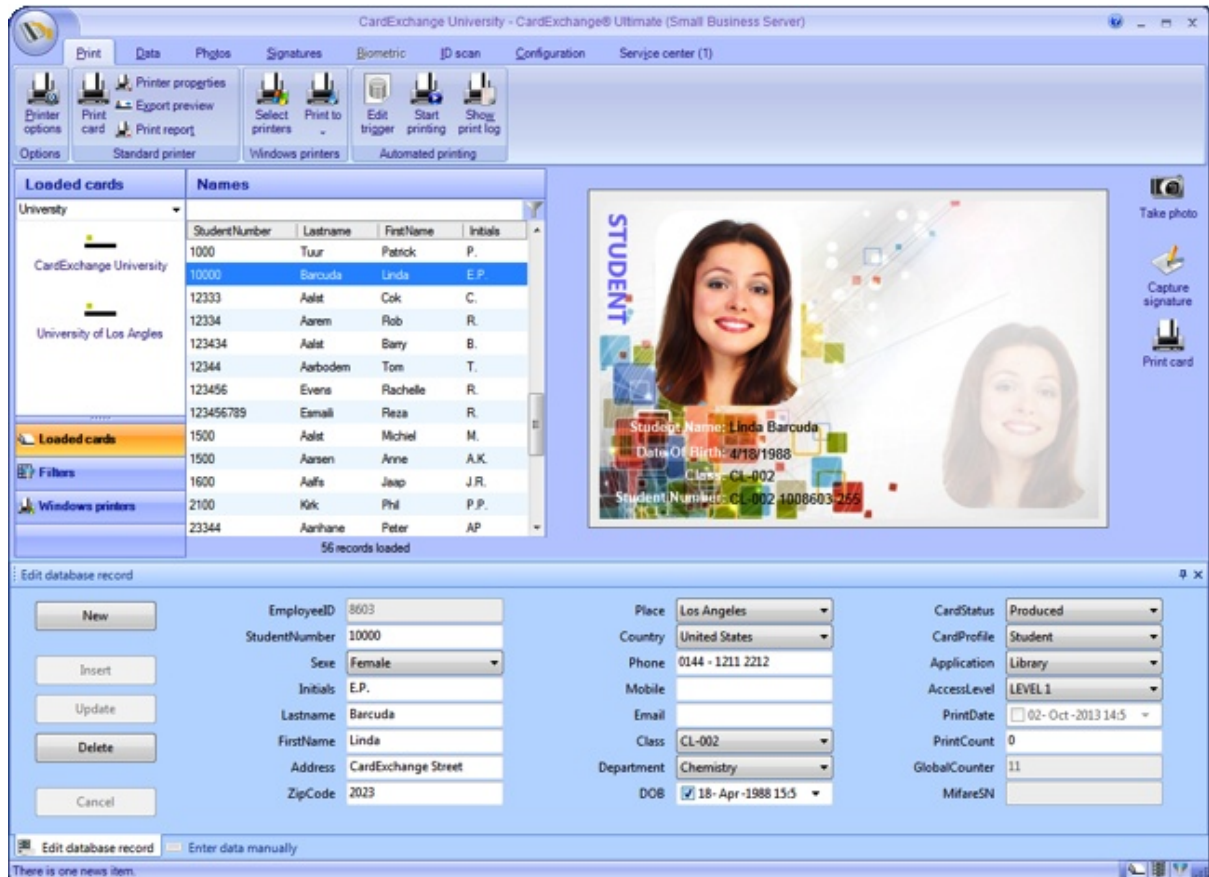
When you open the Data folder you see the sub folders for Backgrounds, Clipart, Database, Database Definitions, Photos, and Templates. Even if you store your designs somewhere else, CardExchange® always makes a local copy of of the original in this Data folder.

The Date folder also contains all the configuration from all the different templates. We therefore strongly advice to make regular backups from this Data folder especially when you have made changes in your configuration.

When your computer crashes and you need to reinstall CardExchange®, after the installation and re-activation, you copy the backup of the Data folder back, start CardExchange® and all your configurations are restored and you can start working directly again.

The Data folder can be located on any location, also on a network server. The Data folder can however not be shared between different CardExchange® editions inside your company. Each CardExchange® license needs to have it's own unique Data folder. If you want shared Data folders, you will have to use our Small Business Server edition.

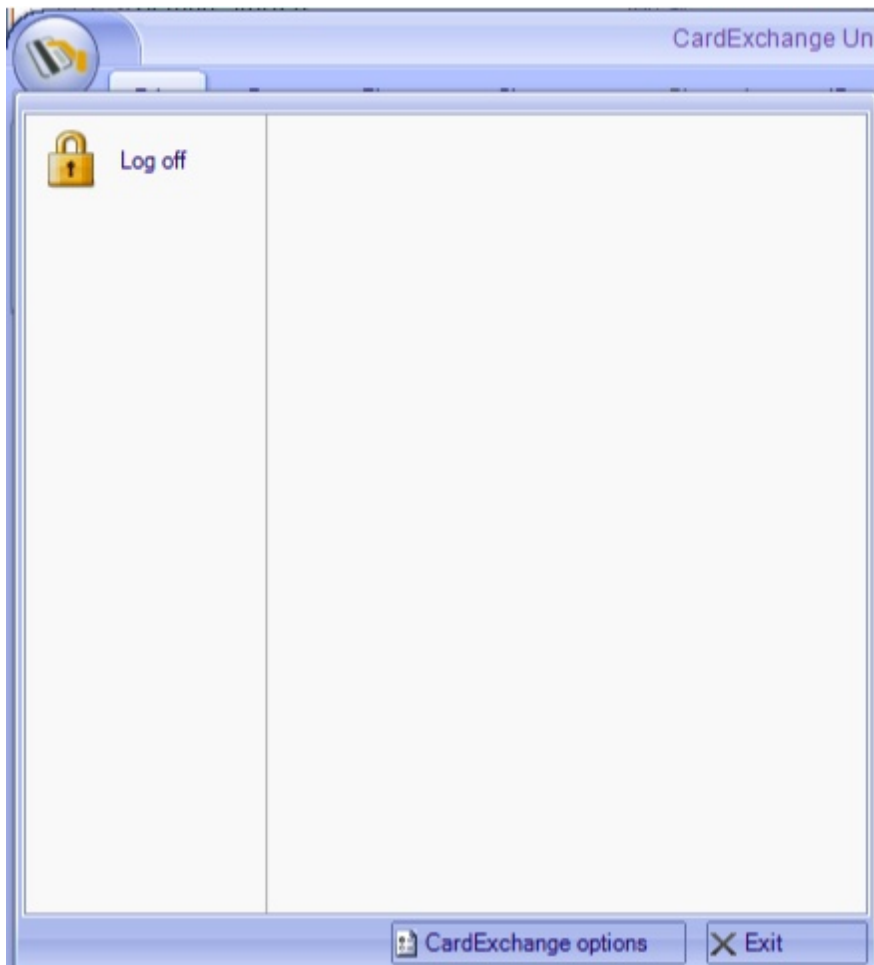
5 Using the Main Interface



The CardExchange® Main Interface is known as the most easiest to use interface in this market. After the system is configured, you only have to make a card-template selection from Loaded cards menu on the left, select a record or records that needs to be printed from the data-grid, take a picture or capture a signature via the buttons on the right, and produce the card(s) by simply clicking on the Print button.

In this section of the Help file we explain the use of the menu and the ribbon bar.

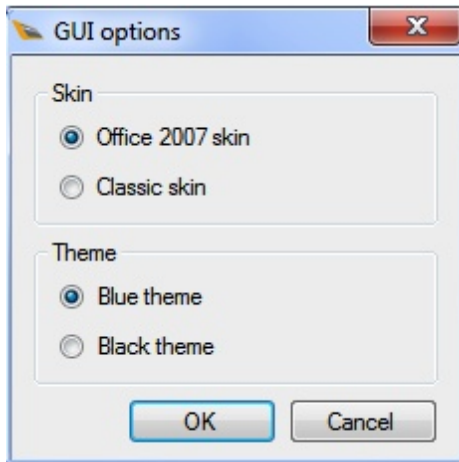
5.1 Menu Overview



Open the menu by clicking on the Application button on the left upper corner. In this menu you can select to log off if you are using [User Authorizations](#).

You can also change the skin and the color of the application by clicking on ["CardExchange® options"](#). Last but not least, the Exit button that closes CardExchange®.

5.1.1 Options



CardExchange® offers two different skins. By default, the Office 2007 skin is selected, but it is possible to use the old Office 2003, Windows XP skin. When changing, you will have to restart CardExchange®.

If you use the Office 2007 skin, you can select the standard Blue theme or the Black theme. These settings apply directly when you click on OK.

5.2 Ribbon Overview



CardExchange® offers a lot of functionality for printing, producing, and creating cards. The Main Interface of CardExchange® is especially designed to create a very user-friendly production environment. All the functionality is organized within each separate tab of the Main Interface ribbon.

TAB DESCRIPTION

[Print](#) All functionality related to printing

[Data](#) All functionality related to data editing

[Photos](#) All functionality related to using photos

[Signatures](#) All functionality related to using signatures

[Biometric](#) All functionality related to using Biometric features

[ID scan](#) All functionality related to using ID scanner features

[Configuration](#) All available configuration functionality

[Service](#) All functionality related to service and support of CardExchange®

[center](#)

5.2.1 Print

IMPORTANT! If you are using our Small Business Multi License Edition Product, please view the "Printing Cards" at the Small Business Server section of this Help file.

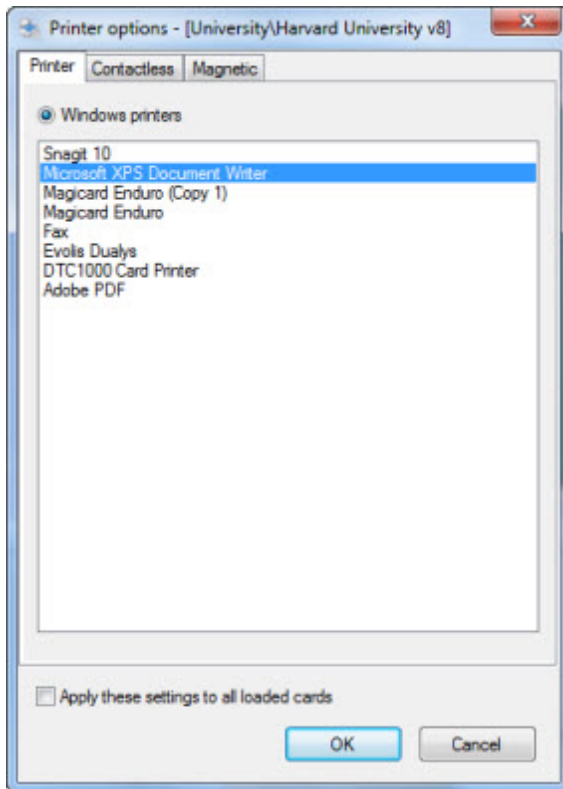


The Print tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Printer Options	Configure your printer(s), contactless encoding, Magnetic encoding
Standard printer	Print card	Opens the print dialog
	Printer properties	Opens the printer properties dialog of the selected printer properties
	Export preview	Exports a preview of the card as a file
	Print report	Opens the Print report dialog
	Windows printers	Select printers
Print to		Print directly to the selected Printer from the drop down menu
Automatic printing	Edit trigger	Edit and activate the printing trigger
	Start printing	Start automatic printing if configured
	Show print log	Show the print log

For more detailed information about printing, please visit the ["Printing Cards"](#) section of this Help file...

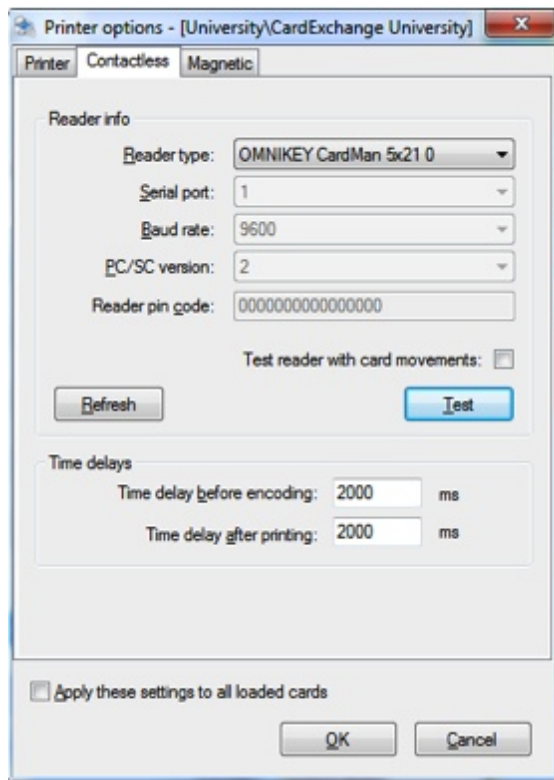
5.2.1.1 Printer Options



When the printer options window is opened, it will present all the installed Windows Printers on the system CardExchange® is running on. Just select the printer you want to use from the list view and click on OK to confirm.

If you want to use the selected printer for all loaded card-templates, make sure you check "Apply these settings to all loaded cards" otherwise each card-template will have it's own specific printer connected.

5.2.1.1.1 Contactless

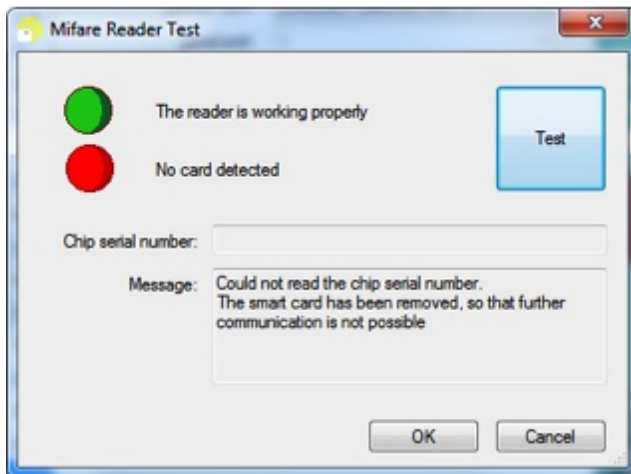


In the Contactless tab you are able to test your hardware configuration for encoding contactless cards.

The Reader Info Section

- **Reader type** - Select the reader being used inside your printer or external
- **Serial port** - Select the serial port the reader communicates with (not applicable for PC/SC)
- **Baud rate** - Select the baud rate (speed) of the used reader
- **PC/SC version** - When PC/SC readers are used, select the version 1 or 2
- **Reader pin code** - If reader requires a pin for access, you have to enter it here
- **Test reader with card movements** - Set to True or False

In the Reader Info Section you can also find two buttons. The button Refresh refreshes the list of readers available in the Reader type drop down menu. When a new PC/SC reader is added to the system, this button needs to be pressed to make it available. The second button is the Test button. Depending on card movements setting, clicking this button will move the card to the encoding position of the printer that is selected in the [Printer Options](#) section and will test the reader.



In the reader test window it will indicate if CardExchange® is able to communicate with the reader, and if a card is presented, and can read the CSN (Chip Serial Number). These test are clearly marked with Red and Green lights.

When using older printers that works with so called escape commands to move the card in the encoding position, there is no information shared about the exact position of the card in the printer. For these printers we need to set the Time delays in the Time delays section.

There are basically two settings that can be entered; Time delay before encoding and Time delay after printing. The average time delay after printing is round 30 seconds (30.000 ms). On the the moment that the card is electronically processed, it will be set to print position. On that moment CardExchange® will prepare the next card for encoding, when printing multiple cards of course. After 30 seconds, independently of the state the printer is in, CardExchange® will instruct the reader to access the card. With these older printers you will have to play a little with these time delays to get the best results. Don't forget to make sure to check the Configuration settings in the [Advanced options](#) for using Factory or non-factory build in readers.

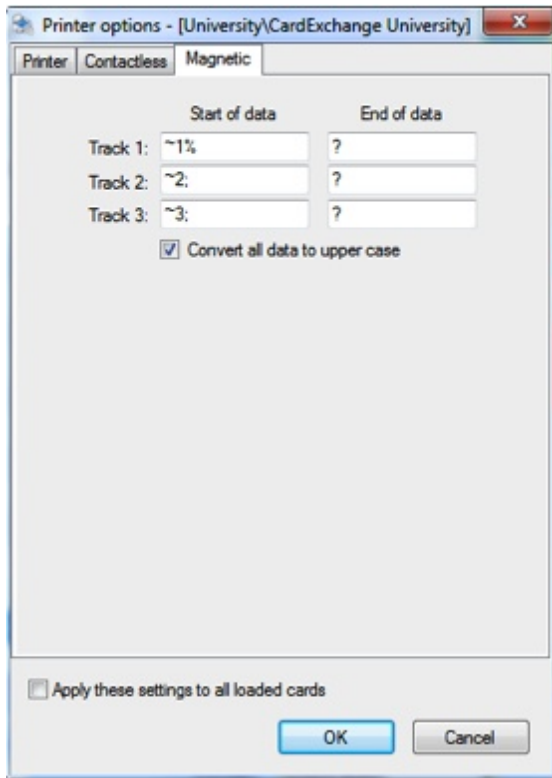
Factory build in readers normally work via SDK's (Software Development Kits) that give CardExchange® full control of the printer and time delays are normally never needed and can stay in the default settings of 2000 ms.

1 sec = 1.000 ms

Of course, all these setting made can apply for all cards or the selected card only.

For more information about Contactless encoding, please see our [Using Contactless Encoding](#) section of this Help file.

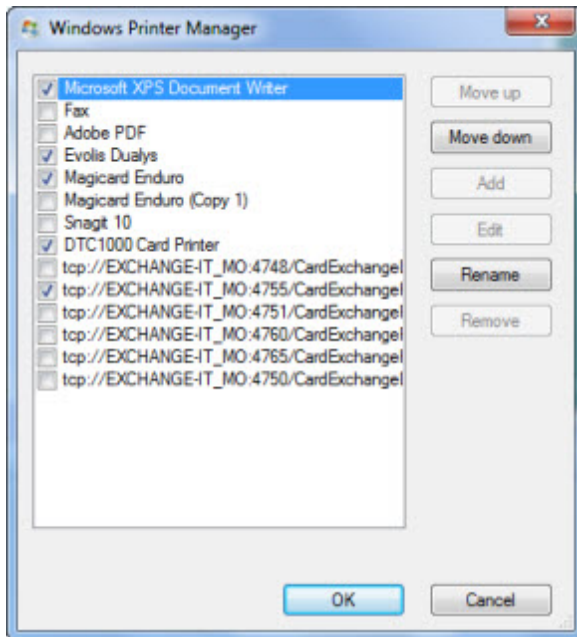
5.2.1.1.2 Magnetic



In the Magnetic tab you can set the start and stop commands for the printers to encode the magnetic stripe. Most common start and stop commands can be found on our [CardExchange® End-Users Forum](#). Of course, these settings can apply to all cards or the selected card only.

IMPORTANT! These Start and Stop commands only apply when using the old version 6 Designer! Magnetic encoding via CardExchange® 7 and 8 is explained in the "[Using Magnetic Encoding](#)" section of this Help File!

5.2.1.2 Select Windows Printers



Besides the fact that each card-template can have its own unique printer connected, via the Windows Printers functionality, you can make specific Windows printers available to overrule the default card-template printer which you configure in the [Printer Options](#) section.

When the Windows Printer Manager window is opened, you can make the printer available by checking the check box in the list view. You can also move printers up and down and rename them so they get more understanding names.

The selected printers will become available in [Windows Printers](#) tab under the explorer menu.

5.2.2 Data



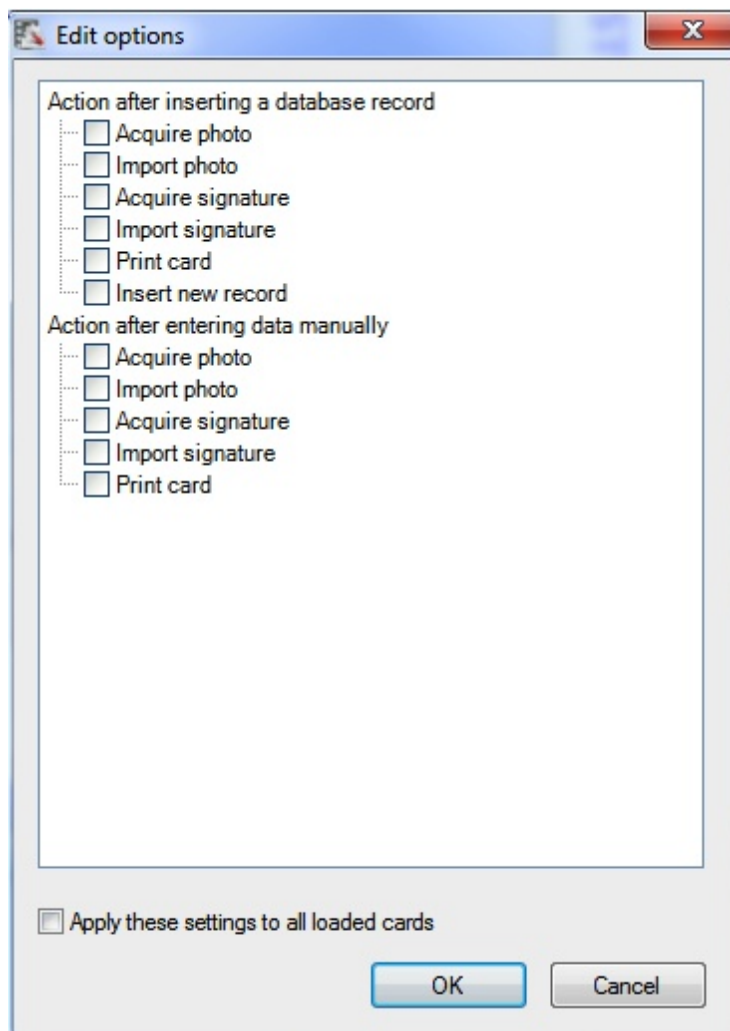
The Data tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Edit Options	Opens the Edit options window
Find	Text box	Enter a value to search for in this text box

	Find name	Opens the Find name dialog
	Find next	Finds the next result matching with the value in the Find name dialog
	Change sort order	Change the sort order (Classic skin only)
	Refresh data	Refreshes the data in the data grid (name list)
	Select all	Selects all the available records in the data grid (name list)
Edit	Database data	Opens the Data edit window in the main interface
	Manual data entries	Opens the Manual data entries window in the main interface
Filters	Edit level one filter	Opens the Edit level one filter dialog
	Edit level two filter	Opens the Edit level two filter dialog
	Enable level three filter	Enables the level three filter for live search on the database
	Filters	Shows all the created level two filters in a drop down menu

For more detailed information about using data, please visit the ["Using Data"](#) section of this Help file...

5.2.2.1 Edit Options



The Edit Options window offers you two different sections to automate your processes. You can set specific actions after inserting a record into the database or after entering data manually.

In both situations, after clicking Apply in the Data Edit window or Manual Data Entry window, CardExchange® can automatically acquire a photo, import a photo, print the card, etc.

Simply select the functionality via the check box and click on OK to apply. If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

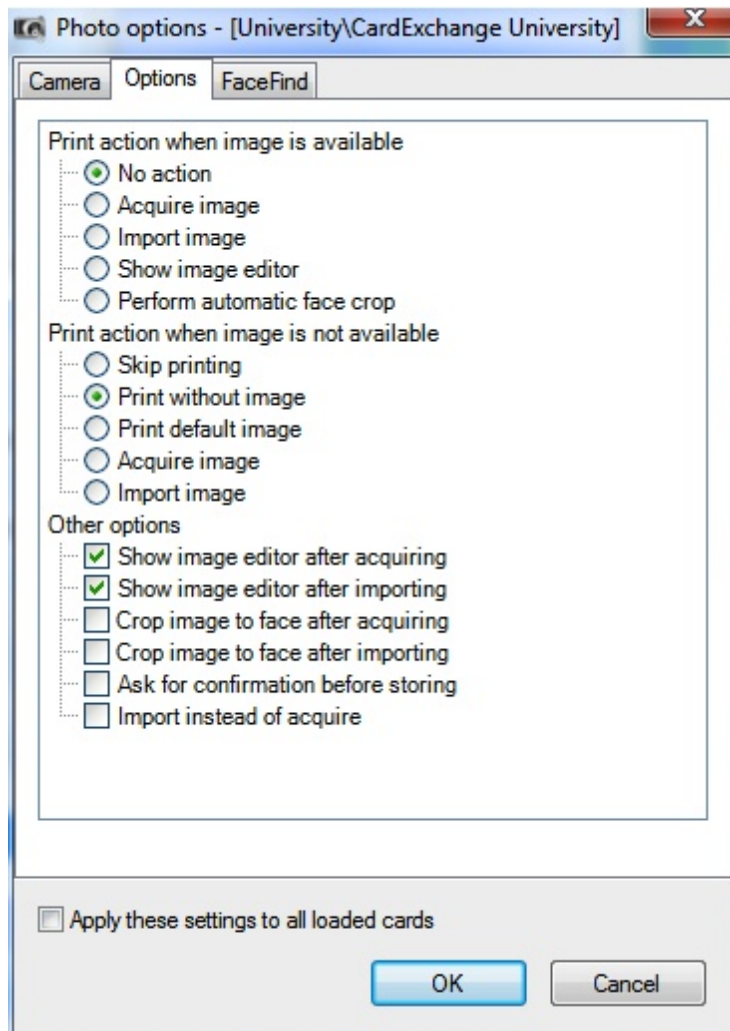
5.2.3 Photos



The Photo tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Photo Options	Opens the Photo options window
	Use Image Tools	Select to automatically open the image editor after
	Ask for confirmation	Check to ask for confirmation before storing the photo
Actions	Take photo	Opens the photo capture window
	Import photo	Opens the file dialog to select a photo image
	Edit photo	Opens the Image editor showing the selected photo
	Export photo	Export the selected photo to a file
	Remove photo	Remove photo from file or database
	Copy photo	Copy the selected photo to clipboard
	Paste photo	Paste photo from clipboard
	Crop to Face	Use auto face recognition on the photo (Professional and higher)

5.2.3.1 Photo Options



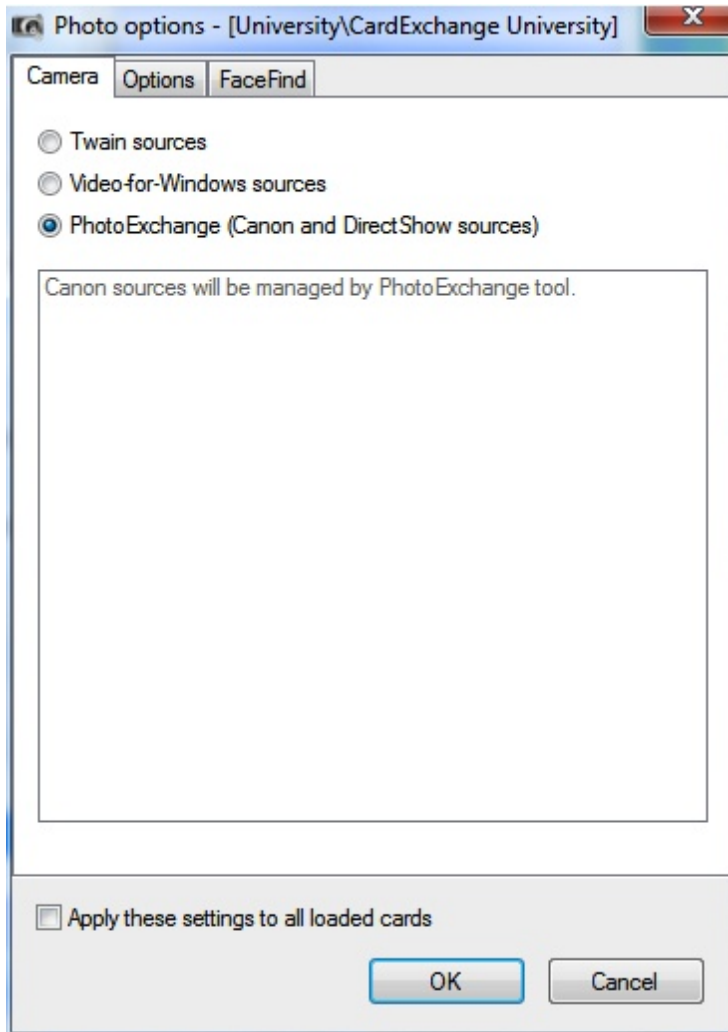
By default, CardExchange® does not print records if an image, photo, is not available. If you have a Premium or higher edition of CardExchange® you can change this behavior as well as other actions.

You can set print actions when image is available or not available like acquire image, skip printing, print without an image, etc.

It is also possible to set other actions like Ask for confirmation, show image editor, etc. One important and useful one is the Import instead of acquire. This changes the behavior of the Take photo button in the ribbon, but more important, the Take photo button in the [Functions Menu](#). So if you are not taking photos with a camera but always import them, select this option and have easier access to your photo files.

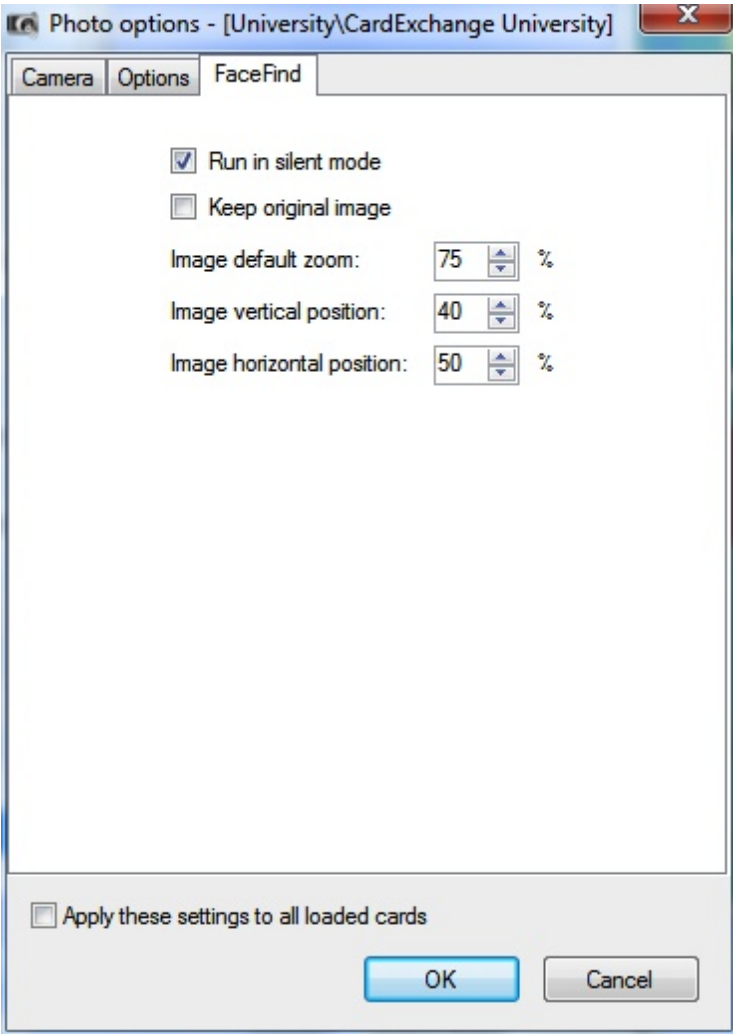
If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

5.2.3.2 Photo Sources



CardExchange® starting from Entry edition, supports all different types of cameras, supported via Twain, DirectShow, Video for Windows, but also Canon Cameras via the Canon SDK's. In the Photo Source window you can select the device that you want to use for capturing photos with CardExchange®.

5.2.3.2.1 Face Find



If you are using a CardExchange® Professional or Ultimate edition, you will have access to the automatic face recognition functionality, Face Find. This functionality allows you to automatically crop the face to the correct size based on elements analyzed from the face on the photo. In this Application tab set all the parameters for this functionality like the size, the horizontal- and vertical offset, etc.

5.2.4 Signatures

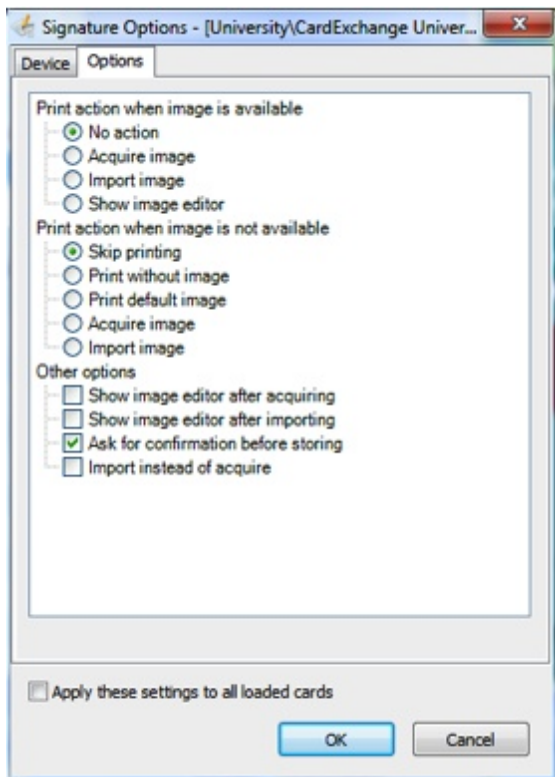


IMPORTANT! Signatures are supported starting from Premium and higher editions!

The Signature tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Signature Options	Opens the Signature options window
	Use Image Tools	Select to automatically open the image editor after
Actions	Ask for confirmation	Check to ask for confirmation before storing the photo
	Capture signature	Opens the signature capture window
	Import signature	Opens the file dialog to select a signature image
	Edit signature	Opens the Image editor showing the selected signature
	Export signature	Export the selected signature to a file
	Remove signature	Remove signature from file or database
	Copy signature	Copy the selected signature to clipboard
Past signature	Past signature from clipboard	

5.2.4.1 Signature Options



By default, CardExchange® does not print records if an image,signature, is not available. If you have a Premium or higher edition of CardExchange® you can change this behavior as well other actions.

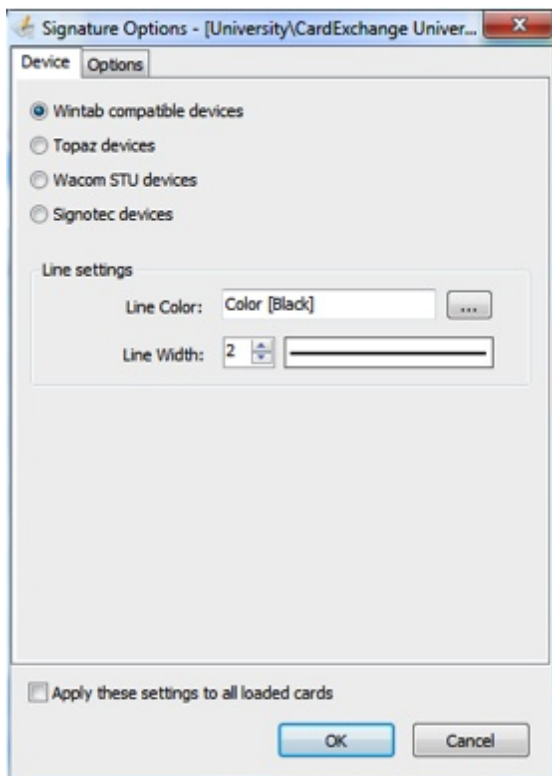
You can set print actions when image is available or not available like acquire image, skip printing, print without an image, etc.

It is also possible to set other actions like Ask for confirmation, show image editor, etc. One important and useful one is the Import instead of acquire. This changes the behavior

of the Capture Signature button in the ribbon, but more important, the Capture Signature button in the [Functions Menu](#). So if you are not capturing signatures with a signature pad but always import them, select this option and have easier access to your signature files.

If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

5.2.4.1.1 Signature Device

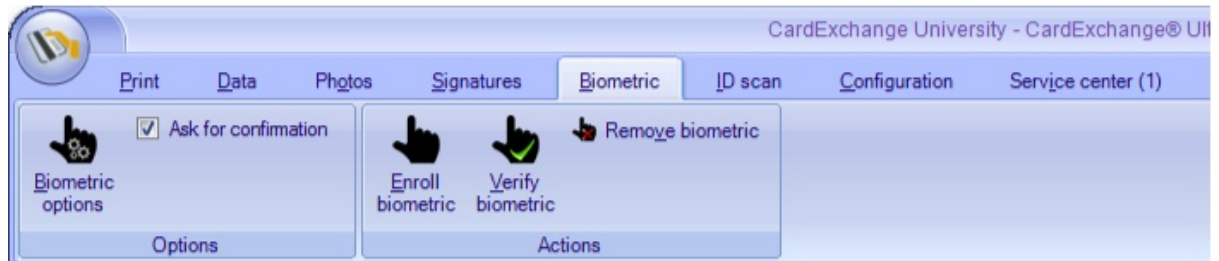


When the Signature window opens, the first selected tab available is the Device tab. CardExchange® supports a large range of Signature Pads from Topaz, Wacom, and Signotec. Also standard Wintab is supported. You can find a complete overview of all supported Signature Pads on our website by [CLICKING HERE!](#)

In the Device window you simply select the brand you are using, line colors if applicable, and the line width.

If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

5.2.5 Biometric

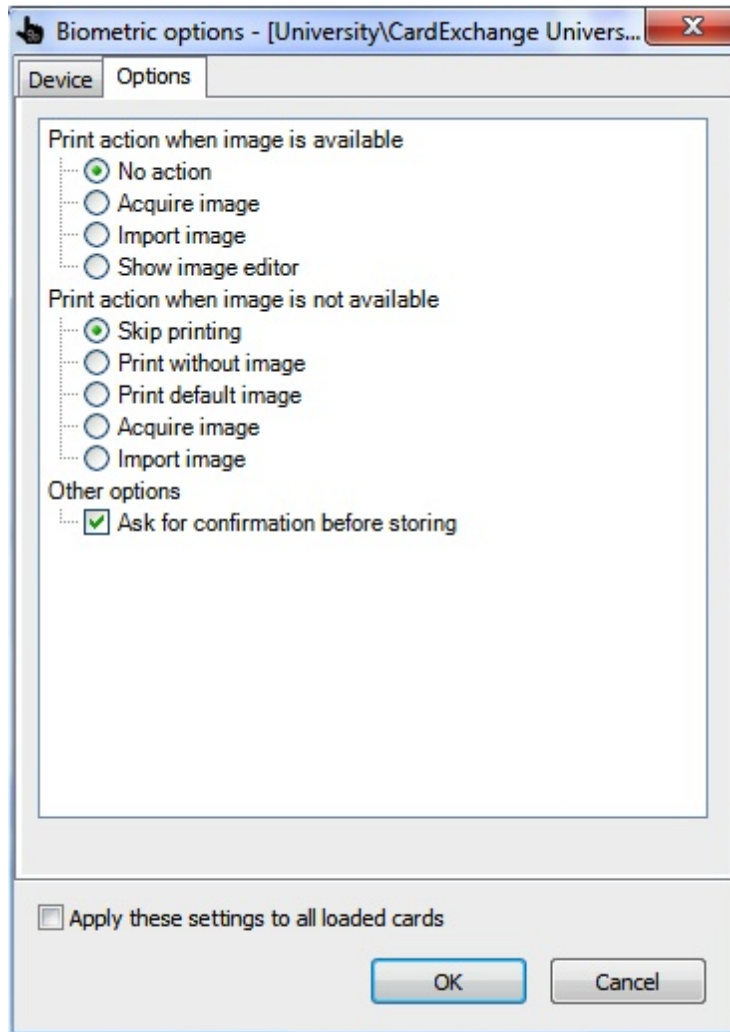


IMPORTANT! Biometric is supported in our Ultimate edition!

The Biometric tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Biometric Options	Opens the Biometric options window
	Ask for confirmation	Check to ask for confirmation before storing the biometric data
Actions	Enroll biometric	Opens the biometric enrollment window
	Verify biometric	Opens the verify biometric window
	Remove biometric	Removes the biometric data from the database

5.2.5.1 Biometric Options

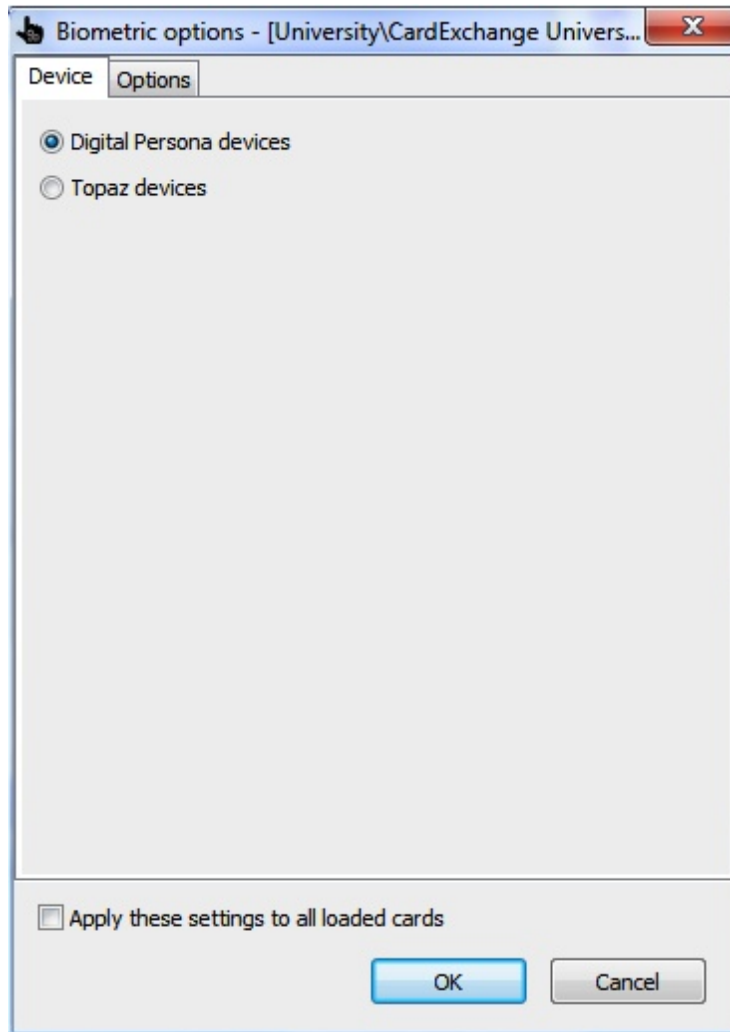


By default, CardExchange® does not print records if a biometric image is added to the page design and is not available. If you have a Ultimate edition of CardExchange® you can change this behavior as well other actions.

You can set print actions when image is available or not available like acquire image, skip printing, print without an image, etc.

If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

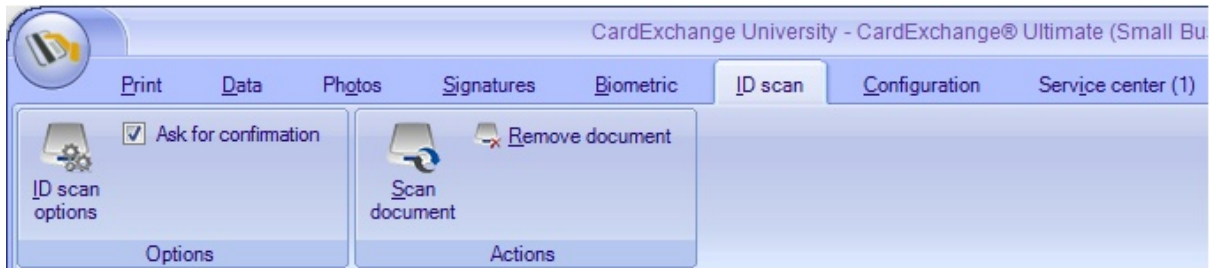
5.2.5.1.1 Biometric Devices



When the Biometric option window opens, the first selected tab available is the Device tab. CardExchange® supports a large range of Biometric devices from Topaz and Digital Persona. You can find a complete overview of all supported Biometric devices on our website by [CLICKING HERE!](#)

In the Device window you simply select the brand you are using. If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

5.2.6 ID scan

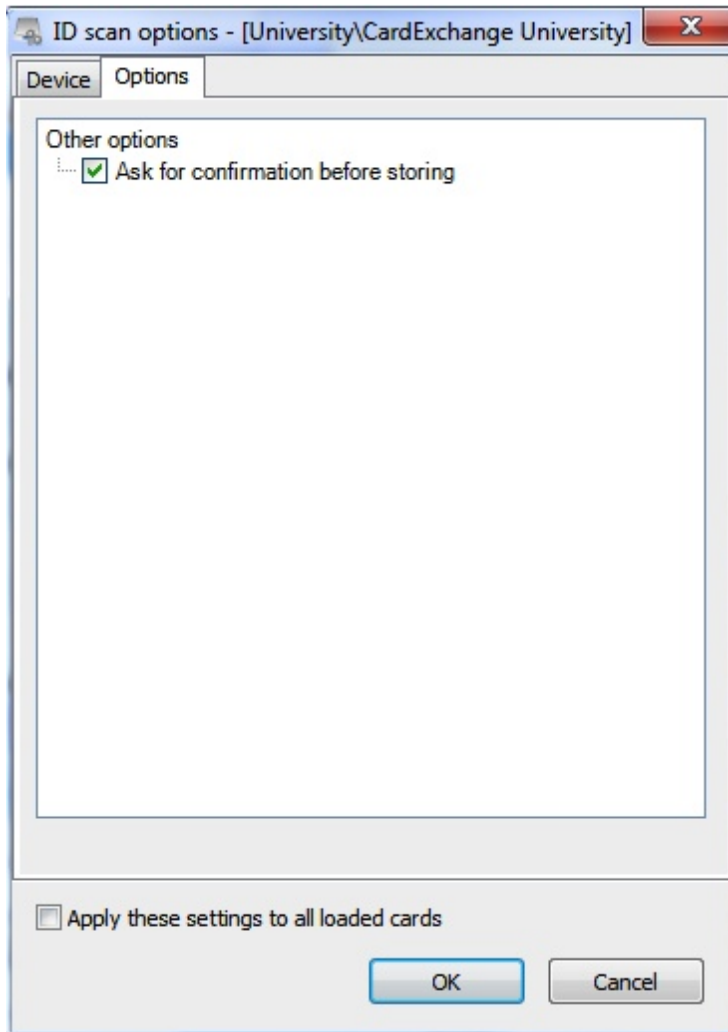


IMPORTANT! ID scanning is supported in our Ultimate edition!

The ID scan tab is organized in different groups with specific functionality.

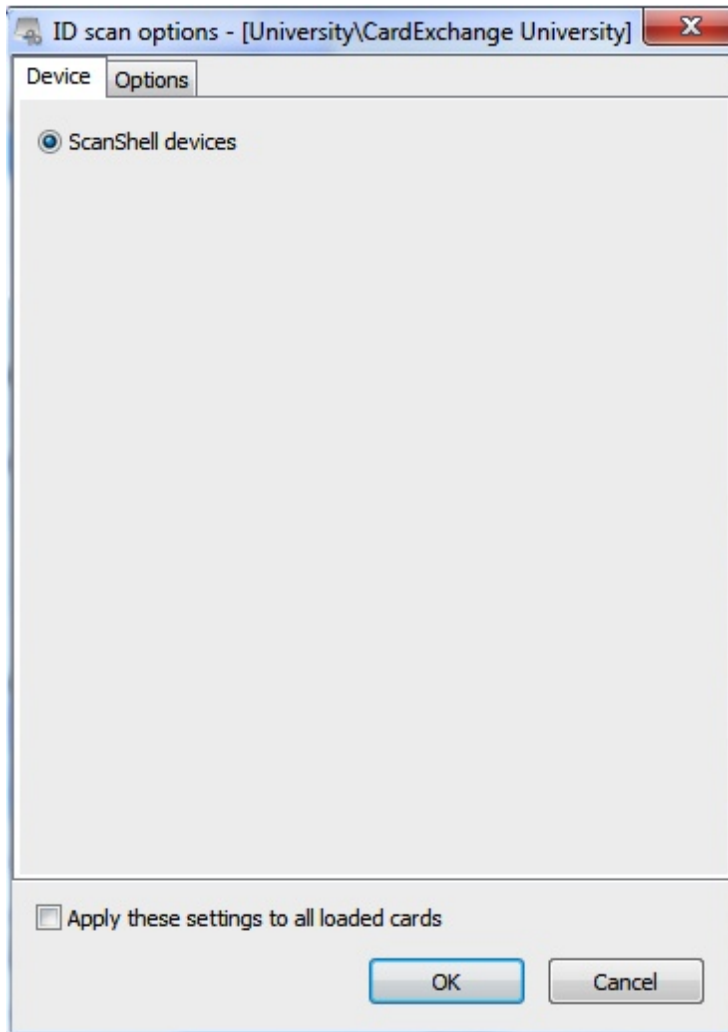
Group	Function(s)	Description
Options	ID Scan Options	Opens the ID scan options window
	<input checked="" type="checkbox"/> Ask for confirmation	Check to ask for confirmation before storing the ID scanner data
Actions	Scan document	Opens the ID scanner window
	Remove document	Removes the document from the database

5.2.6.1 ID Scanner Options



There is only one option that applies to using ID scanners and that is to ask for confirmation before storing the data into the database. This can also be selected directly from the ID scan tab in the main window of CardExchange®.

5.2.6.1.1 ID Scanner Devices



When the IDscan option window opens, the first selected tab available is the Device tab. CardExchange® at this moment only supports ScanShell devices. More devices are planned to be supported. You can always find a complete overview of all supported ID scan devices on our website by [CLICKING HERE!](#)

The use the ScanShell scanner you will have to install the driver and the runtime. You can download this from our download section on our website by [CLICKING HERE](#). The driver can be found in the CardExchange® Driver section.

In the Device window you simply select the brand you are using. If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

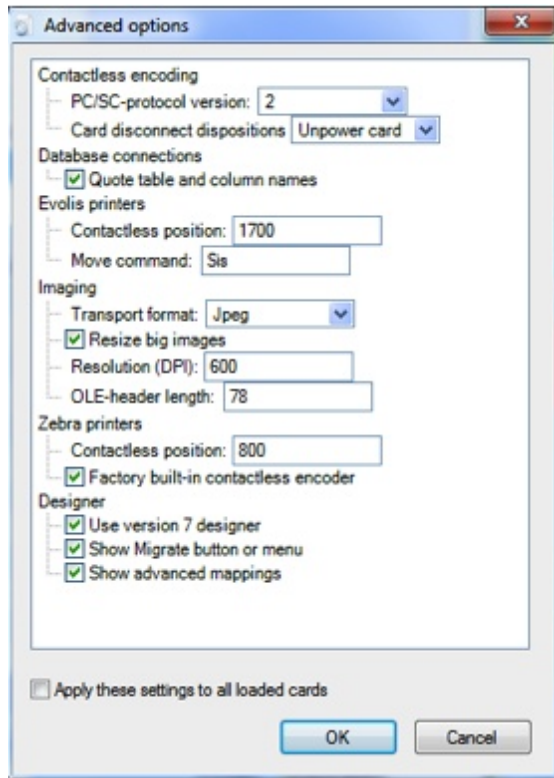
5.2.7 Configuration



The Configuration tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Advanced Options	Opens the Advanced options window
Loaded cards	Show card manager	Opens the Card Manager Window
	Cards	Select available cards from the drop down menu
	Add card	Select to create a new card-template
Selected Card	Card Setup	Opens the Designer in configuration mode to edit the template
	Database Setup	Opens the existing Database connection to make changes
Migration	Migrate version 6 layout	Converts old version 6 designs to version 7 and 8 layouts
Authorization	Account Setup	Opens the wizard to create groups and users
	Enable logins feature	Enables functionality to use log in's

5.2.7.1 Advanced Options



In the Advanced options window you can set some specific settings for the CardExchange® application:

Contactless encoding

PC/SC-protocol: Select the PC/SC protocol 1 or 2

Card disconnectSelect Leave card, Reset card, Unpower card, Eject card dispositions:

Database connections

Quote table and columnSelect if quotes needs to be used (default). Not used with names: Cache DB

Evolis printers

Contactless position: Tune the offset for the card under the contactless reader

Move command: Set the specific move command to be used. Differs for printers with contact

Imaging

Transport format: This is the format that is used internally. Default is Jpeg because this is small and fast. You can also select bitmap (slower performance), and Handle (unsecured)

Resize big images: Reduces the images when they over exceed the resolution set (only for old version 6 layouts)

Resolution (DPI): When Resize big images is checked, they will be resized when they over exceed the DPI value entered here (only for old version 6 layouts)

OLE-header length: This is the amount of bytes to remove from the OLE header for MS Access databases. Default 78 is when using an English MS Access version

Zebra printers

Contactless position: Tune the offset for the card under the contactless reader

Factory built-in contactlessSelect if the printer has a factory built-in encoder so encoder: CardExchange® will use the internal SDK in stead of escape commands

Designer

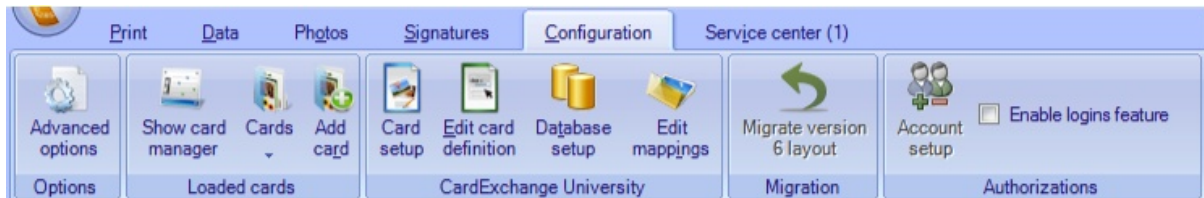
User version 7 designer: If unchecked, the old version 6 designer will be used for creating and editing cards

Show Migrate button orShows the Migrate version 6 layout button in the [Configuration](#) menu: tab

Show advanced mappings: Shows the Edit card-definition and Edit mappings button in the [Configuration](#) tab for using old version 6 templates

If you want to use these settings for all loaded card-templates, make sure you check "Apply these settings to all loaded cards"

5.2.7.2 Advanced Mappings



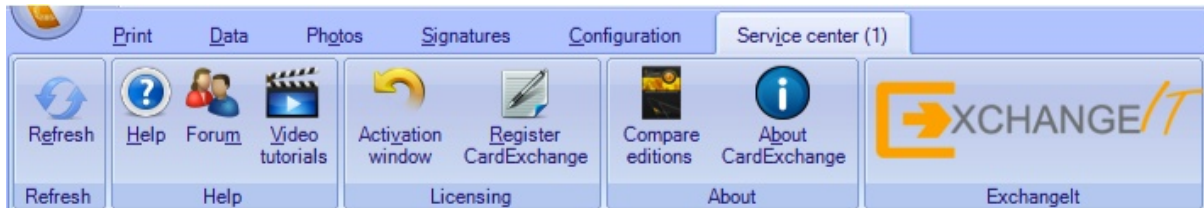
When you have selected to Use Advanced Mappings in the [Advanced Options](#) window, in the Select Card Group you know see two extra buttons appearing:

Group	Function(s)	Description
Selected Card	Edit Card Definition	Opens the Card-definition wizard to make advanced changes
	Edit Mapping	Opens the Card-definition wizard on the mappings section

For both functions goes that they are used for advanced functionality like contactless encoding. Also users with version 6 card-templates will work with the Card-definition wizard.

Users of CardExchange® 7 and 8 do not need to use this functionality.

5.2.8 Service Center

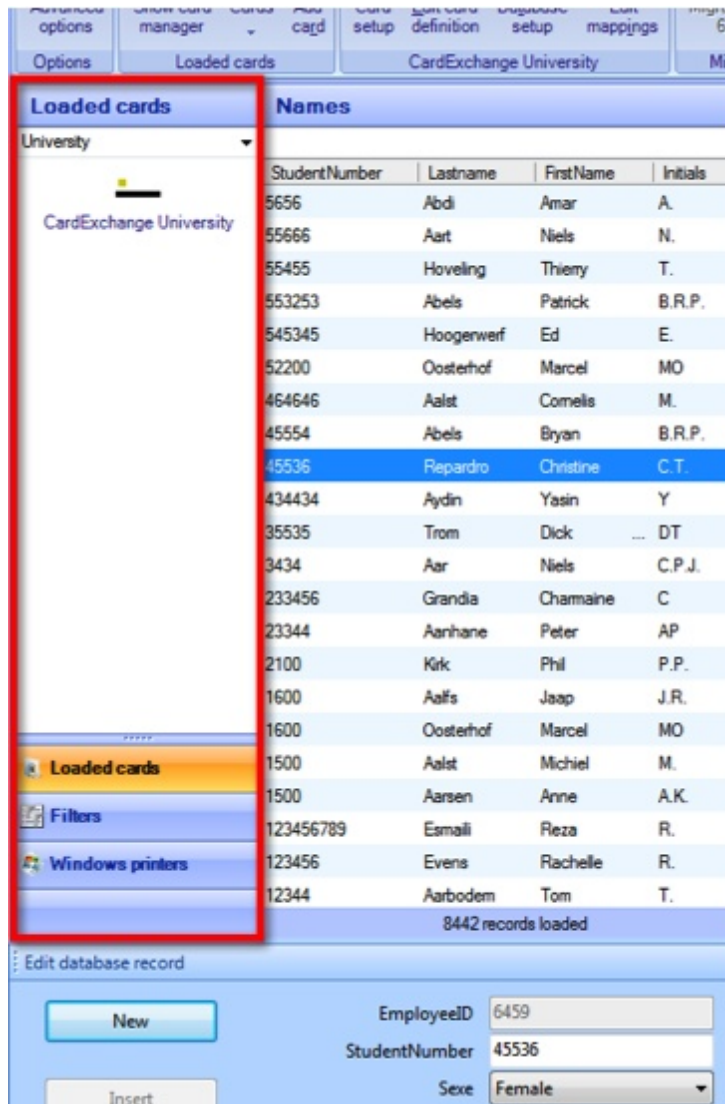


The Service Center tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Refresh	Refresh	Refreshes the available news items
Help	Help	Opens this online help file
	Forum	Opens our FREE End-User Support Forum
	Video Tutorials	Opens our website at the How-To Video section
Licensing	Activation Window	Opens the Activation Wizard window
	Register	Opens the Registration Wizard Window
	CardExchange®	
About	Compare editions	Opens the website at the compare editions section
	About	Opens the About dialog containing license and machineID info
	CardExchange®	
[Vendor]	Vendor	Opens the vendor's website
	Vendor store	Opens the vendor's web store (if applicable)

For more detailed information about the Service Center, please visit the "[Using Service Center](#)" section of this Help file...

5.3 Exporer Menu



The CardExchange® Explorer Menu, also known as the Outlook Ribbon Menu, offers three tab selections:

- [Loaded cards](#) - This tab shows all the available card-templates
- [Filters](#) - This tab shows all available Level Two filters
- [Windows printers](#) - This tab shows all selected Windows filters

5.3.1 Loaded Cards



When the Loaded cards tab is selected, all the available and selected card-templates are show. By clicking on the button, the template with all the settings and configurations will be loaded in the Main interface.

The available card-templates can be divided by groups which can be selected from the drop down menu directly under the tab.

Card-templates, the availability, the position in the menu, etc., is defined via the card manager.

For more information about configuring this time, please see our ["Using the Card Manager"](#) section of this Help file

5.3.2 Filters



CardExchange® offers almost unlimited functionality to find information in the connected database and make it available for your card production.

Our level two filters are known as one of the most powerful filter options in this industry because of the customization they offer and the fact that filters can be defined for specific use by operators to have max error prevent.

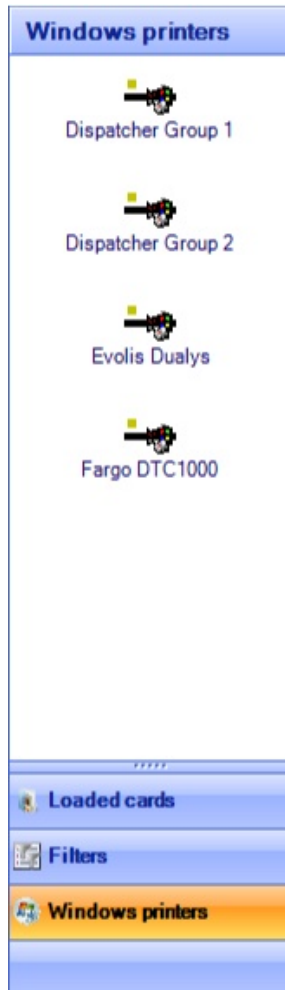
All these defined Level Two filters are available in the Filter section of this Explorer menu and can simply selected by the user by clicking on the button.

The filters can also be divided by groups which, if applicable, can be selected from the drop down menu directly under the Filter tab.

For more information about using and configuring Level Two filters, please visit our "[Level Two Filters](#)" section of this Help file.

Overall information of using filters with CardExchange® can be found in our "[Using Filters](#)" section of this Help file.

5.3.3 Windows Printers



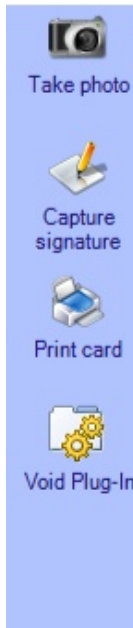
Each card-template in CardExchange® can have its own printer assigned. That means that every time you click the print button, that selected printer takes care of the job.

In some situations it can be very handy to overrule this standard printer by a selectable other printer without changing the whole card-template configuration.

In the section "[Select Windows Printers](#)" we have explained how to set these printers and make them available. All selected printers are presented in this Windows printer tab of the [Explorer Menu](#).

Simply click on the corresponding button to send the job to that printer.

5.4 Functions Menu



In the Functions menu, located at the right side of the main interface, four different buttons can be shown. Starting with an Entry edition, the Function menu will show the Photo and the Print card button.

When clicking on the Photo button, the camera that is selected will be previewed in the photo window. Configuration of the Photo functionality is explained in the "[Using Photos](#)" section of this Help file.

If you have an Premium Edition or higher, also the Capture signature button is show. When clicking it will start the signature pad connected. In the "[Use Signatures](#)" section of this Help file you can find out how to configure this functionality.

Starting from Premium Editions, CardExchange® support External Plug-Ins. External Plug-Ins contain custom functionality or embedded SDK's. For example an embedded Fingerprint Scanner. When clicking on the External Plug-In button, the fingerprint scanner will be started. More information about External Plug-Ins can be found in the "[Using External Plug-In's](#)" section of this Help file.

5.5 Data Record View

StudentNumber	Lastname	FirstName	Initials
52200			MO
464646			M.
45554			B.R.P.
45536			C.T.
434434			Y
35535			... DT
3434			C.P.J.
233456			C
23344			AP
2100			P.P.
1600			J.R.
1600			MO
1500			M.
1500			A.K.
123456789			R.
123456			R.
12344			T.
123434			B.
12334			R.
12333			C.
10000	Barcuda	Linda	E.P.
1000			P.

8442 records loaded

In the Data Record View in the main interface of CardExchange® you see all the records presented that are available in your database. When you make a database connection, in the name list page you select the columns that are shown in the Data Record View. You can find everything about making database connections in the "[Using Databases](#)" section of this Help file.

Record Sorting

Names			
StudentNumber	Lastname	First Name	Initials
10000	Barcuda	Linda	E.P.
	B		H.J.
	B		J.

The Data Record View is a so called data grid showing all your available database records divided by columns. Sorting the records is just as simple as clicking on the column.

Record Look Up

Names			
barc			
Lastname	StudentNumber	First Name	Initials
Barcuda	10000	Linda	E.P.

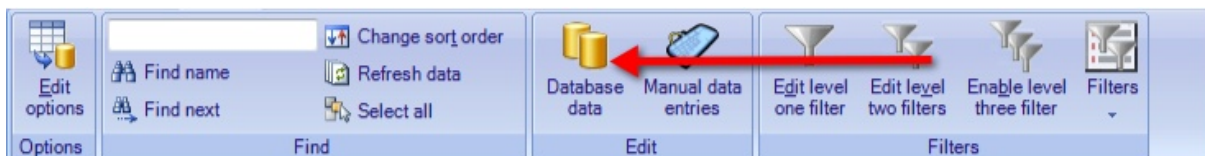
It is very simple to search for records inside the Data Record Overview. Enter the text that you want to search for in the text box directly above the columns. The text you enter always applies to the first column in the Data Record View. If you want to look up records from the Lastname column, you have to drag the column to the front.

Loaded Record Information

Ba	M.L.
8442 records loaded	

In the footer of the Data Record View the total amount of loaded records is shown.

5.6 Data Edit Window



The Database Edit window offers the possibility to manage your connected database data. The window can be called via the Configuration tab in the main window by clicking on the **Database data** button.

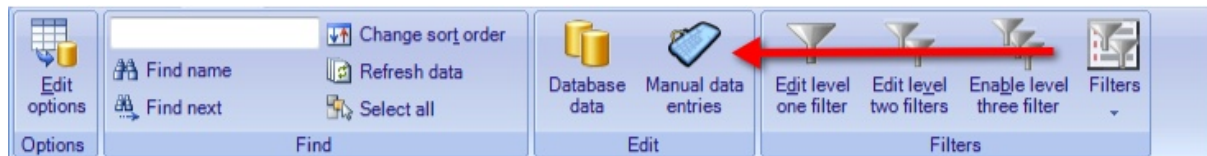
Starting from the Premium edition, this window can be customized and configured with available columns but also drop down menu's.

On the left side it offers buttons for adding a **New** record, **Insert** the record, **Update** a record, **Delete** a record, and **Cancel** your entries.

More about the configuration of this window can be found in the "[Using Data](#)" section of this Help file. More information about database configuration, please see the "[Using Databases](#)" section of this Help file.

IMPORTANT! CardExchange® does not support deleting for MS Excel files. MS Excel can only be inserted and updated.

5.7 Manual Entry Window



The Manual Entry window offers the possibility to enter information into the created manual entries. The window can be called via the Configuration tab in the main window by clicking on the **Manual data entries** button.

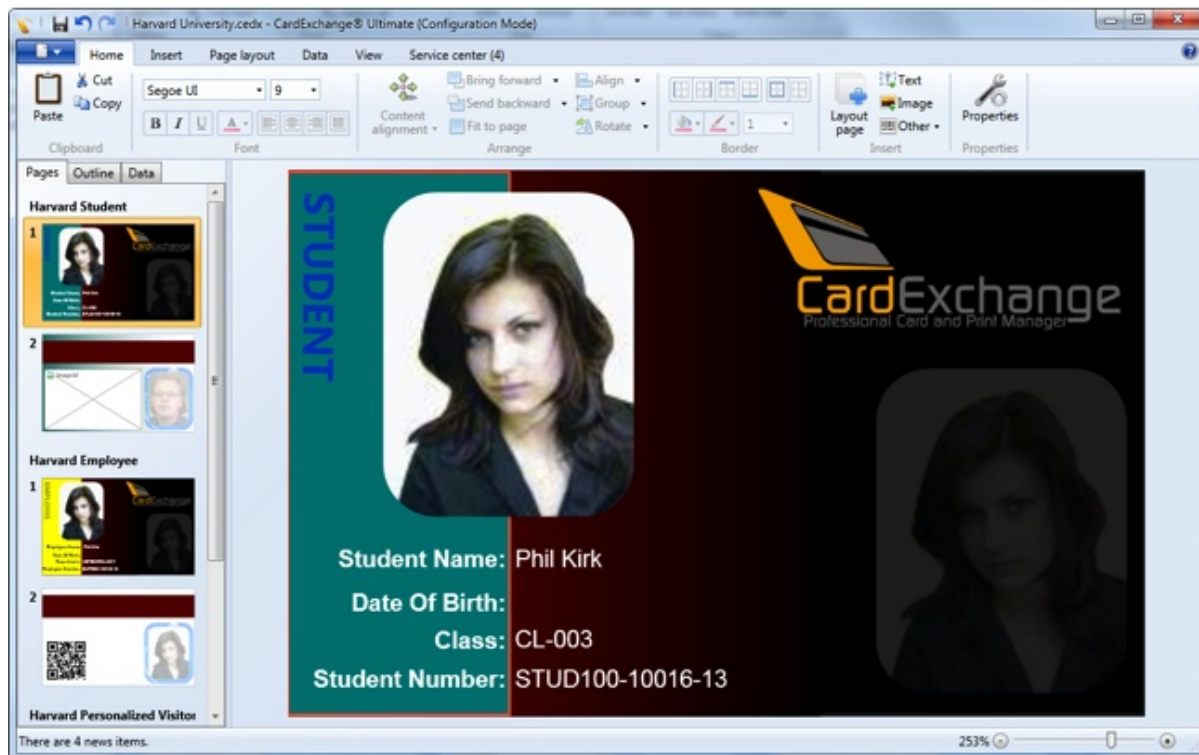
Simply enter the information and click on Apply to make the entered information available.

On the left side it offers buttons to **Clear** the entries, **Apply** the entries, and **Cancel** your entries.

For more information about manual entries, please see our "[Using Manual Entries](#)" section of this Help file.

6 Using the Designer

With the release of CardExchange® 7, a complete new developed card designer was introduced. This new card designer is following the latest Windows technology and is completely developed under the Windows Presentation Foundation (WPF) platform. For printing graphically, XPS printing technology is used.



The interface look and feel follows the latest Windows and Office look and feel. For the setup of the functionality we have chosen to follow flow of Microsoft PowerPoint which will make it very easy to find your way inside of CardExchange® Designer.

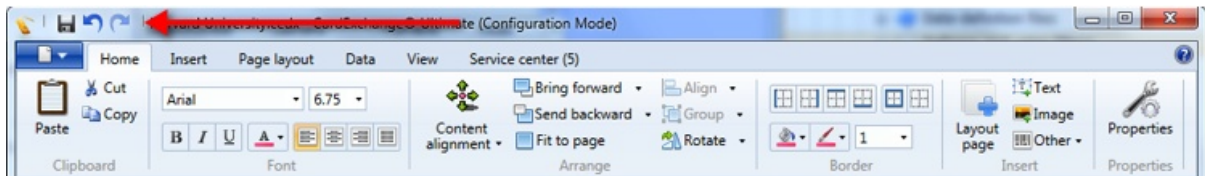
The CardExchange® Designer is also sold as a separate edition of the CardExchange® family and is fully integrated in all higher editions. CardExchange® Designer is not only a separate sold edition which can be used to print cards, it is also used for all the configuration of higher editions of CardExchange®. When running a Entry or higher edition, the Designer will open mentioning the edition used, showing in Configuration Mode.

Where in the older CardExchange® versions, like 2, 3, 4, 5, and 6, configuration and setup from your card was done on two different locations. It was done via functionality called via the main window while the graphical information needed to be defined in the Designer interface. Now all configuration is done in the "Designer" even database connections are made here. Via easy drag and drop functionality (click functionality and drag it to the card design, the need for creating variables is limited to only very specific functionality like scripting.

Talking about scripting, this Designer contains full Python scripting language. General information about Python can be found by [CLICKING HERE](#). For more detailed information

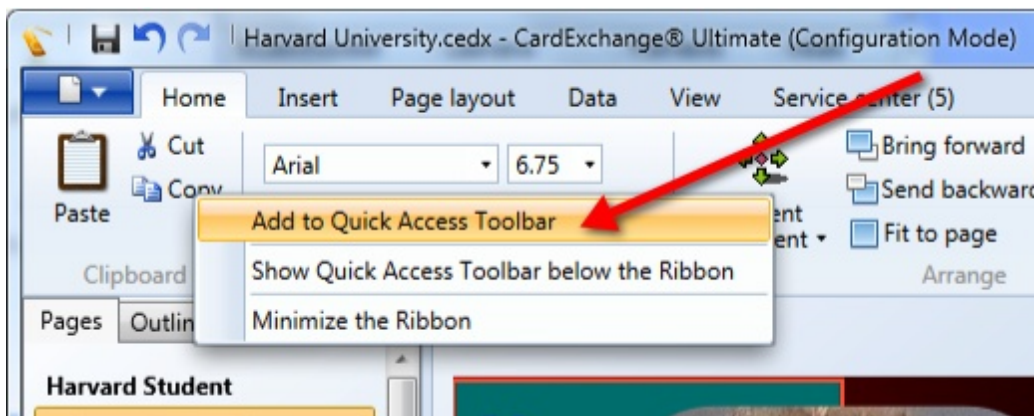
about Python please [CLICK HERE](#).

6.1 Quick Access Toolbar

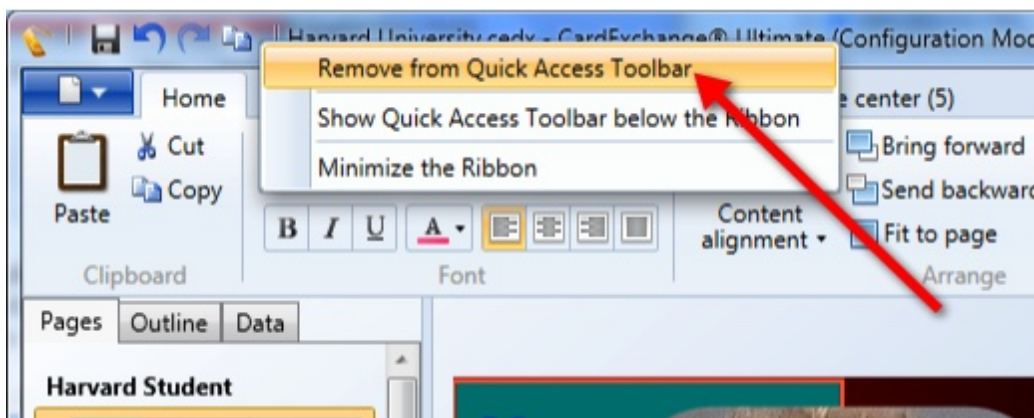


The Quick Access Toolbar is a customizable toolbar that contains a set of commands that are independent of the tab that is currently displayed. You can move the Quick Access Toolbar from one of the two possible locations, and you can add buttons that represent commands to the Quick Access Toolbar.

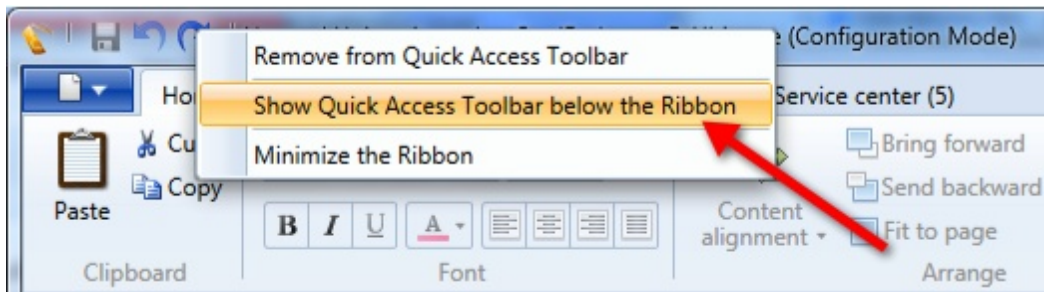
It is very easy to add functionality to the Quick Access Toolbar.



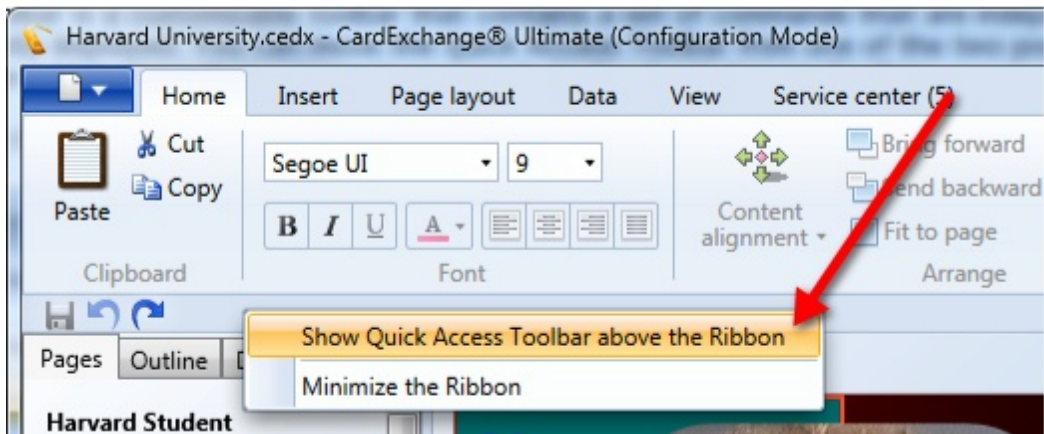
Just simply right mouse click on the functionality that you want to add and select **Add to Quick Access Toolbar** from the opened context menu.



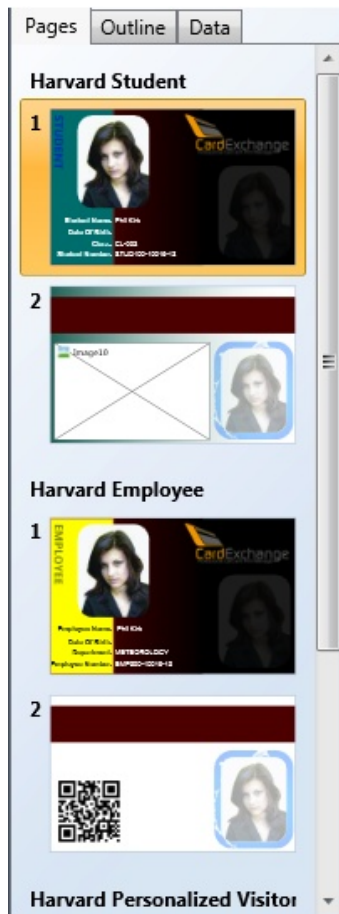
You can also move the Quick Access Toolbar to another location under the Ribbon.



And move it back to the original location.



6.2 Explorer Menu



Just like in the [Main Interface](#), the Designer also contains an Explorer menu. Also here the Explorer Menu is based on the Explorer Menu as it is available in Microsoft® PowerPoint.

This Explorer Menu contains three tabs which are described in sub sections of this Help file.

The Explorer Menu gives an overview of all your created layouts, pages, connected data, etc.

As we informed you in the [Designer Interface](#) section of this Help file, the Designer can be used as a separate edition or as the configuration tool for your Entry and higher editions. You always opens the actual [Template](#) selected in the [Main Interface](#) or the standalone edition template.

6.2.1 Pages

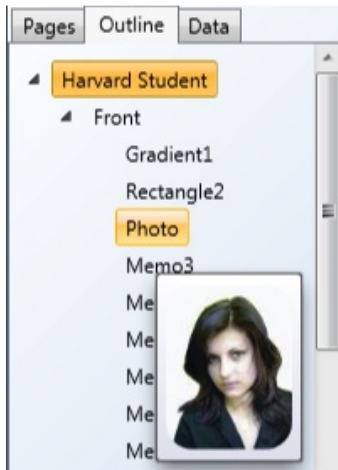


When selecting the Page tab (default) all available and created Layouts and the available pages per layout are shown.

Simply click on the page or the layout header to select. Specific settings for the available Layouts can found in the [Page Setup](#) section of this Help file.

How to [Add Layouts](#) and [Pages](#) can be found in these specific sections.

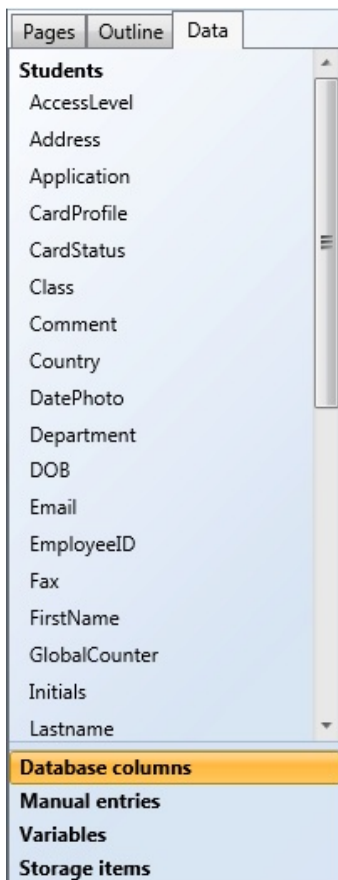
6.2.2 Outline



When the Outline tab is selected you find a quick overview of all the available objects on the pages, in the Layouts, in the Template.

It is presented as a tree view and by hovering over each available object, a preview of the object is shown like in the screen shot, hovering over the Photo object shows the preview of the Photo.

6.2.3 Data

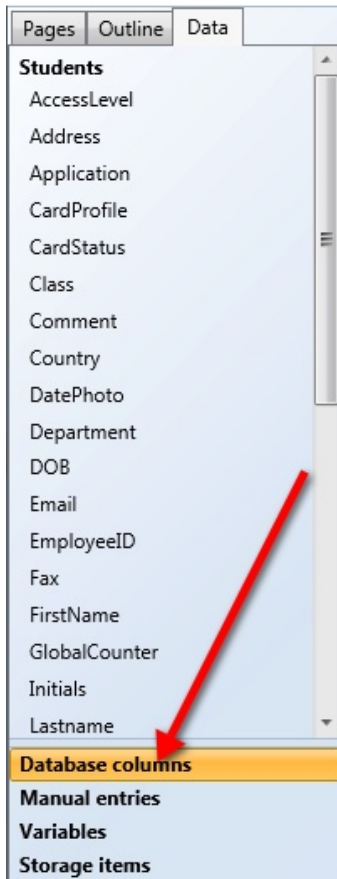


The Data tab is offering, depending on the edition used, four sub tabs:

- [Database columns](#)
- [Manual Entries](#)
- [Variables](#)
- [Storage items](#)

Not all tabs are available in every edition. In the Designer edition you have no option to connect to databases and therefore the Database columns tab will not be available.

6.2.3.1 Database Columns



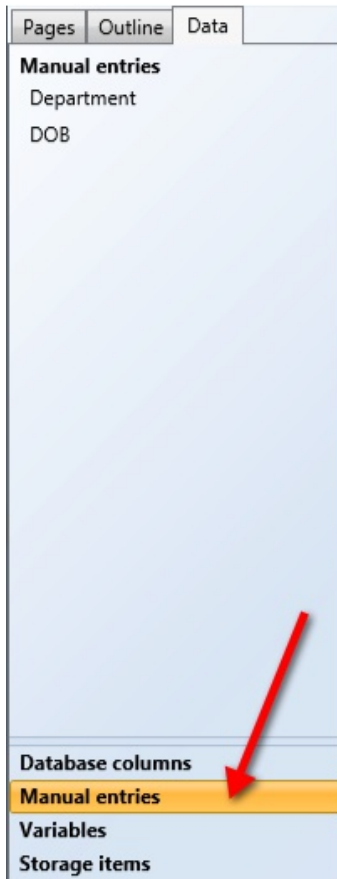
When using Entry or higher editions and you are connected to a database or MS Excel file, this tab contains all the available columns of the connected database/file.

Simply select the item and drag and drop it on your card design. Specific Properties can be set in the [Properties](#) window.

How to configure databases is explained in the "[Using Databases](#)" section of this Help file.

In the Designer edition this option is not available.

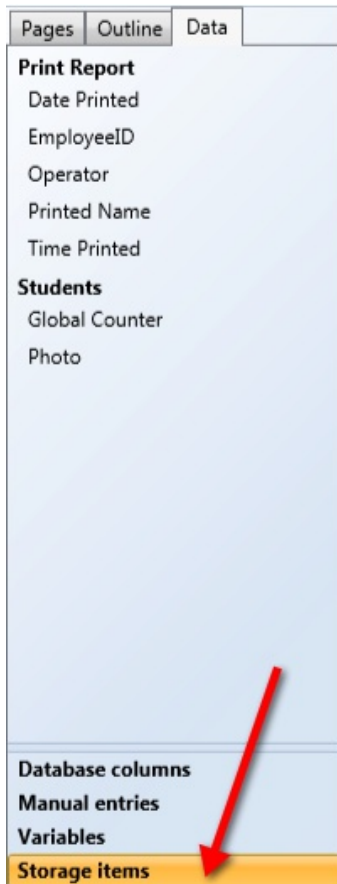
6.2.3.2 Manual Entries



All defined Manual entries are available in the Manual entries tab. You can drag and drop these fields onto your Page layout.

Please visit the [Manual Entries](#) section of this Help file for more information about creating and configuring Manual Entries.

6.2.3.3 Storage Items

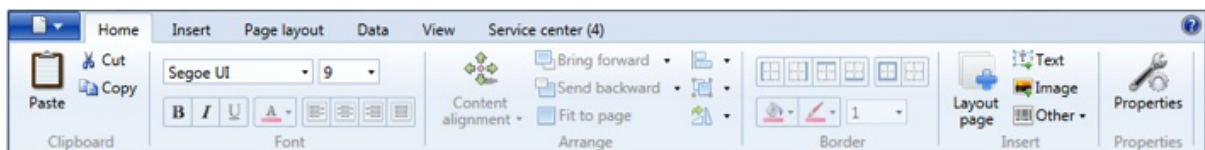


If you want to store data into the connected databases (with the database module) or database, you need to define storage items. Storage items contains the information of the column name in which you want to save your information like photos or print dates. These Storage Items mappings are made via the [Content](#) tab in the [Properties](#) window.

Please visit the [Storage Items](#) section of this Help file for more information about using Storage Items.

Storage Items are available in the Premium and higher editions.

6.3 Ribbon Overview



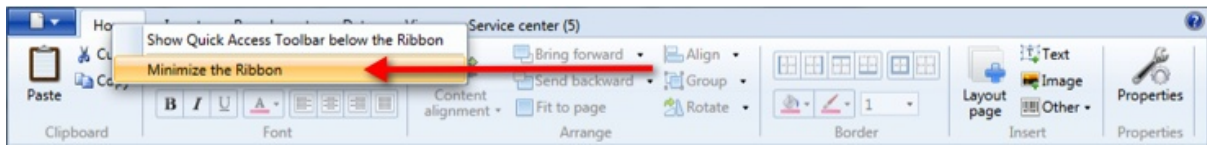
Following the structure of Microsoft® Office, the Home tab reflects all the most common functionality needed most.

Clipboard functionality for easy Copy, Cut, and Pasting. In the Font group you can easily set the font type, size, color, and outline the text.

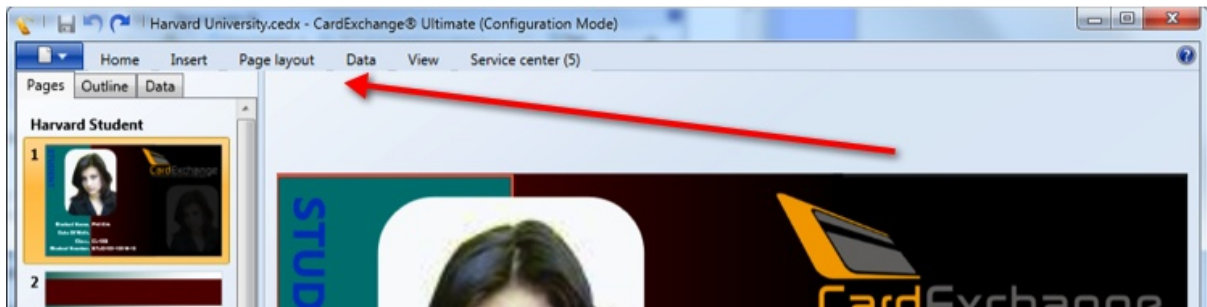
CardExchange® offers almost unlimited possibilities to outline your text and objects. Also borders can be easily set and colors can be chosen.

The main objects for inserting are also available from the Home tab in the Insert group. Last but not least, the [Properties](#) window is called from the Home tab too.

It is also possible to minimize the ribbon if you need more space on your design because you are using a smaller screen.



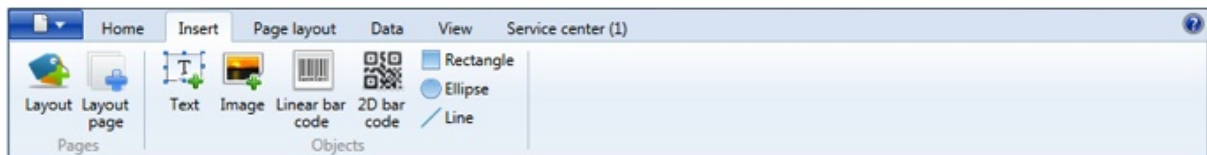
Right mouse click on one of the available tabs to open the context menu and select **Minimize the Ribbon**.



Now you only see the headers of the tabs and more space is offered. Clicking on the tab will have the Ribbon information expand. After selecting the functionality it will close again.

To restore the Ribbon, simple right mouse click on one of the tabs and deselect **Minimize the Ribbon** from the context menu.

6.3.1 Insert



Just like in the Home tab, objects can be selected here. In the Home tab, the Layout button is not available. When running a Professional or higher edition, adding a extra Layout needs to be selected here.

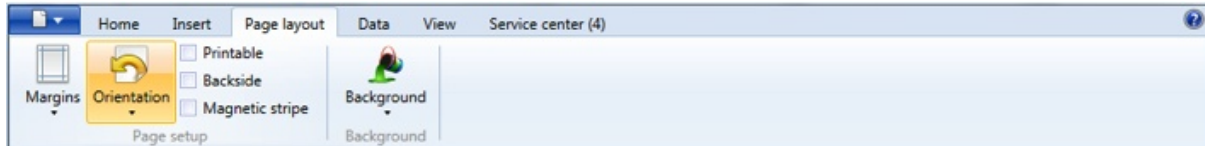
Via the Insert tab you can insert the following objects:

- [Text](#)
- [Images](#)

- [1D Barcodes](#)
- [2D Barcodes](#)
- [Rectangles](#)
- [Ellipses](#)
- [Lines](#)

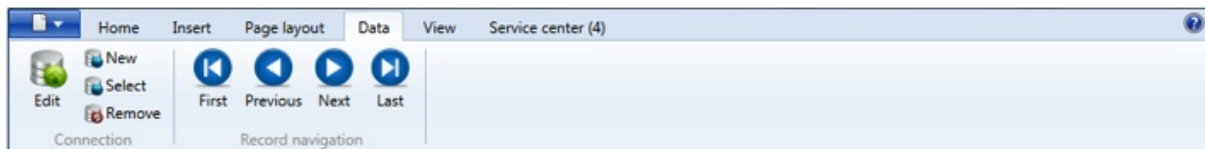
IMPORTANT! The Layout button is not available in the Designer, Entry, and Premium Edition. Multiple Layouts are supported from Professional and higher.

6.3.2 Page Layout



The Page Layout tab reflects the first tab (Page) of the Page Setup window. If you want to add a Background color or Background Image, you can add this via the Background button. More information about the Page Setup can be found in the "[Page Setup](#)" section from this Help file. More information about how to use Backgrounds, please refer to our "[Using Backgrounds](#)" section of our Help file.

6.3.3 Data



When the Data tab is selected, you find two different groups:

Group	Function(s)	Description
Connection	Edit	Opens the Database wizard to edit the existing database connection
	New	Opens the Database wizard to create a new database connection
	Select	Opens the file dialog window to select an existing database connection
	Remove	Disconnects and removes the existing database connection
Record Navigation	First	Navigates to the first available record in the database
	Previous	Navigates to the previous database record in the database
	Next	Navigates to the next record in the database
	Last	Navigates to the last record in the database

For more information about creating and editing database connections, please see our "[Using Databases](#)" section of this Help file.

IMPORTANT! This Data tab is not available in the Designer edition as this edition does not support database connections.

6.3.4 View

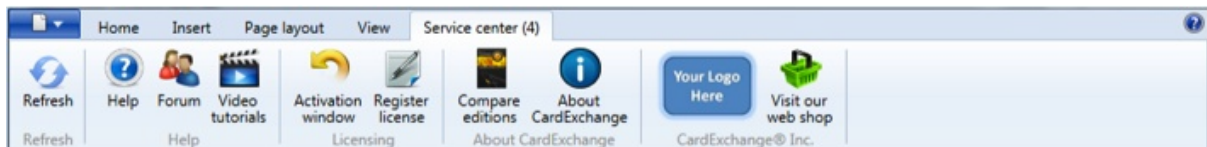


When the View tab is selected, you find two different groups:

Group	Function(s)	Description
Zoom	Zoom in	Zoom in on the current page
	Zoom out	Zoom out on the current page
	100%	Zoom to 100%
	Fit template	Zooms the page that it fits the window
	Fit width	Zooms the page that the width of the page fits the width of the window
Options	Fit height	Zooms the page that height of the page fits the height of the window
	Language	Change the display language of the Designer (Designer edition only)
	Inches	Change the display units to inches
	Centimeters	Change the display units to centimeters
	Pixel	Change the display units to pixels

IMPORTANT! Setting the language is only available in the Designer edition.

6.3.5 Service Center

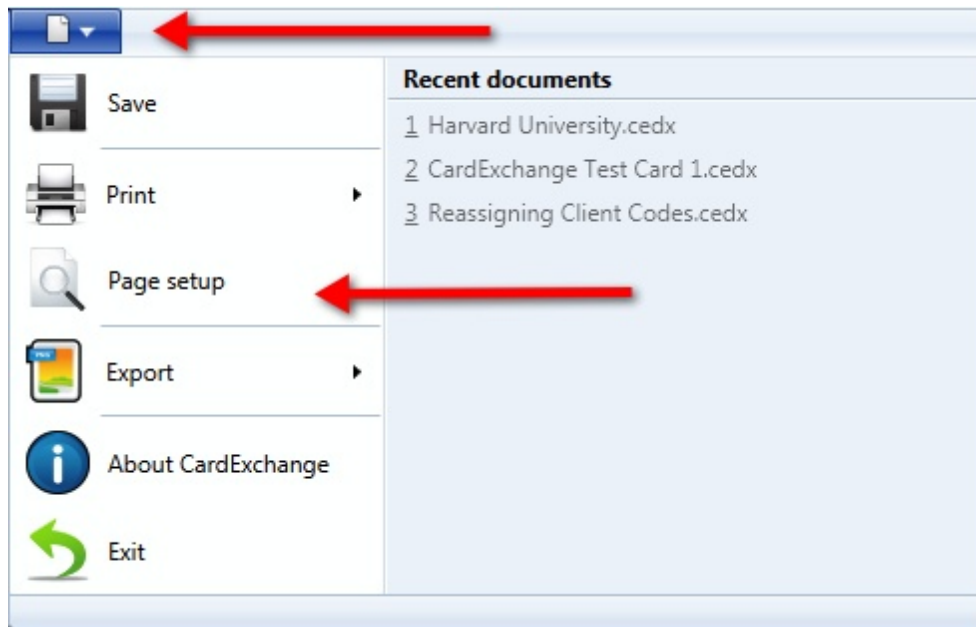


The Service Center tab is organized in different groups with specific functionality.

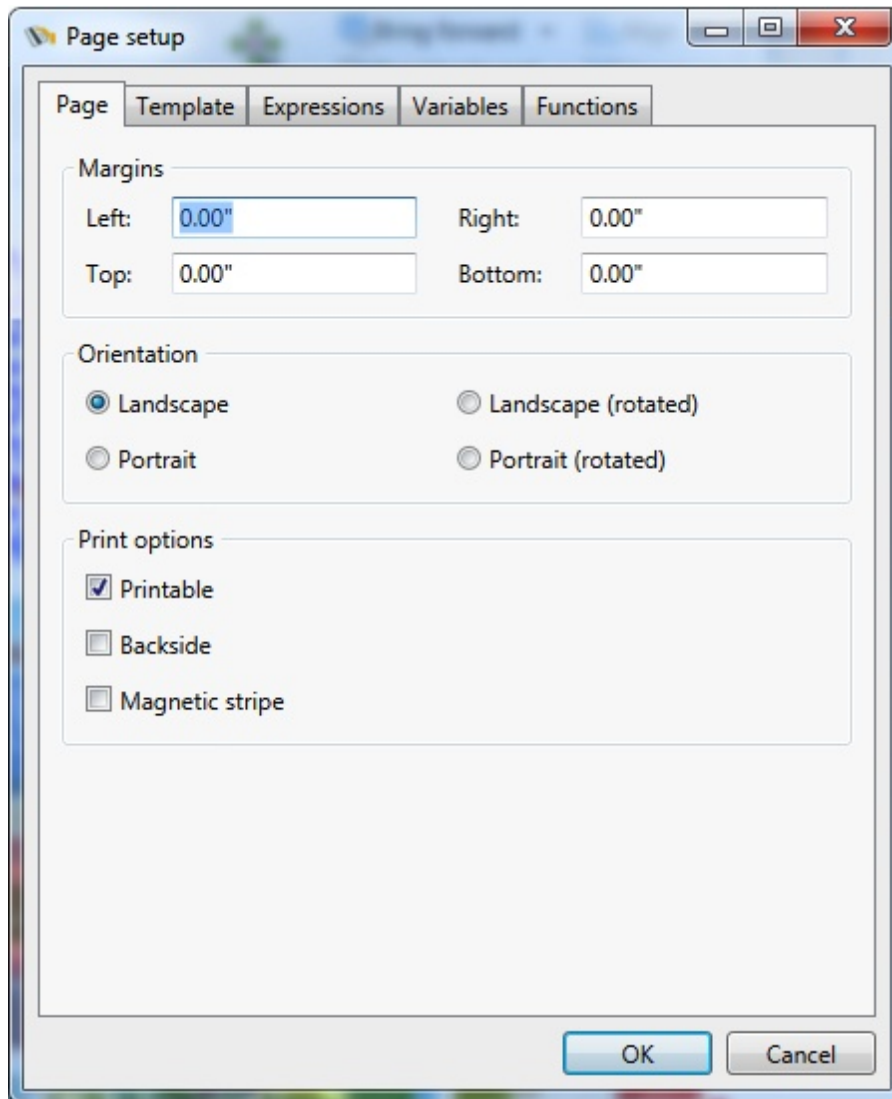
Group	Function(s)	Description
Refresh	Refresh	Refreshes the available news items
Help	Help	Opens this online help file
	Forum	Opens our FREE End-User Support Forum
	Video Tutorials	Opens our website at the How-To Video section
Licensing	Activation Window	Opens the Activation Wizard window
	Register	Opens the Registration Wizard Window
	CardExchange®	
About	Compare editions	Opens the website at the compare editions section
	About	Opens the About dialog containing license and machineID info
	CardExchange®	
[Vendor]	Vendor	Opens the vendor's website
	Vendor store	Opens the vendor's web store (if applicable)

For more detailed information about the Service Center, please visit the "[Using Service Center](#)" section of this Help file...

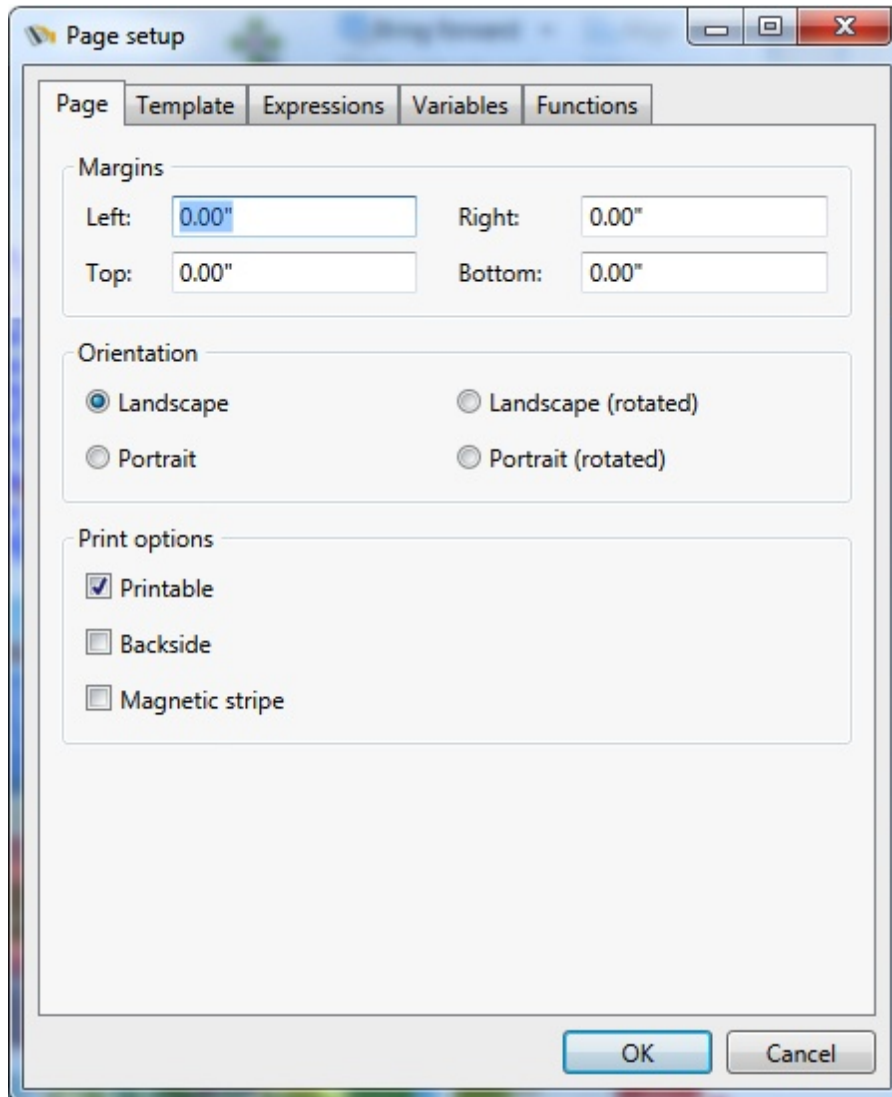
6.4 Page Setup



To start the Page Setup window, click on the Page Setup button in the [Main Menu](#).



6.4.1 Page



For each selected page in your layout, specific settings can be made. For example, if you are having a double sided print with two pages, the front page can be set to Landscape and the backside can be set to Portrait.

Margins

- Enter the page margins

Orientation

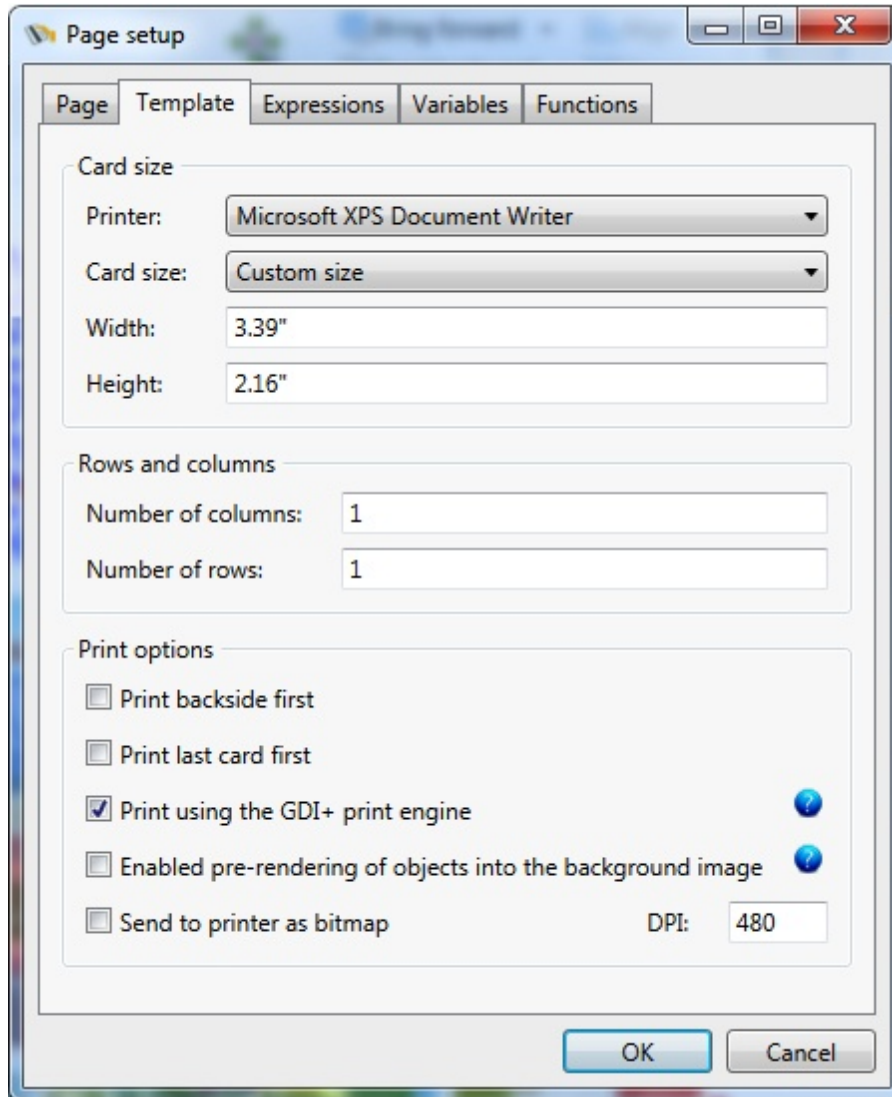
- Change the orientation for landscape or portrait

Print options

- Set the print options for the layout;
 - Select printable for graphical printing the page
 - Select or deselect Backside to print or not print the backside

- Select magnetic stripe if magnetic encoding is used

6.4.2 Template



Every Card (Template) designed with CardExchange® can contain multiple layouts and multiple pages. Each [Layout](#) and [Page](#) can have it specific settings but the template itself holds some specific information like the connected printer being used to print the different pages.

In this section you can define all the specific template settings like selecting the printer being used, card size, etc.;

Card size

- **Printer** - Select the printer to be used
- **Card size** - Select the specific card size
- **Width, Height** - Enter custom card sizes

Rows and columns

- In this section you can define how many columns and rows need to be printed on one page. If you set the Number of rows to 3, 3 records will be printed on, for example, the front page of the card. This technology can be used to print multiple records for, for example, the use of breakable cards. See more information about how to use [Rows and Columns](#).

Print options

- Print backside first - Select this option if the backside of the card needs to be printed first
- Print last card first - Select this option if you want to print the last card from the batch first
- Print using the GDI+ print engine - Select this option for non-compatible XPS printers to ensure highest print quality. For more information [CLICK HERE](#).
- Enabled pre-rendering of objects into the background image - For more information [CLICK HERE](#).
- Send to printer as bitmap - Select this option if you want to have CardExchange® create a bitmap image first and send it to the printer in stead of sending all objects separately

6.4.2.1 Using GDI+ Printing

CardExchange® is developed using the latest Microsoft technology and uses their XPS printing engine for printing. XPS is the technology is going to replace the printer driver technology as it has been used since the beginning of Windows.

Unfortunately not all ID card printer manufacturers already supply drivers that support XPS technology. Therefore CardExchange® 9 now offers also a GDI+ print engine. At this moment we know that Evolis and Datacard are supporting XPS printing.

When ID card printers do not support XPS printing can this result in bad quality of images and problems with resin printing. When this occurs you can set the system to print via GDI+ printing.

As CardExchange® uses advanced graphical objects that sometimes are not supported by GDI+, you can use this technology in combination with [Pre-rendering](#) of objects.

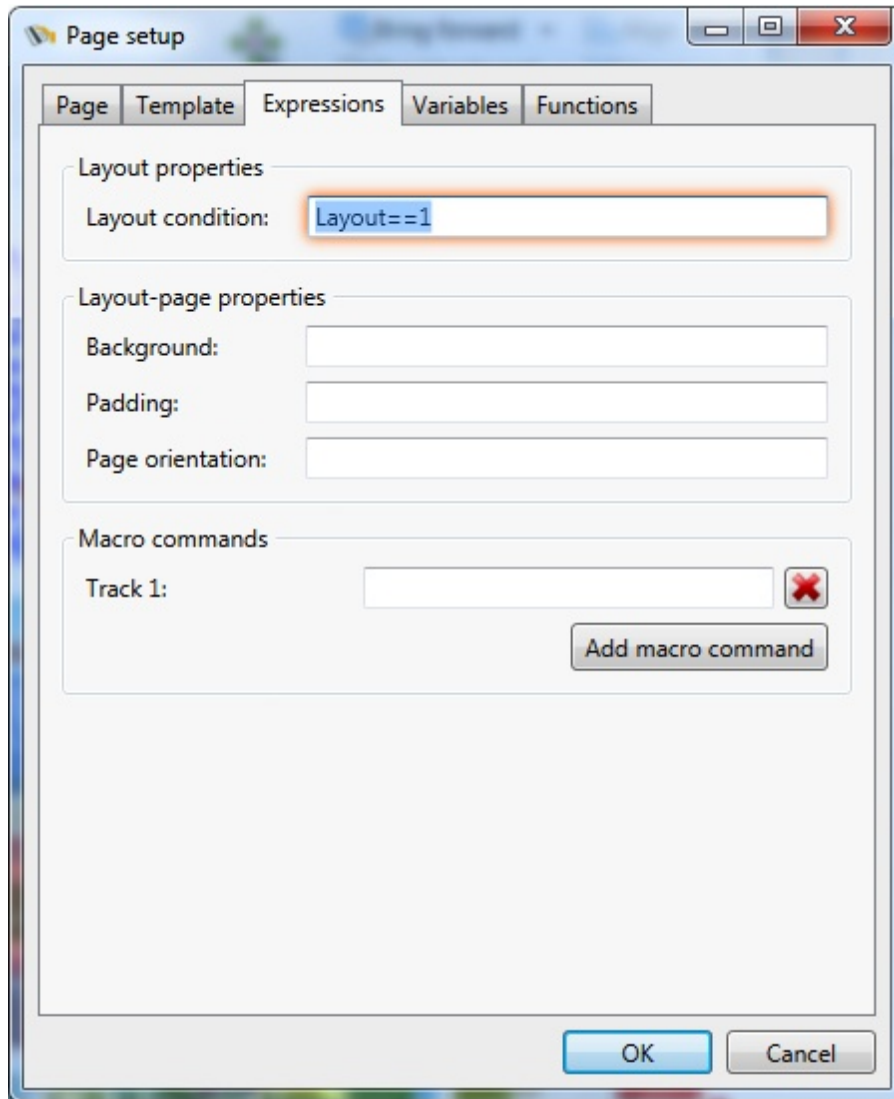
6.4.2.2 Pre-rendering of Objects

This option enables pre-rendering of objects into the background image of the layout page. When selected, all objects that have been flagged for pre-rendering, together with the background image or brush of the layout page, will be rendered to a bitmap image and sent as such to the printer.

By default, only image objects are flagged for pre-rendering, but on the [Visibility](#) tab of the Properties window, pre-rendering can be enabled or disabled for any individual object. Pre-rendering is needed when printing via the GDI+ if your design uses graphics that are not supported by the GDI+.

Pre-rendered objects will always show behind any other objects in the printed result, even if that is not the case on the preview.

6.4.3 Expressions



The CardExchange® Designer integrates a powerful script language that offers users a high level of flexibility when it comes to personalizing their card layouts. Instead of assigning fixed values to layout or layout-page properties, it is possible to control their values through expressions that yield different results in different circumstances. For example, CardExchange® can inspect a field in the database and then decide to set a different background color, or even show a completely different card layout.

The Expressions tab of the page-setup window allows for specifying expressions for the layout condition, a number of layout-page properties and any number macro commands. The layout condition is available for the Professional and Ultimate editions. The layout-page properties and the macro commands are only available in the Ultimate edition.

Expressions are written in IronPython (see <http://ironpython.net>), which is the .NET implementation of Python, (see <http://www.python.org>). Since the documentation of

Python is publicly available on these websites, this help file will limit itself to explaining how Python can be used within CardExchange® and giving some practical examples.

Layout condition

When a card template consists of multiple layouts, the layout-condition property can be used to determine whether a layout applies or not. Imagine, for example, that the template has two layouts and that we type

```
layout == 'A'
```

for the layout condition of the first layout. When pressing the Enter or Tab key or clicking OK, CardExchange® will detect that a new variable called 'layout' was introduced and prompt for a default value. You could set the default value to 'A', as shown in the screen shot below.

Now close the page-setup window, select the second layout and open the page-setup window again. Type in the Expressions tab the layout condition

```
layout == 'B'
```

CardExchange® will not prompt for a default value anymore, because the variable 'layout' is already part of the variables collection. Now, when you close the designer, open the mappings window and map the Visible item 'layout' to a field in the database, the first layout will be shown for records that have the value 'A' in that field, while the second layout will only show if that field contains 'B'.

Layout conditions can be controlled by expressions that are much more complex than this. The expressions can contain functions and they can use multiple variables. It is possible to define the layout conditions in such a way, that for some records multiple layouts apply and for others no layout at all. CardExchange® will print multiple cards for the same record if multiple layouts apply. If no layouts apply, CardExchange® will skip the record when executing a print batch.

Background

Three layout-page properties can be controlled by expressions: the background color, the margins and the page orientation. Background colors are specified using HTML color names ('AliceBlue', 'AntiqueWhite', 'Aqua', etcetera) or using HTML color tags, for example, '#FFCD853F', specifying the alpha, red, green and blue channels respectively. The simplest way of getting a flexible background color is by just typing a variable name in the expressions box, like

```
backgroundcolor
```

CardExchange® will prompt again for a default value, where you can type, for example, 'AliceBlue'. In the mappings window, the variable name will appear among the visible items and can be mapped to a database column that contains the desired color name for each record.

If the color is determined by a flag that does not reflect the color name directly, it is necessary to define a function in the Functions tab, like for example

```
def getcolor(flag):
    if flag == 'A':
        return 'Red'
    elif flag == 'B':
        return 'Green'
    else:
        return 'Blue'
```

This function can be used in the expression for the background color by typing

```
getcolor(flag)
```

where the variable 'flag' should be mapped to a database column that can contain the values 'A' or 'B'. As a result, CardExchange will show a red or green background if that column contains the value 'A' or 'B' respectively. The background will be blue for all other values.

Padding

The padding is the space between the edge of the card and the printed area, more commonly designated as margin when talking about pages. It is not commonly controlled by expressions. The result of the expressions should be either an integer value that specifies the width of the margin in pixels, or a string containing two or four numbers, optionally separated by a comma. The string '10 20' or '10,20' would set a margin of 10 pixels on the left and right sides and a margin of 20 pixels to the top and bottom sides. The string '1 2 3 4' or '1,2,3,4' would set a left margin of 1, a top margin of 2, a right margin of 3 and a bottom margin of 4.

Page orientation

For the page orientation, it is still more unlikely that you want to control it with an expression. The value that the expression should return are 'Landscape', 'Portrait', 'ReverseLandscape' or 'ReversePortrait', where the last two refer to an orientation that has been rotated 180 degrees.

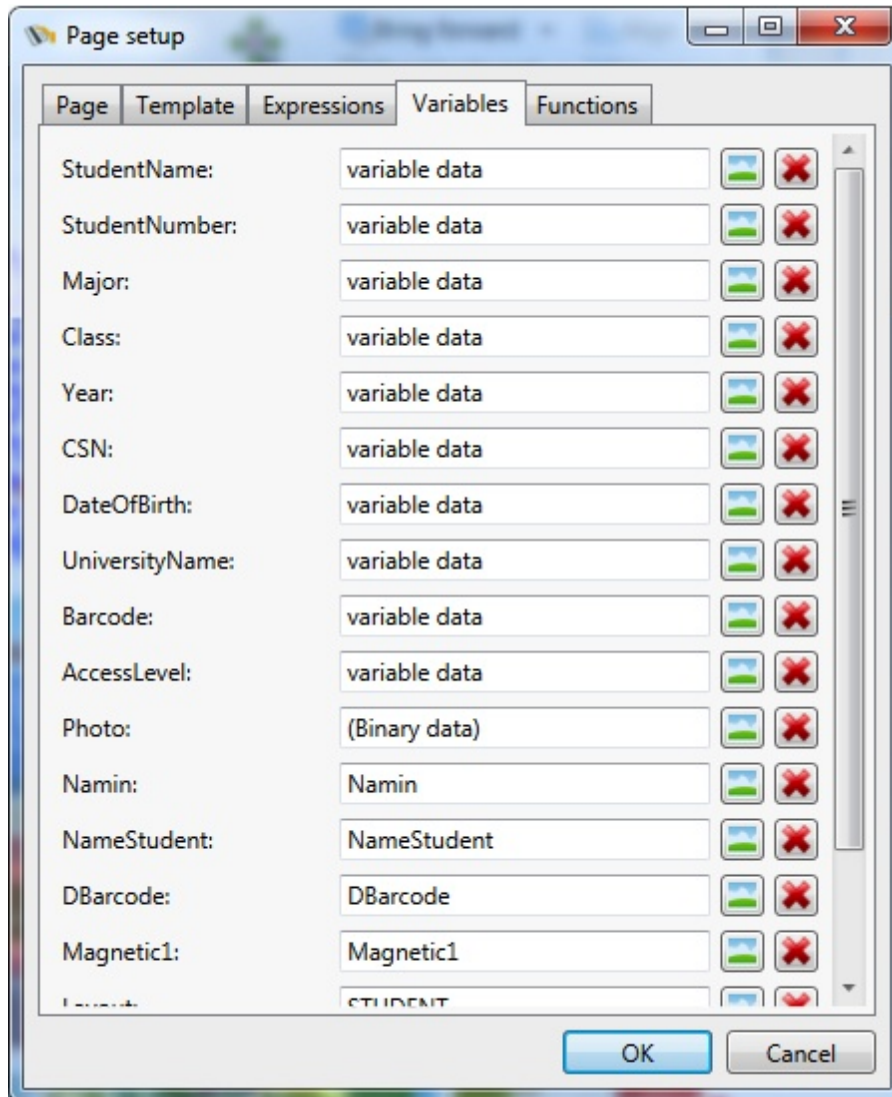
Macro commands

Macro commands are text strings that are sent to the printer as printable characters, but that are interpreted by the printer as special commands. The most common application of macro commands is using them for magnetic encoding. The printer recognizes text strings as macro commands by inspecting the first and sometimes the last characters. For example, on certain printer brands, the string '~1%XXXXX?' is interpreted as a command to encode the characters 'XXXXX' on track 1 of the magnetic stripe.

Although you could define macro commands for magnetic encoding in the Expressions tab of the page-setup window, you normally will not do that, because it is much more user

friendly to enable the magnetic-stripe object in the Page-layout ribbon and configure it in the properties window. However, some printers support other types of macro commands, for example for defining holographic overlays, in which case you can manually add those commands in the page-setup window.

6.4.4 Variables



When expressions are used to determine property values, CardExchange® detects whether any variables were used in the expression. If so, it prompts for default values and adds the variables to the template's variable collection. When you close the designer and go to the mappings window, the template's variables will appear under the Visible items and their values can be mapped to external data, like database columns or manual entries. How the mappings window should be operated is explained elsewhere in the help file.

The Variables tab in the page-setup window, lists the complete variable collection and

allows for following actions:

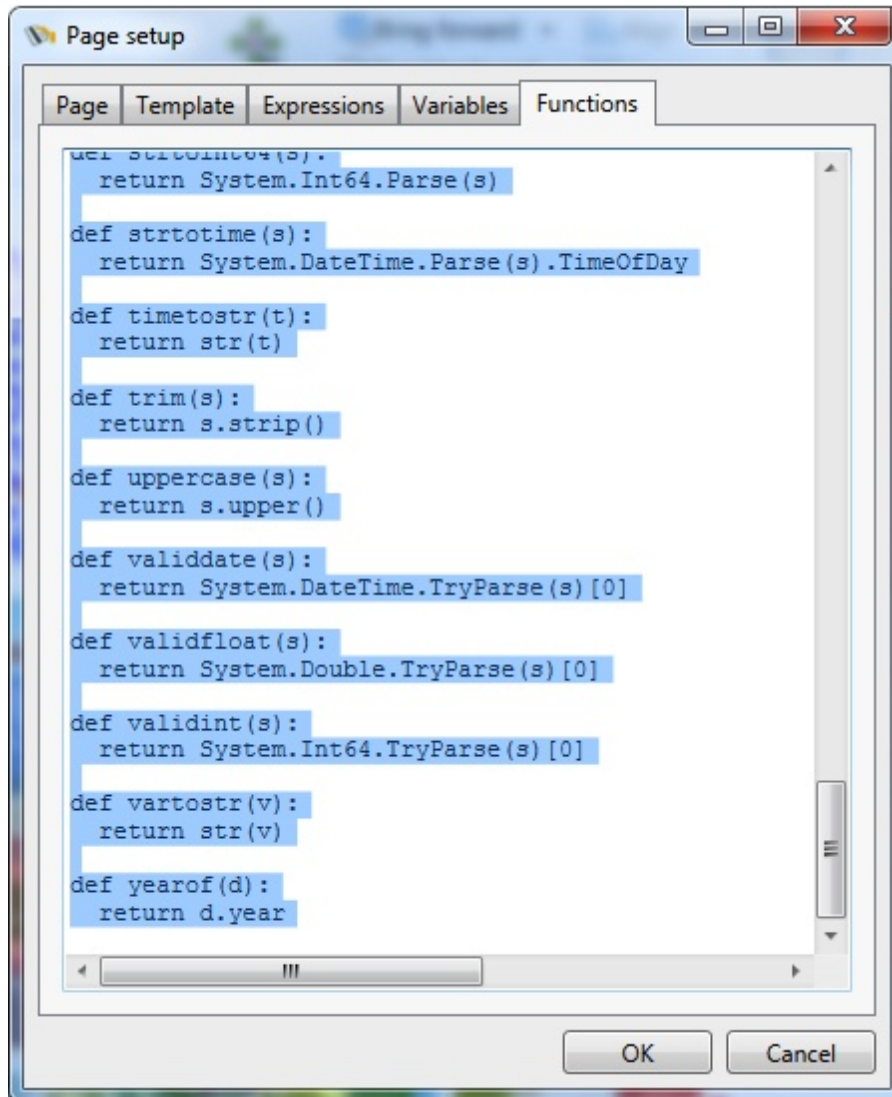
- Changing a variable name by clicking on it in the list and typing a new name. If you rename a variable, be sure that you also adapt any expressions that are using that variable.
- Changing the default value of a variable by typing in the value box.
- Removing a variable by clicking on the button with the red cross. You should only do this if you are sure that the variable is not being used by any expressions.
- Adding a new variable by clicking on the Add-variable button.

If you want the default value of a variable to represent an image, you can click in the image button to show some additional controls that helps you defining the image.

The select-image button allows you to select an image file from the computer. The point-to-file check box allows you to set the default value to the file path instead of the image data.

When you hover over the image, you see two additional buttons that are for editing and removing the image respectively. Please, note that edited images cannot be of the point-to-file type. When you edit a point-to-file image, the point-to-file box will be unchecked automatically. On the other hand, if you check the box for an edited image, the image will revert to the original one.

6.4.5 Functions



The Functions tab in the expressions window shows a single text box where you can type any global definitions you want to use in your Python scripts. When typing here, you need to follow the Python syntax (see <http://www.python.org>). Normally, you will use this space to define custom functions to be used in expressions. An example shown before was the function we defined to determine the background color

```
def getcolor(flag):  
    if flag == 'A':  
        return 'Red'  
    elif flag == 'B':  
        return 'Green'  
    else:  
        return 'Blue'
```

It is also possible to define global variables, that is, variables that can be used in

expressions or functions, but that will not be listed under the visible items. For example, we could change the above function definition to

```
colorA = 'Red'
colorB = 'Green'
colorC = 'Blue'

def getcolor(flag):
    if flag == 'A':
        return colorA
    elif flag == 'B':
        return colorB
    else:
        return colorC
```

To get a taste of the level of complexity you can achieve with custom functions, see the below definition of a function that converts a string to name casing. It uses the regular-expressions module of Python (see <http://www.python.org> for more information).

```
import re

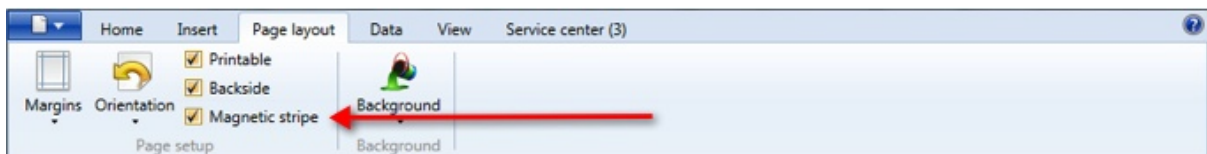
def namecase(s):
    return re.sub('\w+', capitalizematch, s)

def capitalizematch(m):
    return capitalize(m.group(0))

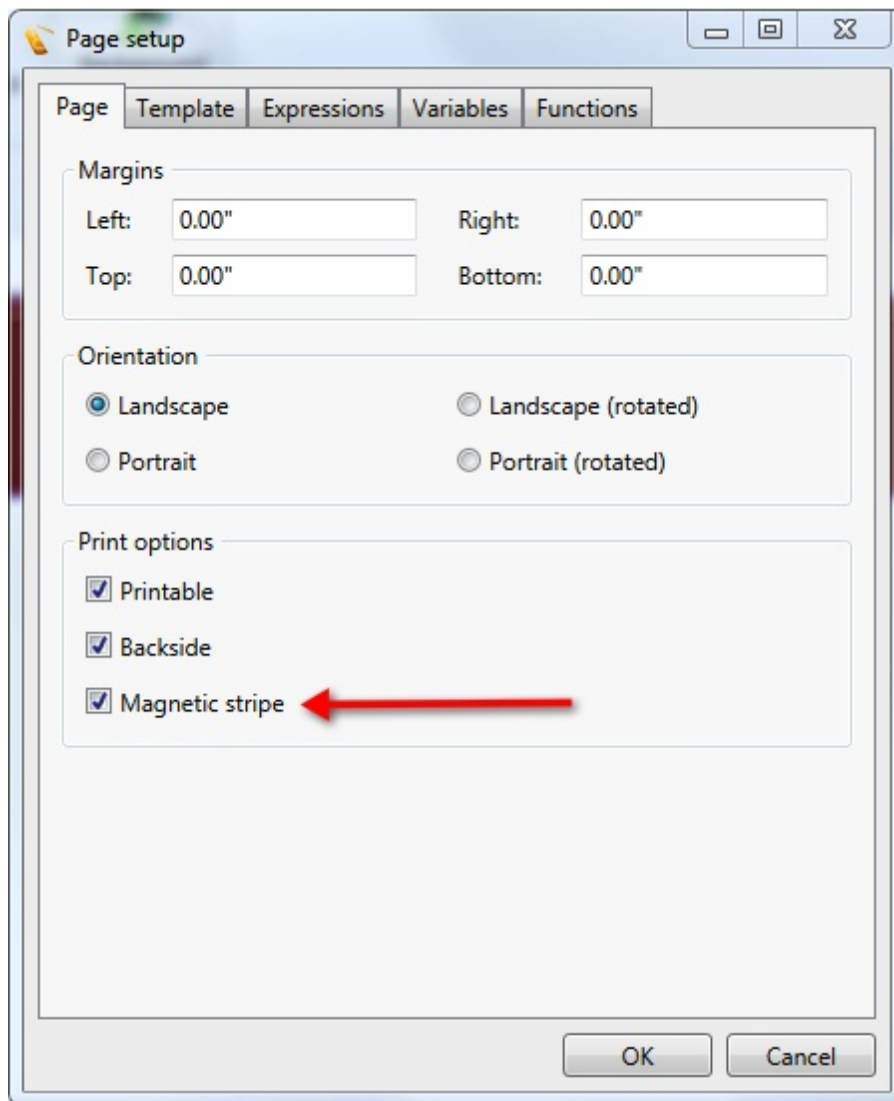
def capitalize(s):
    if len(s) > 1:
        return s[:1].upper() + s[1:].lower()
    elif len(s) == 1:
        return s.upper()
    else:
        return s
```

With the name-case function, you can convert a string like 'jOHn SMith' into 'John Smith'.

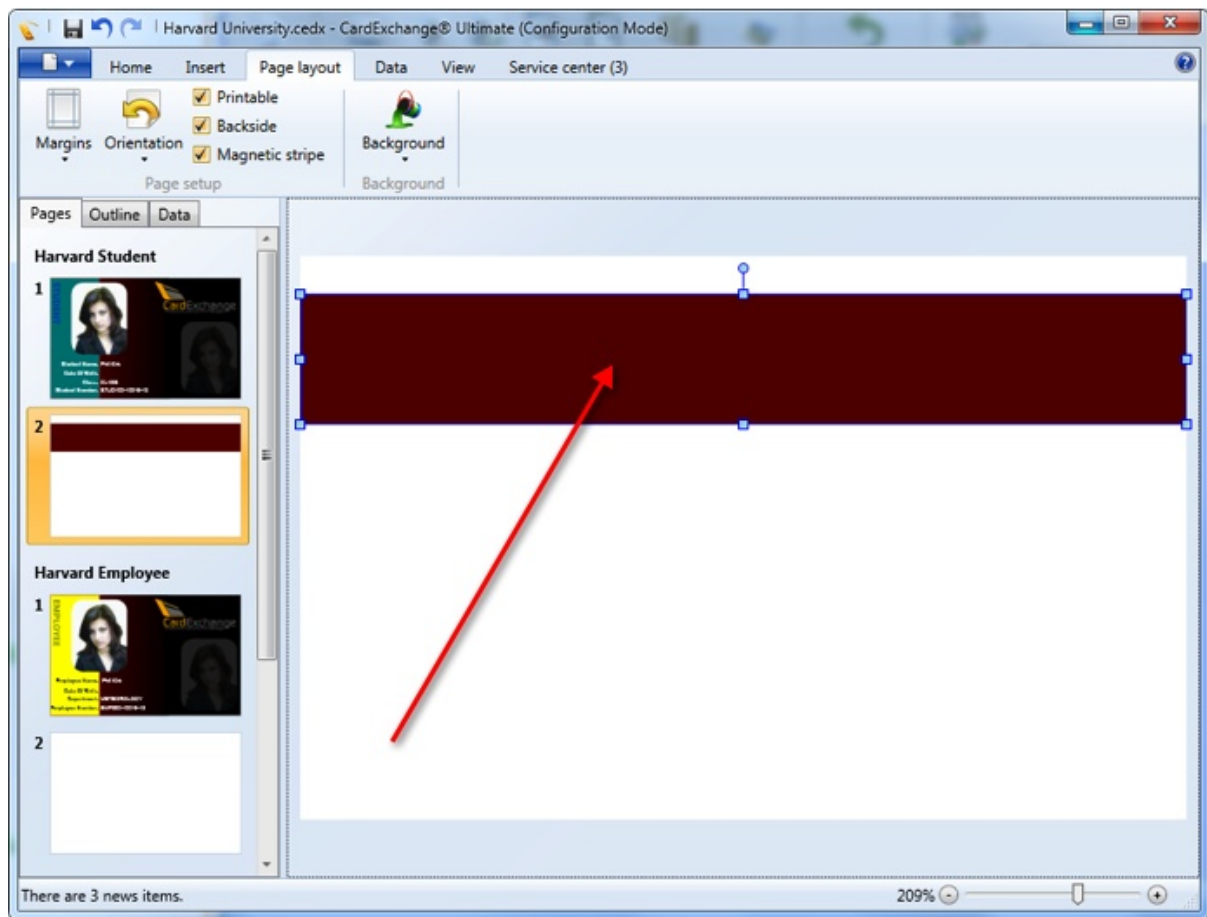
6.5 Magnetic Encoding



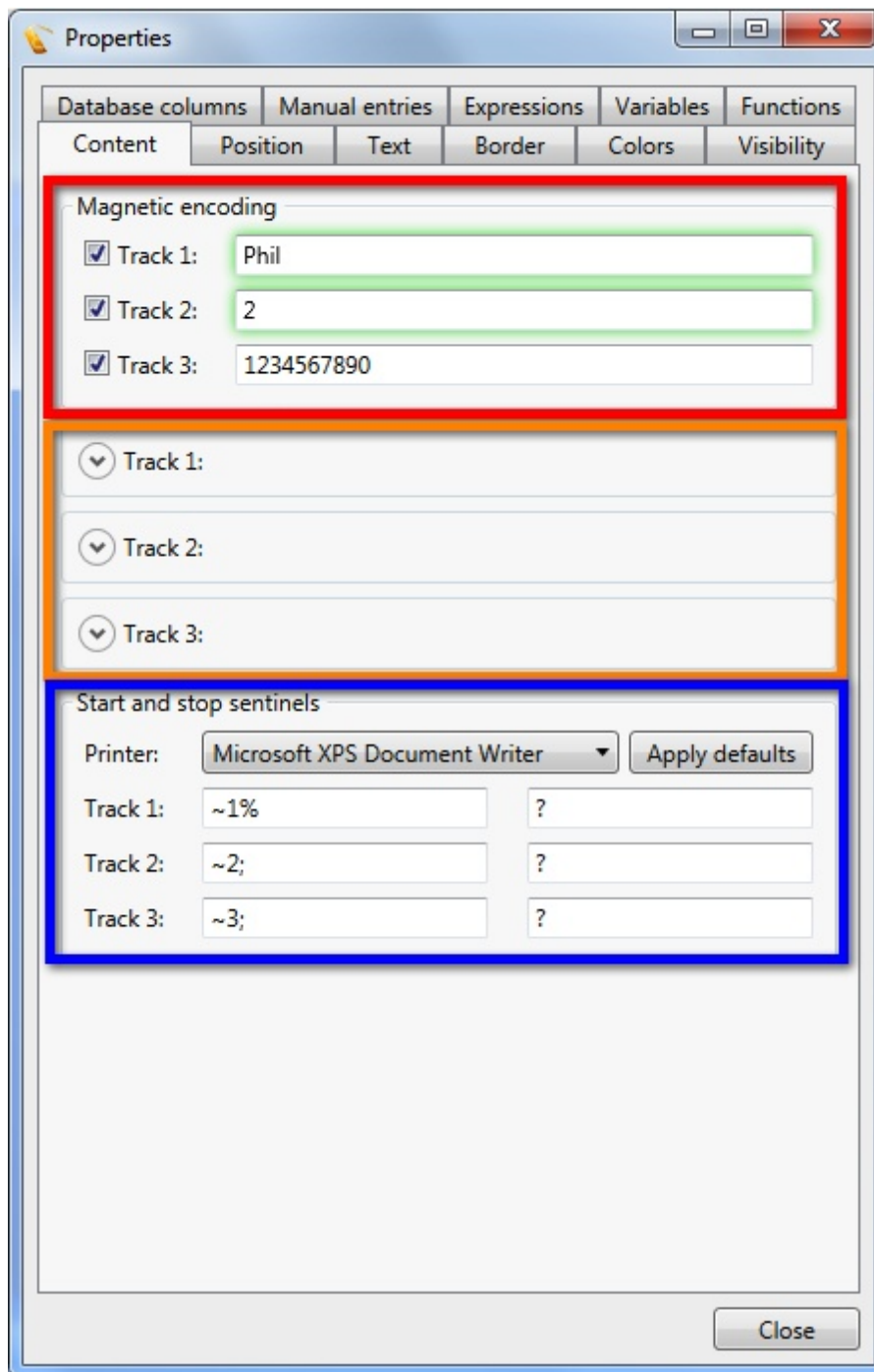
Magnetic encoding with CardExchange® is very easy to configure. Just check the **Magnetic stripe** check box in the [Page layout](#) tab or select Page Setup from the Menu.



Select the Page and check the Magnetic stripe check box.



In the Page design you now see a red magnetic stripe rectangle appearing as indicated with the **red** arrow. Now make sure that you have the [Properties](#) window open and make sure the [Content](#) tab is selected and that the magnetic area on your page design is selected.




In the Properties window you now see three sections:

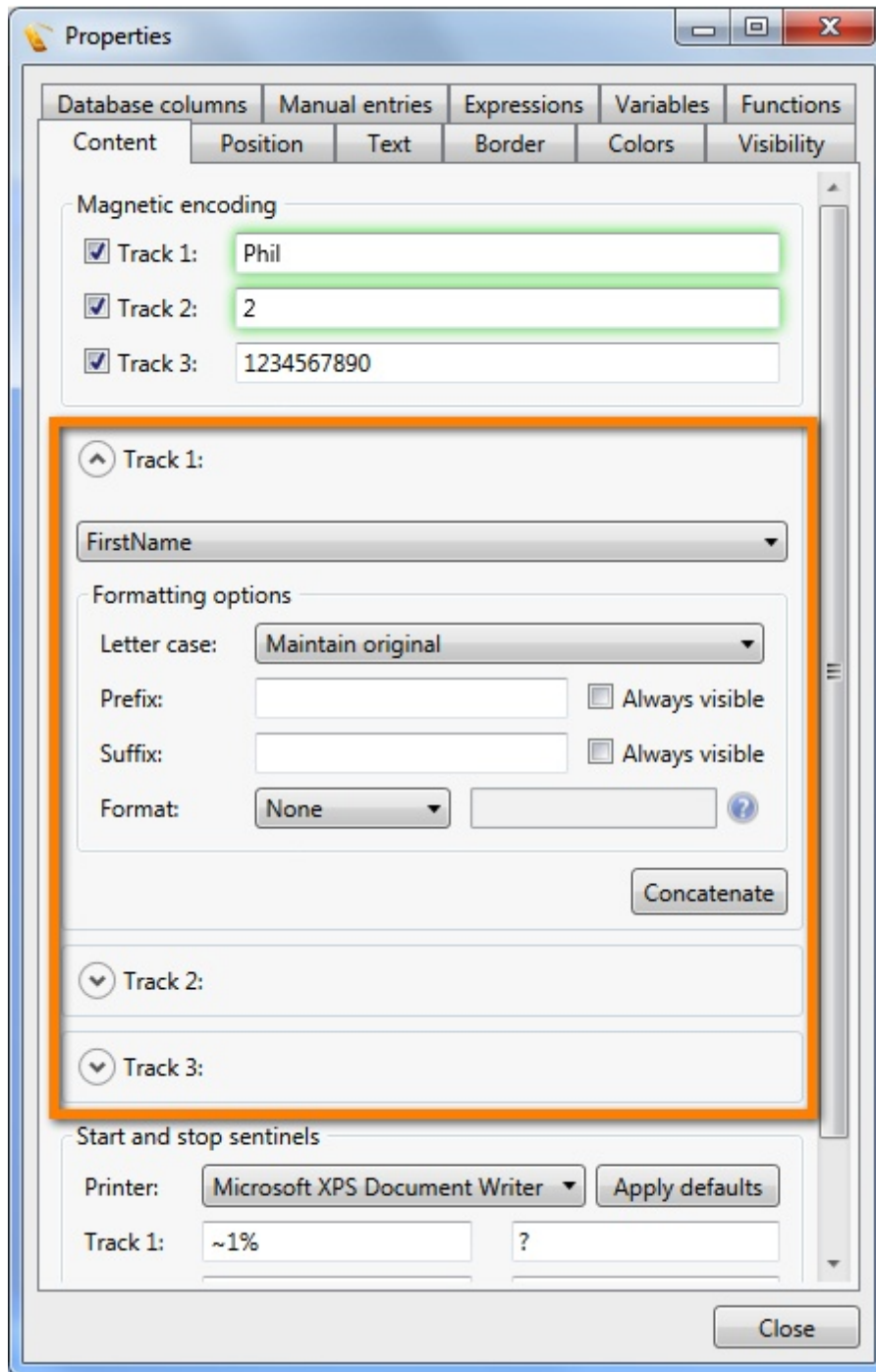
- Magnetic encoding
- Track 1, Track 2, and Track 3
- Start and stop sentinels

Magnetic encoding

In this group, indicated with the **red** rectangle, you select which track you want to write to. Just select the check box for each track to make it available. In the text box next to the Track you can directly enter information (fixed value) or drag a database column into it. For each selected track the track object, indicated in the **orange** rectangle, will become available.

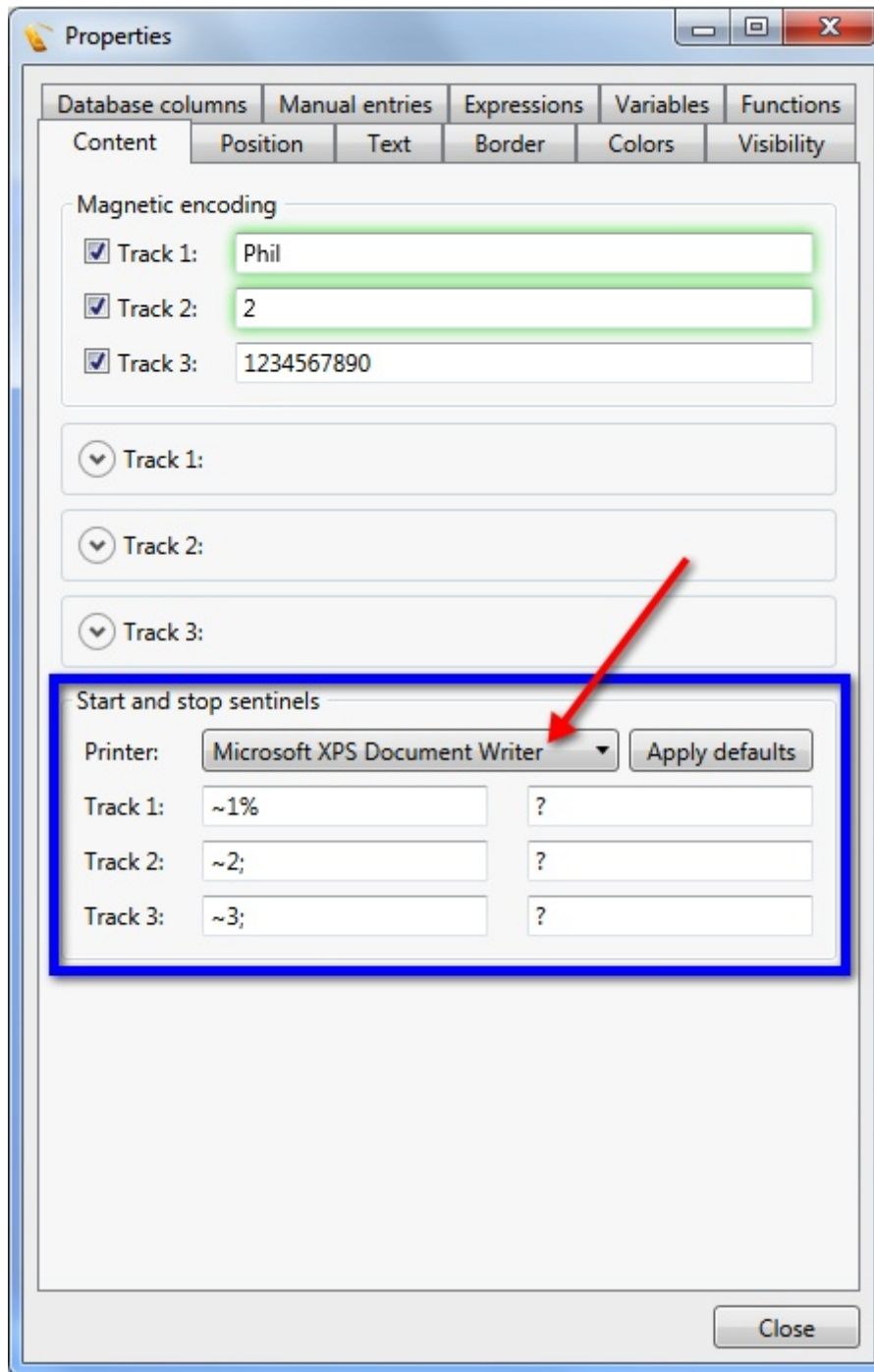
Track 1, Track 2, and Track 3

In this group, indicated with the **orange** rectangle you can set or change the information that is being coded to the magnetic stripe. Click on the  to expand the Track info.



Just like with normal objects, with the Magnetic Encoding you can also use the [Standard Object Types](#) to connect.

Start and stop sentinels

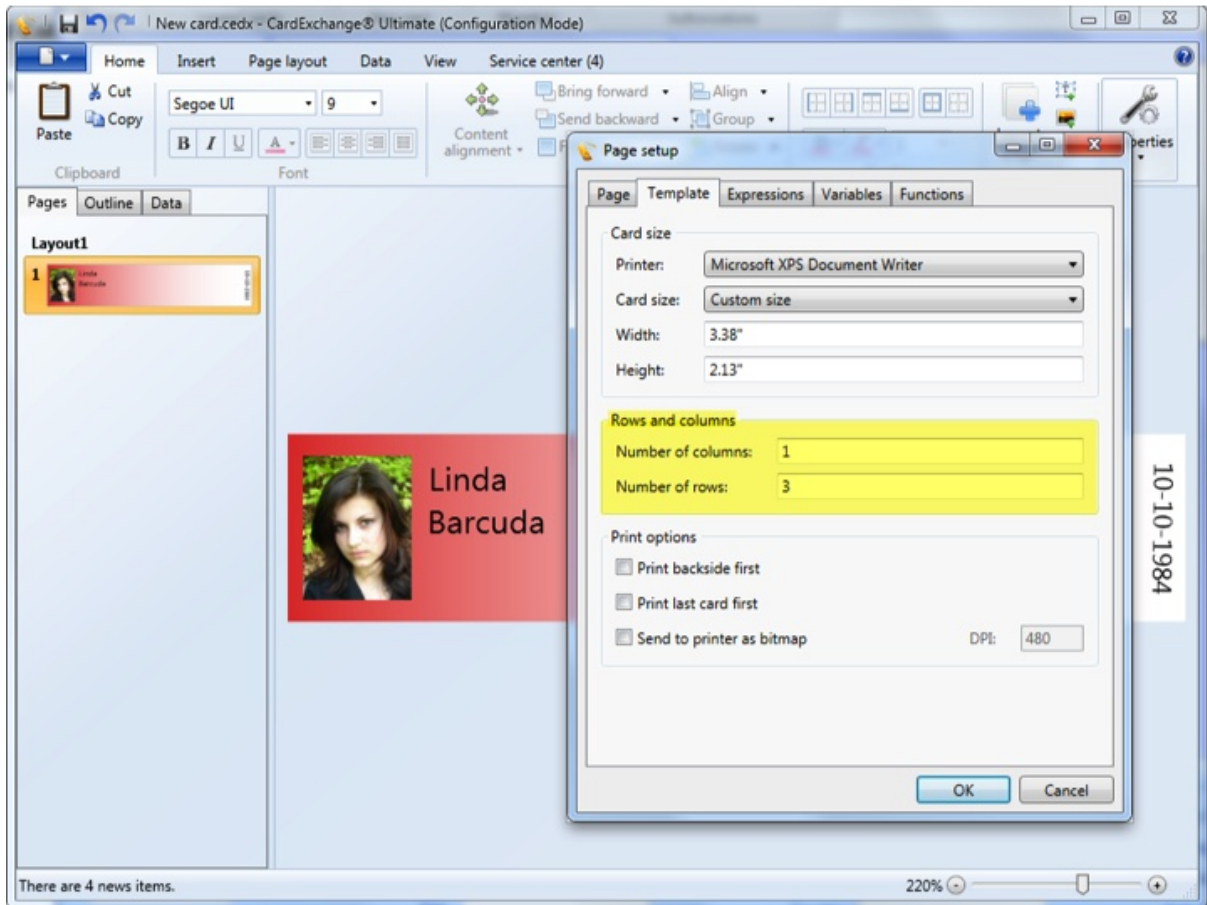


All ID Card Printers are using start and stop sentinels for moving the card into encoding position. Although encoding of magnetic cards is based on an ISO standard, the commands used are mostly different per manufacturers brand.

To make sure you are using the correct start and stop commands, the most common commands are available via CardExchange® directly. Just select the printer you are using from the printer drop down menu and click on Apply defaults.

If you are using specific start and stop sentinels, you can directly enter them into the text boxes.

6.6 Rows and Columns



CardExchange® offers the possibility to print multiple records on a your card. This can be very handy when printing, for example, breakable cards for key chains.

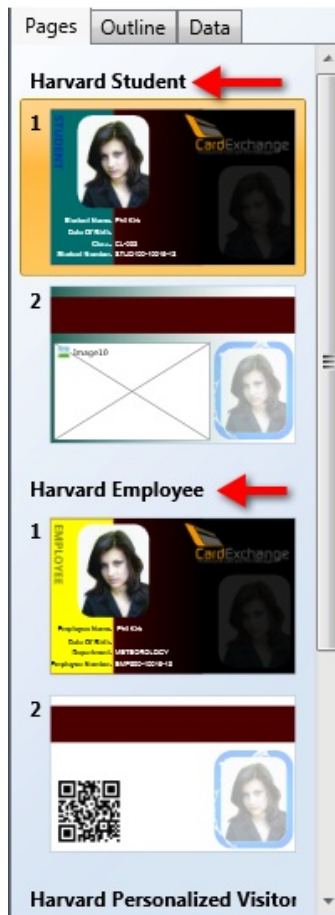
Select the [Layout](#), open the [Page Setup](#) window, and select the Template tab. Here you can find the Rows and Columns section. Enter the amount of columns and rows you want to use. For example, using one column and 3 rows will have the following print result:





Of course, because CardExchange® supports Windows printers, you can also use this to create face books for your A4 or Letter printers.

6.7 Templates



As you have read in the [Designer Interface](#) section of this Help file, all your configuration is done in the Designer. Therefore the CardExchange® Designer works based on templates.

To understand how CardExchange® works, it is important to take special note of this section of the Help file.

Basically every time you create a new card with CardExchange® you are creating a new Template.

In the [Main Interface](#) of CardExchange® you always switch between the different available Templates (see the "[Loaded Cards](#)" section).

With the Designer you always create a new or open the selected **Template**. But it is always **ONE Template!**

Each **Template** has always one ID Card Printer connected, one Database connection, one MIFARE® Classic or DESFire connection, one External Plug In, etc.

Each **Template** can have have Multiple Layouts. In the screen shot you see "Harvard Student" and "Harvard Employee". These are the layouts inside the template. Each layout can have it's own unique conditions like [Magnetic Encoding](#) settings. By selecting the layout, you can simply call the [Page Setup](#) window from the [Main Menu](#) to set the specific conditions.

This offers very powerful functionality. Using Multiple Layouts inside one Template makes it for example, possible to automatic switch between the different available Layouts within the Template. More information how to create this type of functionality can be found in the [Expressions](#) section of this Help file.

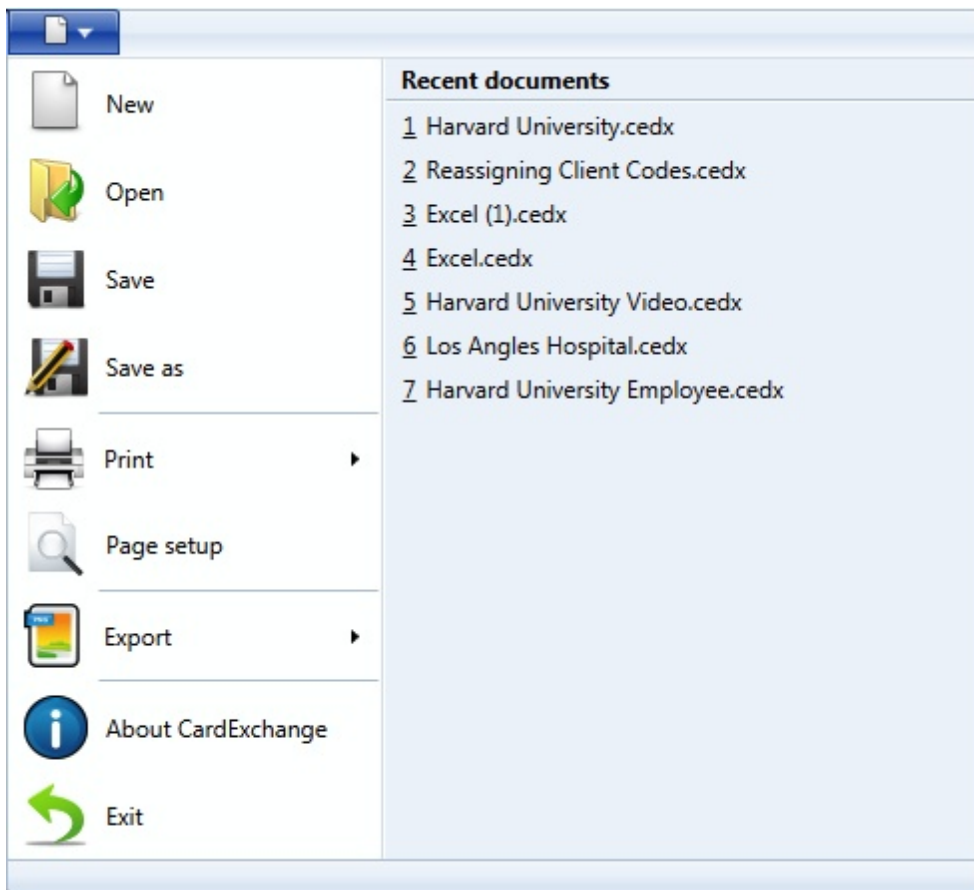
More information about Layouts can be found in the "[Adding](#)

[Layout\(s\)](#)" section of this Help file.

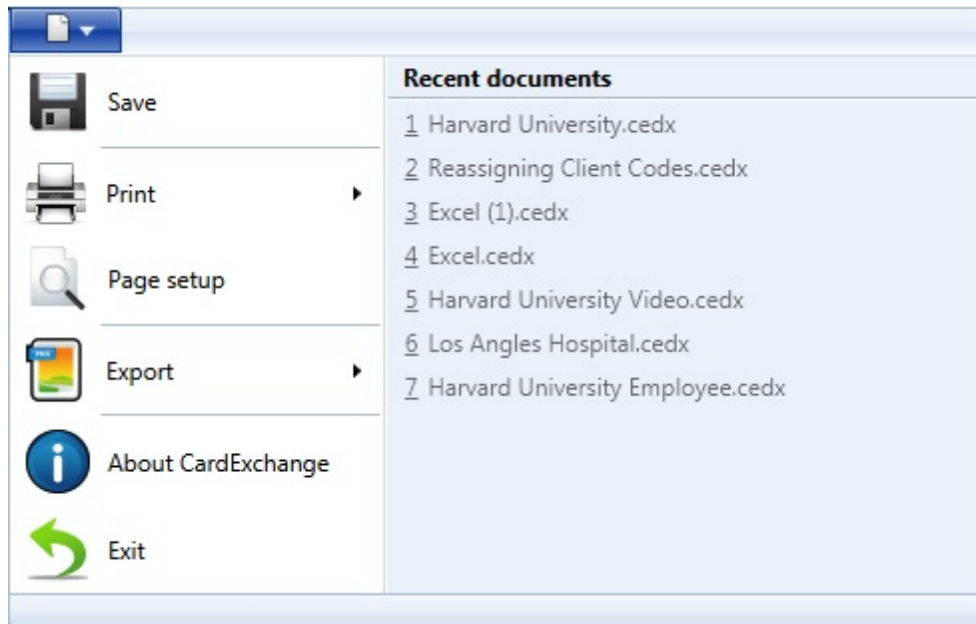
Each Layout can have Multiple Pages. You can have a Page for the Front Side, a Page for the Back Side, but also a Page for a UV panel on the Front and/or a UV panel on the Back. Each Page holds all the objects like text, image, barcode, etc., objects.

6.8 Menu Overview

In the Main menu of the Designer you can find all common functionality needed to load, save, print, etc., your card. It is very important to be aware that there are basically two versions of this menu. The version for the Designer as shown below:



And the version for the Entry and higher editions as shown below:



In the Designer menu you can create a new template, open an existing template, and save an existing template under a different name.

When you are using a Entry or higher edition, this functionality is not available because the creation of new templates is managed via the Card Manager. More information about the Card Manager can be found in our "[Using the Card Manager](#)" section of this Help file.

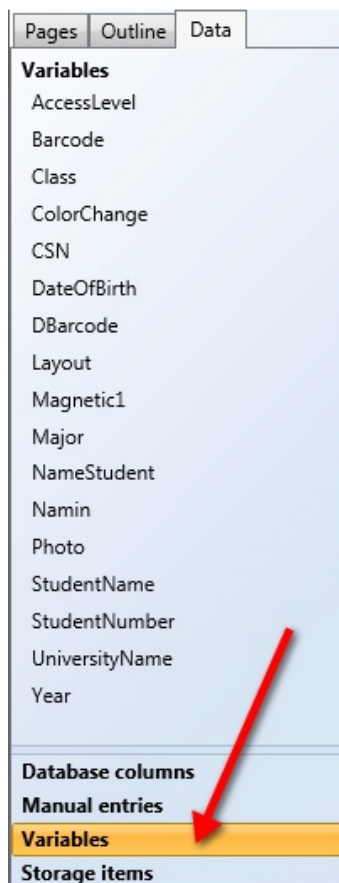
Available functionality

- **New *** Create a new template (Only available in the Designer edition. In all other editions adding goes via the Step-by-Step wizard). For more information about Adding cards, please see our "[Add a Card](#)" section of this Help file.
- **Open *** Open an existing template (**Designer Edition only**)
- **Save** Save the template and/or the modifications you made
- **Save as *** Save the template as (**Designer Edition only**)
- **Print** This menu has three sub items:
 - **Print** (Select the printer, the amount of copies, etc.)
 - **Quick Print** (Send the template directly to the default printer without making any changes)
 - **Print preview** (Preview and make changes to pages before printing)

For more information about printing, please see the "[Printing Cards](#)" section of this Help file.
- **Page setup** Opens the Page Setup window. More information about Page Setup can be found in the "[Page Setup](#)" section of this Help file

- **Export** This menu has five sub items and allows you to export the card layout as an image. You can export different formats like BMP, JPG, PNG, etc.
- **About CardExchange®** This opens the about window with version information of CardExchange®
- **Exit** This will quit the Designer or close the Configuration mode (Entry and higher Editions)

6.9 Variables

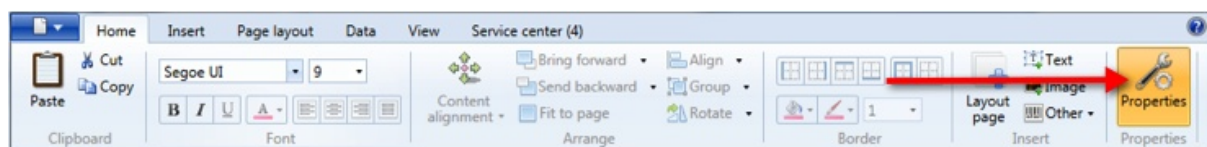


The variables in the CardExchange® designer can be used as input for Python scripts and their value can be mapped to for example a database column or a manual entry. Mappings are made via the [Content](#) tab in the [Properties](#) window.

Please visit the [Variables](#) section of this Help file for more information about using Variables.

Variables are available in the Ultimate edition.

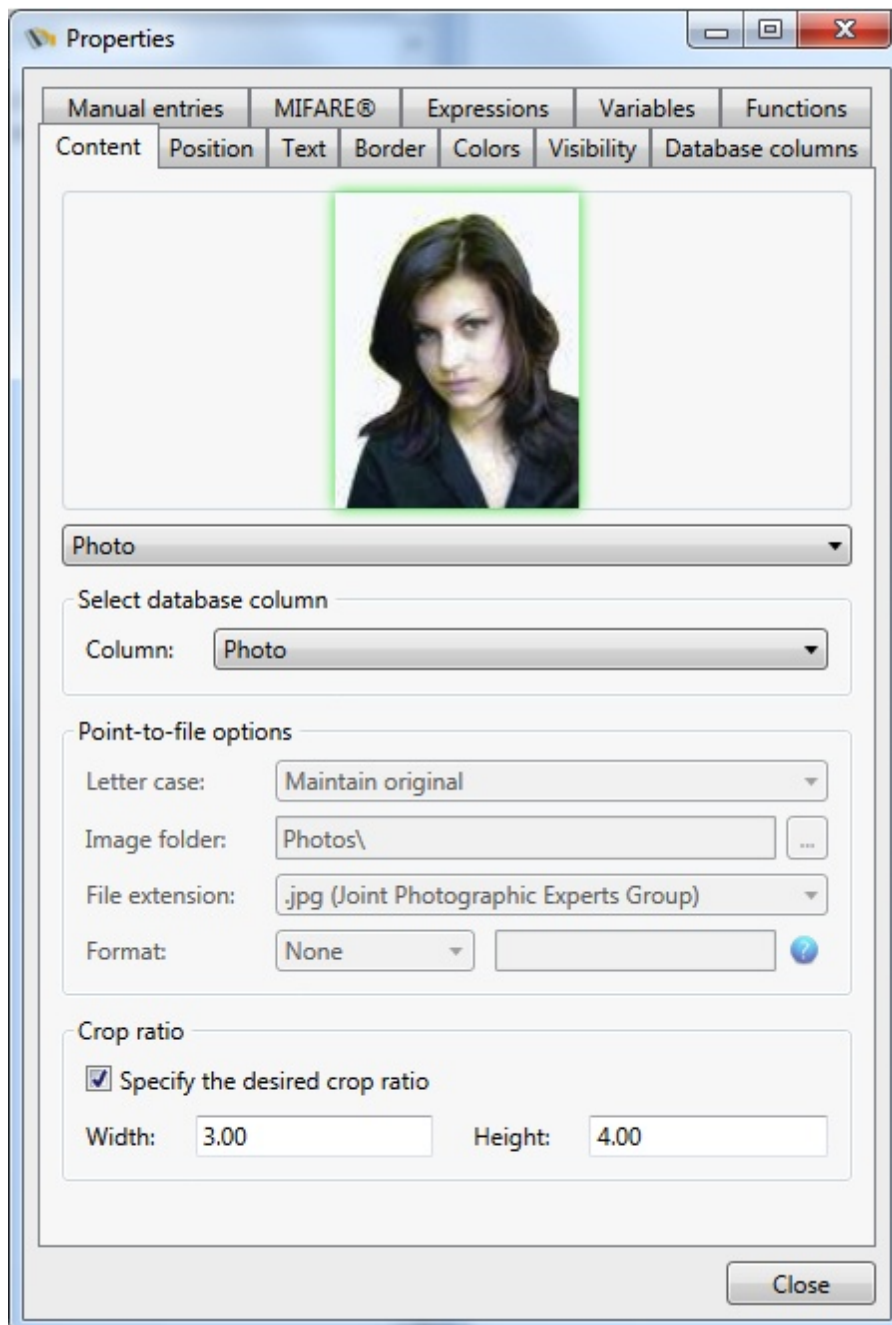
6.10 Properties



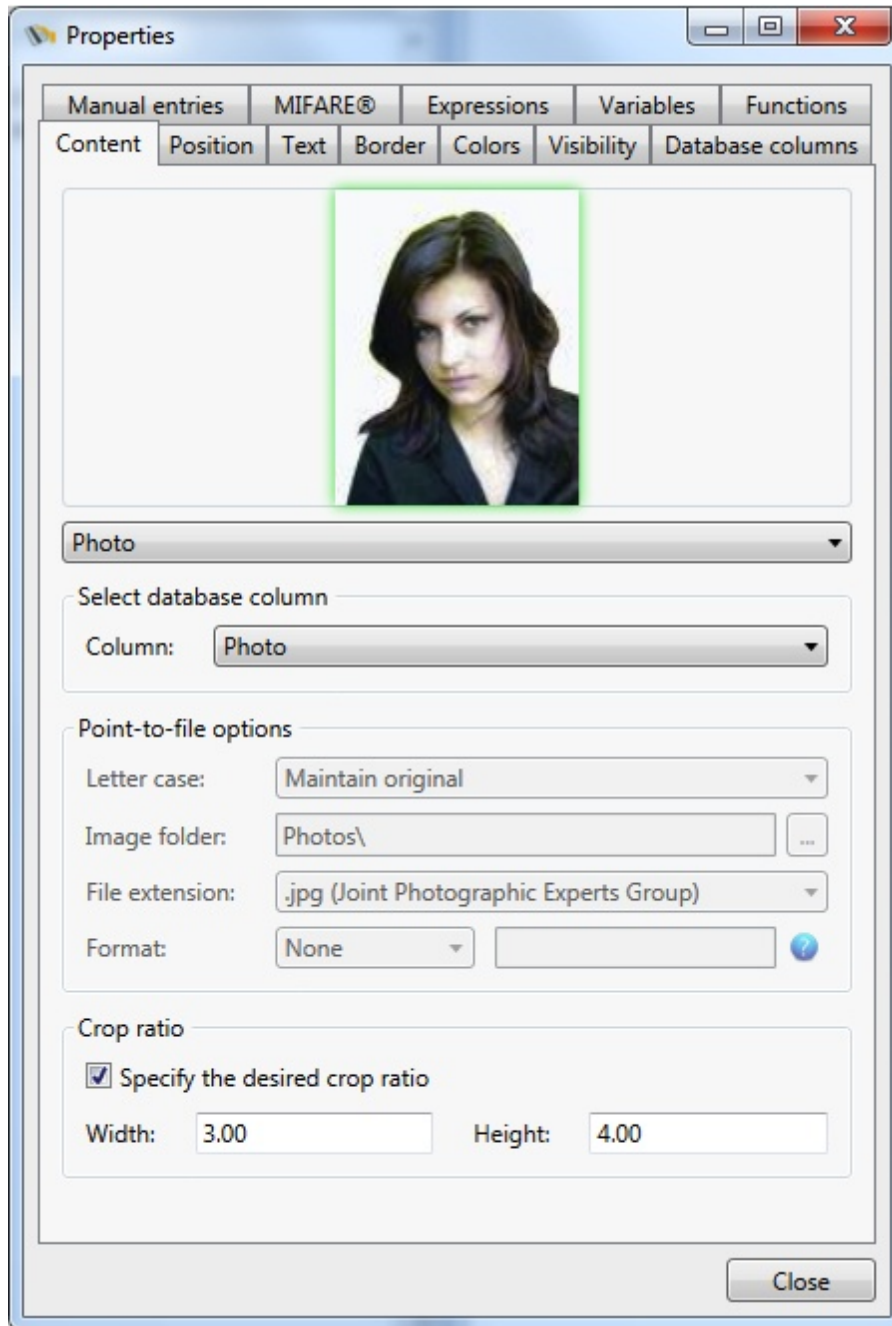
All objects used with the CardExchange® Designer have way more properties as shown in the Add Object window. All these properties are available in the Properties Windows. Click on the Properties button in the Home tab to open. In the Properties Window you can find

specific properties for:

- [Content](#)
- [Position](#)
- [Text](#)
- [Border](#)
- [Colors](#)
- [Visibility](#)
- [Database Columns](#)
- [Manual Entries](#)
- [Expressions](#)
- [Variables](#)
- [Functions](#)



6.10.1 Content



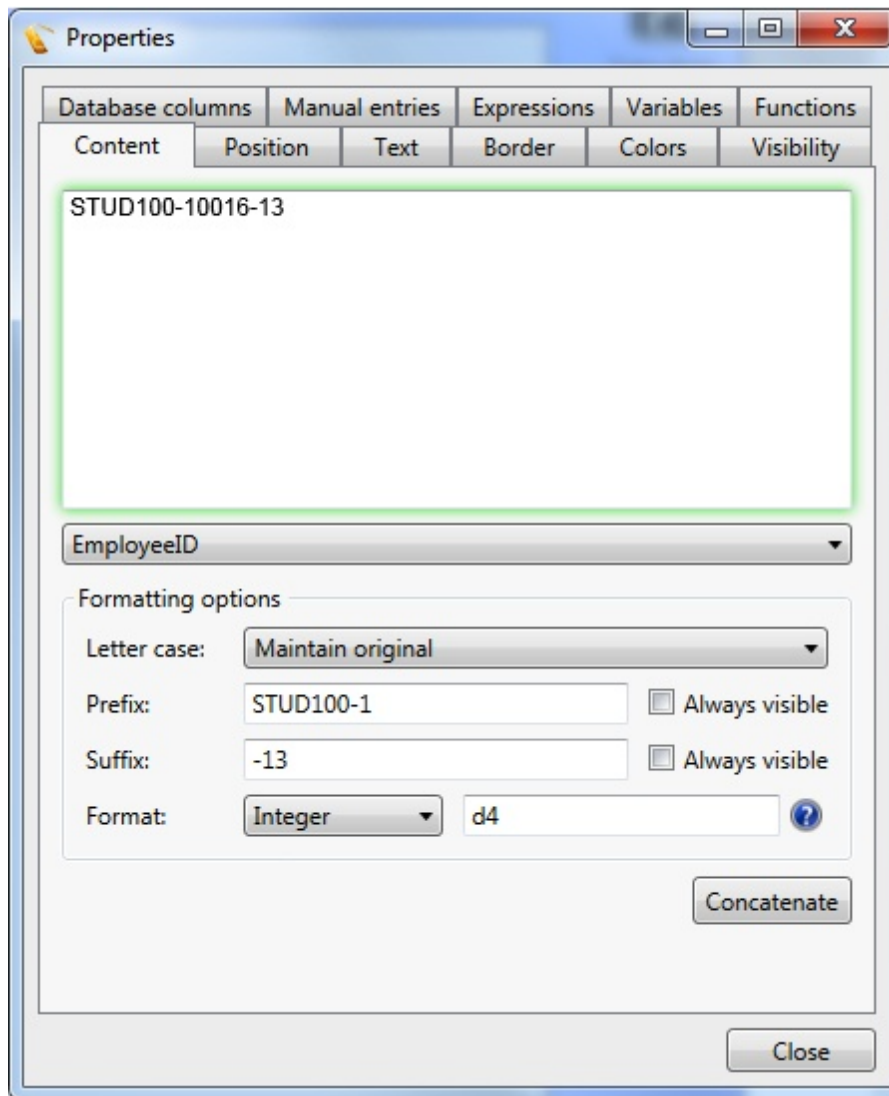
In the content tab you can enter information when you are using a [Fixed Value](#) object. This information will then be presented on the Page design in the [Text](#) object. Of course when connected to a database, this Content tab will show the data from the connected column. The box around the text area will be **GREEN** when it contains information coming from a connected database, **ORANGE** when it contains [Manual Entry](#) information, and **RED** when it contains information from Scripts. When using fixed text, it will have no color and look like the screen shot.

You can change the information by selecting a different [Standard Object Type](#). But can

also be set for using photos, signatures, etc. More information can be found in the "[Using Images](#)" section of this Help file.

In stead of selecting a Standard Object, the information can also simply be changed by selecting a database column from the [Data Menu](#) in the [Explorer Menu](#) and drag and drop this field directly into the Content text area.

Formatting Options



The Content tab also offers the possibility to do some advanced formatting. In the Formatting Options group you can set the Letter case for the content. You have four options for the Letter case:

- **Maintain Original** - No changes to the original
- **Lowercase** - Makes the content Lowercase
- **Uppercase** - Makes the content Uppercase
- **Namecase** - Makes all the first letters Uppercase

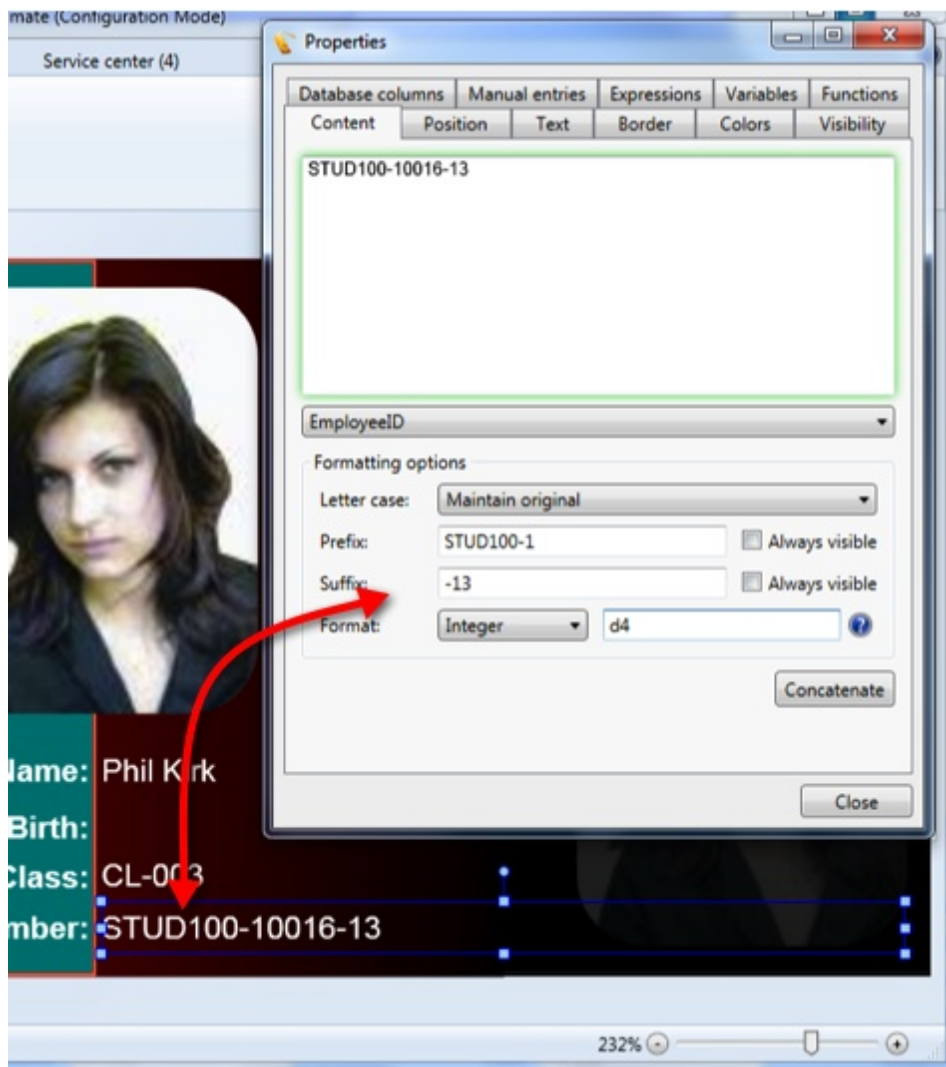
You can add a prefix and a suffix to your content and make it always visible. By default it is unchecked which means that if there is no content available, for example from the database, the prefix or suffix information will not shown.

You can also set the Format of the content. This can be handy if you want to make sure that it is always a integer, date, text, etc., content. You can select the following Formats:

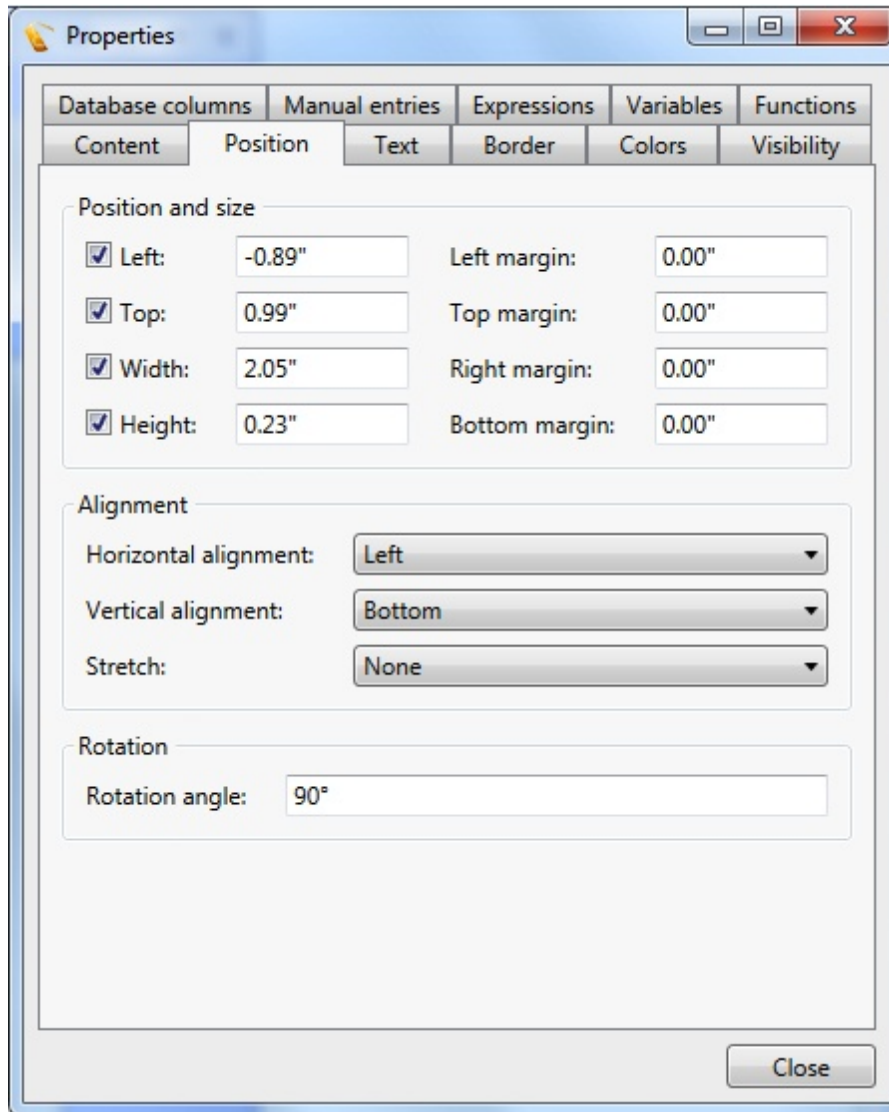
- **Date/Time**
- **Decimal**
- **Floating Point**
- **Integer**
- **None**
- **String**

You can also format the content based on kinda script. For example in the screen shot we entered '**d4**'. That means that the content will be representing four digits. So if the value from the database is 1, setting it to **d4** will show **0001**.

No bringing it all together, the screen shot with the specific settings will represent the follow information on the card to be printed:



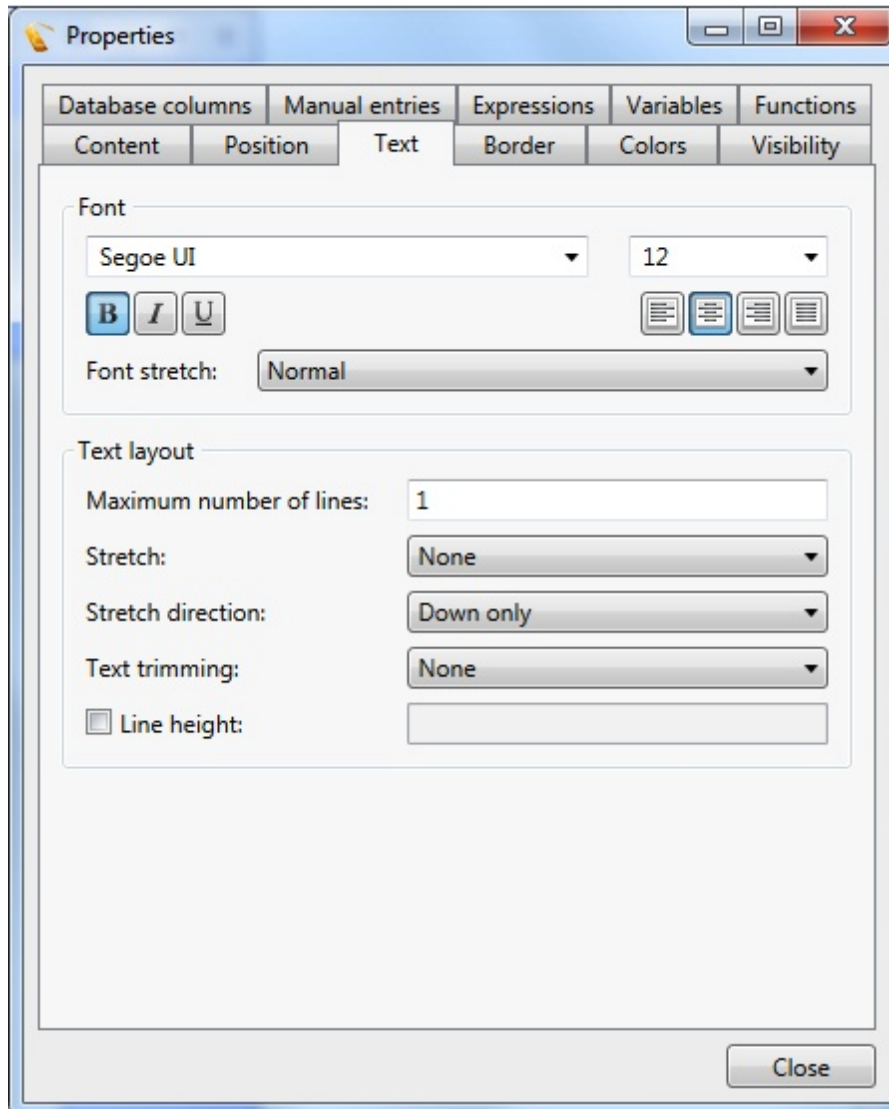
6.10.2 Position



In the Position tab you can set the specific position, sizes, and margins. Of course you this reflects the position on the Page as you dragged and dropped it so what is the need. In some situations you will have to set the positions, sizes, and margins based on specs provided by the customers. In stead of trying to accomplish this with a very stable hand, you can here directly enter the values.

Also the Horizontal and Vertical alignment can be set. Set the preferred stretch setting and, if applicable, enter the rotation angle in degrees.

6.10.3 Text



In the Text tab you can set the Font Type and the Font Size in the Font Group. Besides the alignment options, you can set the Font Stretch. The Font Stretch is not the same as the text stretch because it determines the intense of the font when stretching while the standard stretch just make sure the text fits in the text box. With the Font Stretch you can choose from:

- **Normal** (*Default*)
- **Ultra Condensed**
- **Extra Condensed**
- **Condensed**
- **Semi Condensed**
- **Semi Expand**
- **Expand**
- **Extra Expand**
- **Ultra Expand**

In the Text Layout you can set the Maximum number of lines for the text object. That means if you set, for example, the value to 2, it does not matter how large the text object on the page is, it will only use maximum two lines for the text. If you do not use stretch functionality, it will not fit the box if it over exceeds 2 lines.

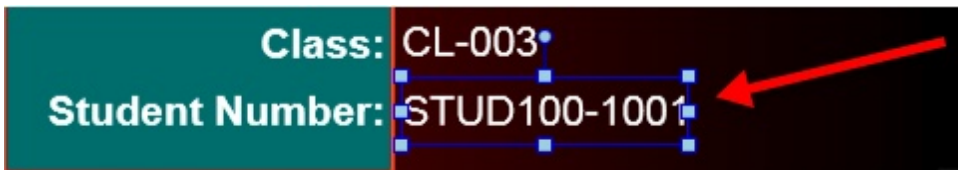
Bringing it to the Stretch option. Stretching and Stretch Direction combines the perfect functionality to get good results in your text object on the Page. In the Stretch Drop Down Menu you can select:

- **None** (*default*)
- **Fill**
- **Uniform**
- **Uniform Fill**

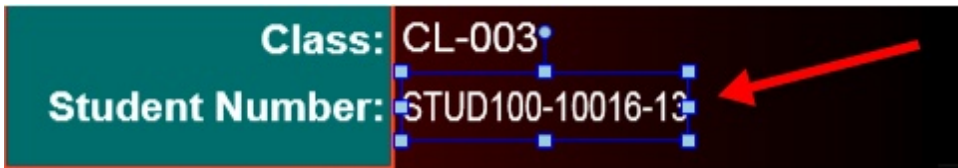
In the Stretch Direction you can select:

- **Up Only**
- **Down Only**
- **Both**

Now, for example, when selecting the option **Fill** in the Stretch Drop Down Menu, in combination with the **Down Only** option from the Stretch Direction Menu, the **Font** will be re-sized horizontally only.

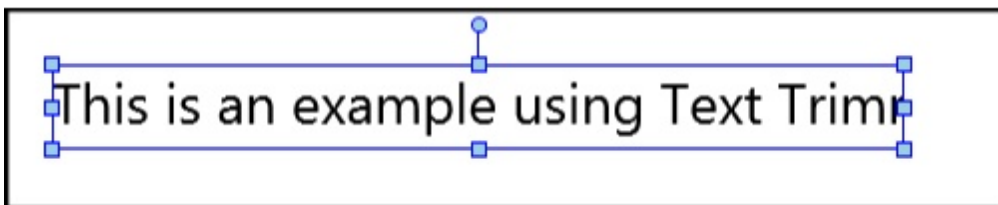


Text Object without Stretch

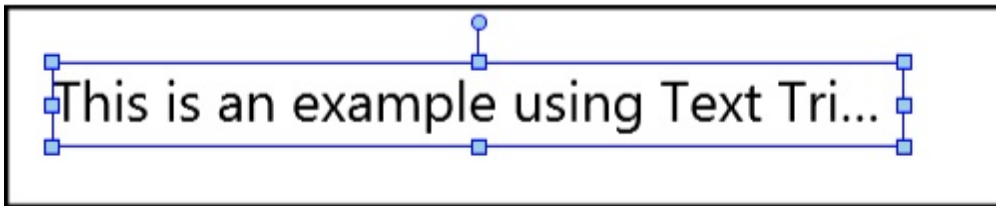


Text Object with Stretch set to Fill, Stretch Direction to Down Only

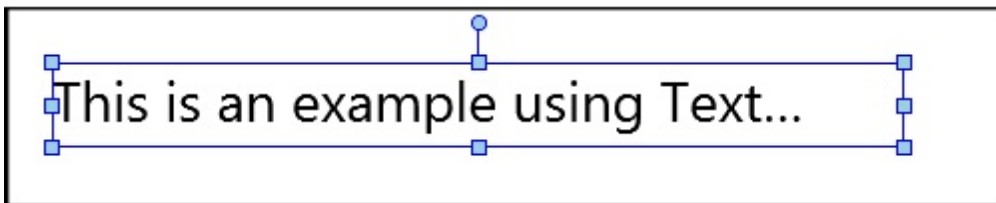
In stead of using Stretch functionality, you can also trim the text. There are basically three options for text trimming:



Text Object without Text Trimming

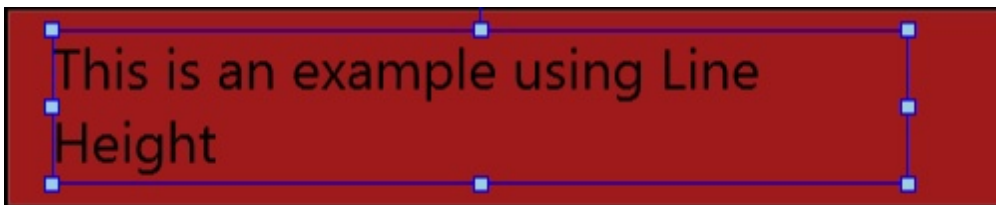


Text Object with Character Ellipsis Text Trimming

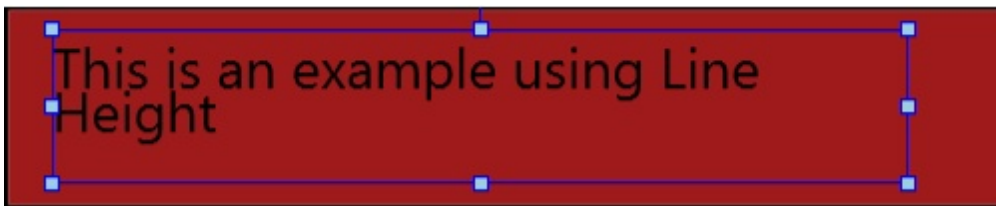


Text Object without Text Trimming

Last option in this Text property is setting the Line Height. By default this is not disabled and it uses the standard line heights for the Font Type. In some situations it can be that the standard will eat up to much space you have available on Page Design. When you select the check box, the text box right next to it becomes available and you can enter a value for the line height. The value used is depending on the settings you made in the Options section in the [View](#) tab, centimeters, inches, or pixels. See example below:

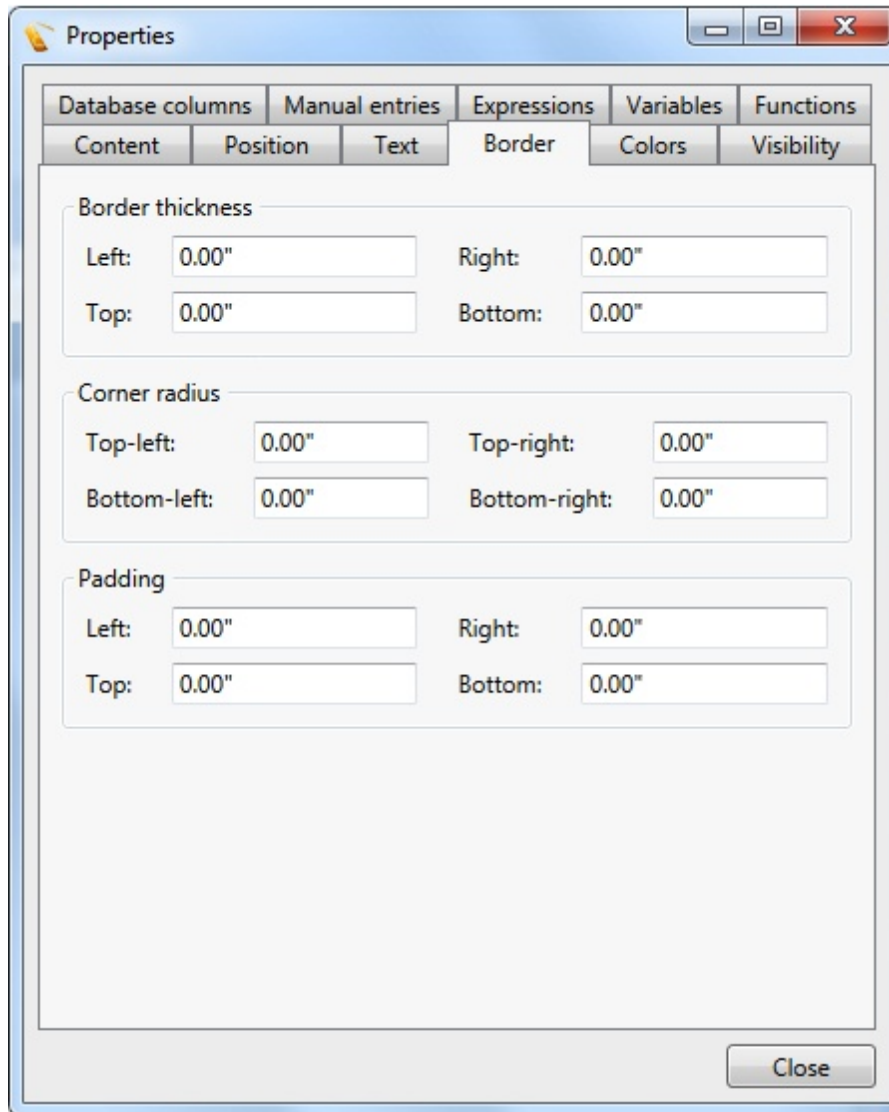


Text Object without using Line Height

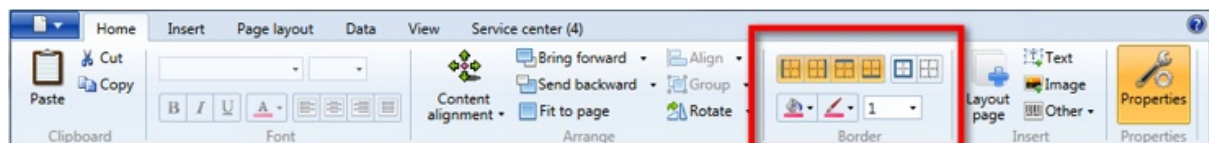


Text Object using 0.10" Line Height

6.10.4 Border

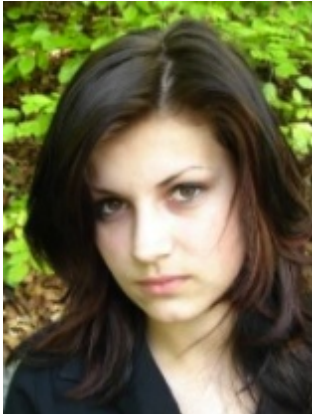


In this section of the Properties Window you can set the properties for the borders of the objects. In the first group you can define all the values for the Border thickness. For example, when adding a rectangle object to your Page Design, you can select the border thickness from the Home menu in the Border section:

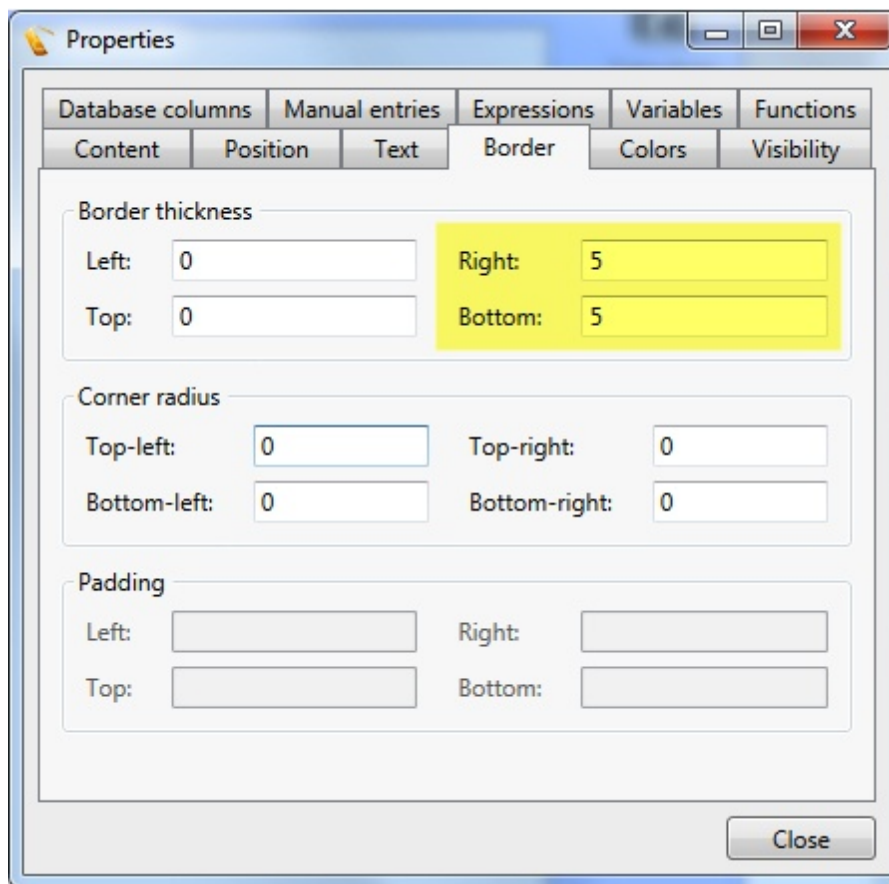


You can also enter this directly in the Border Thickness section of the Border tab. This is handy if you need to set specific values provided by your customer.

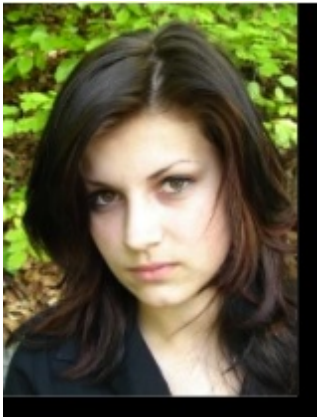
For example, we add a photo object on the Page Design and set the values for entering to pixels in the Options section of the [View](#) tab. This object looks like below:



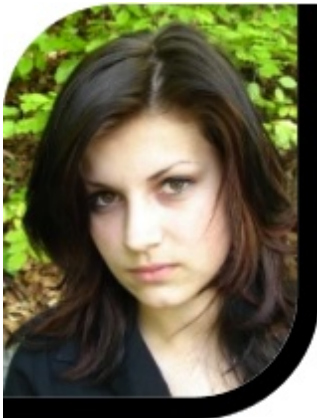
Now we set the Border Thickness to 5 pixels for the Right and Bottom:



Now the photo object will look as below

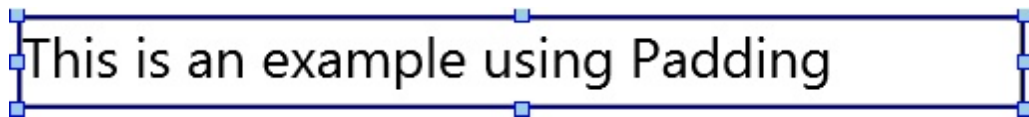


Now you get totally fancy by combining this with the Corner Radius. For example, we set the Corner Radius for the Top-Left and the Bottom-Right to 25 pixels and see the result below:



This can be done with all existing objects available with CardExchange®. It even can become more advanced if we are combining the objects borders with colors and backgrounds. More about this in the [Colors](#) section of this Help file.

Last but not least, when using Text Objects you can use padding. Padding is the space inside the object and is therefore not the same as Margin as that is the space outside of the object.

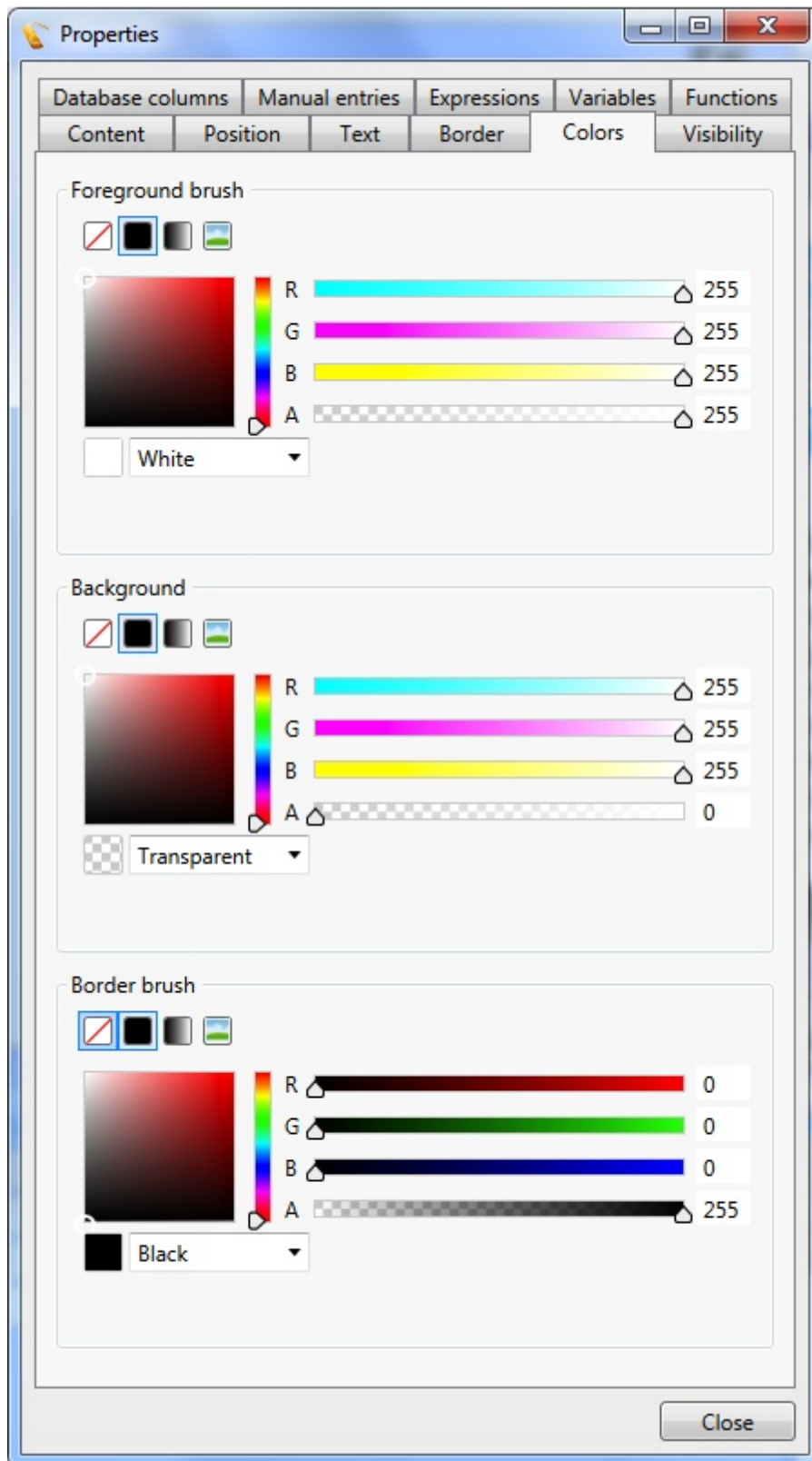


Text Object without Padding



Text Object with Left and Top Padding

6.10.5 Colors



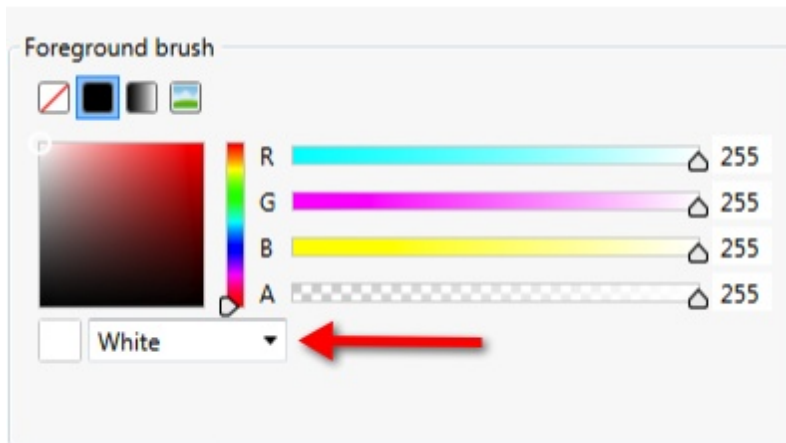
Depending on the object used on the [Page](#) design, different color options are available divided in three different groups:

- **Foreground brush** - sets the foreground color of the object
- **Background** - sets the background color for the object
- **Border brush** - sets the border color for the object

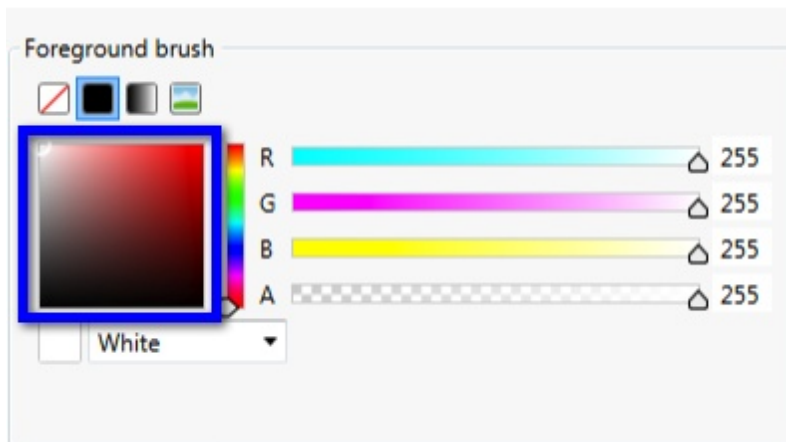
Each group offers four different style options:

-  **Transparent**
-  **Solid color**
-  **Gradient**
-  **Image**

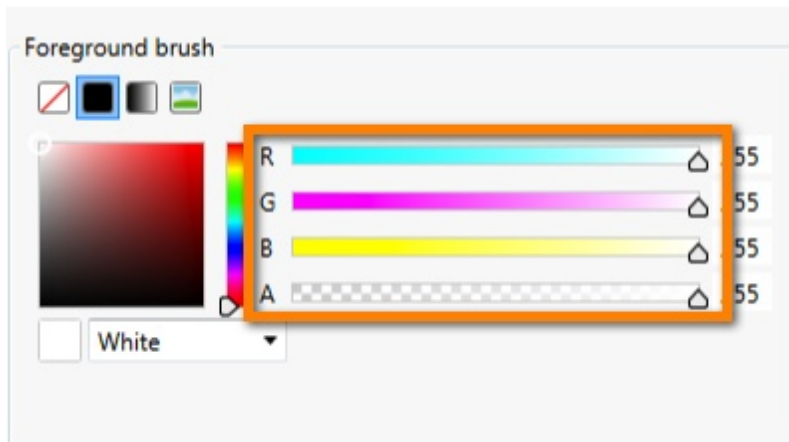
Colors can be selected directly from the drop down menu as indicated with the **red arrow**:



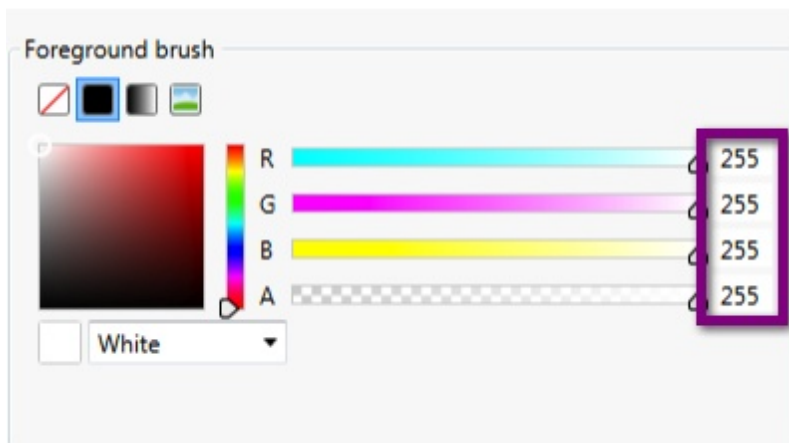
Picked from the color selection area as indicated with the blue rectangle:



Created by moving the color sliders to the preferred position as indicated with the orange rectangle:



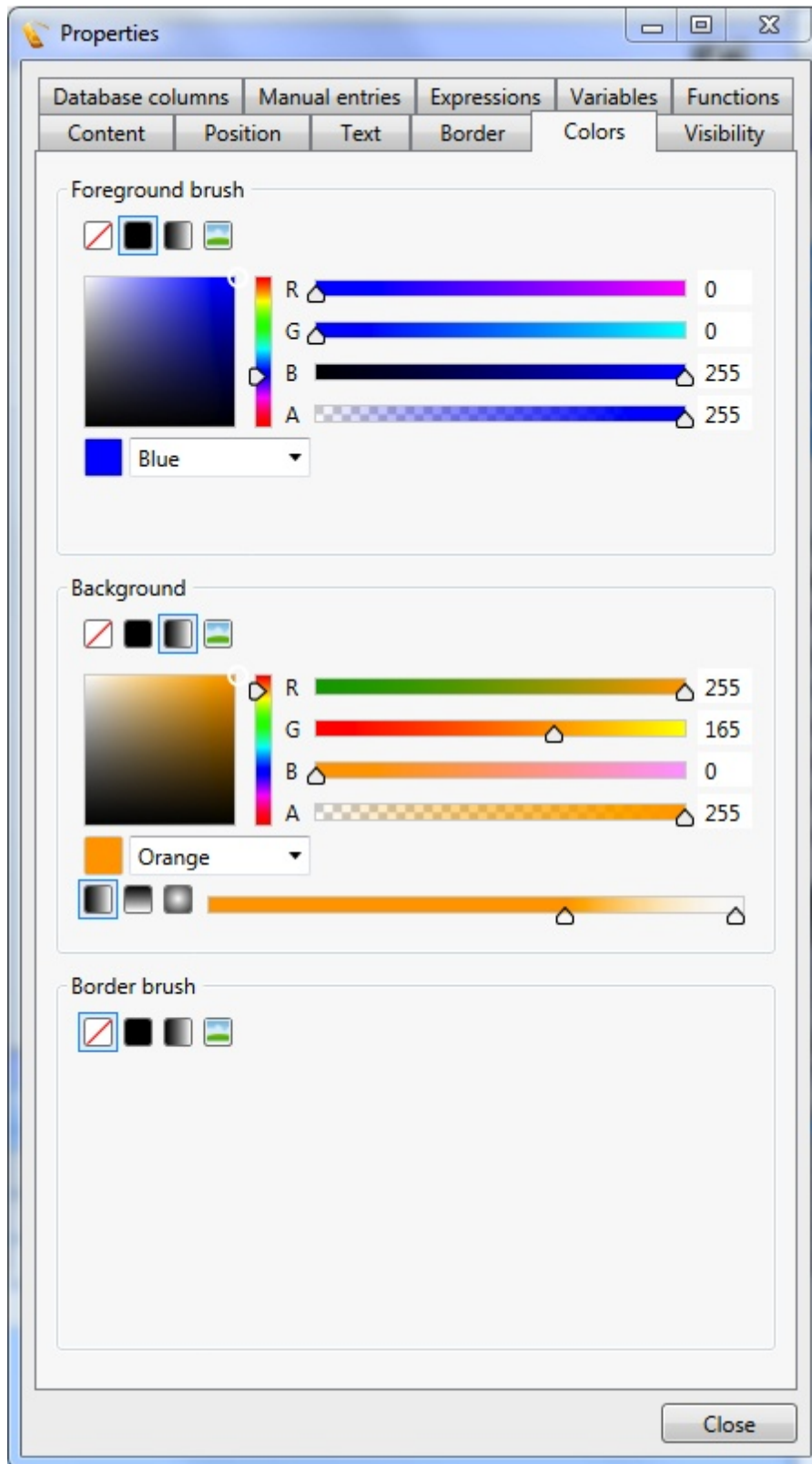
Or directly entered into the text boxes right from the color sliders as indicated with the purple rectangle:



There are so many possibilities to combine that it is impossible to explain them all. We have created a couple of examples which are explained in the sub sections of this Color subject.

6.10.5.1 Text Object Example

For this example we added a text object to the Page design and set the colors as shown below:

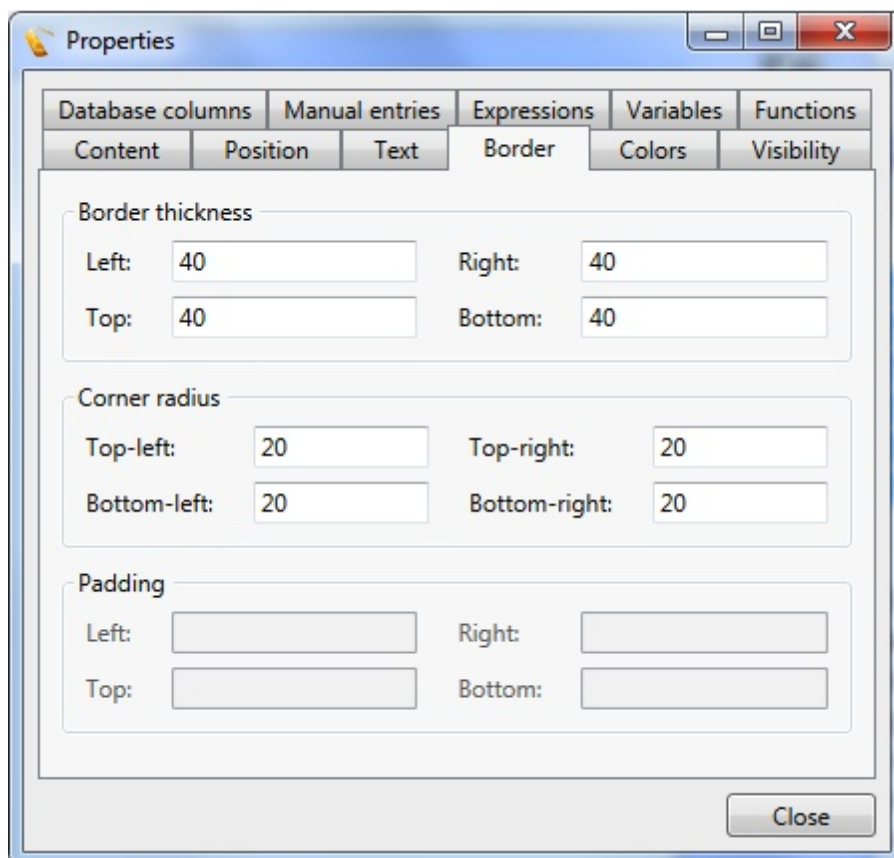


The foreground color is set to blue and for the background color we used orange with a gradient style which creates the result below:

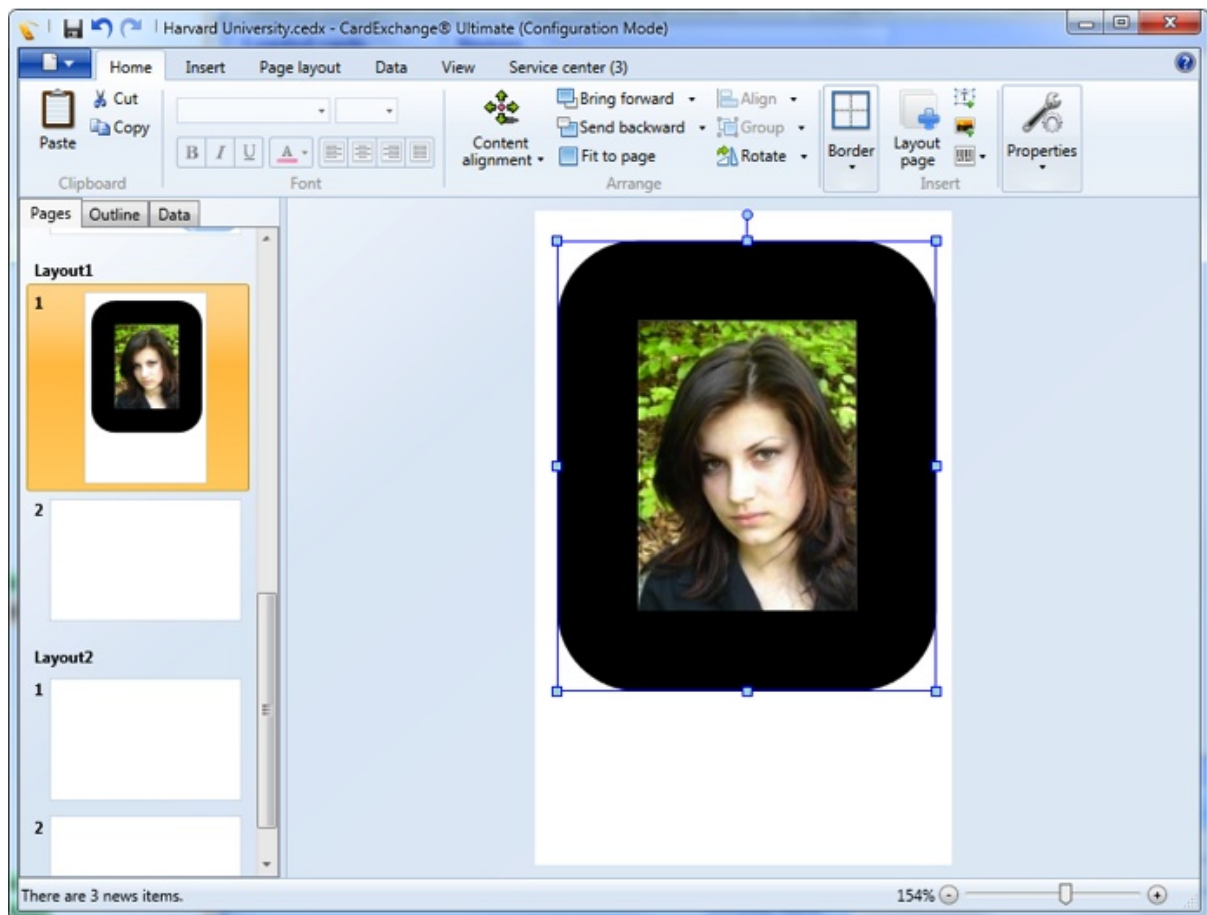
Using Color with an Text object...

6.10.5.2 Image Object Example

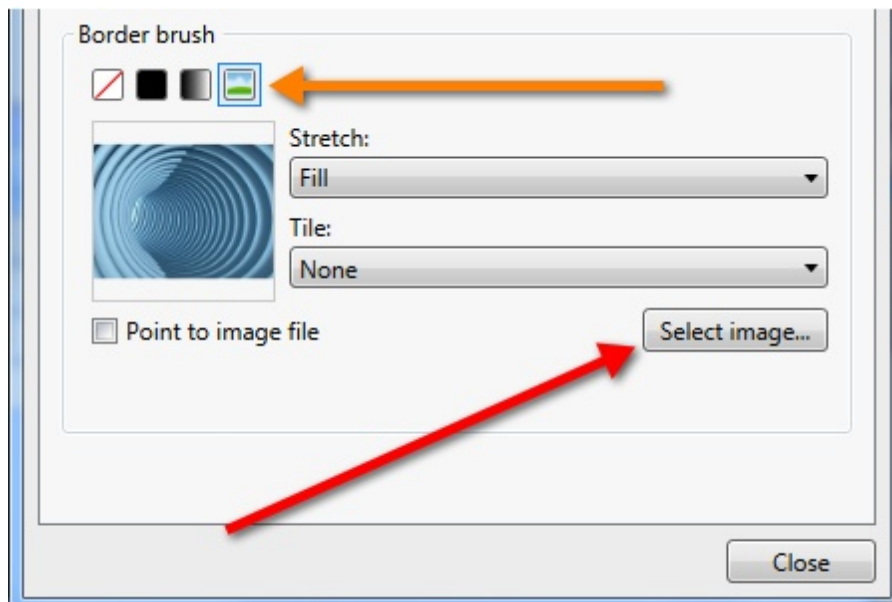
For this **Image Object** example we added a **Image** of a photo to the [Page](#) design and created a border via the [Border](#) tab. We have set the system to use pixels and we have the set the properties as following:



Now the **Image object** on the [Page](#) design looks like below:

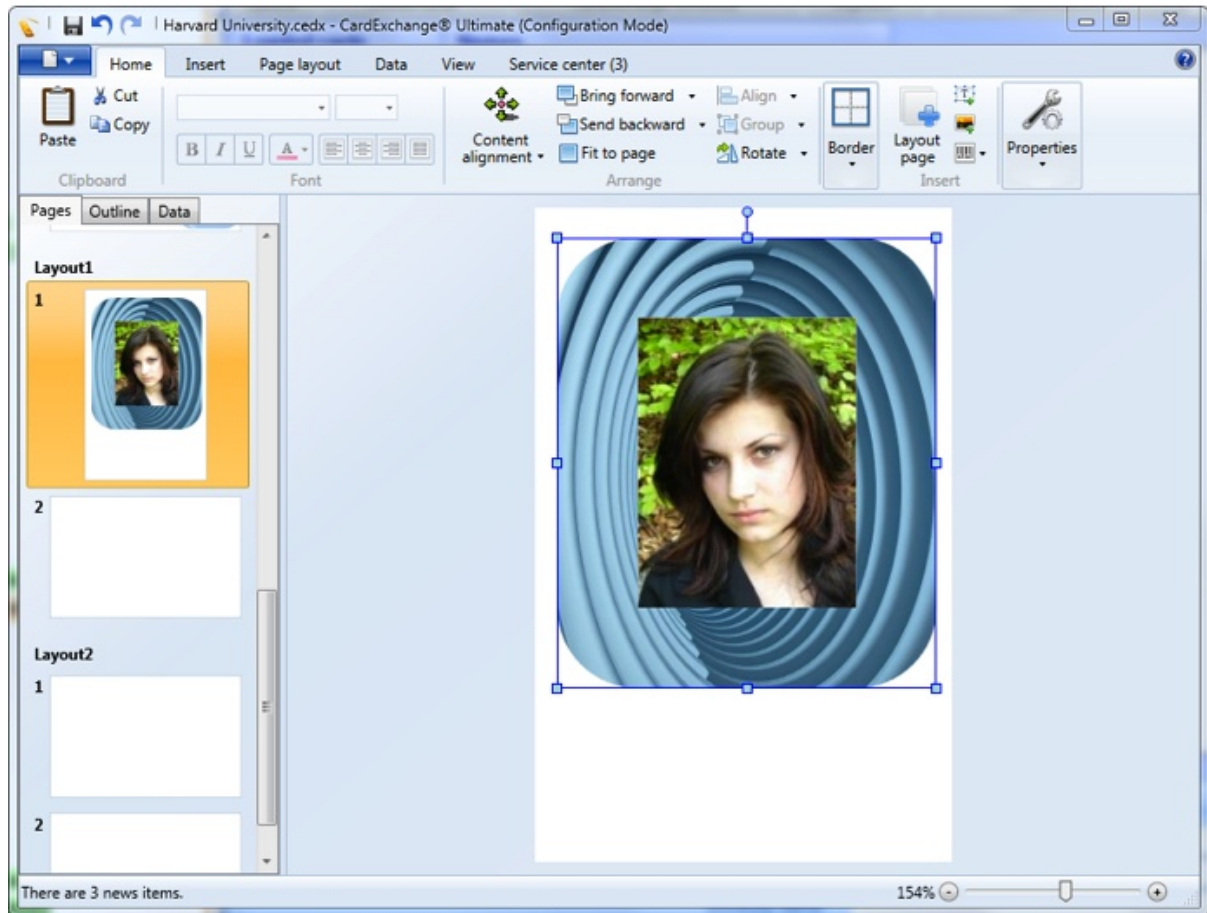


What we will do now is replace the **Solid Color Border** with an Image that we will load.

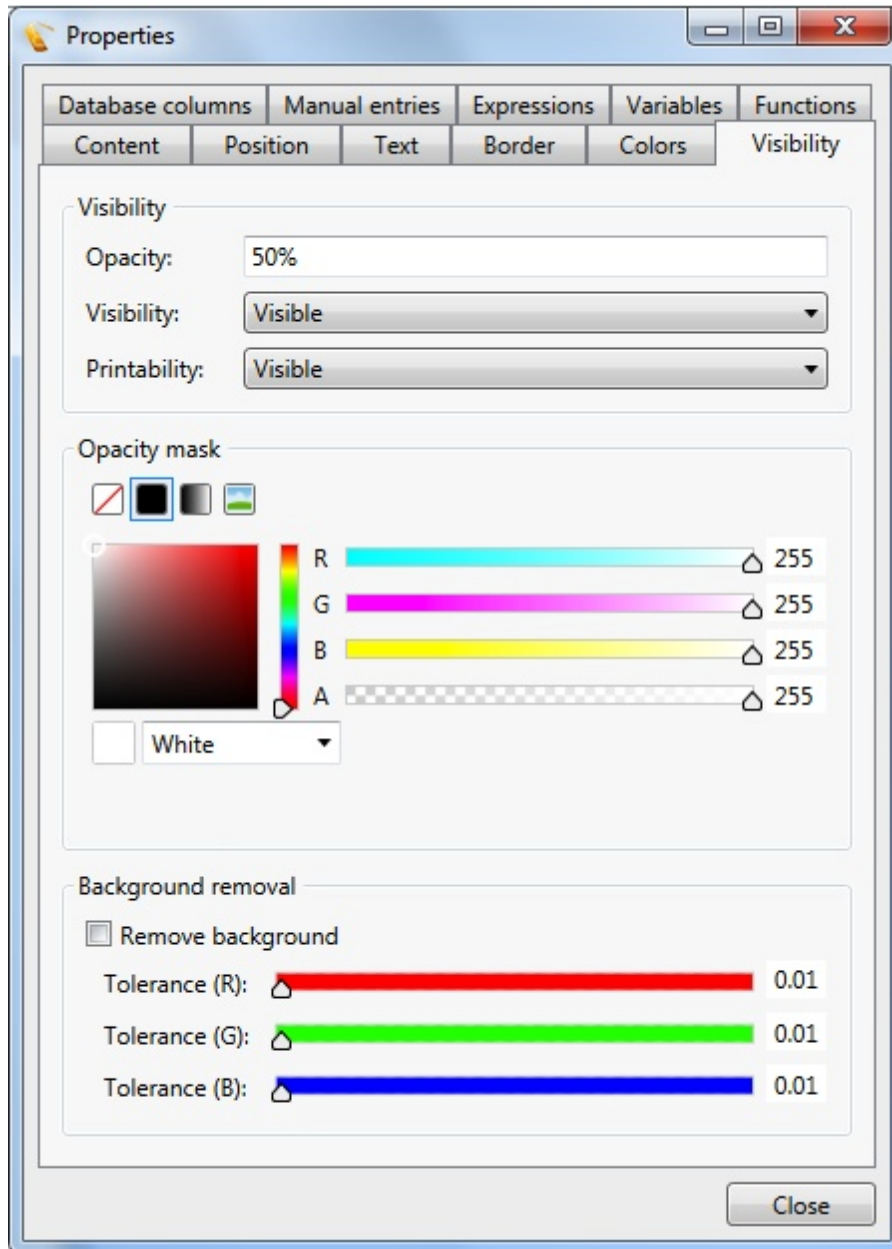


In the **Border brush** group we select the Image style as indicated with the **orange**

arrow and we select an image by clicking on the **Select image...** button as indicated with the **red arrow**. When the image is loaded, the **Page** design will show the following result:



6.10.6 Visibility

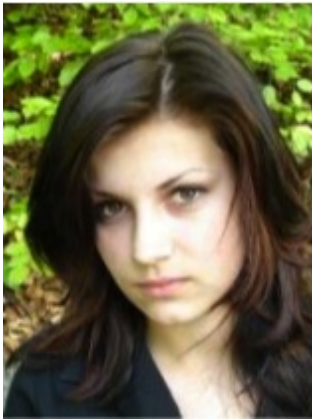


The Visibility tab contains three separate group sections:

- Visibility
- Opacity mask
- Background removal

Visibility

In the visibility group you can set the opacity of the image on the Page design. This can be used to create ghosting images. For example, as shown in the screenshot, see the differences in the images shown below:

**No Opacity****Opacity 50%**

Besides setting the opacity for the image, you can also select the visibility of the image as well the printability. Each drop down menu offers three selections:

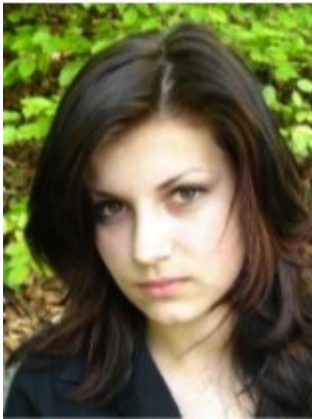
- Visible
- Hidden
- Collapsed

Opacity Mask

With the Opacity mask you can do some great and advanced stuff. For example, we have created an opacity mask using the gradient tool and the background color orange.



Now take a look at the photo images below. On the left you have the original and on the right the photo with the opacity mask.

**No Opacity****Using Opacity Mask**

But you can also load images or use solid colors.

Background Removal

CardExchange® offers advanced background removal. Use the sliders to define the correct removal. You can also enter the values directly into the text boxes right from each color slider. For example, we removed the background based on the slider configuration below.

Background removal

Remove background

Tolerance (R):  0.10

Tolerance (G):  0.10

Tolerance (B):  0.12

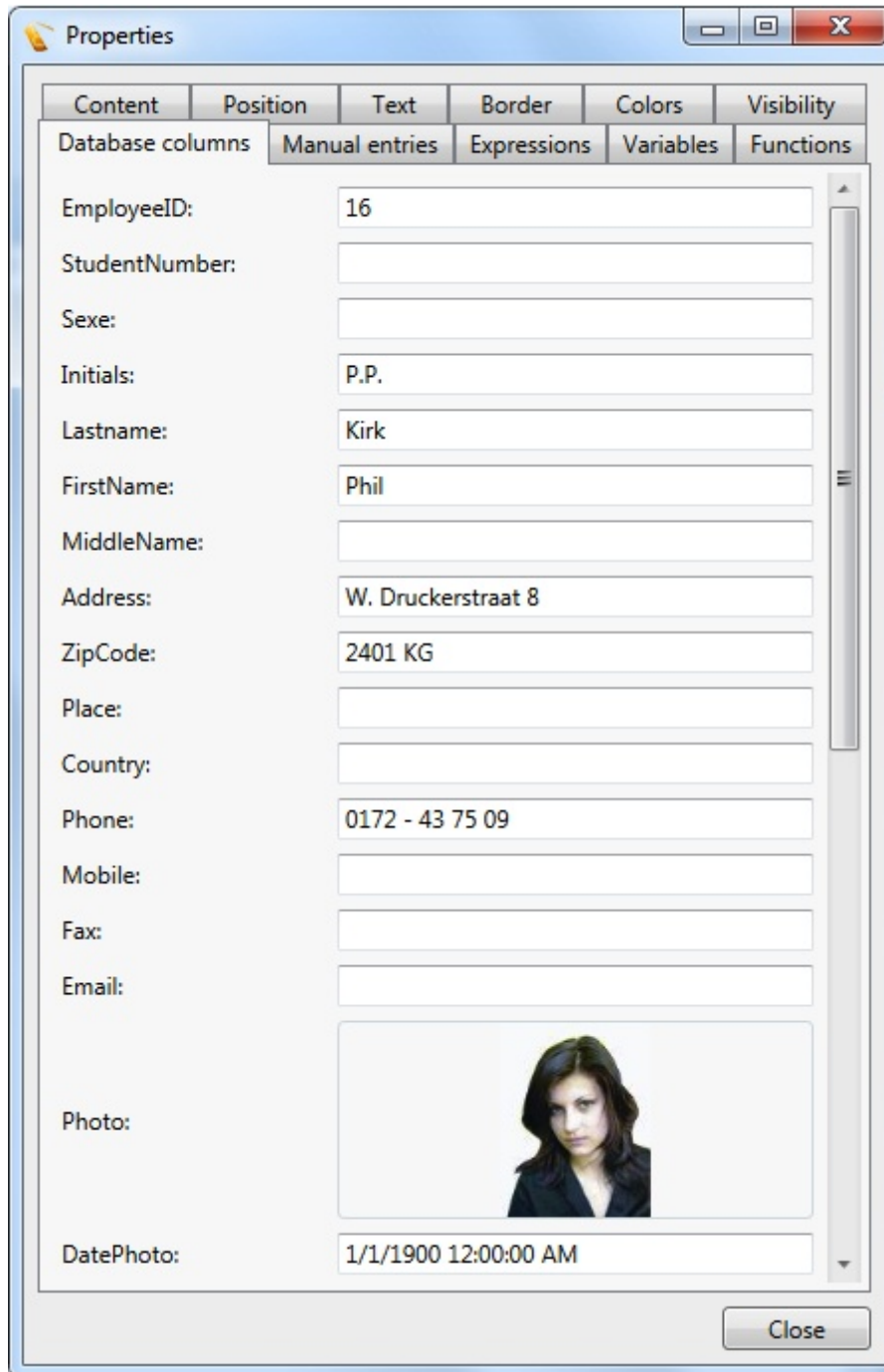
Now take a look at the photo images below. On the left you have the original and on the right the photo with the background removed.

**No Removal****Background Removed**


It is important to realize that the result of the background removal depends on the quality

of the image and the used background. Always try to use real blue or green backgrounds when taking photos as this offers the best removal result.

6.10.7 Database Columns

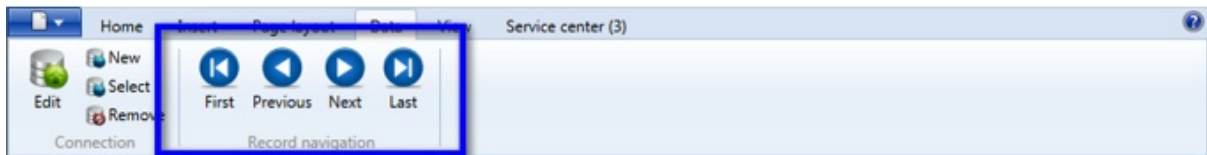


The screenshot shows a 'Properties' window with a tabbed interface. The 'Database columns' tab is selected, displaying a list of database fields with their corresponding values. The fields and values are as follows:

Field Name	Value
EmployeeID:	16
StudentNumber:	
Sexe:	
Initials:	P.P.
Lastname:	Kirk
FirstName:	Phil
MiddleName:	
Address:	W. Druckerstraat 8
ZipCode:	2401 KG
Place:	
Country:	
Phone:	0172 - 43 75 09
Mobile:	
Fax:	
Email:	
Photo:	
DatePhoto:	1/1/1900 12:00:00 AM

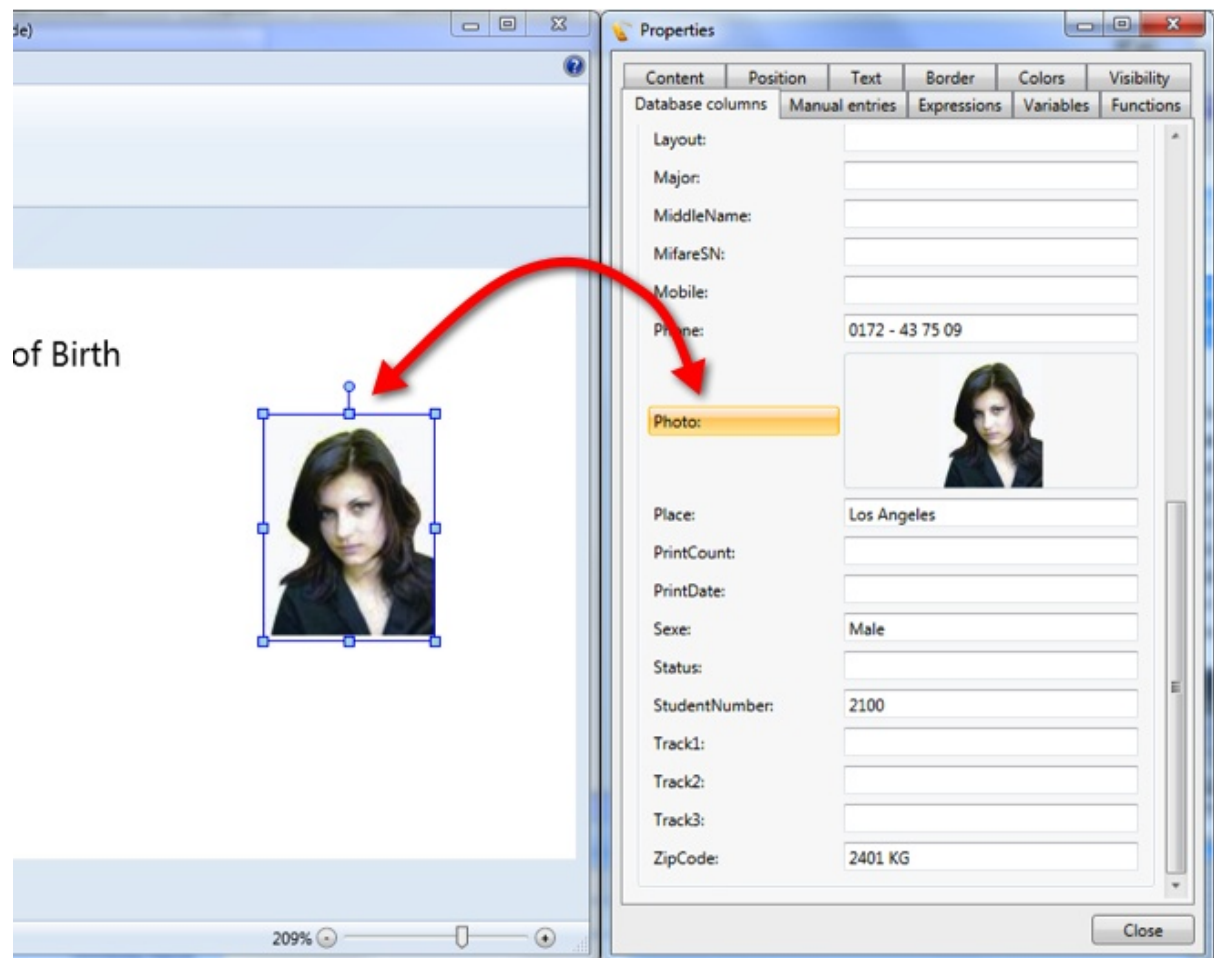
A 'Close' button is located at the bottom right of the window.

When you are connected to a **Database**, all the available database columns become available in the **Database columns** tab of the [Properties](#) window. See our [Database](#) section of this Help file for more information about connecting to and using Databases.

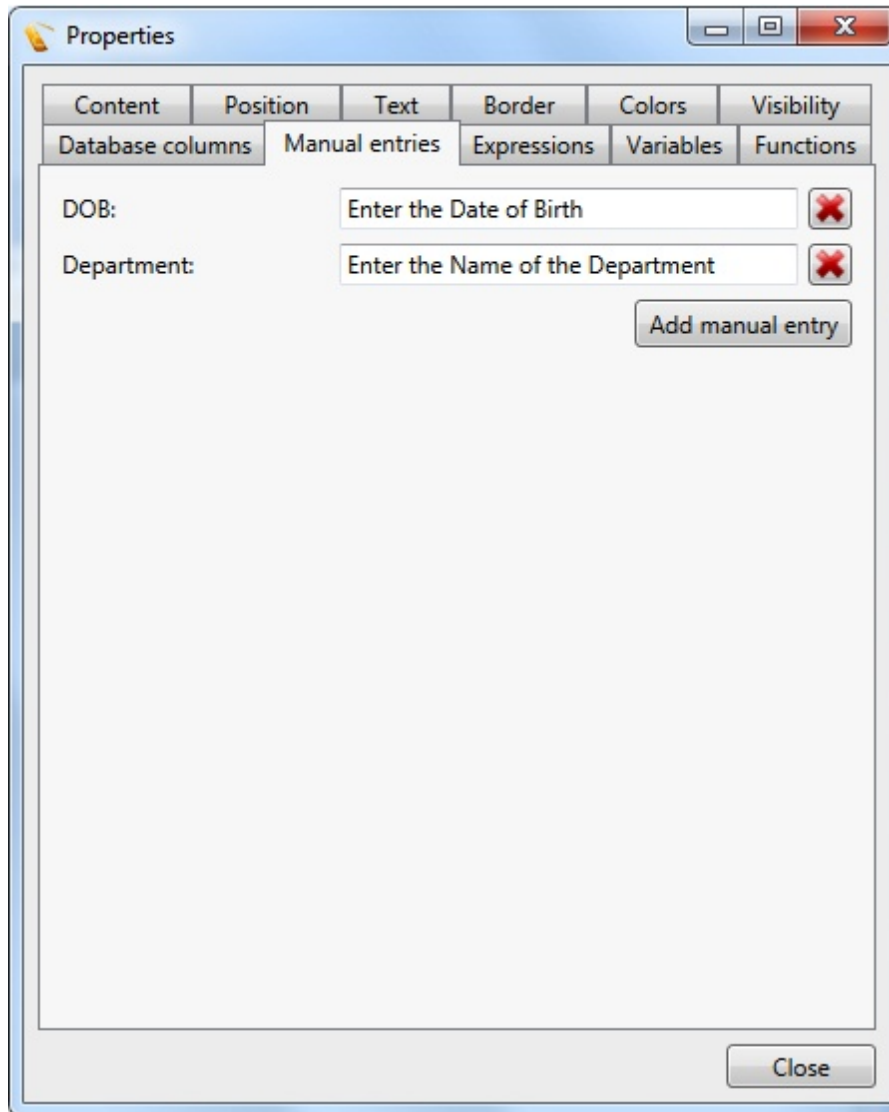


Via the **Record navigation** section in the [Data](#) tab, you can easily navigate between the different available records and the selected record will be shown in the Database columns tab.

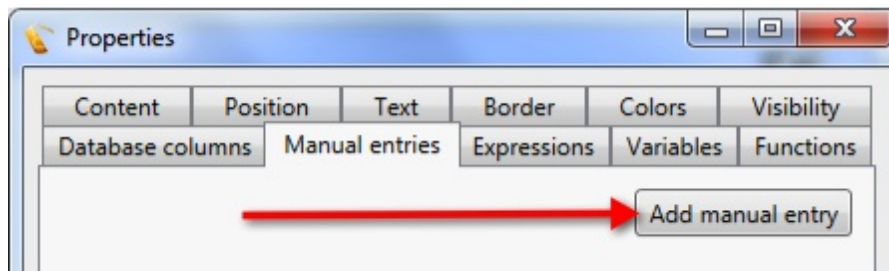
Just like with the [Manual entries](#), these database columns can be directly drag and dropped to the Page design via the Data tab of the Explorer menu as explained in the [Add Database](#) section of this Help file.



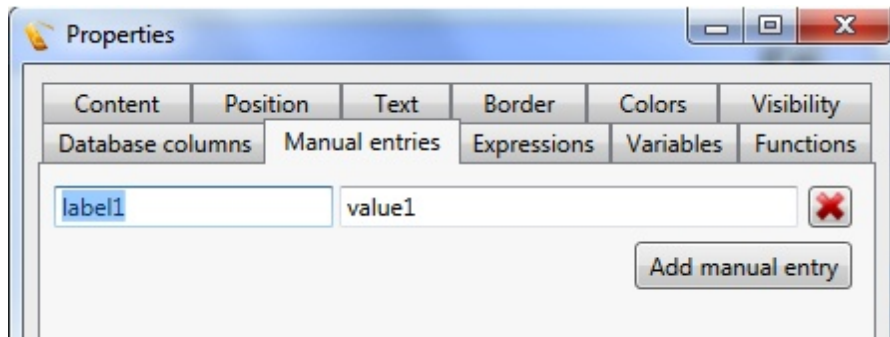
6.10.8 Manual Entries



The [Manually Entry Window](#) gives you the possibility to enter data that should appear on the card without the intervention of a database. To be able to manual enter data, you first have to define Manual Entries. To add a manual entry, select the Manual entries tab of the Properties window.



And click the **Add manual entry** button indicated with the **red** arrow.



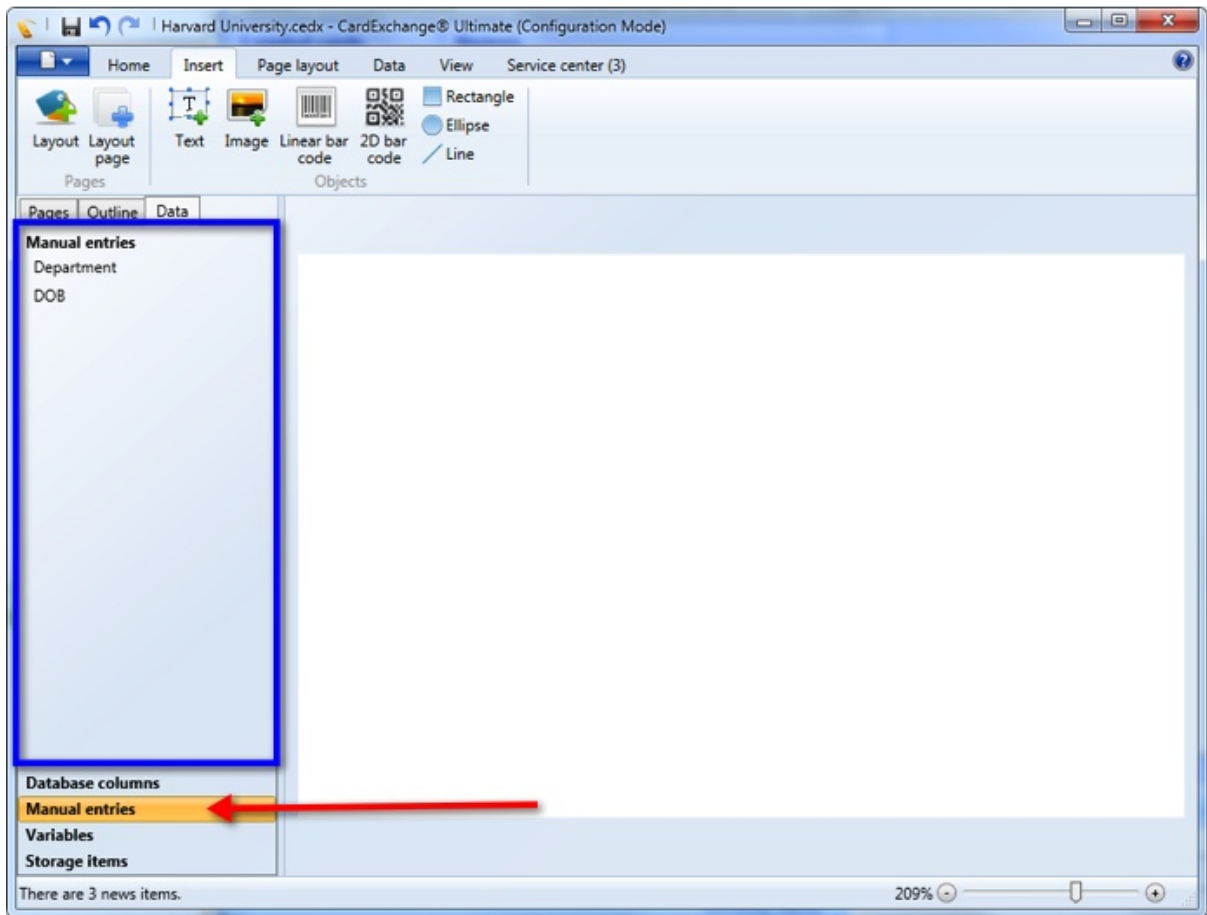
When the Entry is added, you start with entering a name for the label, indicated with **label1**. For example, DOB (Date of Birth). Next you enter a value or an informing text in the value1 field. This can be, for example, **Enter the Date of Birth** or but you can also put a value like **100** if you are using the entry to always store the same value.



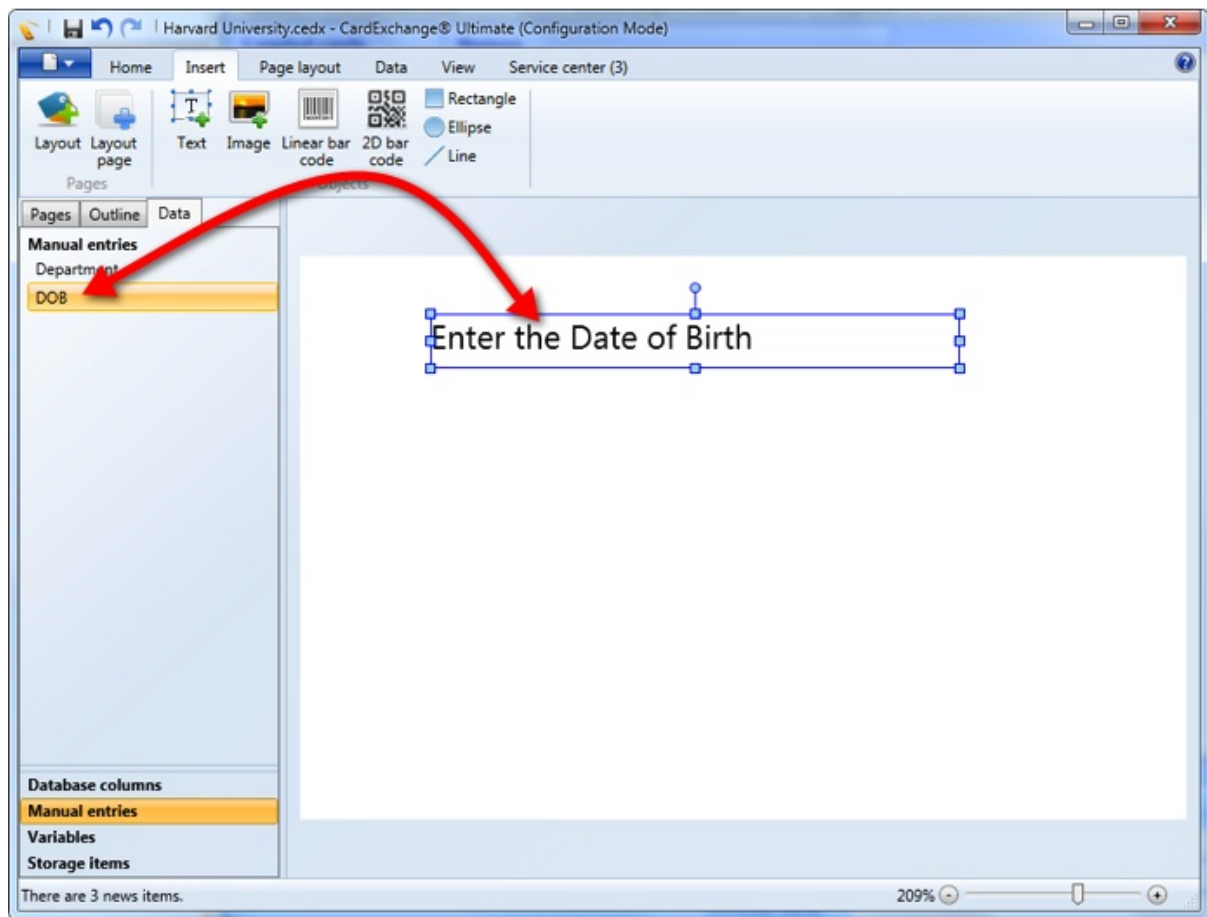
The label of the manual entry reflects the label of the [Manually Entry Window](#) indicated with the **red arrow** and the value reflects the text box indicated with the **black arrow**.

You can add unlimited **Manual entries** to your [Page](#) design.

Now when you are done adding your Manual entries, they will become available for adding them to your [Page](#) design in the [Data](#) tab of the [Explorer](#) menu.

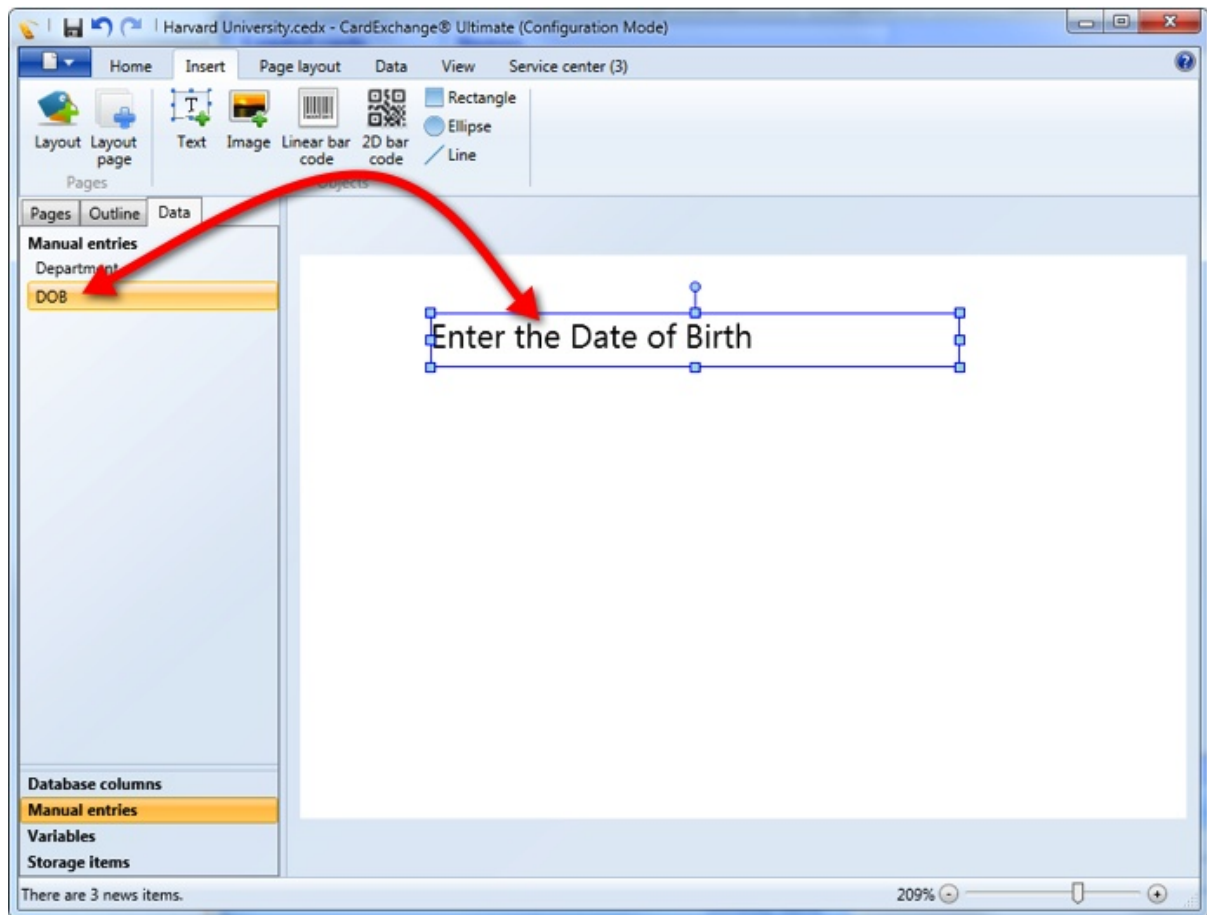


When you select the [Data](#) tab of the [Explorer](#) menu, you will see the Manual entries tab as indicated with the red arrow. When you select this tab, the added Manual entries become available as shown in the blue rectangle. Now you can simply drag and drop them to your [Page](#) design.

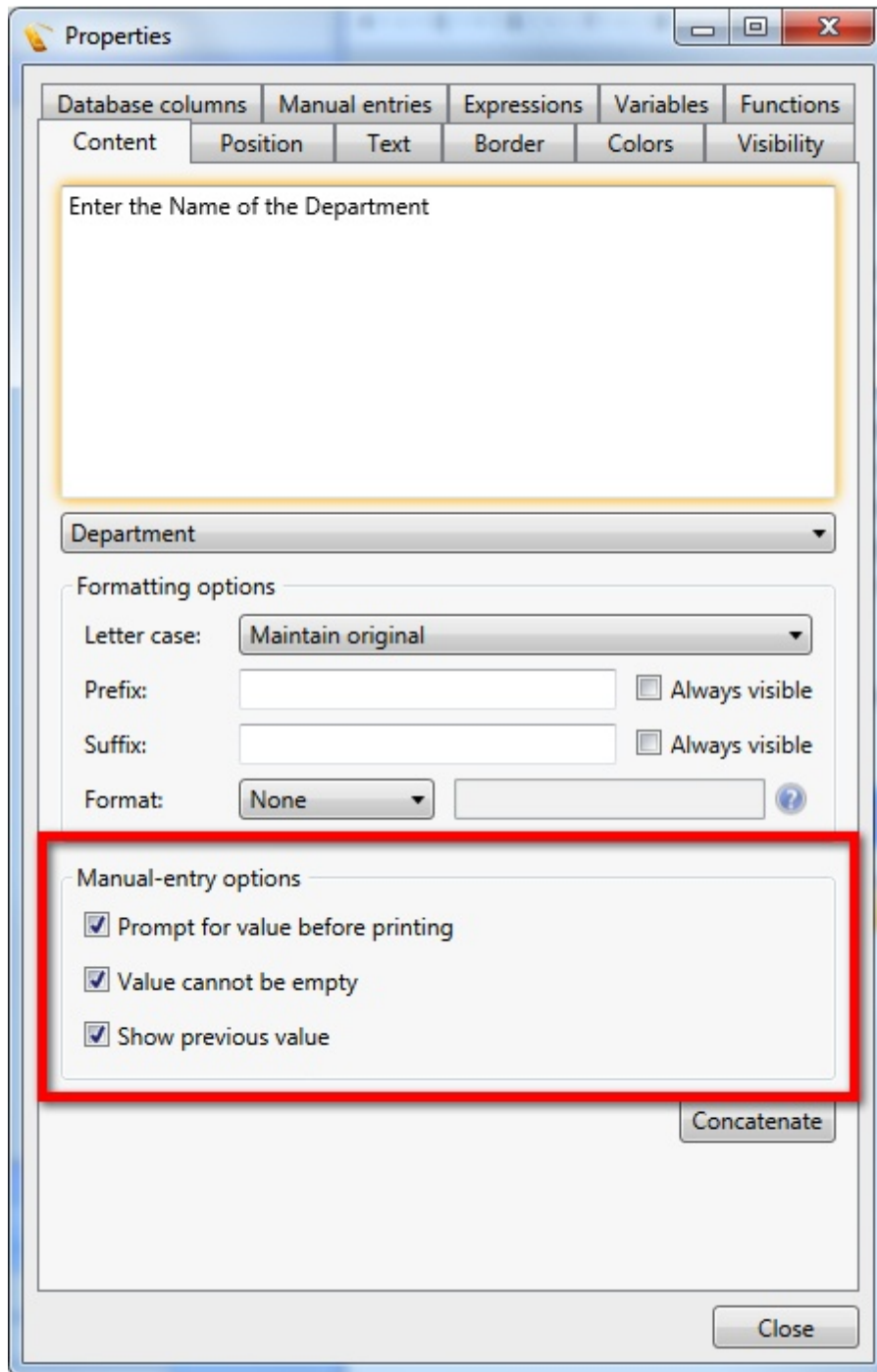


This can also be done from the **Manual entries** tab in the [Properties](#) window.

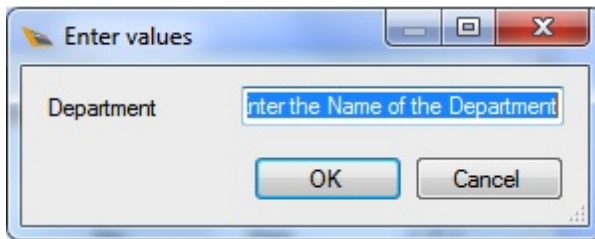
6.10.8.1 Options



When you added a Manual Entry to your Page design, specific properties become available in the [Content](#) tab of the [Properties](#) window.

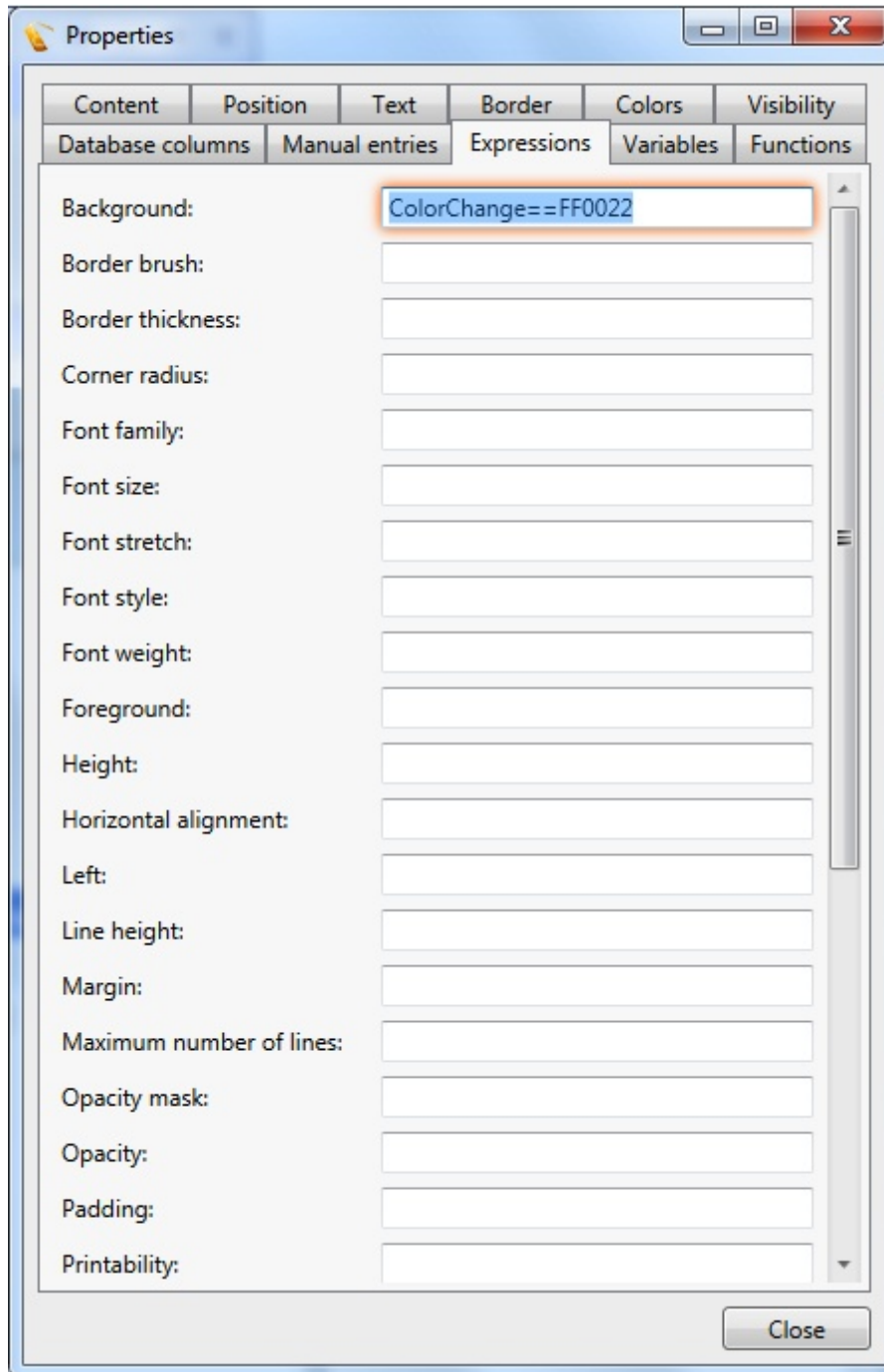


In the [Content](#) tab you now see a group named **Manual Entry Options**. Here you can set the options **Prompt value before printing** which will prompt the dialog below:



Besides prompting for a value, you can also indicate that a value needs to be entered by selecting **Value cannot be empty** and you can show the previous value by selecting **Show previous value**.

6.10.9 Expressions



IMPORTANT! Expressions are supported in our Ultimate edition only!

The **Expression** tab of the [Properties](#) window makes it possible to control any property of a **Page** object by means of a Python script, a **Database** column or a **Manual Entry**.

To control an object property with a script, select the object and enter the Python script

in the text box next to the property name. For example, select a text object on the card layout and enter the following script for the Background property of that text object (in this case the script is just a single variable name):

vColor

After pressing **Enter**, the designer will prompt for a default value for the script variable *vColor*. Here you can type, for example:

Red

After closing the pop-up window, the background of the text object will be **red**. The text box where the script was entered will show a red glow to indicate that this value is now controlled by a script. Changing the value of the script variable in the [Variables](#) tab of the [Properties](#) window, will make the background color of the text object change accordingly.

For any script defined in the **Expressions** tab, it is important that the result value can be converted to the correct data type. CardExchange® recognizes many text representations, like **Red** in the above example. Please, note that CardExchange® recognizes the standard color names as well as the HTML representation of a 32-bits ARGB color, for example:

#FFFF0000

Scripts can only contain a single line of code. For that reason, it will generally be necessary to define functions in order to get program more complex functionality. For the **Background** property, one can, for example, define the following function in the [Functions](#) tab (For more information about [Functions](#), please see the [Functions](#) section in this Help file).

```
def IsValid(s):  
    if s == 'OK':  
        return 'Transparent'  
    else:  
        return 'Red'
```

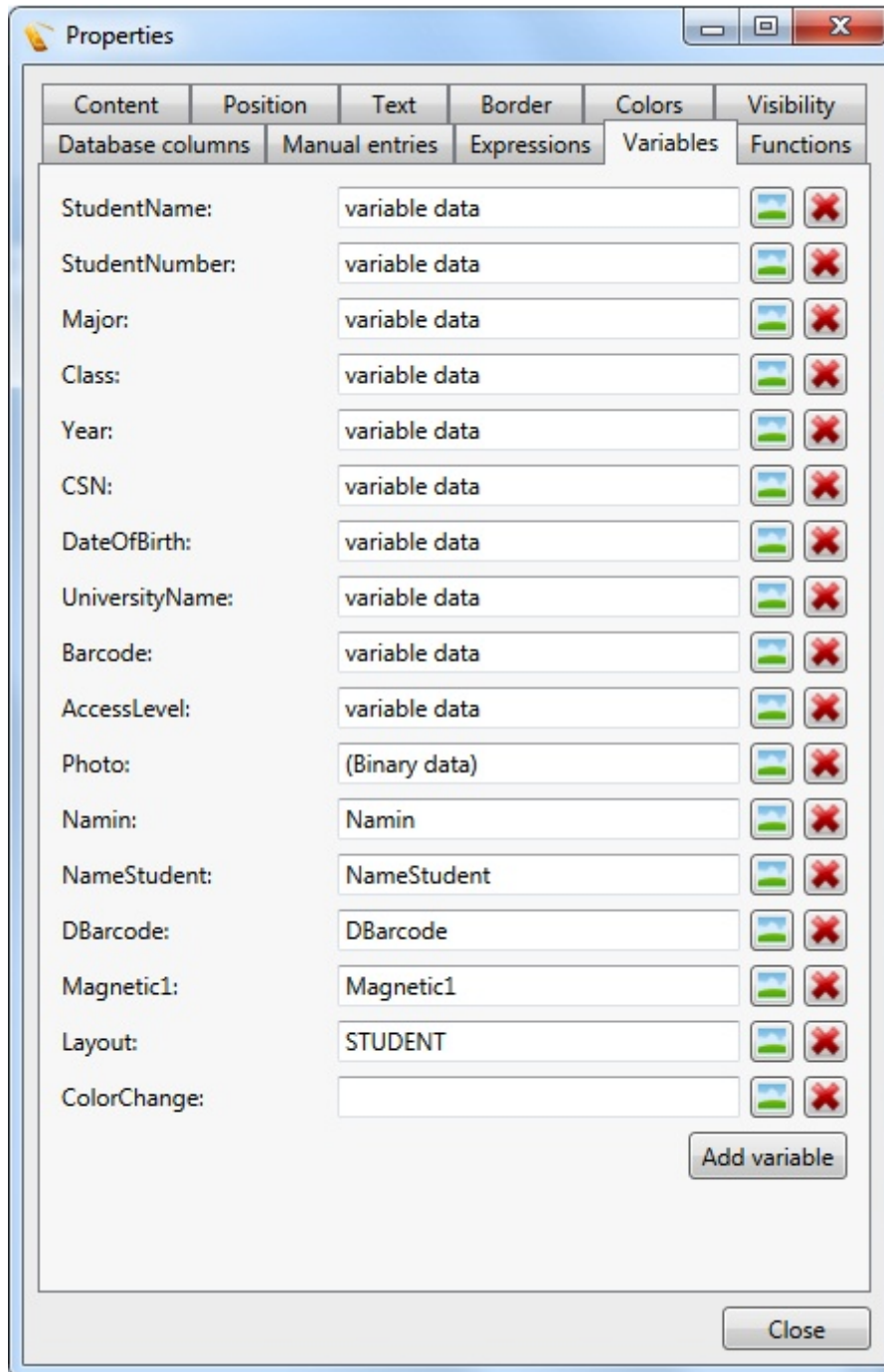
With this function, the script for the Background property can look like

IsValid(vStatus)

If the variable **vStatus** has the value **'OK'**, the background of the text object will be **transparent**, and **red** otherwise.

It is also possible to control the **value** of a **property** directly by a **database column** or **manual entry**, without the intervention of a **script**. This can be achieved by dragging and dropping a **database column** or **manual entry** from the [Data](#) tab of the main window and drop it on the text box in the **Expressions** tab. Database-column mappings are characterized by a **green** glow and Manual Entries by a **yellow** glow.

6.10.10 Variables



IMPORTANT! Variables are supported in our Ultimate edition only!

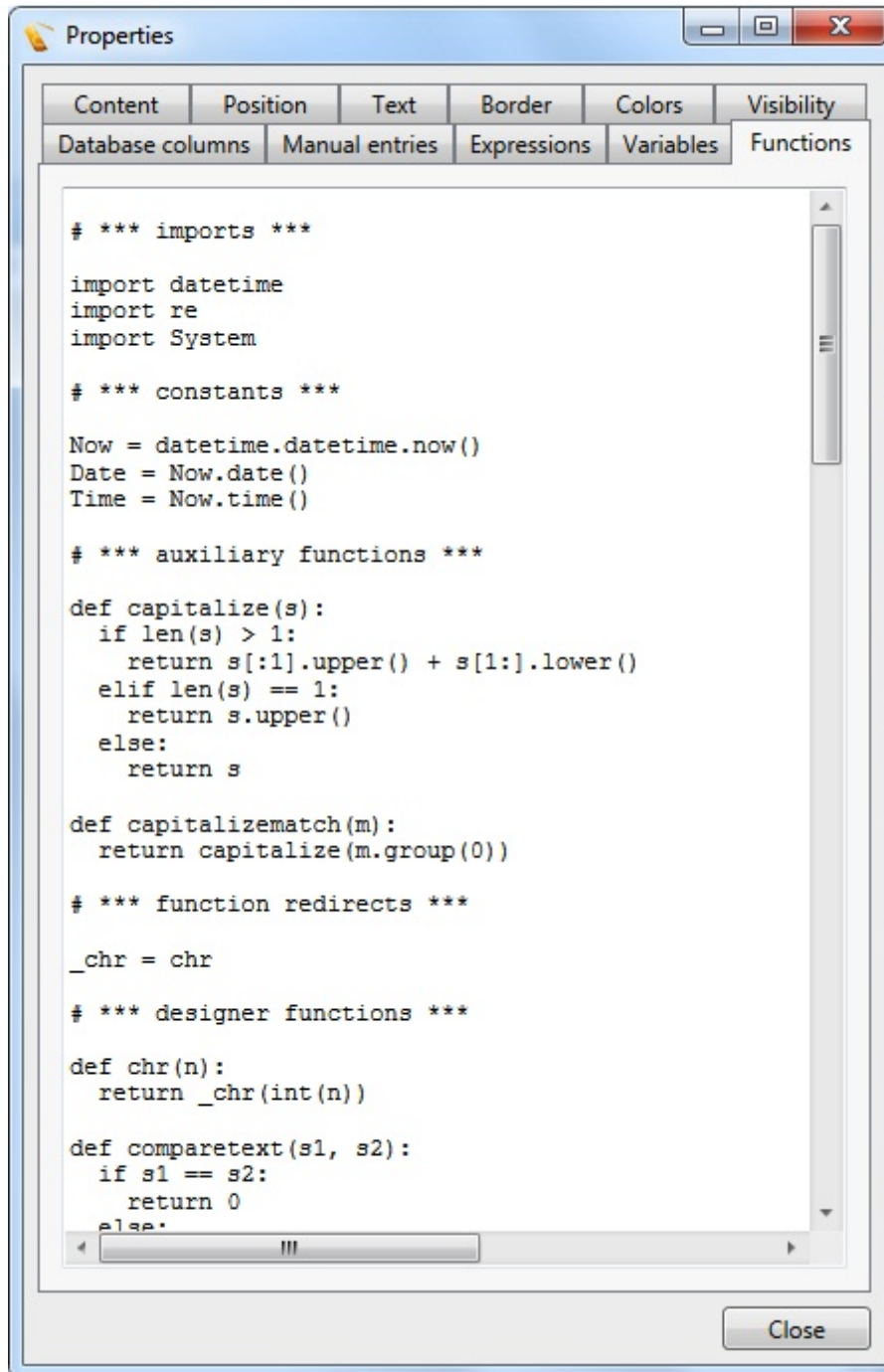
Whenever a script is typed in the CardExchange® designer, the **variables** used in that script are automatically added to the **template**. With the **Variables** tab it is possible to see all variables that have currently been defined and manage their properties. The following actions are possible:

- **Rename** a variable by clicking on its name and typing a new name.
- **Change** variable's value by typing in the text box next to its name.
- **Set** the variable's value to an image by clicking on its image button and selecting an image.
- **Remove** a variable by clicking on its remove button.
- **Add** a new variable by clicking on the Add-variable button.
- **Connect** a variable to a database column by dragging the column from the Data tab and dropping it in the text box
- **Connect** a variable to a manual entry by dragging the column from the Data tab and dropping it in the text box
- **Create** a text object on the card layout content is mapped to the variable by dragging the variable name from the Variables tab and dropping it on the card layout.

Please, note that any variable that has not been connected to variable data in the designer will be available in the Advanced Mappings window in the configuration section of the main interface. This provides a way to use the advanced data mappings instead if the integrated mapping functionality in the designer.

Please visit the [Advanced Mappings](#) section of this Help file for more information.

6.10.11 Functions



IMPORTANT! Functions are supported in our Ultimate edition only!

In the **Functions** tab, it is possible to define global **variables**, **functions** and **references** that can be used in **Python scripts**. By using well-defined functions, the scripts in the [Content](#) and [Expressions](#) tabs can be kept consistent. It would not be possible to use much of the power of **Python** in scripts, if you could not define functions.

A function definition should strictly follow the **Python** syntax as described in the **Python** documentation. An example of a function is:

```
def IsValid(s):
    if s == 'OK':
        return 'Transparent'
    else:
        return 'Red'
```

This function returns either **'Transparent'** or **'Red'** depending on the value of the input parameter **s**.

Global variables can be defined in the **Function** tab with a simple assignment statement. Once defined, they can be used in **functions** and **scripts**. For example, instead of the above function, we could make the following definition, with the global variable **warningColor**:

```
warningColor = 'Red'

def IsValid(s):
    if s == 'OK':
        return 'Transparent'
    else:
        return warningColor
```

Finally, the **Functions** tab can be used to reference **Python** modules, in order to use them in **functions** and **scripts**. The following example imports the **.NET Framework System** module and uses it to re-format a date string:

```
import System

def FormatDate(s):
    d = System.DateTime.Parse(s)
    return d.ToString('dd-MM-yyyy')
```

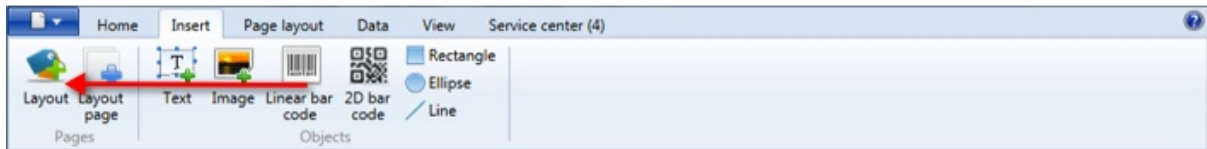
CardExchange® uses **IronPython** for executing scripts. **IronPython** is the **.NET Framework** implementation of the well-known **Python scripting language**. For extensive documentation on **IronPython**, please visit www.ironpython.org.

6.11 Layouts

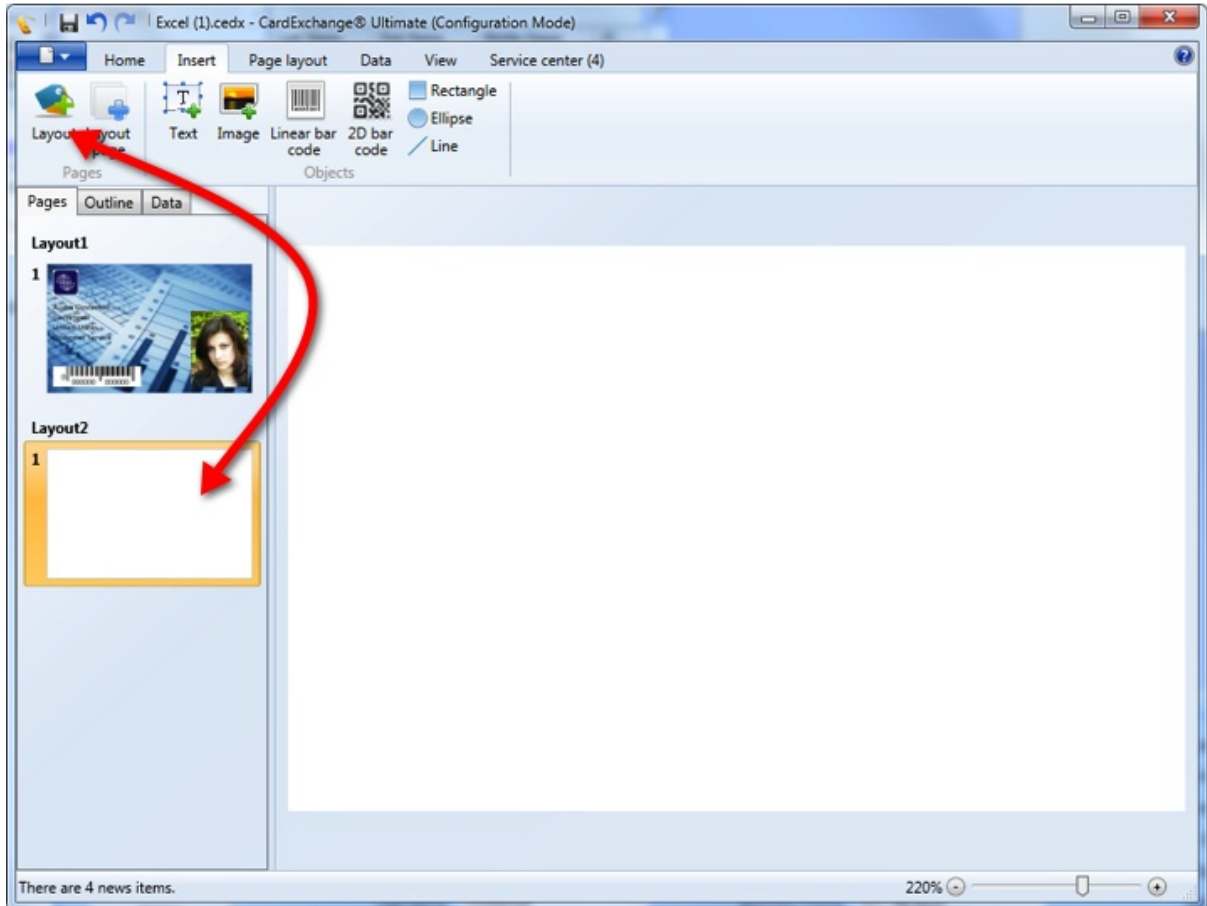
As explained in the [Templates](#) section of this Help file, Layouts can contain one or more Pages. If you are running a Designer, Entry, or Premium edition, only one layout is allowed. When running a Professional or Ultimate edition, you can use multiple layouts within your template.

Layouts are very powerful as they offer you the possibility to change based on information out of the connected database. Also each layout can have its own setting like for example, no magnetic encoding or magnetic encoding.

6.11.1 Adding Layout(s)



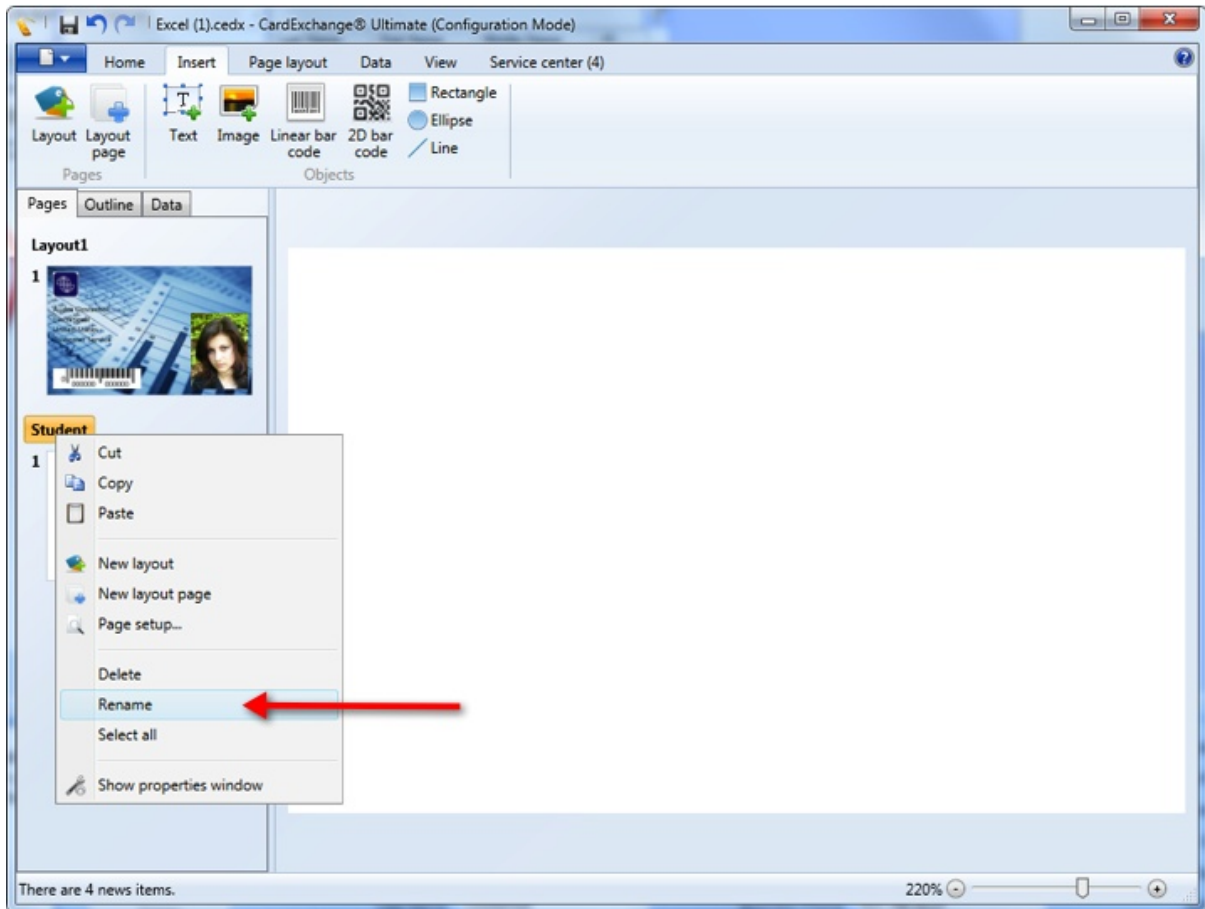
Adding a Layout is simple clicking on the Layout button and a new layout will be added.



When adding a layout, it always adds a layout based on the previous layout. So for example in the screen shot Layout2 contains only one page because Layout1 contains only one page. If Layout1 would had two pages, Layout2 would also have two pages.

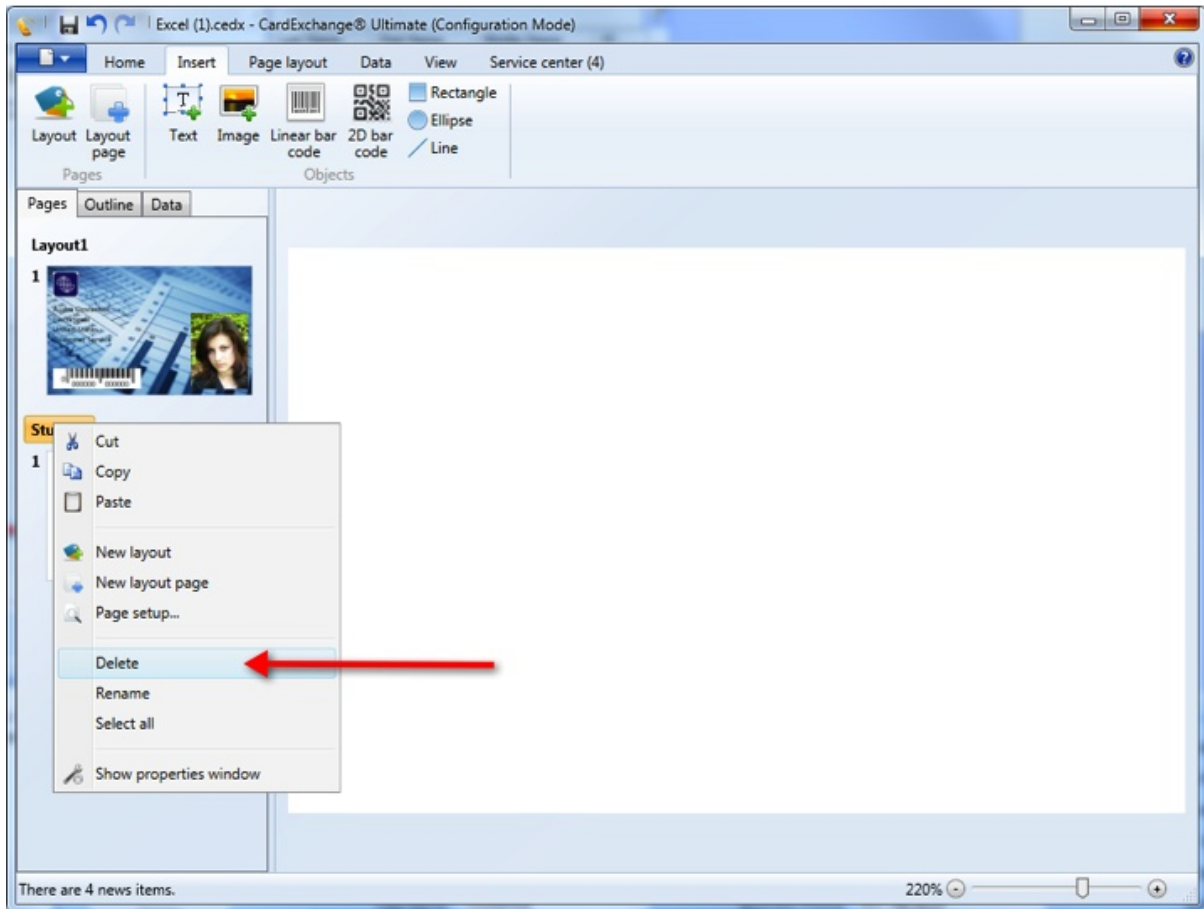
Each page can be setup via the [Page Setup](#) window as described in that section of this Help file.

6.11.2 Edit Layout(s)



For your own convenience it is possible and advisable to rename the Layout(s). When you right click on the Layout name a context menu will be show and you select Rename. You can also double click on the Layout name and change it.

6.11.3 Delete Layout(s)



You can easily delete a Layout from your template by selecting the Layout and press Delete on your keyboard. By selecting the Layout and right click on the mouse, in the presented context menu you choose Delete.

You can always undo your deleting by pressing Ctrl+Z or the Undo button in the [Quick Access Toolbar](#).

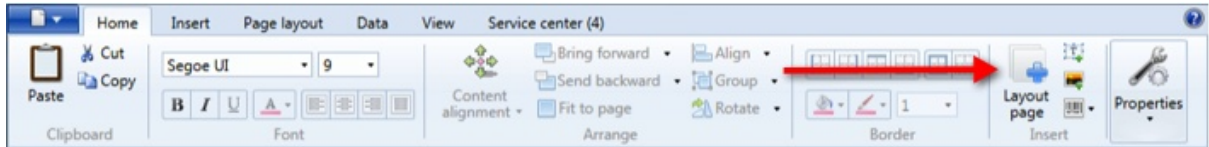
6.12 Page(s)

Every Layout can basically have unlimited Pages. A Layout can have for example a Front-side Page, a Back-side Page, a Front-side UV Page, etc.

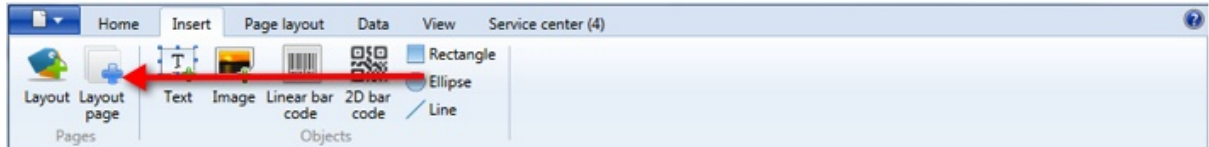
Each Page can be set to Portrait or Landscape and of course can have it's own unique objects.

In this section of the Help file we will explain how to Add pages to your layout and how to Delete them.

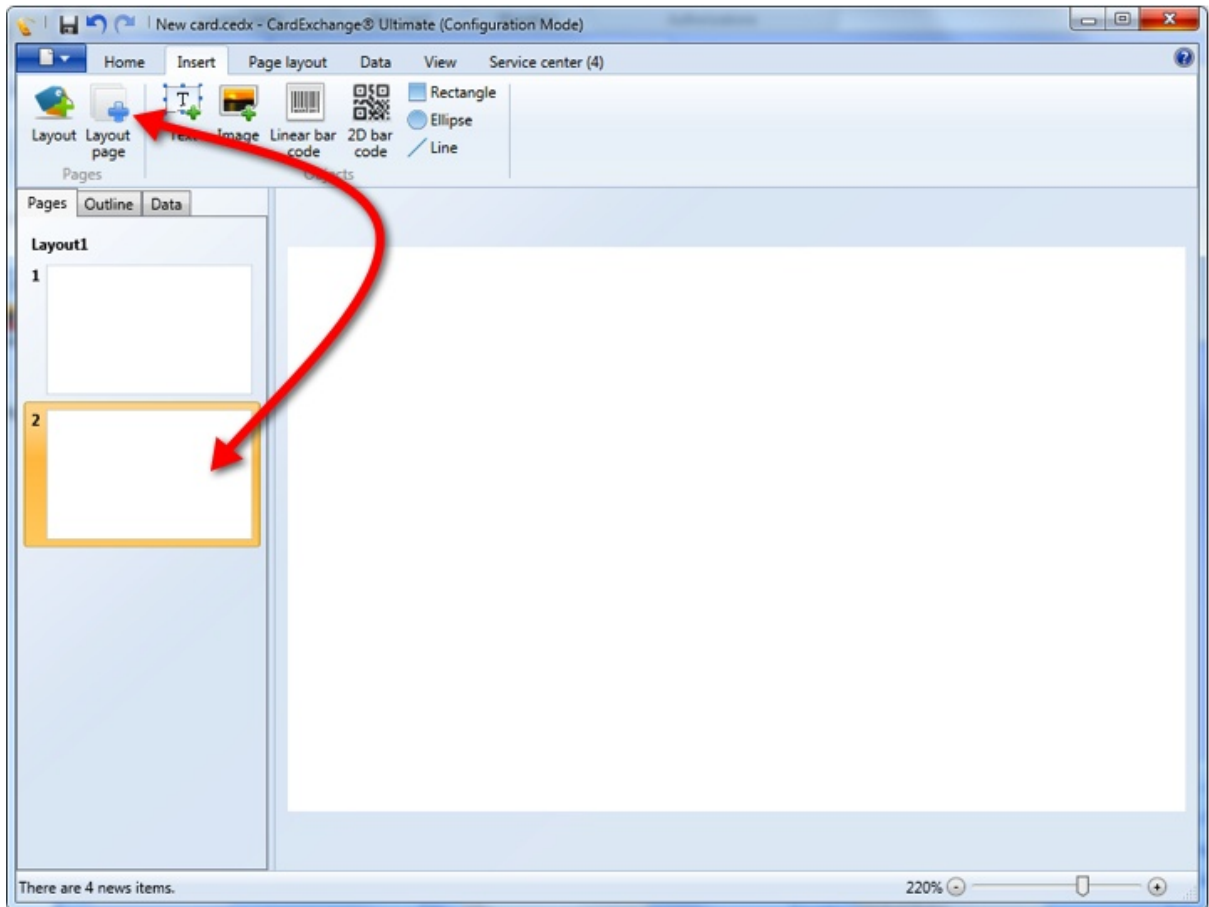
6.12.1 Adding Page(s)



When you have selected your layout, you can add a page by clicking on the Layout Page button in the Home tab.



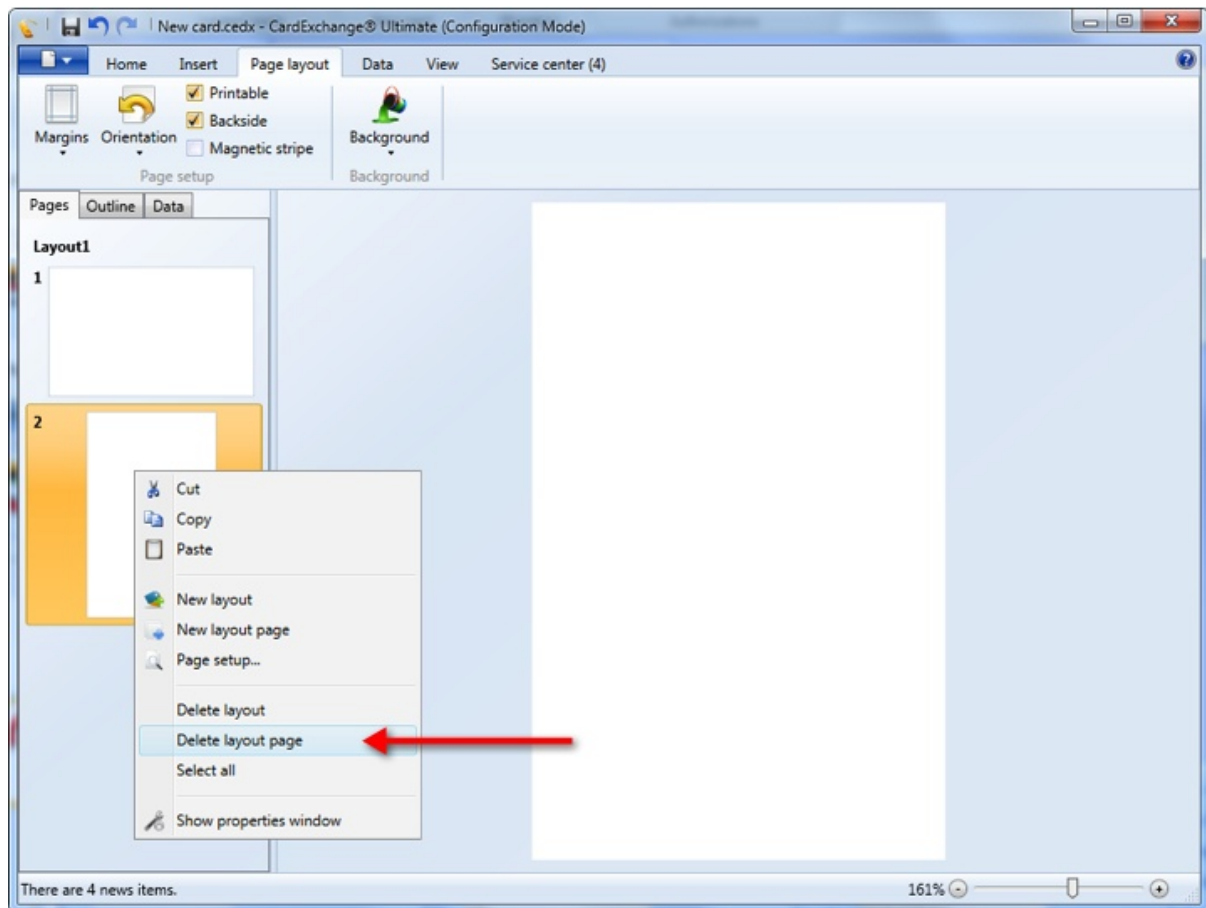
You can also add a Page via the Layout page button in the Insert tab.



Click on Layout page to add the page as shown in the screen shot.

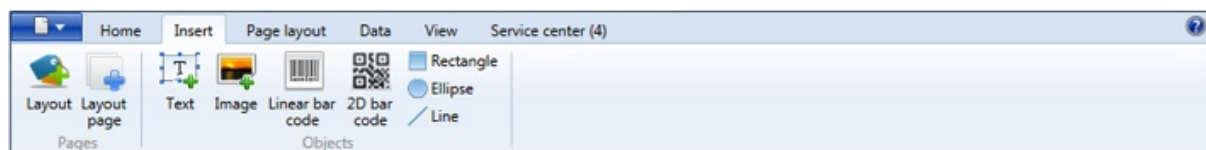
Each page can be setup via the [Page Setup](#) window as described in that section of this Help file.

6.12.2 Delete Page(s)



You can delete a page by selecting it and click on Delete on your keyboard or via the right mouse click content menu, selecting Delete layout page.

6.13 Objects

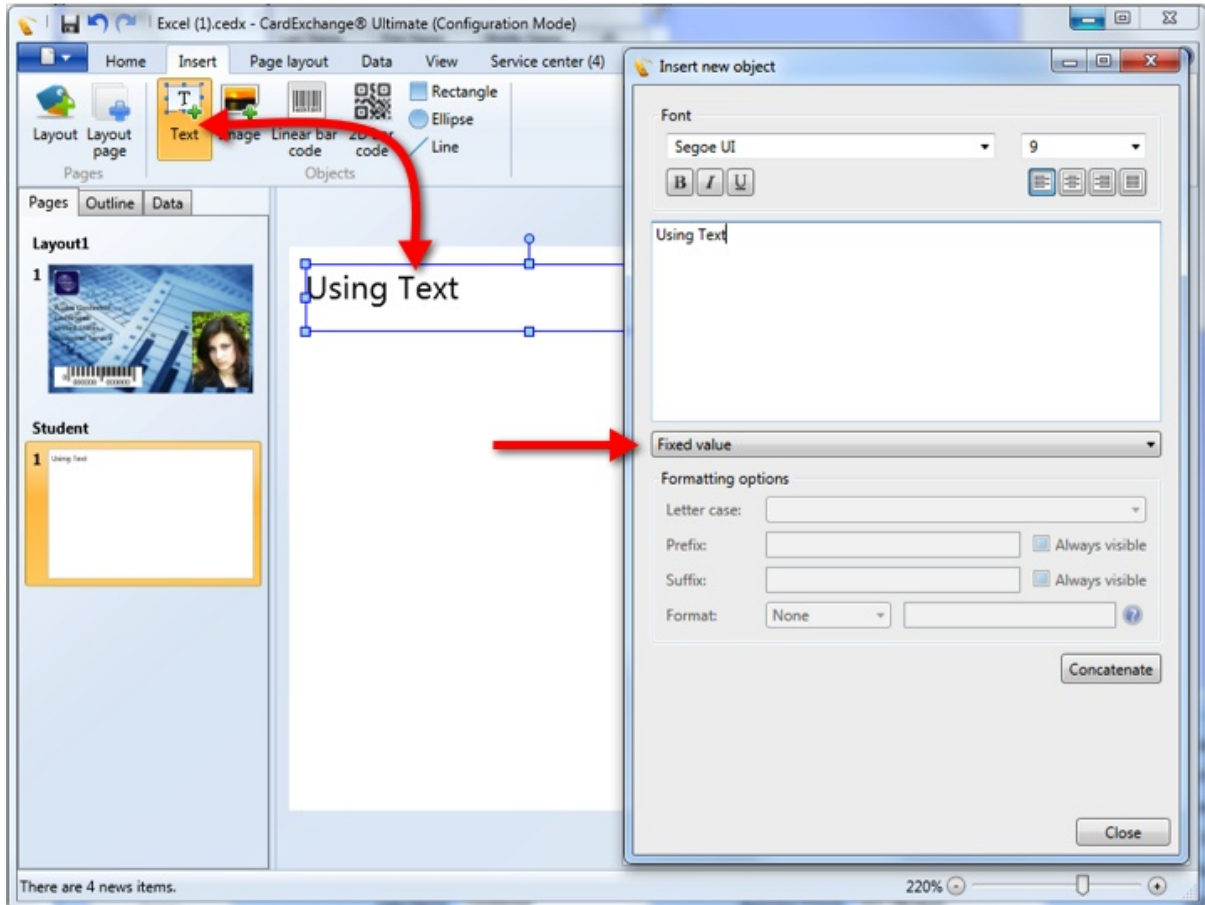


CardExchange® offers a lot of objects to design your card. From standard text objects to image objects for photos and signatures to 1D and 2D barcodes, lines, etc.

Each object comes with a collection of Properties that can be used to customize your objects to your wish. The properties of the objects are explained in the [Properties](#) section of this Help file.

In this section we will go over each available object and how to use it.

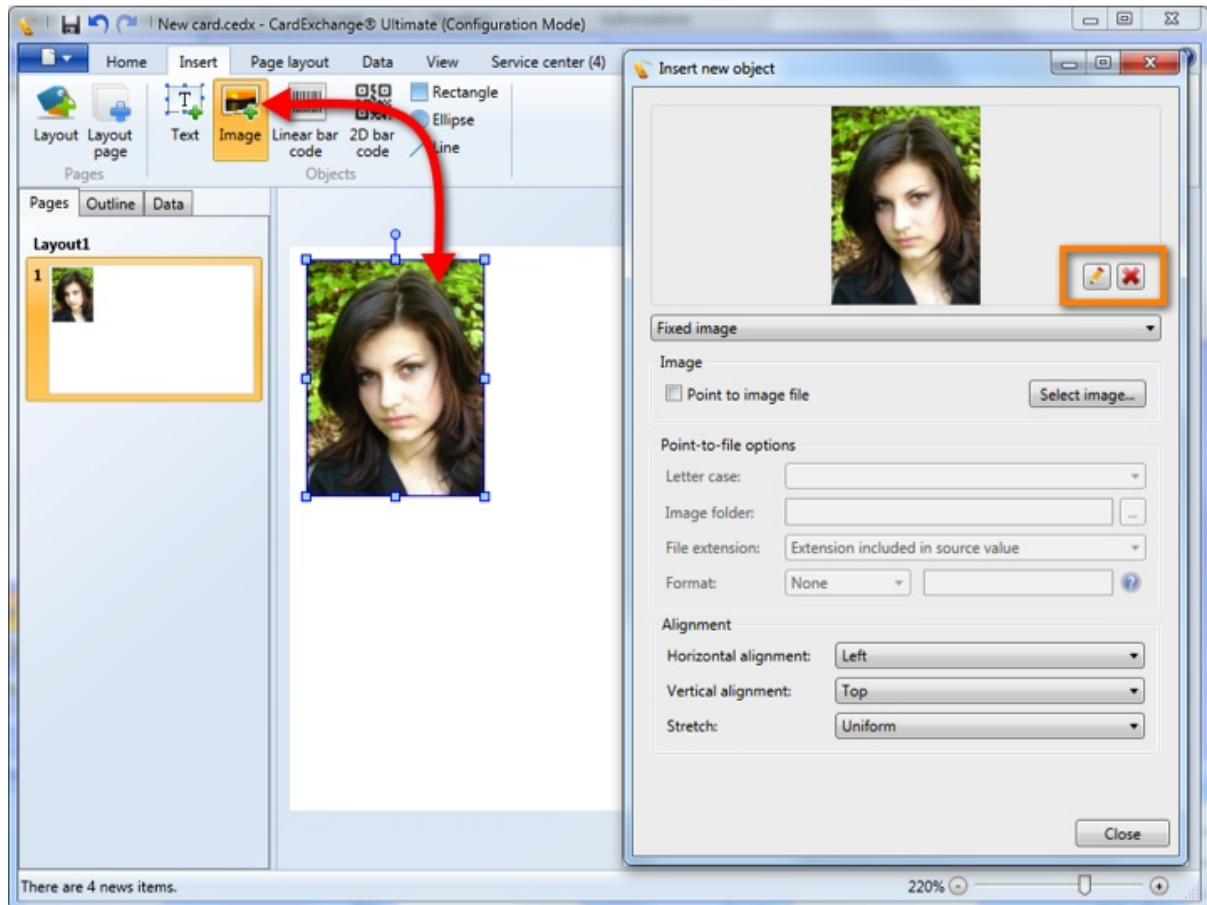
6.13.1 Text



Select the Text object from the Insert tab or from the Insert section of the Home tab. Click with the mouse on a location of the page and select one of the available Standard Object Types from the drop-down menu. Select the font type, size, outlining, etc.

For more information about the different Standard Objects, please see the "[Using Standard Objects](#)" section of this Help file.

6.13.2 Image(s)





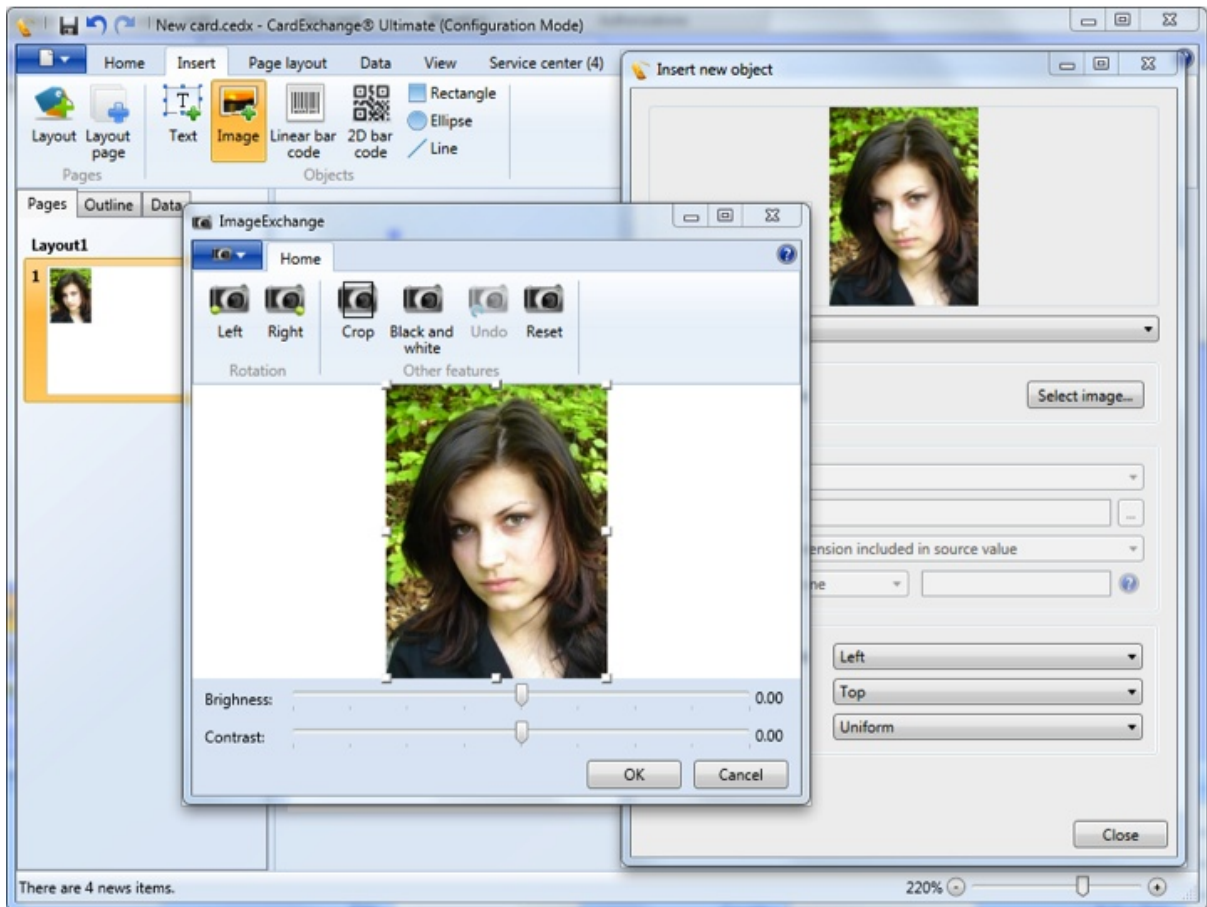
Select the Image object from the Insert tab or from the Insert group at the Home tab and place this on the page by clicking on a location on the page.

When the Insert new object window opens, it is default set to Fixed Image. You can also select [Photo](#), [Signature](#), [Variable Image](#), and Script. You can find more information about these configurations in the specific sections of this Help file.

When using the Fixed image, you can select an Image by clicking on the Select image... button. When the image is presented, you can check the 'Point to image file' check box. By default it is unchecked which means that the image is embedded into the page. If the check box is checked, a reference to the file is made. The advantage of this is that it keeps your templates small because it does not contain images, disadvantage is that if the folder that contains the folder is moved or removed, your image will not be shown anymore.

Of course it is also possible to align the image to your wished. You can align the image horizontal, vertical, and stretch.

When you hover over the presented image, you will see two buttons appearing. The  button will delete the previewed image, the  button will open the [ImageExchange® Editor](#) to make change to the image.

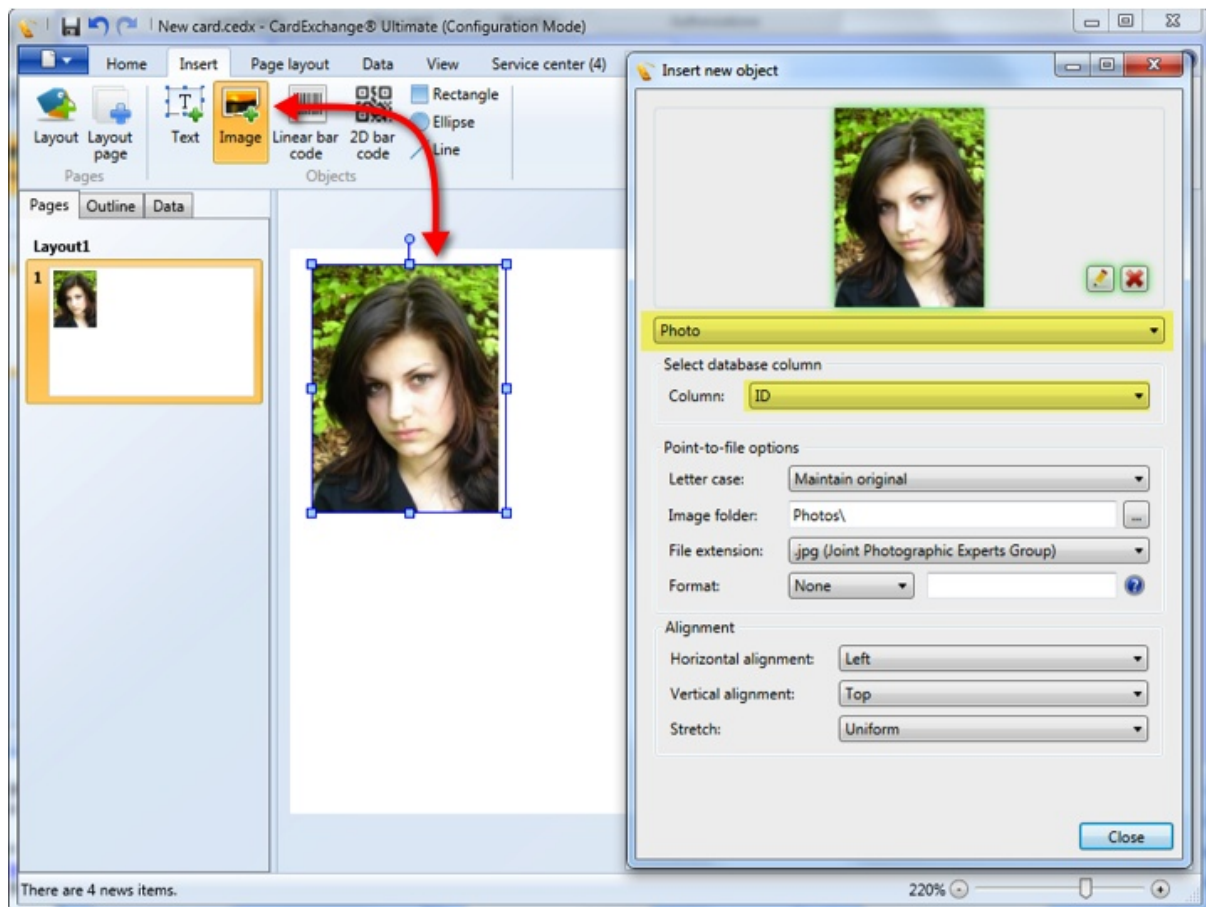


More information about using the ImageExchange® Editor can be found in the "[Using Image Editor](#)" section of this Help file.

IMPORTANT! Every object in CardExchange® has many Properties which are not shown in the **Insert new object** form. Please see the [Properties](#) section of this Help file for more information about specific use of functionality.

6.13.2.1 Photo(s)


IMPORTANT! This Photo option is available from Entry editions and higher!



Using photos is specifically related to the use of database and is therefore not available in the Designer edition. Starting from Entry, you can select and dedicate an image to a specific photo field in the database or a reference to a photo in a folder based on a 'Point to image file' reference.

The process for adding the image is exactly the same as explained in the "[Using Images](#)" section of this Help file.

Select **Photo** from the object drop down box and the Select database column drop down box will become available. If you select the ID field of the connected database, the system will automatically make it a 'Point to image file' connection. It can also be that your database contains the complete reference to image file locations if that is the case, please leave the Image folder location empty and set the file extension to 'Extension included in source value'.

The image folder location can be entered directly as it can also be selected by clicking on the  button. Select the file extension of the image, we currently support BMP, JPG, PNG, GIF, and TIFF.

You can also set the format of the value coming from the database you know for sure there is no mismatch.

If the database contains the image data and you have selected the image column, the

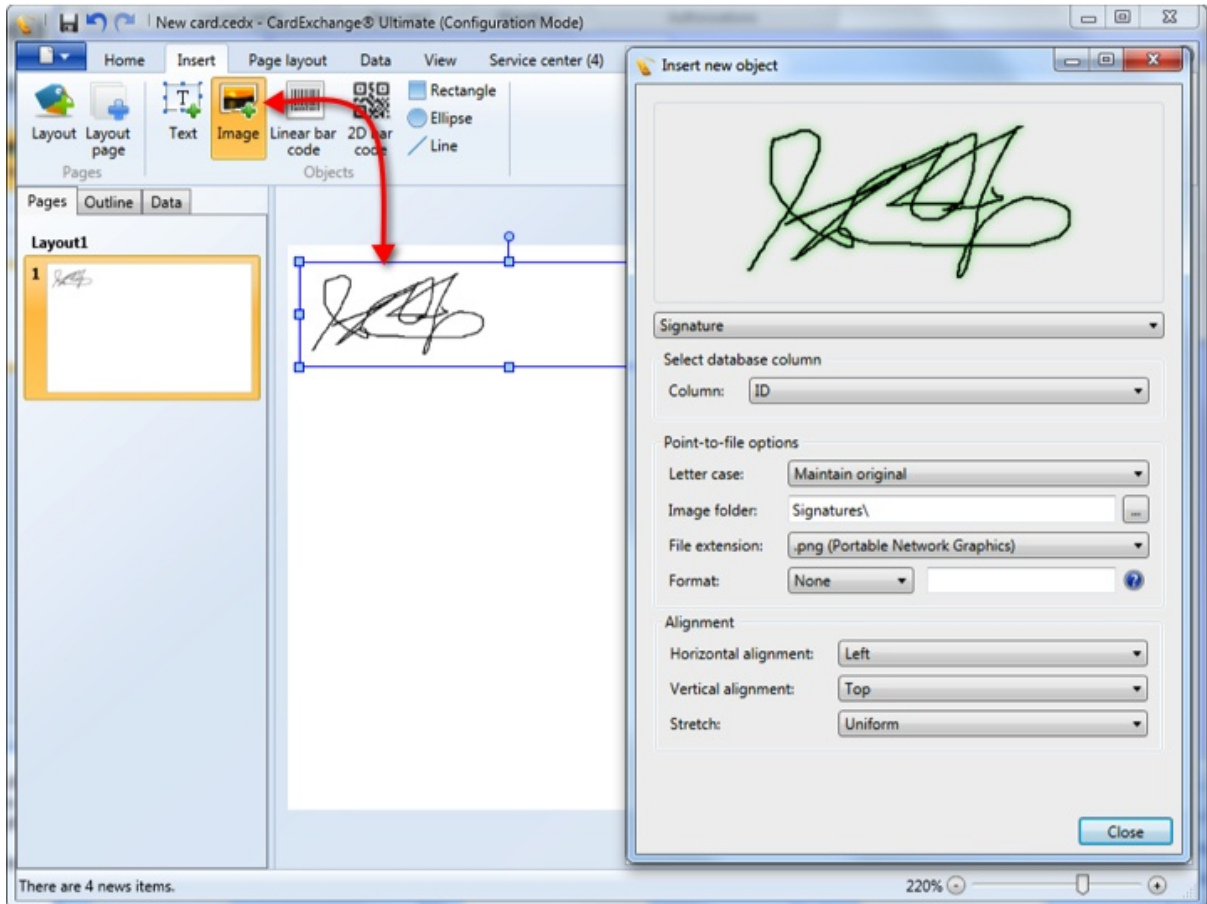
'Point-to-file options' section will be disabled.

More information about Photos can be found in the "[Using Photos](#)" section of this Help file.

Check for more options like colors, borders, visibility, etc., the [Properties](#) section of this Help file.

6.13.2.2 Signature(s)


***IMPORTANT!** This Signature option is available from Premium editions and higher!*



Starting from Premium, you can select and dedicate an image to a specific signature field in the database or a reference to a signature in a folder based on a 'Point to image file' reference.

The process for adding the signature is exactly the same as explained in the "[Using Images](#)" section of this Help file.

Select **Signature** from the object drop down box and the Select database column drop down box will become available. If you select the ID field of the connected database, the system will automatically make it a 'Point to image file' connection. It can also be that your database contains the complete reference to image file locations if that is the case, please leave the Image folder location empty and set the file extension to 'Extension included in source value'.

The image folder location can be entered directly as it can also be selected by clicking on the  button. Select the file extension of the image, we currently support BMP, JPG, PNG, GIF, and TIFF.

You can also set the format of the value coming from the database you know for sure there is no mismatch.

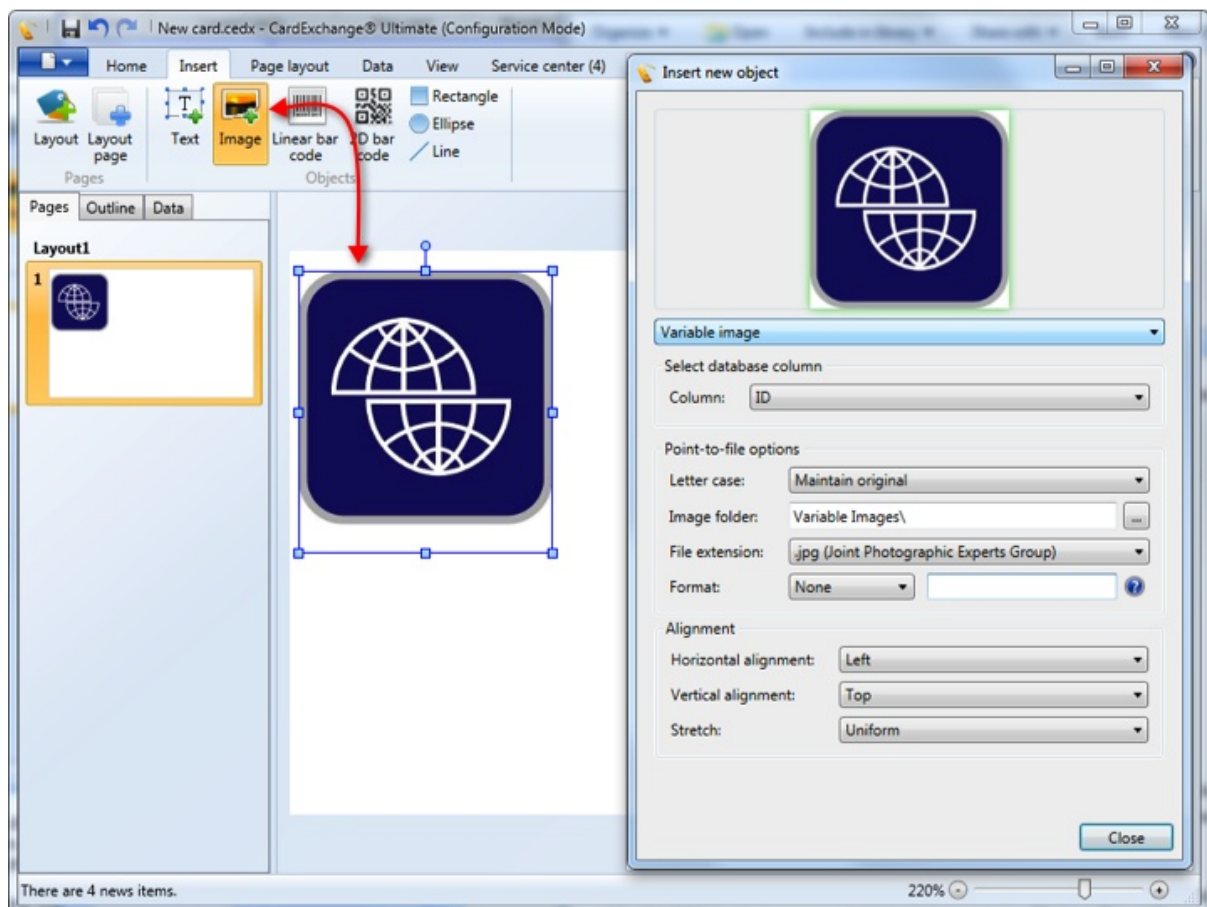
If the database contains the image data and you have selected the image column, the 'Point-to-file options' section will be disabled.

More information about Signatures can be found in the "[Using Signatures](#)" section of this Help file.

Check for more options like colors, borders, visibility, etc., the [Properties](#) section of this Help file.

6.13.2.3 Variable Image(s)


IMPORTANT! This Variable Image option is available from Premium editions and higher!



Our Premium edition offers a unique feature that allows you to switch images based on a value of the database.

The process for adding the Variable Image is exactly the same as explained in the "[Using Images](#)" section of this Help file.

Select **Variable image** from the object drop down box and the Select database column drop down box will become available. If you select the ID field of the connected database, the system will automatically make it a 'Point to image file' connection. It can also be that your database contains the complete reference to image file locations if that is the case, please leave the Image folder location empty and set the file extension to 'Extension included in source value'.

The image folder location can be entered directly as it can also be selected by clicking on the  button. Select the file extension of the image, we currently support BMP, JPG, PNG, GIF, and TIFF.

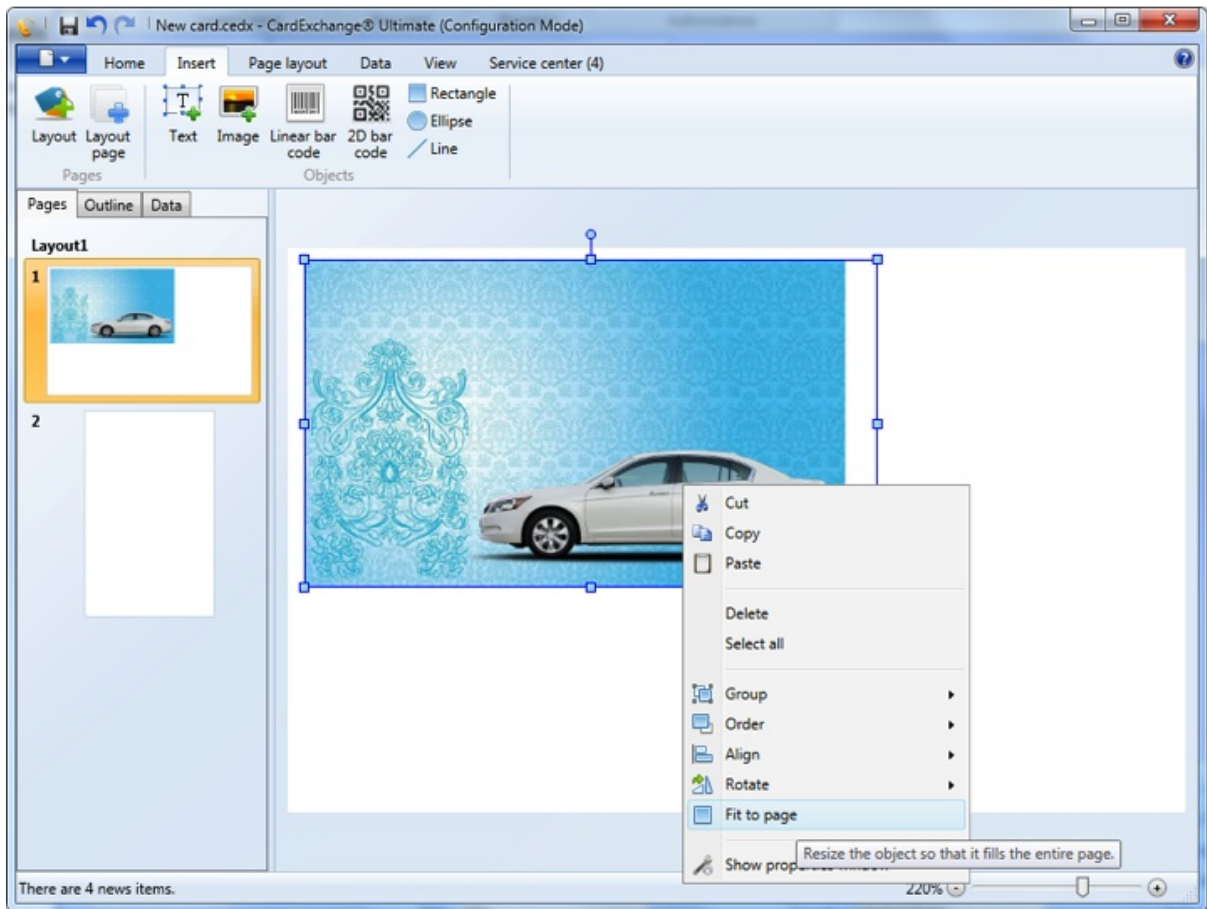
You can also set the format of the value coming from the database you know for sure there is no mismatch.

If the database contains the image data and you have selected the image column, the 'Point-to-file options' section will be disabled.

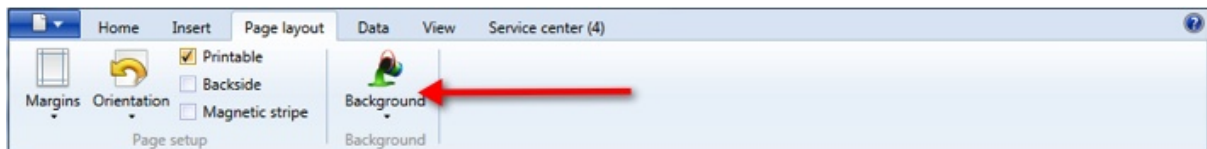
Check for more options like colors, borders, visibility, etc., the [Properties](#) section of this Help file.

6.13.2.4 Backgrounds

There are basically two ways to use backgrounds on your page. You can simply add an Image object to your Page, select the Image to use, and select Fit to page.



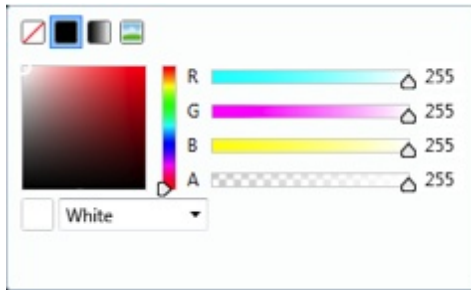
A better way to go is using the Background functionality offered in the Page Layout tab.



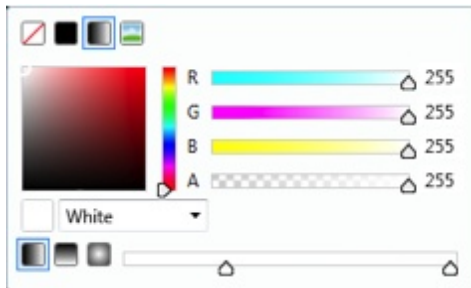
When you click on the Background button, four options are offered.



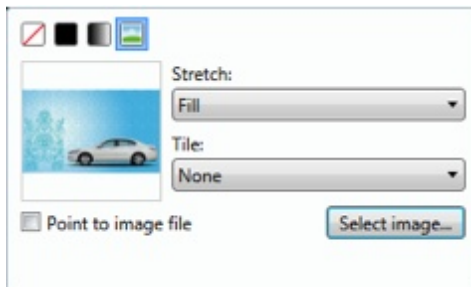
Use no color or image...



Choose from a one solid color...



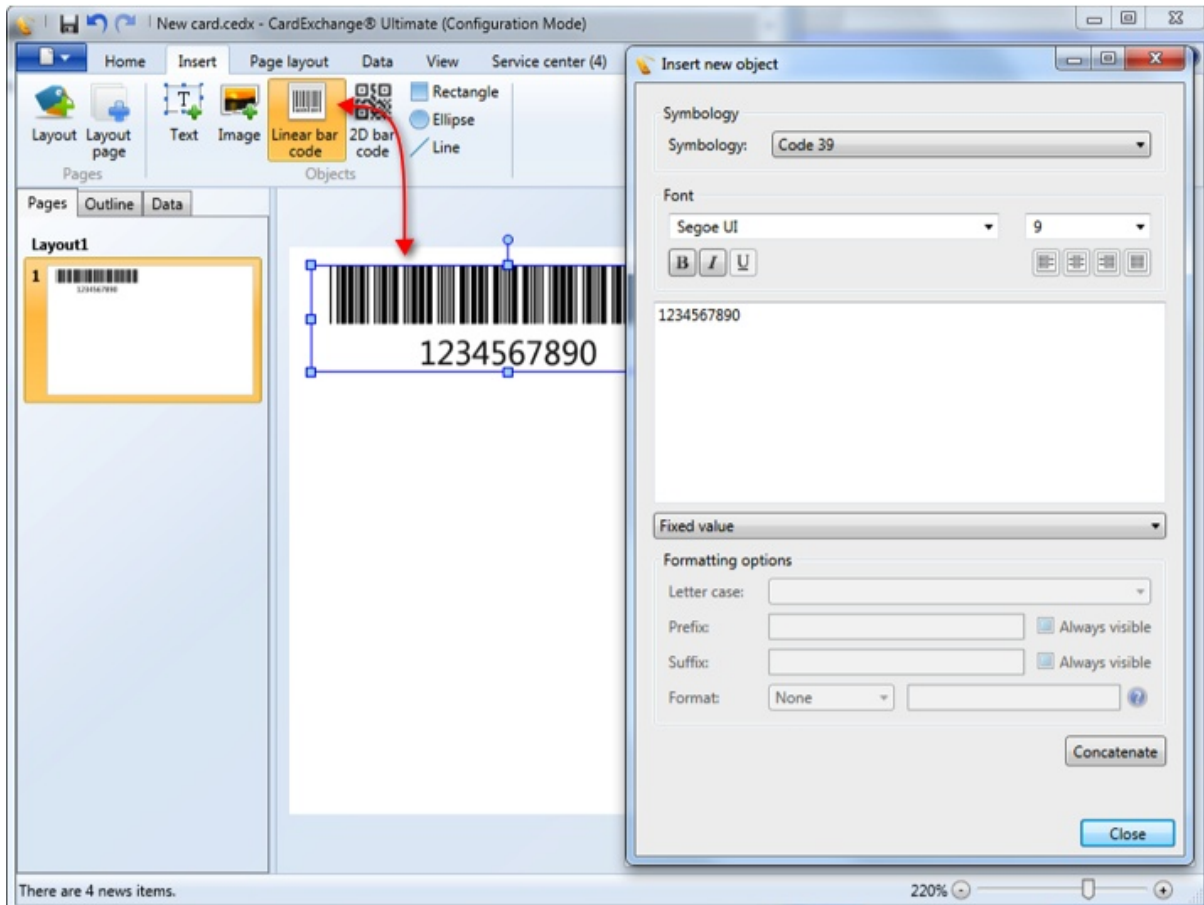
Use a Gradient color...



Or use a background image.

The advantage of using a background via the Page Layout tab is that it will always make sure that it completely covers the whole card. As you know, the card sizes vary when using a Direct-to-Card printer or a re-transfer printer. With a re-transfer printer the print size of the page layout is larger and using this Background functionality makes sure that your image is always fitting the page and you will have no white lines with printing.

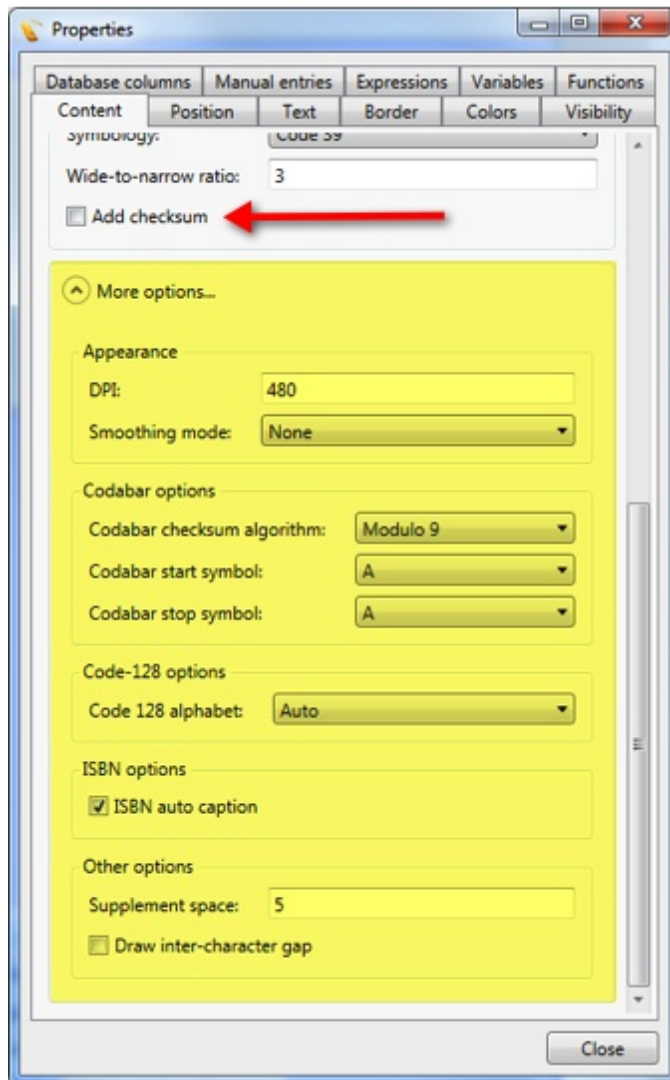
6.13.3 1D Barcode



To add a 1D barcode object to you page, just select the **Linear barcode** button from the Insert tab and click on a location on the page to place it. Now select the Symbology that you want to use from the drop down menu. All most common 1D Barcodes are supported.

Standard the Fixed value is selected, for using other values please see the "[Using Standard Object Types](#)" section of this help file.

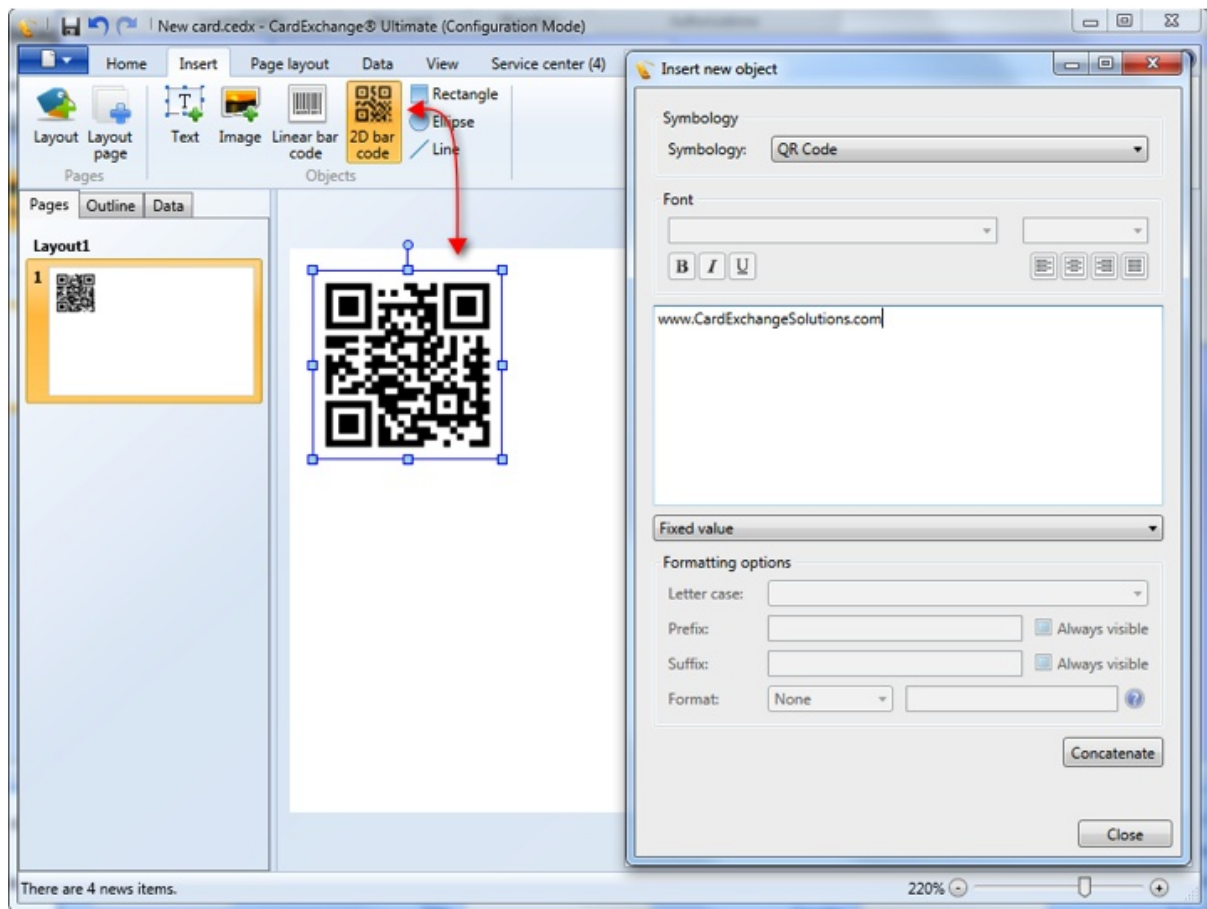
Of course a lot of extra options are available for the 1D Barcodes but they need to be access via the [Properties](#) window of the Designer. When the properties window is opened, select the Content tab.



You can add a checksum, set the options for specific barcodes like Codabar, Code-128, etc.

6.13.4 2D Barcode

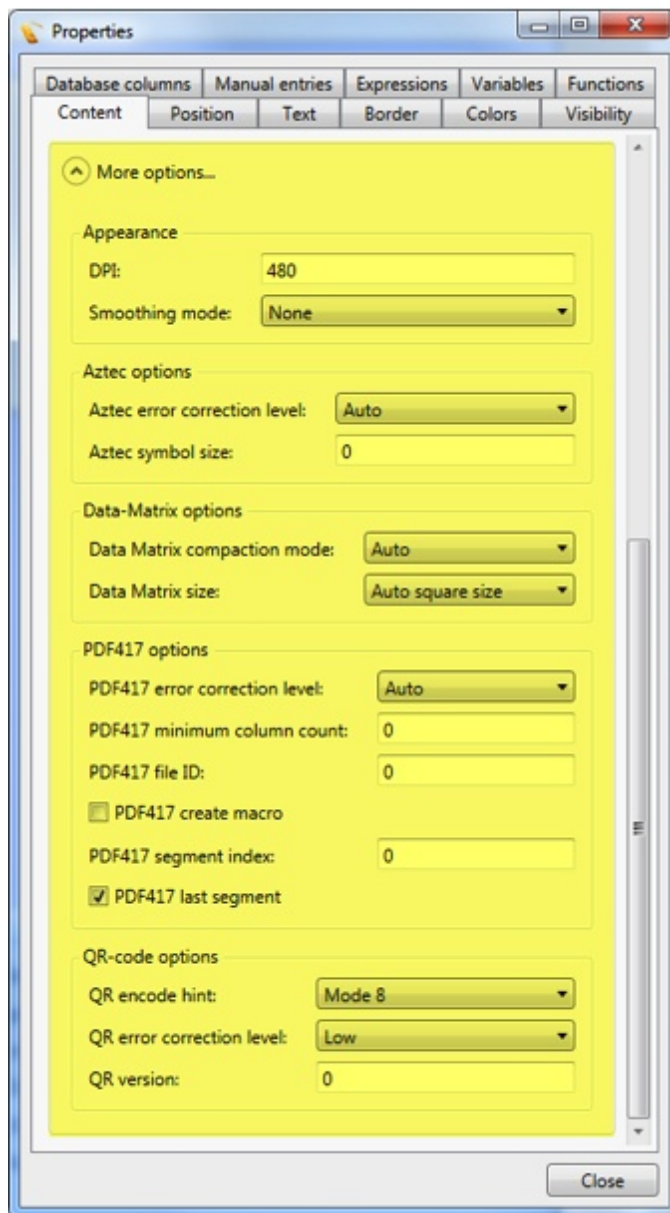
IMPORTANT! This 2D Barcode option is available from Premium editions and higher!



To add a 2D barcode object to you page, just select the **2D barcode** button from the Insert tab and click on a location on the page to place it. Now select the Symbology that you want to use from the drop down menu. All most common 2D Barcodes are supported.

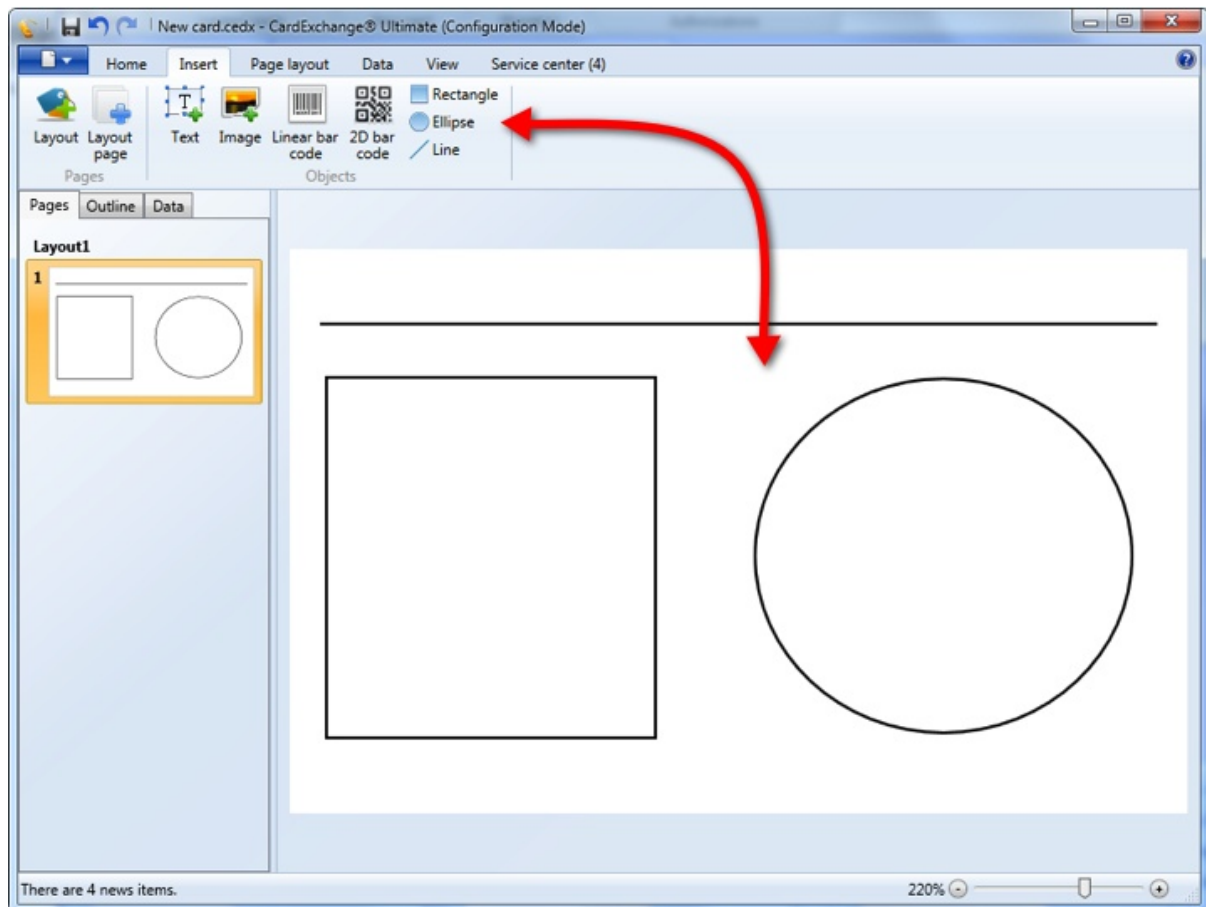
Standard the Fixed value is selected, for using other values please see the "[Using Standard Object Types](#)" section of this help file.

Of course a lot of extra options are available for the 2D Barcodes but they need to be access via the [Properties](#) window of the Designer. When the properties window is opened, select the Content tab.



Just like with the 1D barcodes, a lot of specific 2D barcode options can be set.

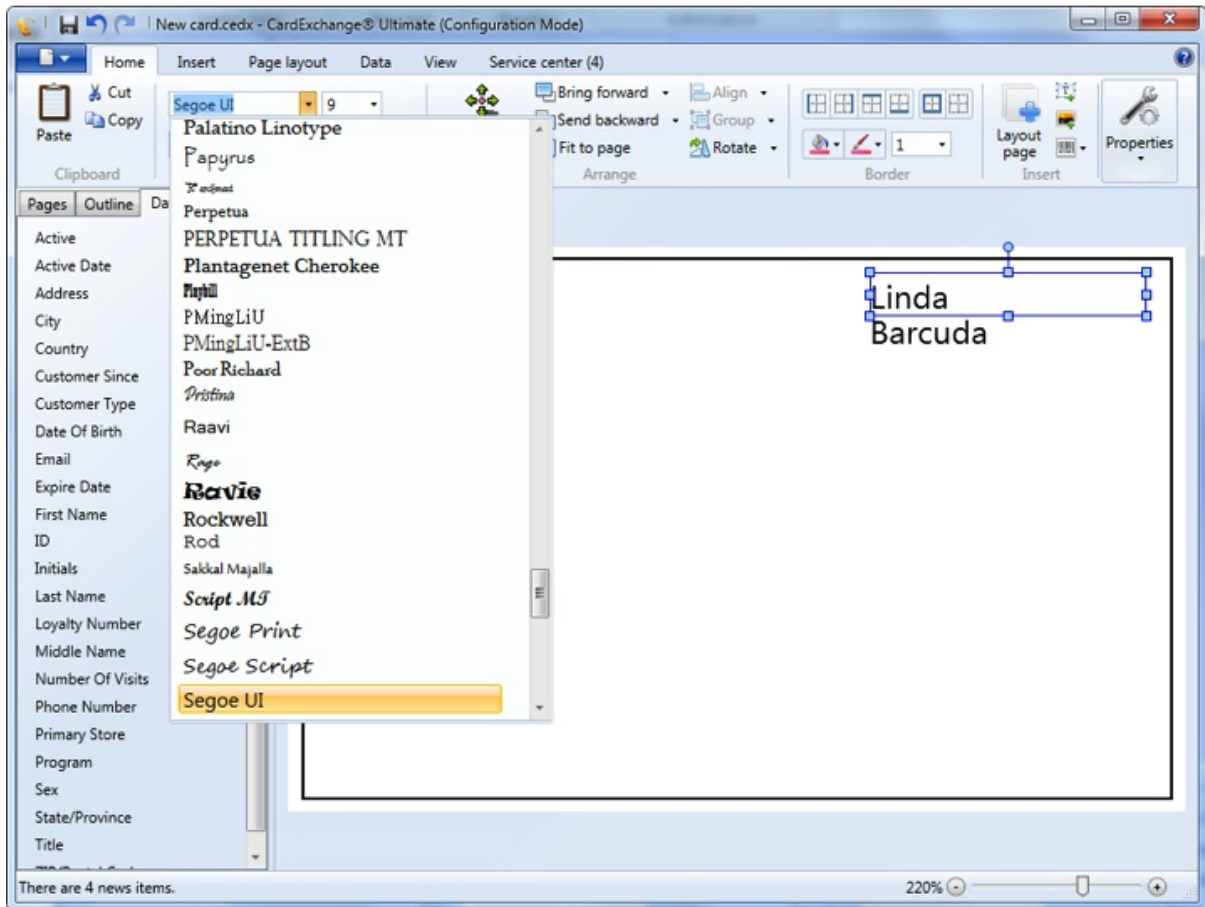
6.13.5 Drawing Objects



Select the Line, Rectangle, or Ellipse button to add it to the page.

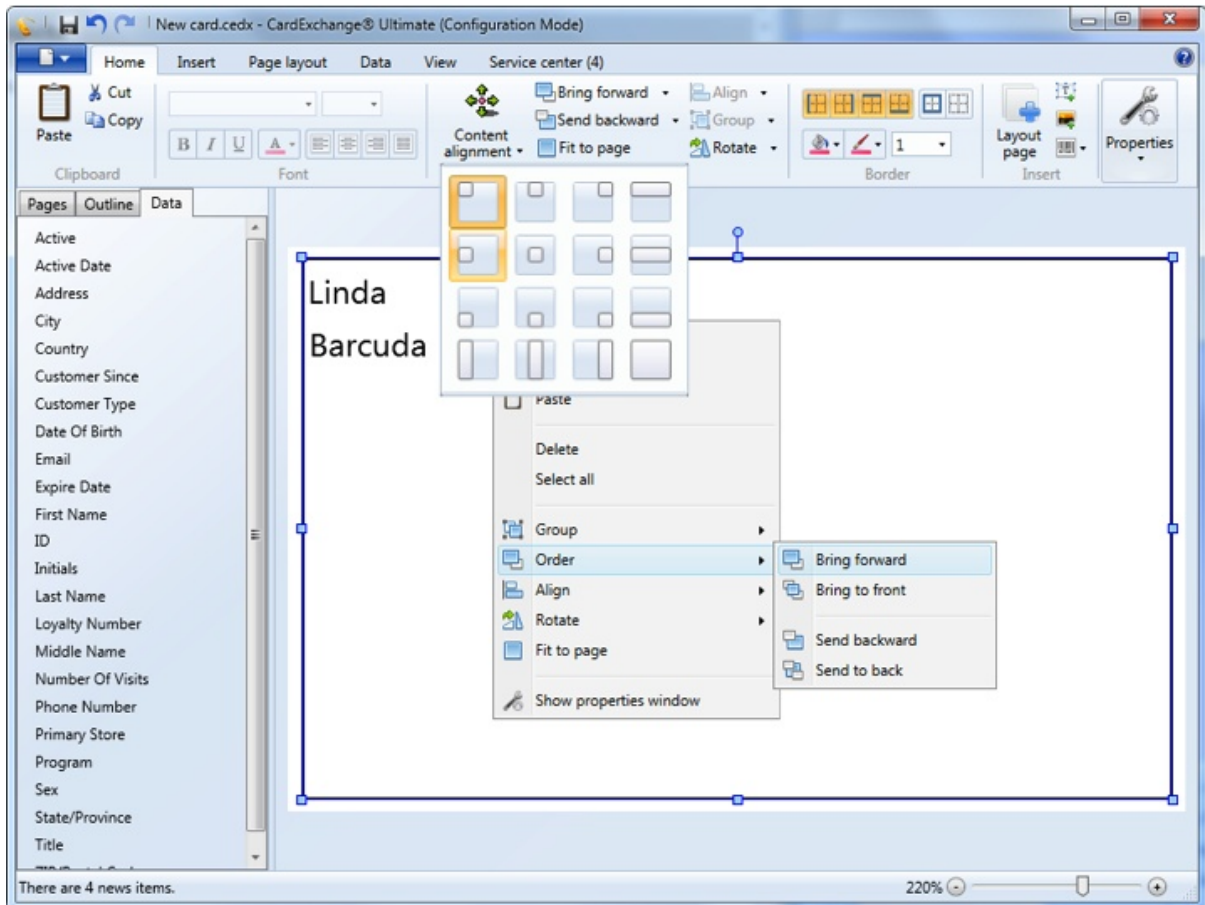
Check for more options like colors, borders, visibility, etc., the [Properties](#) section of this Help file.

6.13.6 Formatting Objects



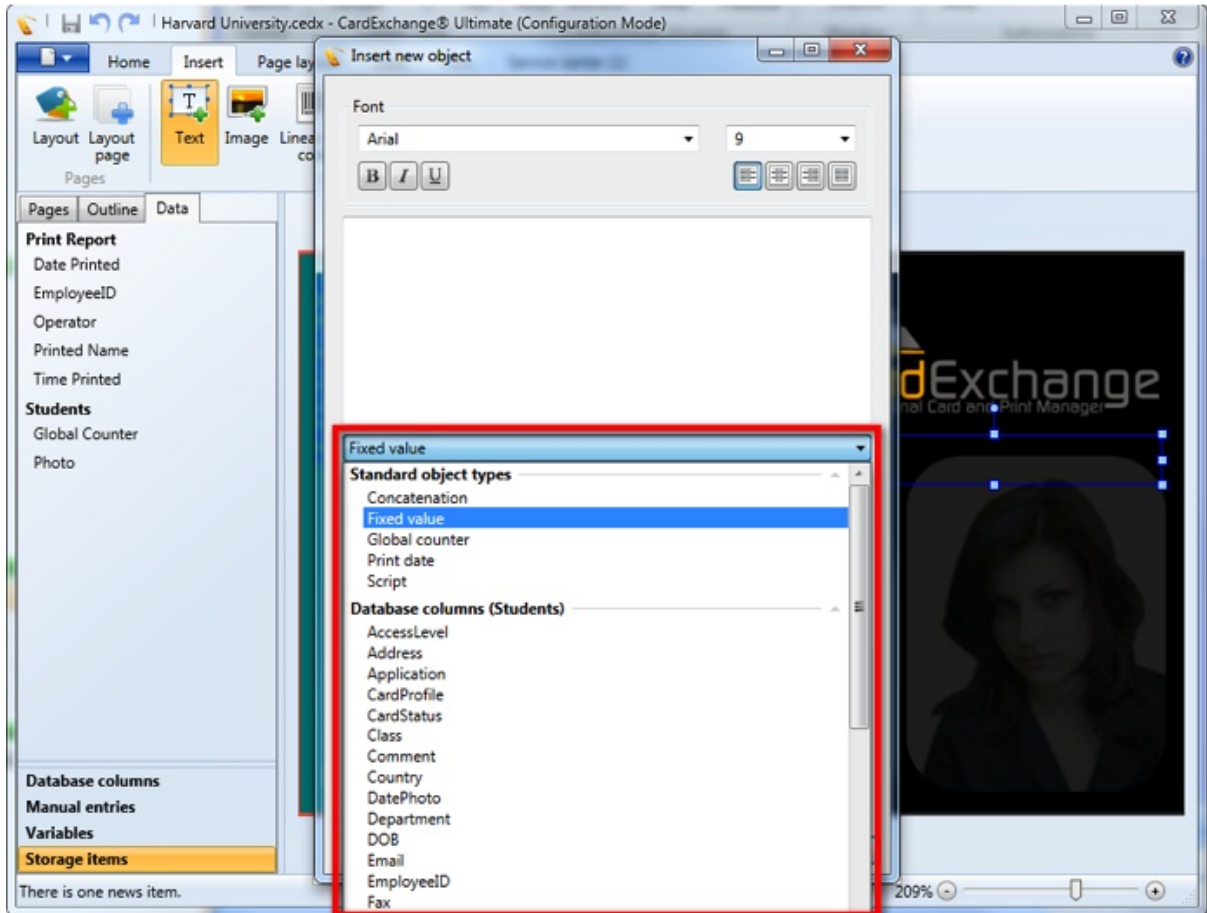
In the Home tab you can select the font, font size and font color that you want to use for your object. For more information about formatting of objects, please see our ["Properties"](#) section of this Help file.

6.13.7 Arranging of Objects



CardExchange® offers a lot of functionality to arrange your objects on the page. All the arranging functionality is available via the Arrange group in the Home tab or via the Context menu.

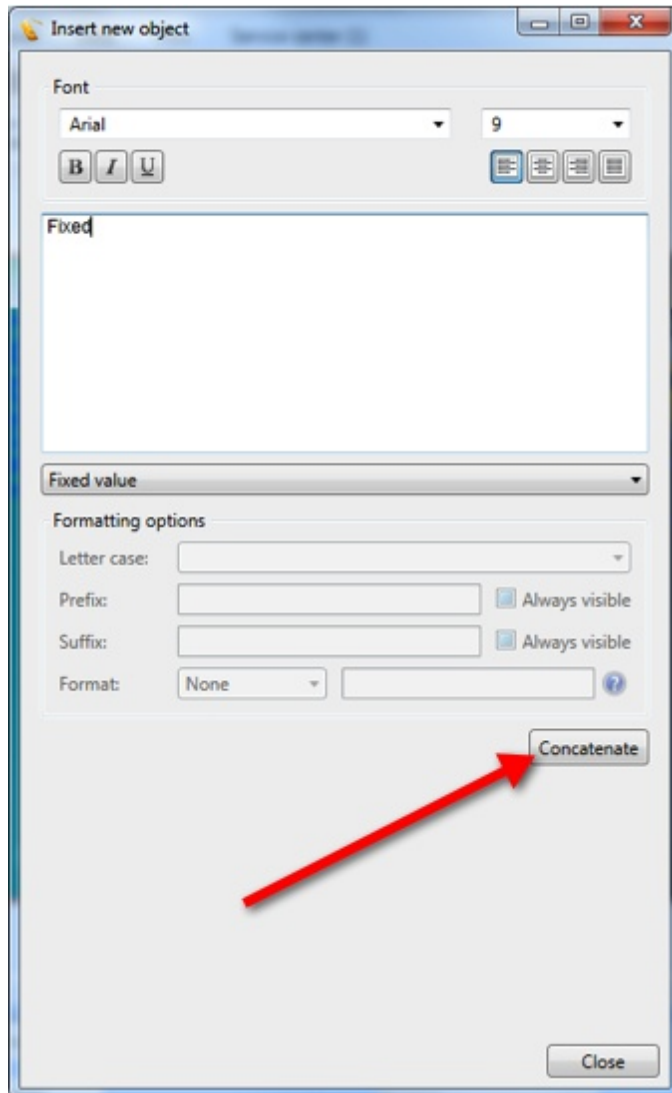
6.14 Standard Object Types



With exception for the Image object, CardExchange® offers Standard Object Types. **Standard Object Types** is functionality that can be connected to the object. In this section we will inform you how to use these **Standard Objects Types**.

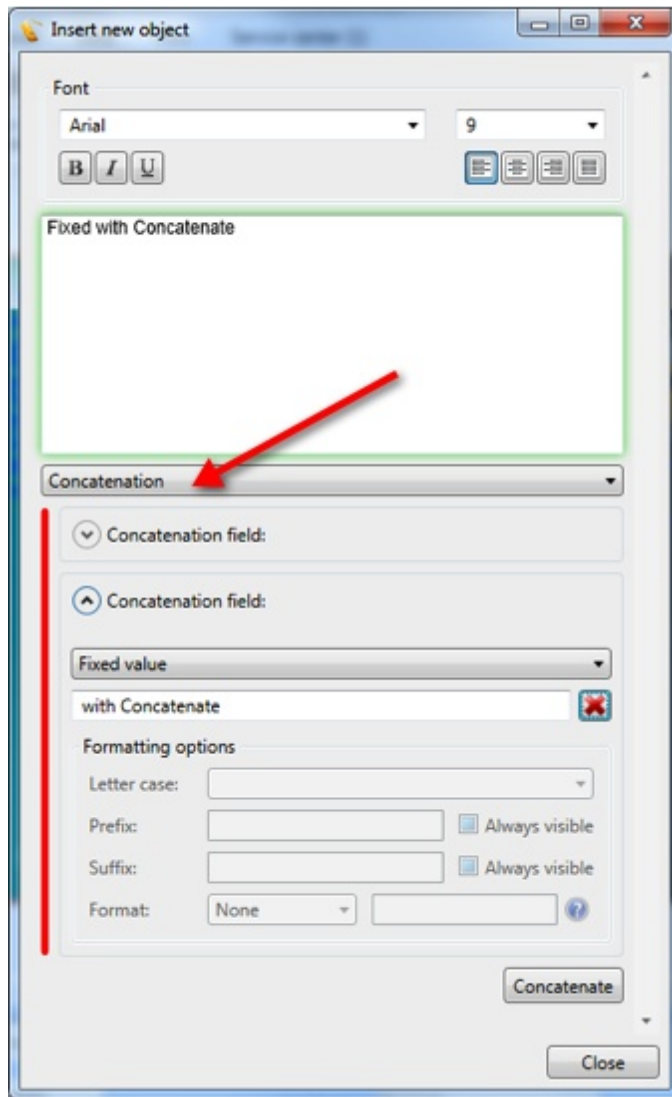
Standards Objects Types can be selected when adding a new object to your Page designer or via the [Content](#) tab in the [Properties](#) window.

6.14.1 Concatenation




Concatenation is very powerful functionality offered in CardExchange®. It offers you unlimited ways to present or store data.

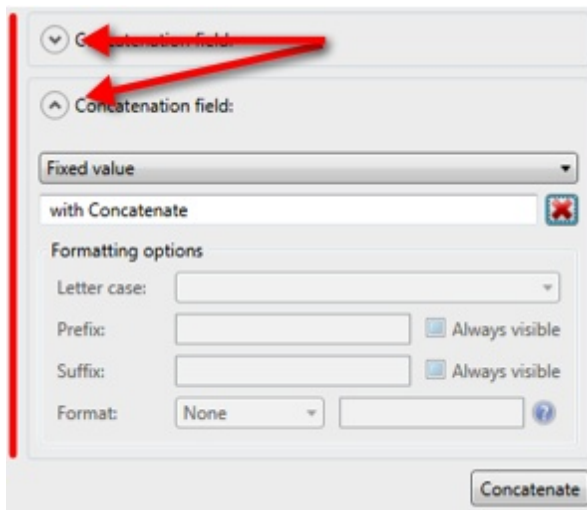
In this example we are adding a new [Text object](#) to our [Page](#) design and we have it set to the default **Standard Object Type, Fixed Value**, and we enter a name into the text area, in this case "Fixed" Now we click on the **Concatenate** button under the formatting options.



Now we get a new option to select a **Standard Object Type**, in this case, also a **Fixed Value** is used but this can be any **Standard Object Type** available.

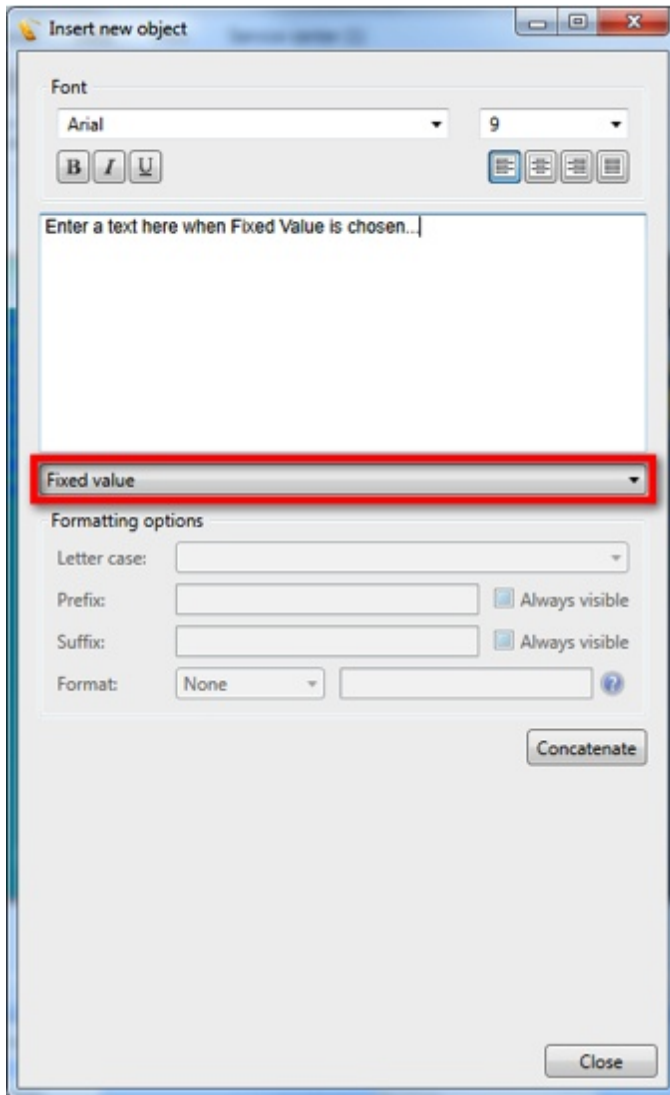
Now you see that the **Standard Object Type** is changed from Fixed Value to **Concatenate** as indicated with the **red arrow**.

The **Concatenations** are divided by expandable tabs. When you click on the left down arrow  it will open the selected one and close the previous opened:



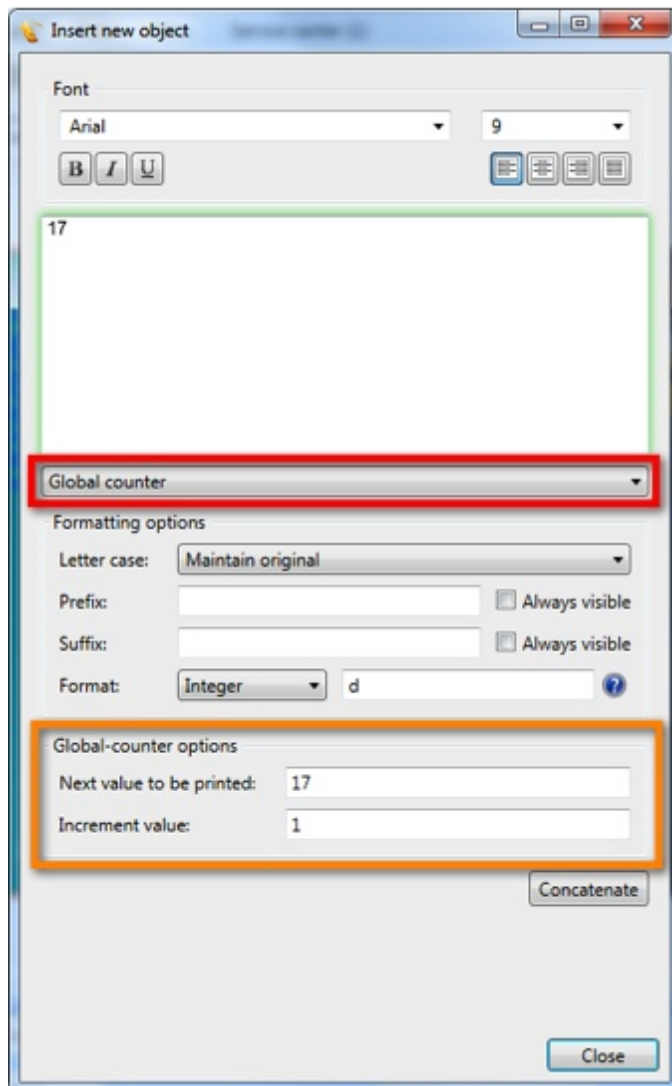
You also see a **red vertical** line on the left. This indicates the group of **Concatenations**. There are no limitations to the amount of **Concatenations** you can make. You can always change your **Concatenations** in the [Properties](#) window at the [Content](#) section.

6.14.2 Fixed Value



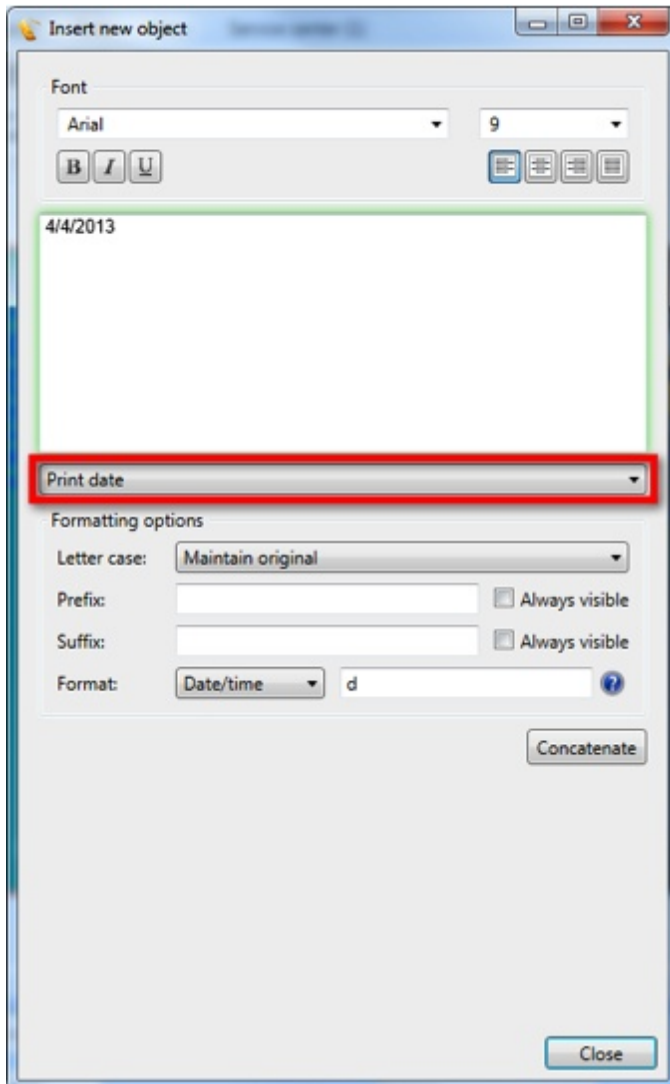
Select **Fixed Value** from the **Standard Object Type** drop down menu, indicated with the **red rectangle** and enter the text into the text area.

6.14.3 Global Counter



Select **Global Counter** from the **Standard Object Type** drop down menu, indicated with the **red rectangle** and set the **Global Counter** options in the group indicated with the **orange rectangle**. When using the **Global Counter**, you see that the text area is indicated with a **green rectangle**. This means that the value shown is generated based on the settings for the Global Counter and cannot be changed in the text area.

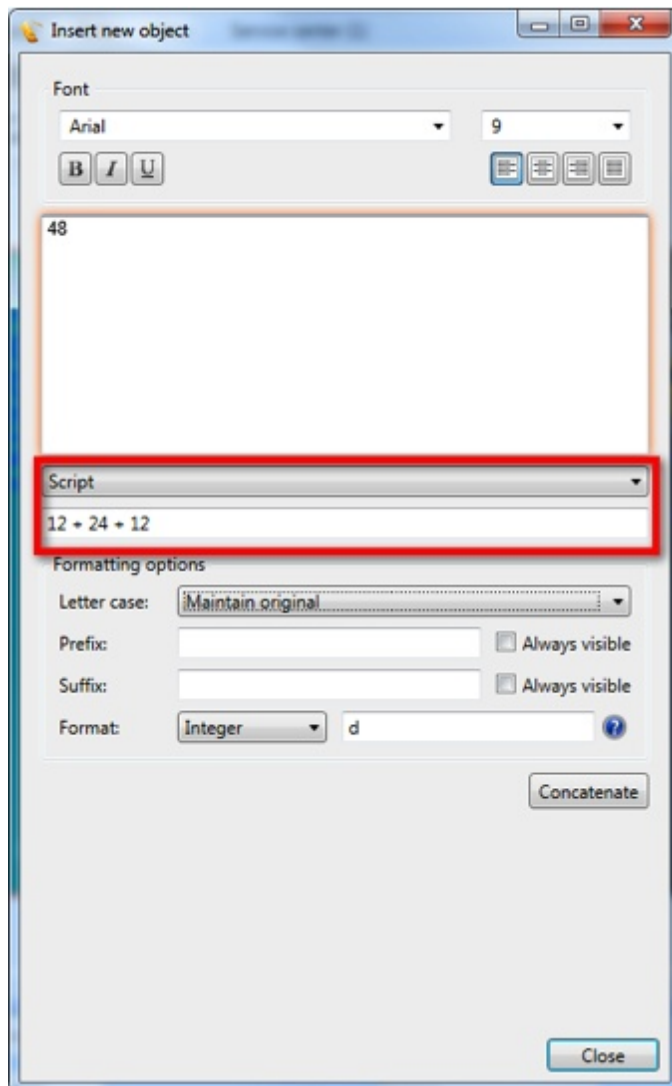
6.14.4 Print Date



Select **Print Date** from the **Standard Object Type** drop down menu, indicated with the **red rectangle** and it will directly present the date. You can also show the date and time or time only by setting the date format options. When using the **Print Date** you see that the text area is indicated with a **green rectangle**. This means that the value shown cannot be changed in the text area.

The date reflect the date and time as available on your computer.

6.14.5 Script

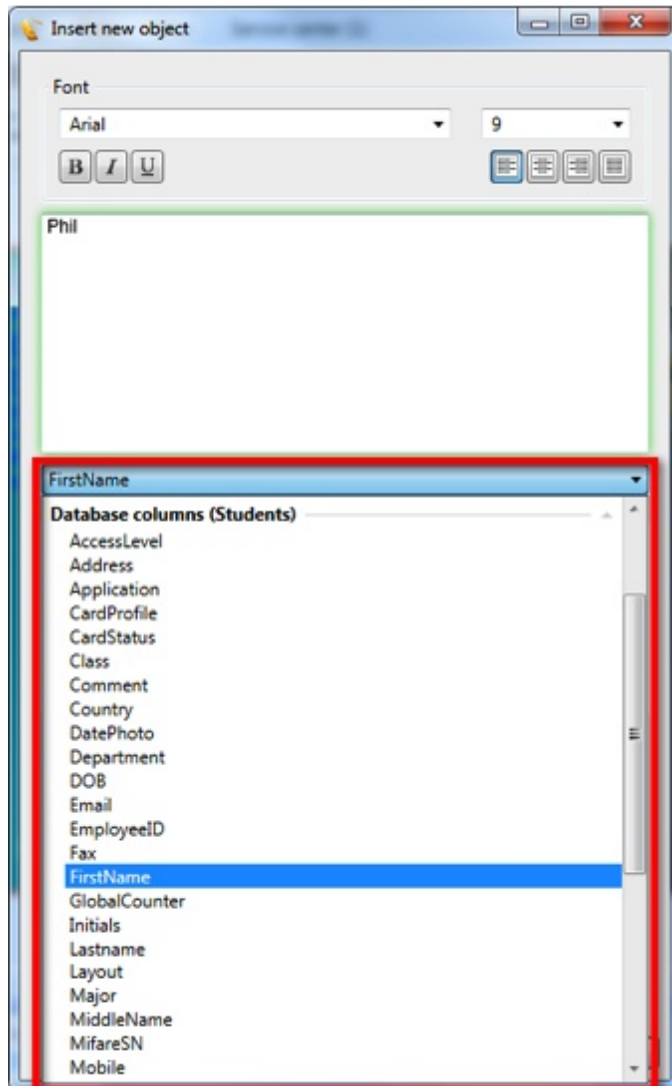


Select **Script** from the **Standard Object Type** drop down menu, indicated with the **red rectangle** and enter the script in the text field under the drop down menu.

You will see that the text area is now indicated with a red/orange color which means that the value shown is calculated based on the script.

***IMPORTANT!** Scripting is only available in the Ultimate edition.*

6.14.6 Database Columns



When you are running a Entry or higher edition of CardExchange® and you are connected to an database, in the **Standard Object Type** drop down menu all the database columns are available for selecting. The **Standard Object Type** Database columns also indicates the name of the connected database in the header. In this example it mentions 'Database columns (Students)'. Because CardExchange® offers multiple database connections in the Professional edition and higher, multiple databases and columns can be selected here.

When selecting a database column from the list, you will see that the text area is indicated with a **green rectangle**. This means that the data shown is coming from the connected database and cannot be edited in the text area.

See our [Database](#) section in this Help file for more information about using databases.

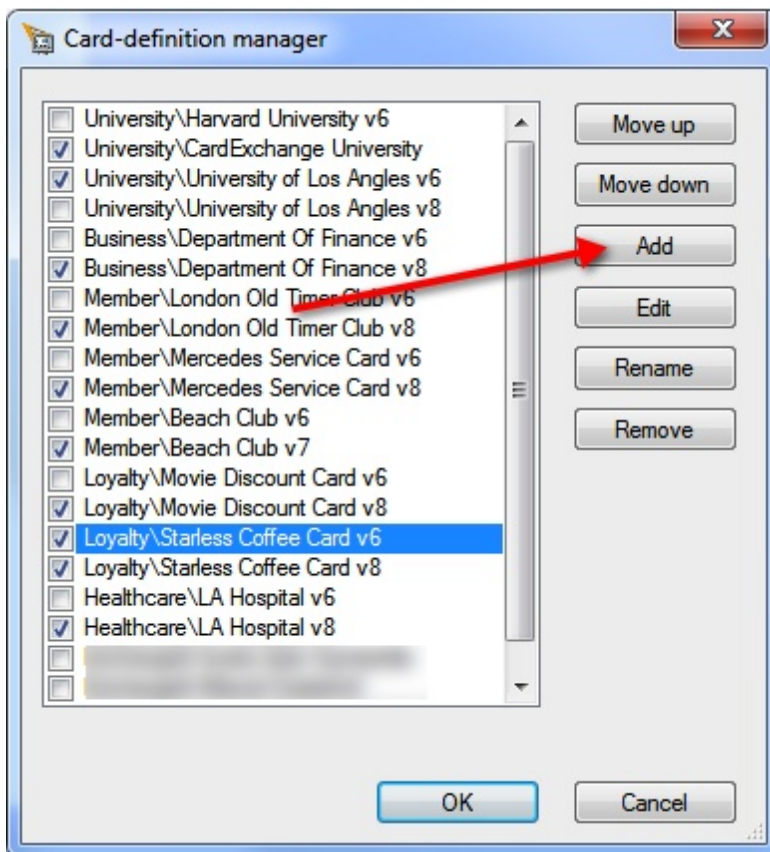
7 Adding Card Templates

There are two ways in CardExchange® to add a new card-template. You can do it basically from scratch using the Designer or you can use the CardExchange® User Guided Wizard. But whatever you choose, you start by clicking some buttons.

When you are using an Entry or higher edition, two ways will lead you to Rome.



When you select the Configuration tab, in the Loaded Cards group you can directly select Add card or click on the Show Card Manager



And click on Add. For each process goes that it starts in the CardExchange® User Guided Wizard. When clicking on add, this wizard will start.



If you use or not use the wizard, the new card-template needs to have a name, so provide that in this window, but it can also be assigned to a category. Categories are presented in a drop down menu directly under the [Loaded Cards](#) tab in the [Explorer](#) menu. Categories are very powerful especially if you are using a lot of different card-templates. A couple of standard categories are available, but if you want to use another category, just simply type the name of the category in the drop down menu field and it will be available for future card-templates.

By default this wizard starts up when you start CardExchange®. De-check the "Show this wizard at startup" option if you do not want this.

When you have entered all the information in this first page of the wizard, proceed with Next to go to page 2.



In this page of the wizard we determine what we are doing... using the wizard to create a new card-template or do it from scratch. When the first option is selected "Use the 'Step by Step' setup wizard" (default), you will be taken through the wizard ending up with a card-template shown. How to add a card-template using the wizard is explained in the section "[Using the Wizard](#)" of this Help file.

When you selected to skip the wizard option and want to do it from scratch,



Just click on the Finish button. The whole process is explained in the "[Using the Designer](#)" section of this Help file.

7.1 The Wizard



Using the wizard is in most of the cases the best way to go. From this point, in nine clear explained steps you will be heading towards a complete designed card-template including or not including database connections, barcodes, backgrounds, logo's, etc. Let's proceed and click on Next!

Step 1



In this page you need to select if you want to create a single or a double sided card-template. Also the orientation needs to be set. Choose Landscape or Portrait. When done, click Next to proceed.

Step 2



In this page you need to select if you want to connect to a database or not. In this Help file we are using the connection to the database option. Make your choose and click on Next to proceed.

Step 3



CardExchange® offers unlimited ways to use databases, multiple databases, etc. In the wizard we are offering a selection of basic database templates you can choose from for MS Excel files as well for MS Access. For using MS Access database you need at least a Premium edition. If you want to use one of the provided database templates, simply select one of them. Of course it is also possible to add your own database connection and make all fields available in the wizard. The whole adding of a new database connection is explained in the "[Add Database](#)" section of this Help file. When you are done, hit Next to proceed.

Step 4



After selecting the database template, in this page all the available columns are made available for you to select. To add the field to your design, just click on the check box before the column name. It also a special check box to automatically combine the first, middle, and last name field on your design. When all the needed columns are selected, proceed by clicking Next.

Step 5



Photos and signatures are important objects for your design. In this page of the wizard you can select to add a photo or signature to your design. For using signatures, a Premium or higher edition is needed. When you select Add a photo, you can select the referring database column from the drop down menu. If you are using a connection to an MS Excel file, using a photo will always be a "Point-to-image-file" connection as MS Excel cannot contain binary photo information. If that is the case, we strongly advice to use a field from the database that is really unique like the ID field. Keep in mind, names are not unique! Proceed with Next when you have made your selection.

Step 6



A card always looks better when using a background color or a background image. In this page of the wizard you can choose to one of them or or both. Select the color needed from the drop down menu or click on Browse and select the background image you want to use. Click Next to proceed.

Step 7



Who doesn't want one... a logo. Here you can select the logo that you want to add to your design. Just click on the Browse button, select the logo you want, and click on Next to proceed.

Step 8



1D barcodes are available starting from the Entry edition. We offer a large variety of 1D barcodes. Barcodes can be selected from the drop down menu. The data for the barcode can come from manual entered information or directly from the connected database. Last step to take, click Next to proceed.

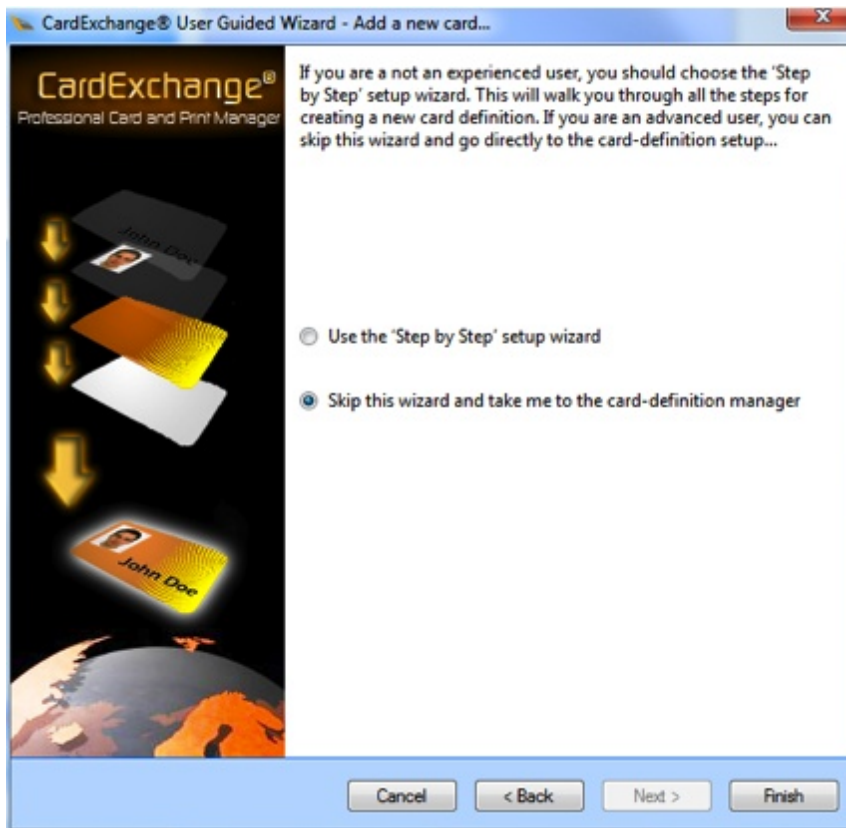
Step 9



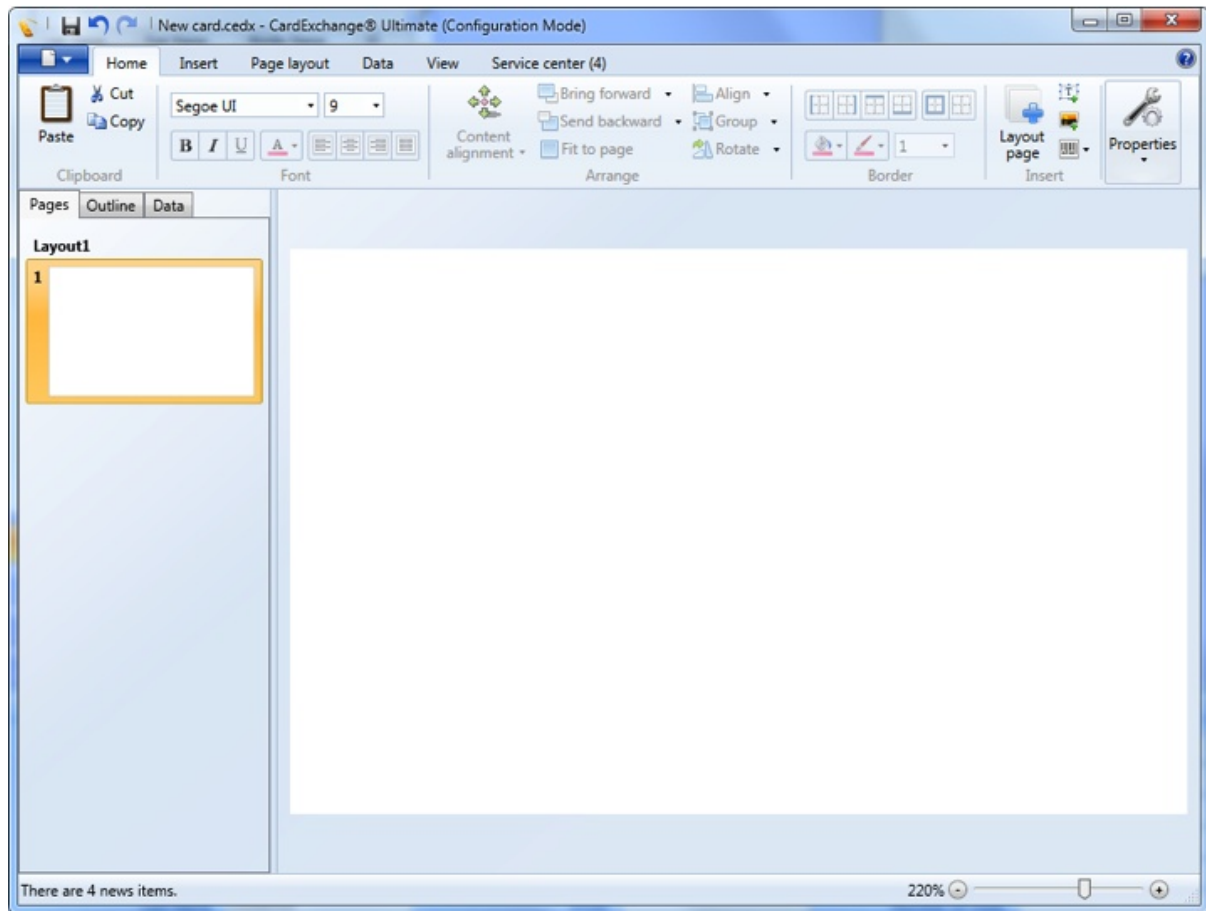
CardExchange® has now all the information to generate the card-template and as soon as you click on Finish, the template will be generated. If you have the check box selected, the Designer will open offering you the possibility to make adjustments to the created design, if not, the card will be directly show in the Main Interface and the database, if applicable, will be loaded and shown. And that's all she wrote.

More information about editing the design can be found in the "[Using the Designer](#)" section of this Help file.

7.2 The Designer

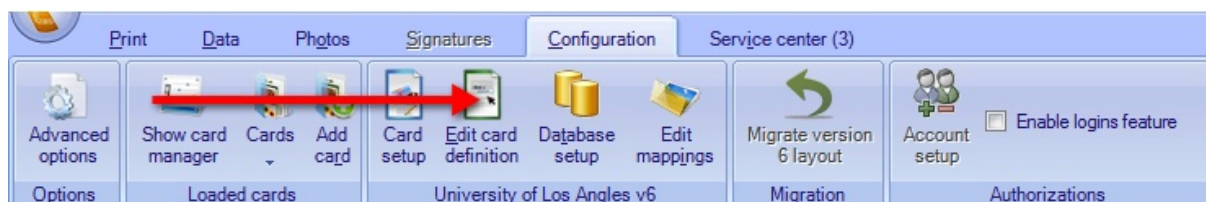


When you directly want to enter the Designer and create your template from scratch you have to select to skip the wizard and click on Finish.



The CardExchange® Designer will open with a blank template. Take notice of the caption which is mentioning 'CardExchange® Ultimate (Configuration Mode)'. Starting from Entry editions, the caption always reflects the edition you are using and mentioning the configuration mode status indicates that it is not works as a stand alone Designer license.

7.3 Edit Card Definitions



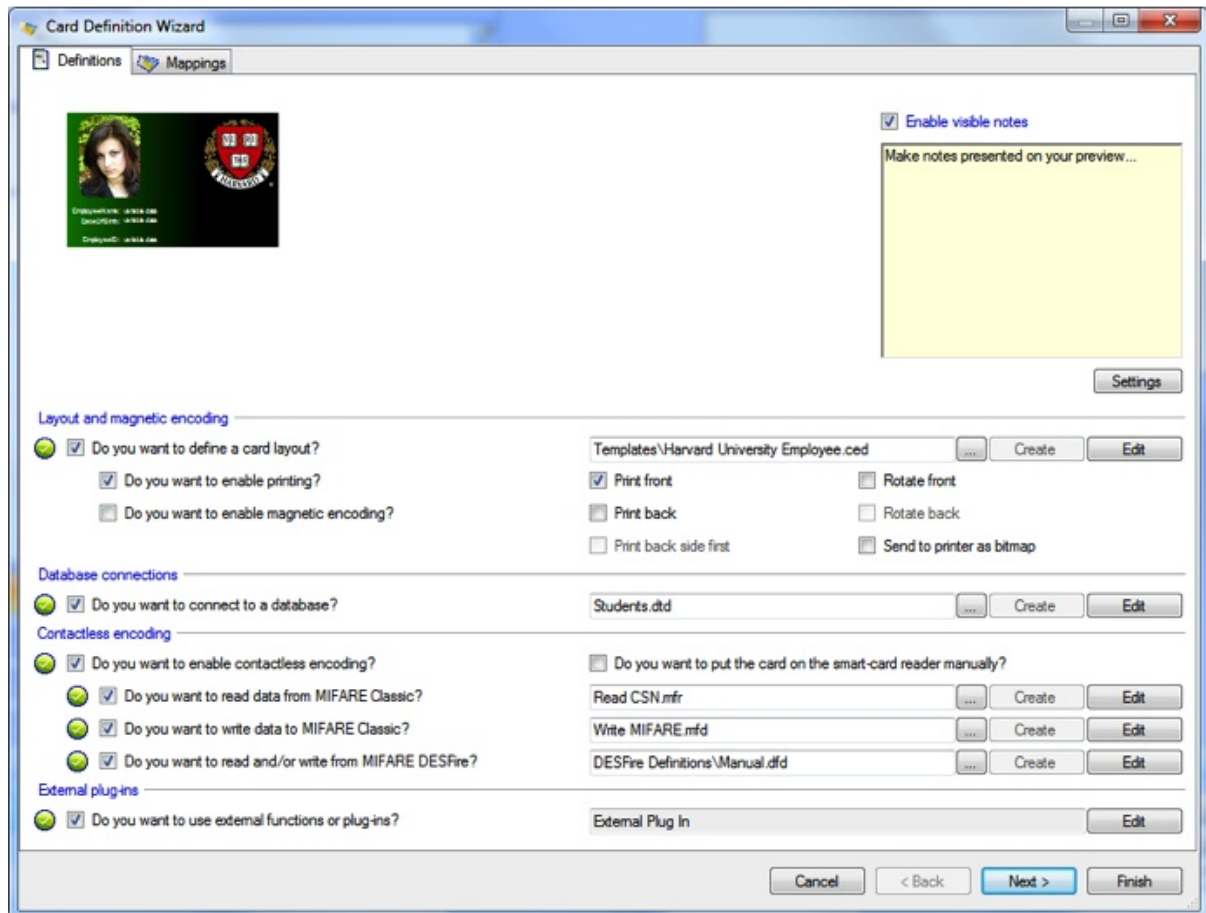
In CardExchange® version 4 we introduced the Card-Definition Wizard. Although this wizard seemed logical, a lot of our customers found it very hard to work with. At this moment we are moving all the functionality that is and was available via this wizard to the new Designer but not all is done yet. For more advanced stuff like external plug ins or contactless encoding, this wizard is still needed. But you also still need it when you still use old version 6 layouts and have not converted them.

At this moment, when you are using a **Designer, Entry, Premium, or Professional** and you are not using [External Plug In's](#), you will not need this wizard anymore. When you are

using [Contactless Encoding](#) or [Plug Ins](#) you still need to use the old [Card-Definition wizard](#) and [Advanced Mappings](#) Window. Along the way, more and more functionality will be embedded into the Designer so at the end, this Card-Definition wizard will become obsolete.

The Card-Definition wizard contains two pages. The first page contains all the information about the layout, database connections, contactless encoding, and plug in's. Both pages are explained in the sections [Card Definition Wizard](#) and [Advanced Mappings](#).

7.3.1 Card Definition Wizard



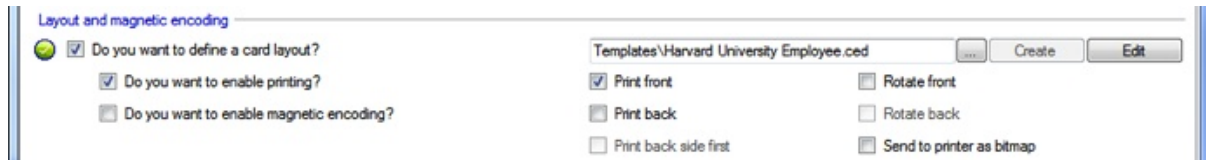
Depending on the edition you are using, the definition setup is divided in 4 sections:

- **Layout and magnetic encoding**
- **Database connections**
- **Contactless encoding**
- **External Plug Ins**

Besides of the different sections, the definition wizard also offers functionality to create a visible note per card definition that will be shown on the main window of CardExchange®. Simply type the information that you want to show to the user, click on Settings to make some changes to the fonts and colors, and the note will be available for the user.

Layout and Magnetic Encoding

7.3.1.1 Layout and Magnetic Encoding



In this section of the wizard you are defining the card templates. You can create new ones, edit existing ones, or select card template files. All the basic settings that have to do with producing a card are available in this section. Because CardExchange® is a card production application, a card layout always needs to be created. Other selections are:

Functionality	Description
Do you want to enable printing?	Select this option if you want to produce cards. Deselect if you want to use CardExchange® to encode cards only...
Do you want to enable magnetic encoding?	Select this option if you want to encode magnetic cards. For more information about magnetic encoding see 'Using magnetic encoding' section...
Print front	Default this option is set to the settings of the card layout. If the card layout is created as double sided, this option will be checked. Deselect this option if you have a double sided card layout and you don't want to print the frontside...
Print back	Default this option is set to the settings of the card layout. If the card layout is created as double sided, this option will be checked. Deselect this option if you have a double sided card layout and you don't want to print the backside...
Rotate front	When selecting this option, CardExchange® will rotate the complete front of the card 180 degrees and send it to the printer driver.
Rotate back	When selecting this option, CardExchange® will rotate the complete back of the card 180 degrees and send it to the printer driver.
Print backside first	In case of the use of printers with laminators, and when using double sided card layouts, you want to print the backside first because the front of the card needs to be laminated. Setting this option makes sure that the backside will be printed first and the front side last, which means that the lamination will be placed on the front...
Send to printer as bitmap	Most printers printing based on layer information. Occasionally printers cannot work with that, like the Zebra P600 series, the print a correct card with these printers the complete layout needs to be processed and send to the printer driver as a Bitmap for the best result. Selecting this option sends the card layout as an image to the printer driver...

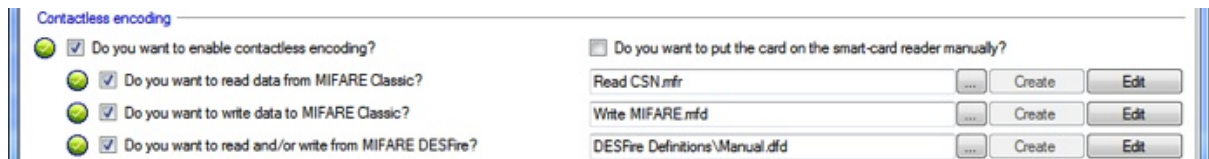
7.3.1.2 Database Connections



In this section of the wizard you are defining your database definitions. You can create new ones, edit existing ones, or select database definition files.

Functionality	Description
Do you want to connect to a database?	Select this option if you want to connect to a database and want to create a database definition... Click on Create to create a new definition or click on Edit to edit a existing one.

7.3.1.3 Contactless Encoding



In this section of the wizard you are defining your contactless encoding definitions. You can create new ones, edit existing ones, or select definition files:

Functionality	Description
Do you want to enable contactless encoding?	Select this option if you want to use CardExchange® to encode contactless cards. Only available as Premium with the contactless module...
Do you want to put the card on the smart-card reader manually?	Select this option if you have a external encoder. CardExchange® will ask, after graphical personalization of the card, to put the card on the external reader before executing the next print job...
Do you want to read data from MIFARE® Classic?	Select this option if you want to read information from a MIFARE® Classic card
Do you want to write data to MIFARE® Classic?	Select this option if you want to write information to a MIFARE® Classic card.
Do you want to read and/or write from MIFARE® DESFire?	Select this option if you want to use CardExchange® to read and/or write from a MIFARE® DESFire card.

7.3.1.4 External Plug In



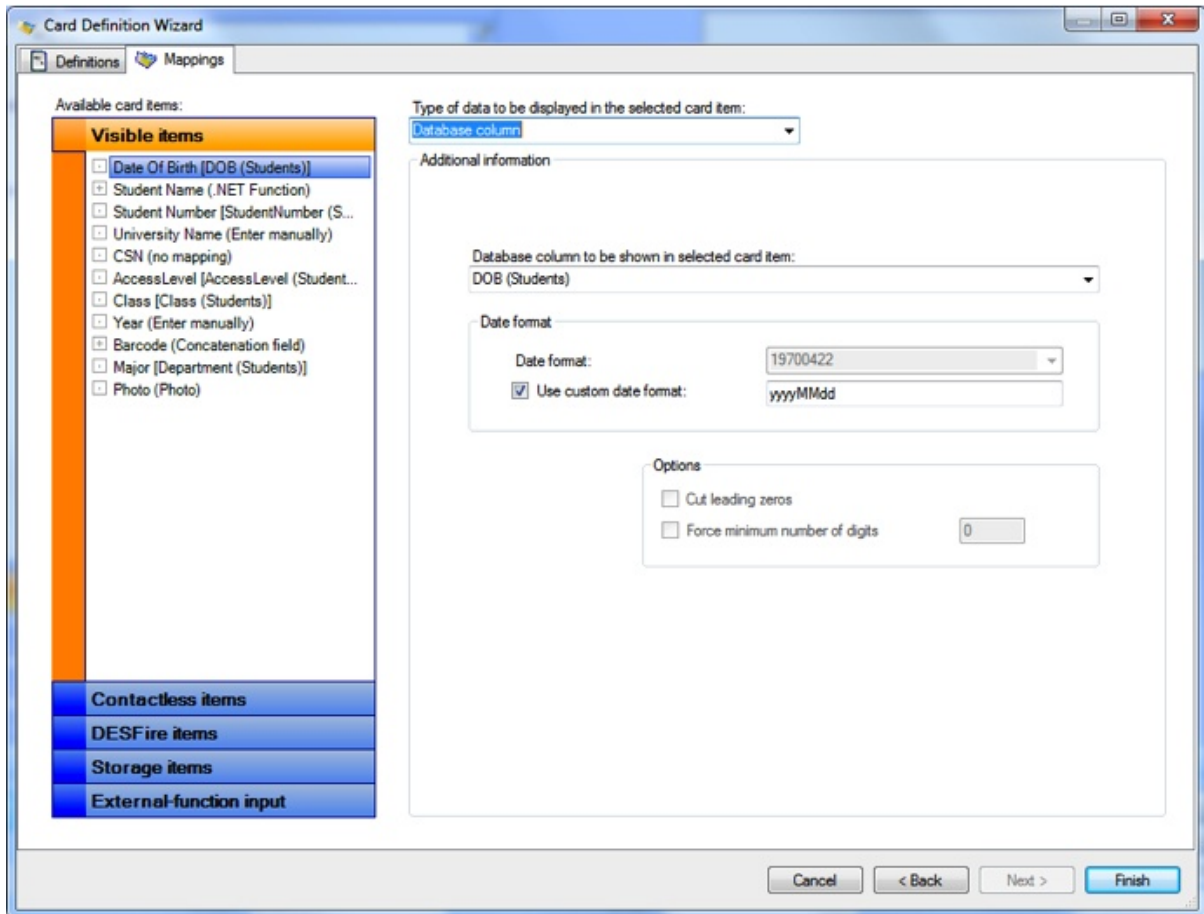
CardExchange® offers unlimited possibilities to embed any non-existing, business logic, or third party Software Development Kits. In this section of the wizard you define your external plug in settings.

Functionality	Description
---------------	-------------

Do you want to use external functions or plugins?

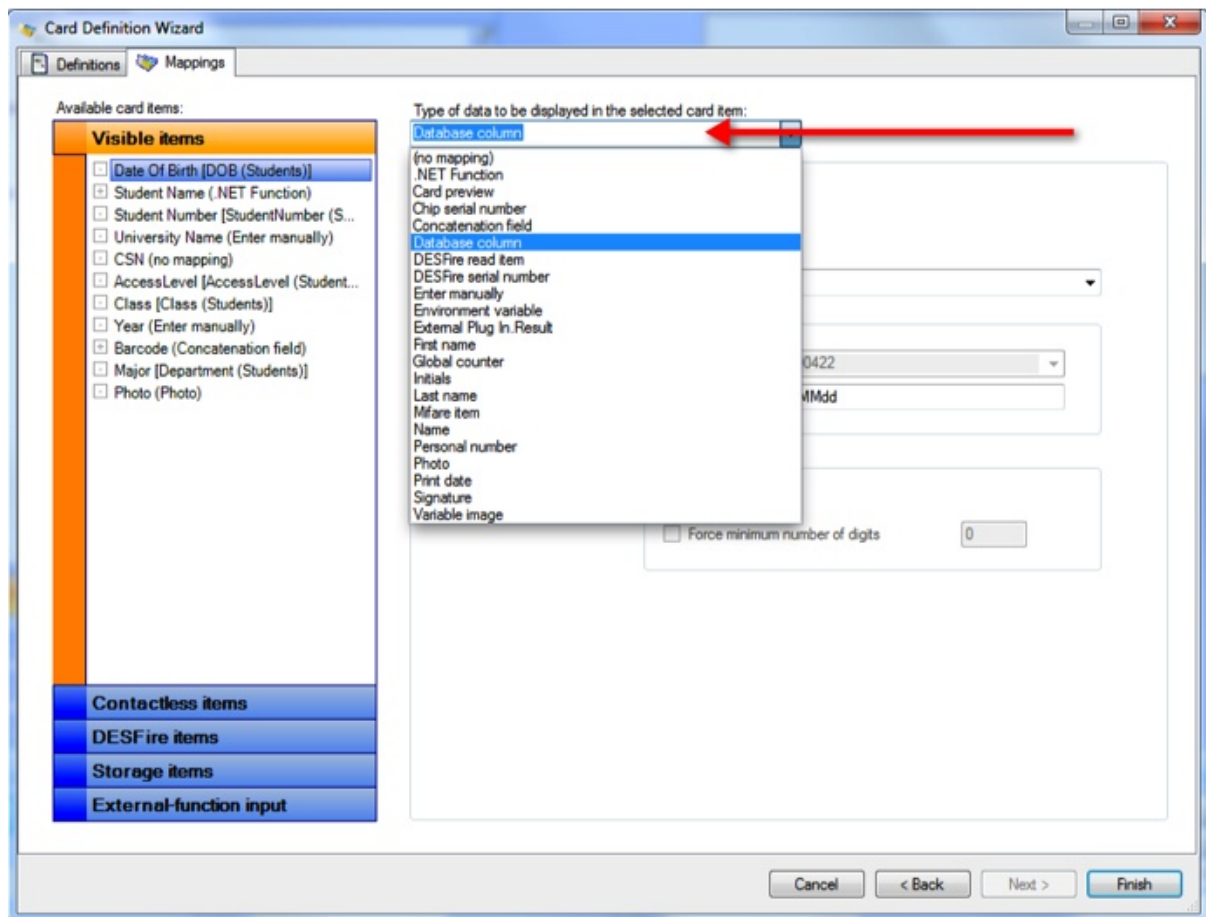
Select this option if you have received an external plug that needs to be configured for use inside of CardExchange®.

7.3.2 Advanced Mappings



At the left-hand side you see a navigator object with **one, two, three, or four** tabs, depending on whether you are using the magnetic or contactless encoding options. The tab Visible items shows all ordinary card objects that you have given a name to in CardExchange® Designer. Visible items can be text fields, images or bar codes. The card design of this example has named card items like Student Name, Photo, Barcode, etc. The first one is a text field, the last three are image fields.

Simply select the Tab of the Explorer on the left side to make the mappings available.



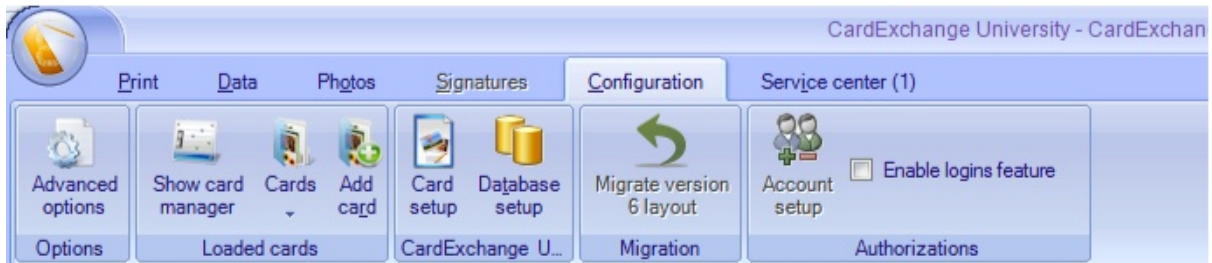
From the drop down menu, as indicated with the red arrow, you can select all types of Standard Object Types to map to the items in the Explorer on the left side. Most of the functionality is already available in the new Designer and these objects are linked to that separate section of the Help file.

Depending on the edition running, it offers Standard Object Types for:

- .NET Function
- Card preview
- Chip serial number
- [Concatenation field](#)
- [Database Column](#)
- DESFire read item
- DESFire serial number
- [Enter manually](#)
- Environment variable
- External Plug In Result
- First name
- [Global counter](#)
- Initials
- Last name
- MIFARE Item
- Name

- Personal number
- [Photo](#)
- [Print date](#)
- [Signature](#)
- [Variable image](#)

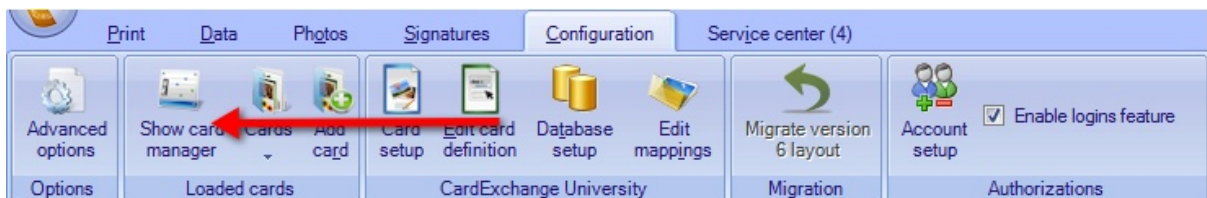
8 Managing Card Templates



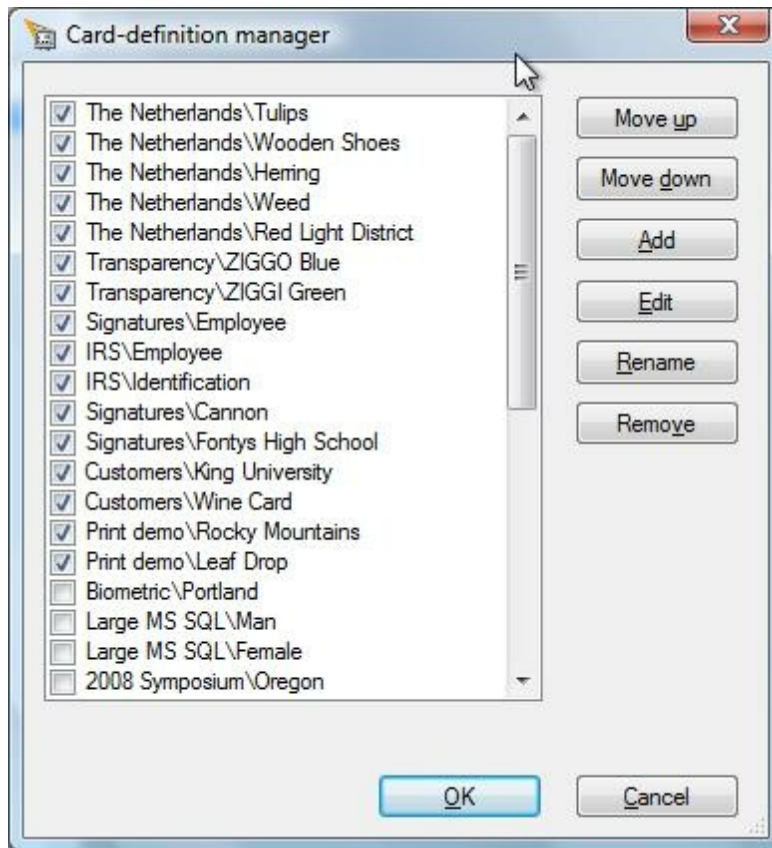
In CardExchange® we offer the possibility to manage unlimited card-templates. A card-template is a collection of card-layout(s), card-page(s), and/or database connections, and/or contactless encoding, etc. All available card-templates are managed from the [Card Manager](#). How to work with the [Card Manager](#) is explained in the [Using the Card Manager](#) section.

8.1 The Card Template Manager

In CardExchange® all card-templates are managed via the Card Manager.



The Card Manager is called from the [Configuration](#) tab of the CardExchange® Main window.



In this Card Manager window, all loaded card-templates are presented in a selectable list on the left side. You can check and de-check card-templates by clicking on the check boxes for the card-template names. De-selecting a card-template means that it will not be visible in the [Explorer Menu](#) under the [Loaded Cards](#) tab.

With the buttons on the right side of the Card Manager window you can perform the following actions:

Button	Description
Move up	Moves the selected card up in the Loaded Cards tab
Move down	Moves the selected card down in the Loaded Cards tab
Add	Add a new card-template and opens the card-template wizard
Edit	Opens the card-template in the Designer for editing
Rename	Rename the selected card as it appears in the Loaded Cards tab
Remove	Remove the card-template

By clicking OK, the window will be closed and all changes will be saved. Hitting Cancel will cancel all changes made except the ones done via the Edit functionality.

For more information about how to add new card-templates, please see our ["Add a Card"](#) section of this Help file.

8.2 Migrating Version 6 Layout(s)

Although CardExchange® 7 and 8 still supports version 6 templates we can imagine that you would like to use your old card-templates with the new Designer and take benefit of all the new functionality offered now. Because we can imagine that you do not want to redo all your existing version 6 card-templates, CardExchange® version 7 and 8 offers functionality to migrate the old templates to the new version 7 or 8 standard.



When selecting the [Configuration](#) tab, you can find the **Migrate version 6 layout** button. If this button is not shown, please see the "[Advanced Options](#)" section in this Help file and check the **Show Migrate button or menu** option in the Advanced Options window.

When the button is available, simply click on the **Migrate version 6 layout** button and the selected card-template (*.ced) will be migrated to the new version 7 or 8 format (*.cedx).



When the card template is migrated, the new template will be loaded and clearly marked as **(migrated)**. You do not lose your original template!

9 Printing Cards

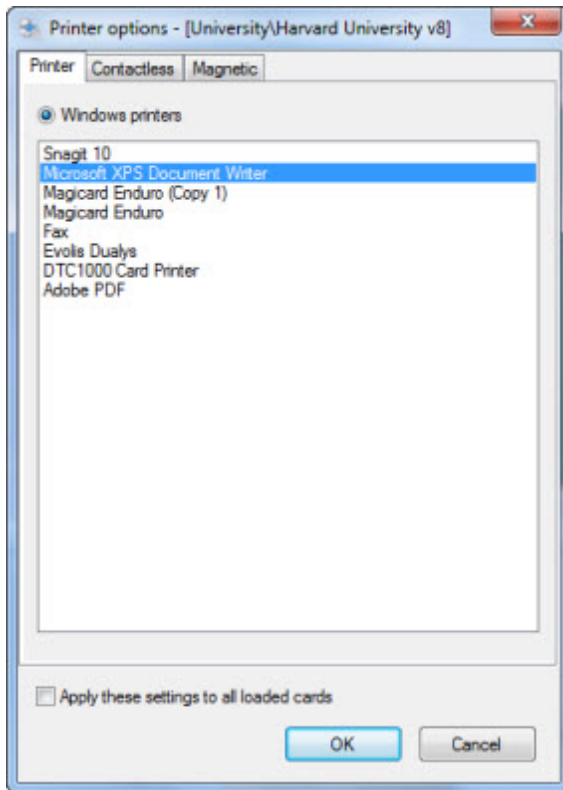
IMPORTANT! If you are using our Small Business Multi License Edition Product, please view the "Printing Cards" at the Small Business Server section of this Help file.



The Print tab is organized in different groups with specific functionality.

Group	Function(s)	Description
Options	Printer Options	Configure your printer(s), contactless encoding, Magnetic encoding
Standard printer	Print card	Opens the print dialog
	Printer properties	Opens the printer properties dialog of the selected printer properties
	Export preview	Exports a preview of the card as a file
Windows printers	Print report	Opens the Print report dialog
	Select printers	Select printer(s) that can be directly accessed via Print to and the Explorer Menu
Automatic printing	Print to	Print directly to the selected Printer from the drop down menu
	Edit trigger	Edit and activate the printing trigger
	Start printing	Start automatic printing if configured
	Show print log	Show the print log

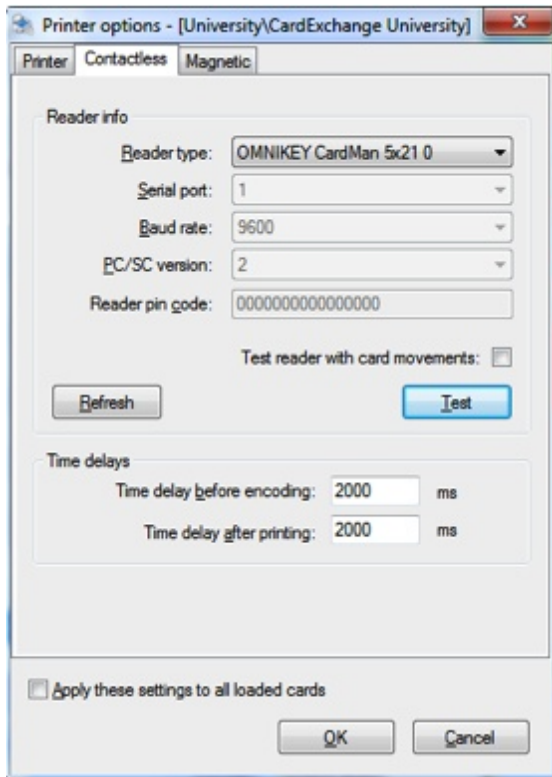
9.1 Select Standard Printers



When the printer options window is opened, it will present all the installed Windows Printers on the system CardExchange® is running on. Just select the printer you want to use from the list view and click on OK to confirm.

If you want to use the selected printer for all loaded card-templates, make sure you check "Apply these settings to all loaded cards" otherwise each card-template will have it's own specific printer connected.

9.1.1 Contactless

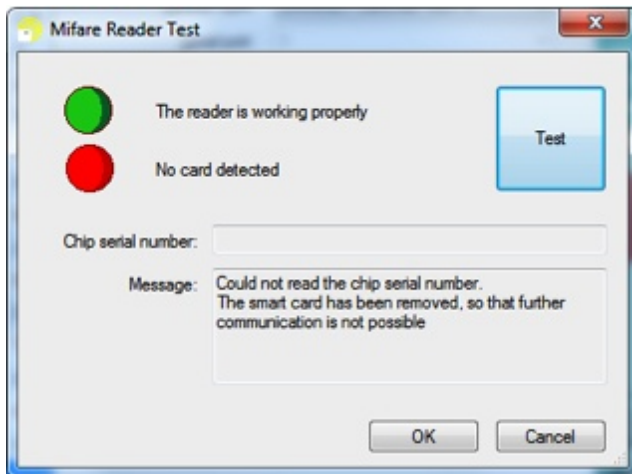


In the Contactless tab you are able to test your hardware configuration for encoding contactless cards.

The Reader Info Section

- **Reader type** - Select the reader being used inside your printer or external
- **Serial port** - Select the serial port the reader communicates with (not applicable for PC/SC)
- **Baud rate** - Select the baud rate (speed) of the used reader
- **PC/SC version** - When PC/SC readers are used, select the version 1 or 2
- **Reader pin code** - If reader requires a pin for access, you have to enter it here
- **Test reader with card movements** - Set to True or False

In the Reader Info Section you can also find two buttons. The button Refresh refreshes the list of readers available in the Reader type drop down menu. When a new PC/SC reader is added to the system, this button needs to be pressed to make it available. The second button is the Test button. Depending on card movements setting, clicking this button will move the card to the encoding position of the printer that is selected in the [Printer Options](#) section and will test the reader.



In the reader test window it will indicate if CardExchange® is able to communicate with the reader, and if a card is presented, and can read the CSN (Chip Serial Number). These test are clearly marked with Red and Green lights.

When using older printers that works with so called escape commands to move the card in the encoding position, there is no information shared about the exact position of the card in the printer. For these printers we need to set the Time delays in the Time delays section.

There are basically two settings that can be entered; Time delay before encoding and Time delay after printing. The average time delay after printing is round 30 seconds (30.000 ms). On the the moment that the card is electronically processed, it will be set to print position. On that moment CardExchange® will prepare the next card for encoding, when printing multiple cards of course. After 30 seconds, independently of the state the printer is in, CardExchange® will instruct the reader to access the card. With these older printers you will have to play a little with these time delays to get the best results. Don't forget to make sure to check the Configuration settings in the [Advanced options](#) for using Factory or non-factory build in readers.

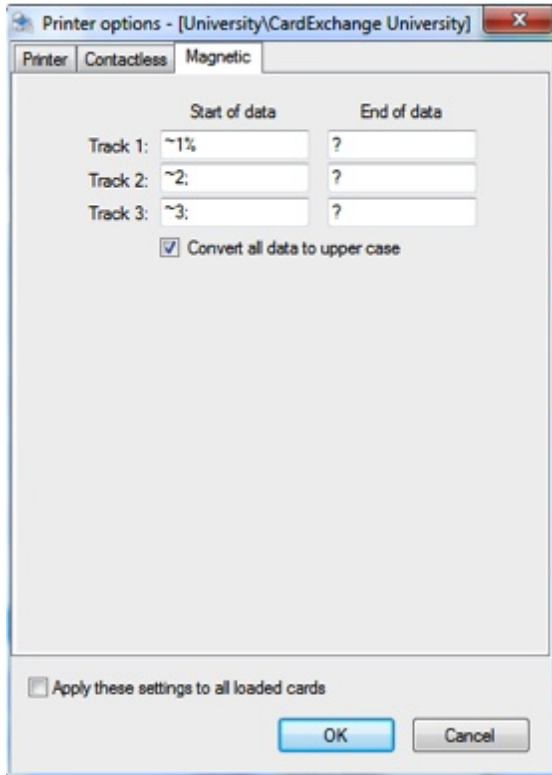
Factory build in readers normally work via SDK's (Software Development Kits) that give CardExchange® full control of the printer and time delays are normally never needed and can stay in the default settings of 2000 ms.

1 sec = 1.000 ms

Of course, all these setting made can apply for all cards or the selected card only.

For more information about Contactless encoding, please see our [Using Contactless Encoding](#) section of this Help file.

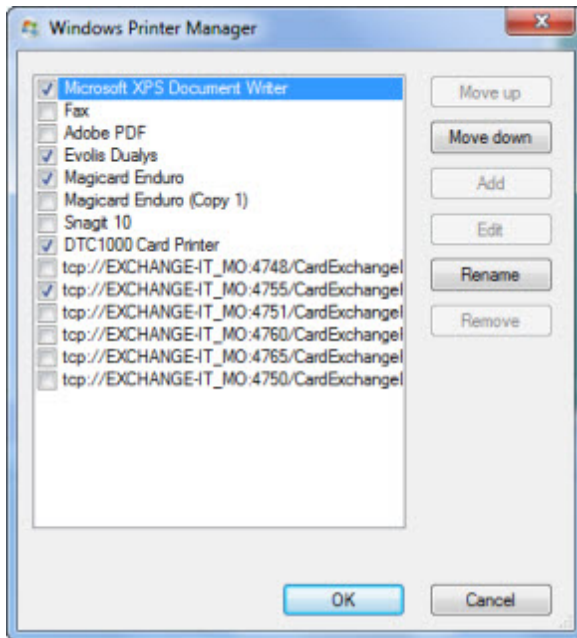
9.1.2 Magnetic Encoding



In the Magnetic tab you can set the start and stop commands for the printers to encode the magnetic stripe. Most common start and stop commands can be found on our [CardExchange® End-Users Forum](#). Of course, these settings can apply to all cards or the selected card only.

IMPORTANT! These Start and Stop commands only apply when using the old version 6 Designer! Magnetic encoding via CardExchange® 7 and 8 is explained in the "[Using Magnetic Encoding](#)" section of this Help File!

9.2 Select Windows Printers



Besides the fact that each card-template can have it's own unique printer connected, via the Windows Printers functionality, you can make specific Windows printers available to overrule the default card-template printer which you configure in the [Printer Options](#) section.

When the Windows Printer Manager window is opened, you can make the printer available by checking the check box in the list view. You can also move printers up and down and rename them so they get more understanding names.

The selected printers will become available in [Windows Printers](#) tab under the explorer menu.

9.3 Print Using Standard Printer

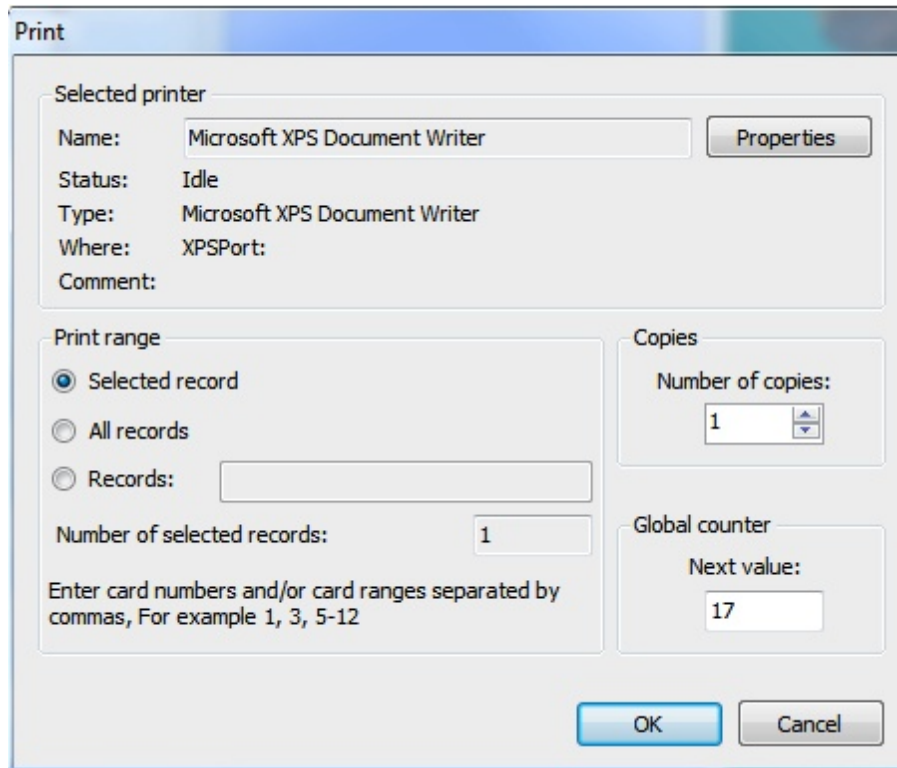


There are three ways to print a card to the standard printer.

- Click the **Print** button in the Standard printer section of the Print tab,
- Select the **Print** option in [Functions Menu](#) or
- Press **Ctrl+P** on your keyboard

If you use the horizontal toolbar, CardExchange® will start printing directly, using the

default settings. Otherwise, CardExchange® displays the window shown below.



In the **Selected printer** group you can find the information of the printer you are printing too like the **Name** of the printer, the **Status** of the printer, **Type**, etc.

Just like in normal Microsoft Office Applications, in the **Print range** group you can set to print the **Selected record**, **All records**, or a selection of **Records**. The **Number of selected records** is indicated in this named field.

Next to the name, the button **Properties...** gives access to the **printer-properties** window, allowing to adjust any settings before starting to print. Generally, it is not necessary to change the printer properties once they have been defined for the first time.

In the **Copies** group you can enter or select the amount of copies that needs to be printed. By default CardExchange® prints one copy.

If the card uses a global counter, in the **Global counter** group you can see the number indicating the global counter number that will be used for the first card to be printed. For each consecutive card the global counter will be incremented by one. The global counter can be edited to change this number to another value. It is up to the user to decide whether changing the default value is necessary.

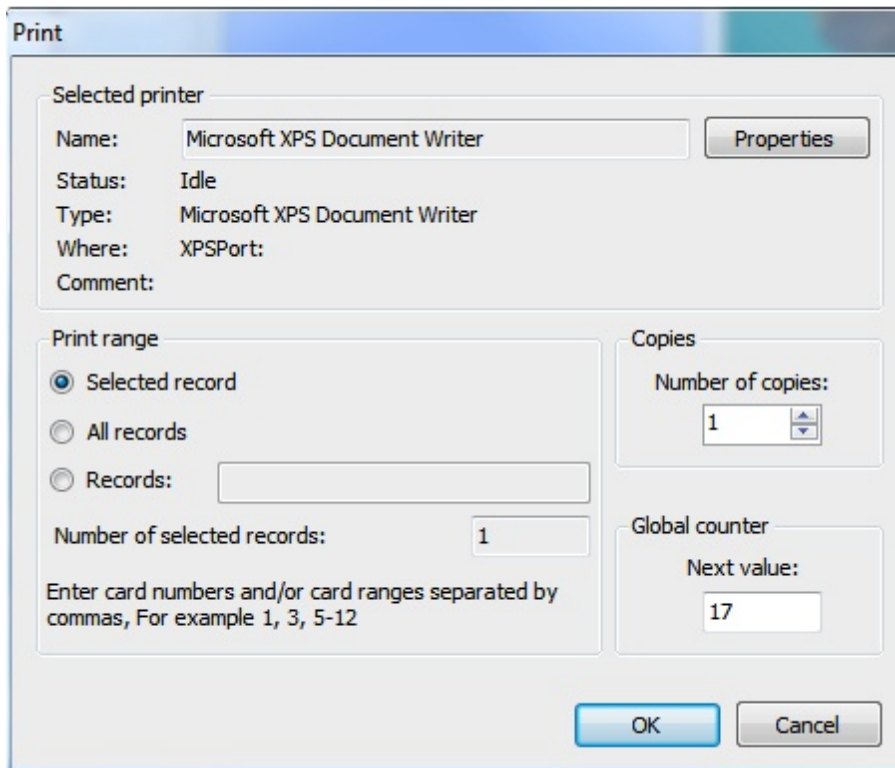
9.4 Print Using Windows Printer



There are two ways to print a card to a Windows printer instead of the standard printer.

- Click on the **Name** of the printer in the [Windows printers](#) tab in [Explorer Menu](#) or
- Select the **Printer Name** from the drop down menu in the Windows printers section of the Print Tab.

In both cases, the Print command window appears.



In the **Selected printer** group you can find the information of the printer you are printing too like the **Name** of the printer, the **Status** of the printer, **Type**, etc.

Just like in normal Microsoft Office Applications, in the **Print range** group you can set to print the **Selected record**, **All records**, or a selection of **Records**. The **Number of selected records** is indicated in this named field.

Next to the name, the button **Properties...** gives access to the **printer-properties** window, allowing to adjust any settings before starting to print. Generally, it is not

necessary to change the printer properties once they have been defined for the first time.

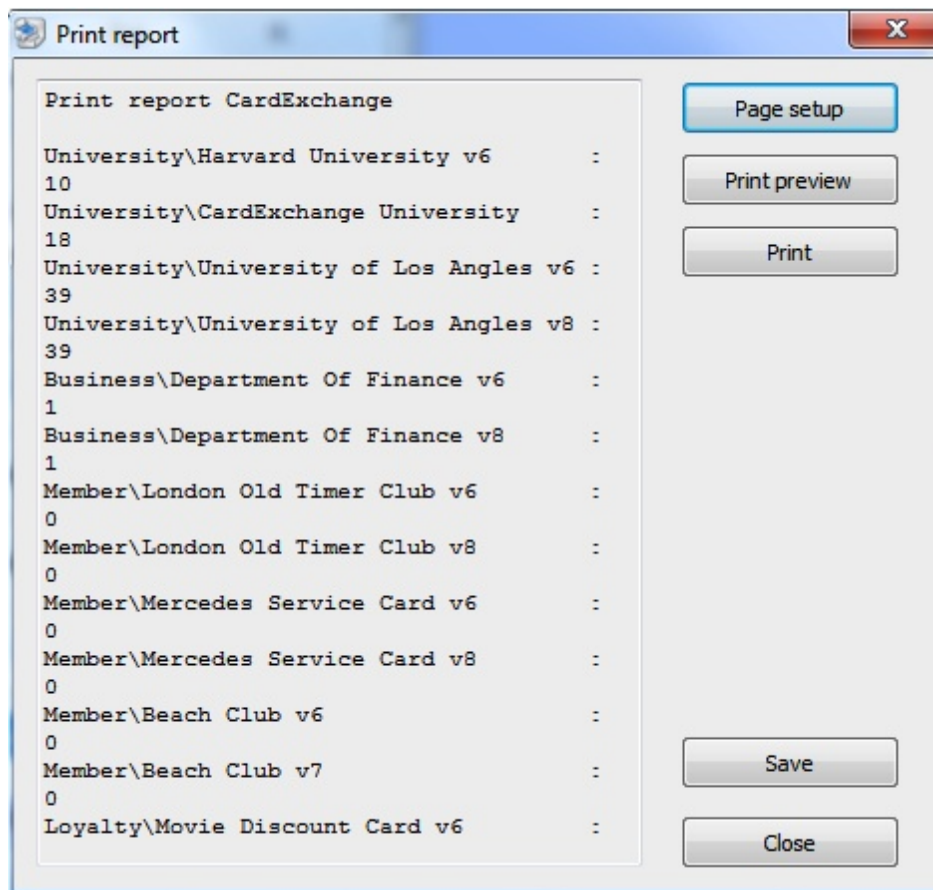
In the **Copies** group you can enter or select the amount of copies that needs to be printed. By default CardExchange® prints one copy.

If the card uses a global counter, in the **Global counter** group you can see the number indicating the global counter number that will be used for the first card to be printed. For each consecutive card the global counter will be incremented by one. The global counter can be edited to change this number to another value. It is up to the user to decide whether changing the default value is necessary.

9.5 Viewing the Print Report



You will find the Print report option under the **Standard printer** section of the **Print** tab. If you click this option, a simple report will be displayed showing how many prints have been made of the loaded cards since the system administrator loaded them into CardExchange®.



The **Print** button allows you to send the summary to a printer. Use the **Page setup** button to specify the layout options you want to use. Use the **Print preview** button to view the result before printing it.

You can also save the summary in a file. To do this click **Save**. Then choose the folder into which you want to save the overview and specify the file name. The summary can only be saved as a text document.

9.6 Automatic Printing

With the **Auto Print Server** module you are able to fully automate the print process for each connected card layout through your own application. That means that when the Auto Print Server is configured and you add a new record through your own application, for example a **Access control application**, CardExchange® monitors the database from this application and when the new record appears in the database, CardExchange will automatically print the connected card.

The **Auto Print Server** functionality is based on creating triggers on the database. These Triggers are created by means of the powerful [Storage Items](#) in our **Database**

Connection Wizard. By setting a trigger condition, like checking if the assigned database field is empty, CardExchange® monitors what happens in your database. Together with this functionality we introduce a new filter level, which will be set independently of any other filter created. These triggers can be set for every connected card template in CardExchange® and for each trigger you are able to set trigger intervals.

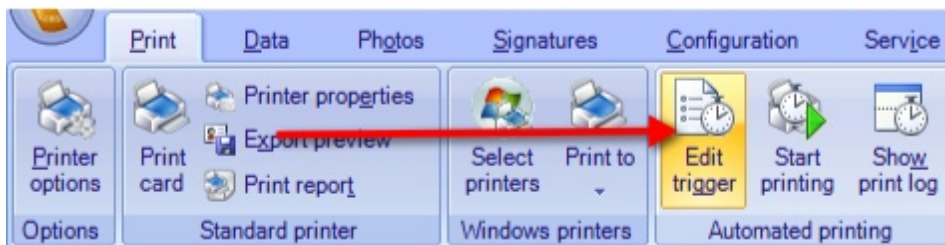
The **Auto Print Server** Module allows you to have CardExchange® working on the background, but CardExchange® monitors and reports all jobs that prints. This window contains information about records that are printed, card-layouts, printer errors, etc.

***IMPORTANT!** Automatic Printing is available for Professional and higher editions!*

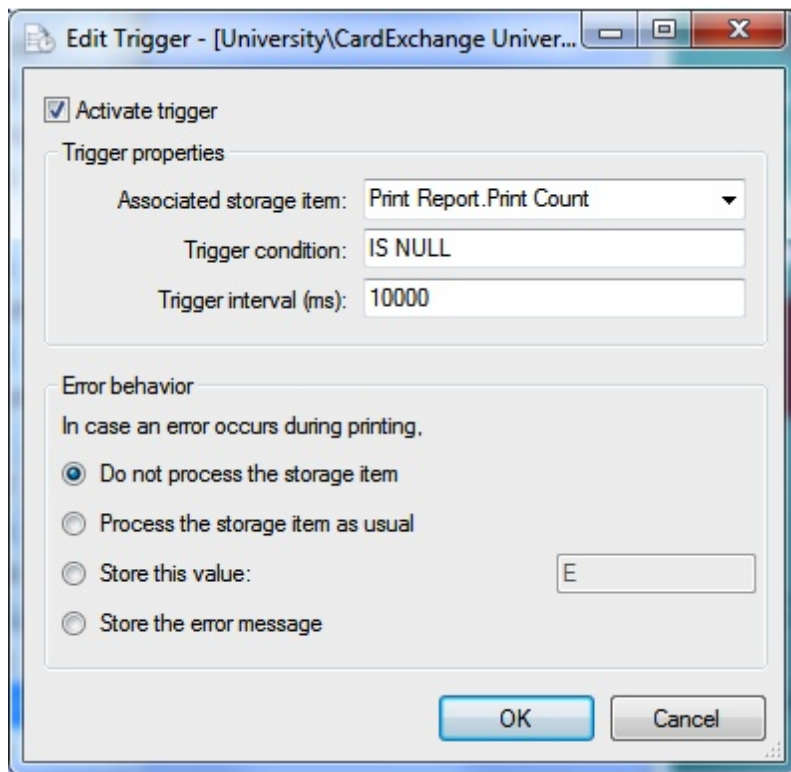
9.6.1 Configure

Automated Printing is based on creating a trigger of a field in the connected database. This means that for using this functionality, [Storage Items](#) needs to be created. Based on the Storage Item, CardExchange® will monitor any changes of the field. [Storage Items](#) are created when the database connection is made. Connecting to a database and creating storage items is mentioned in section '[Databases](#)' of this Help file.

Considering the fact that the [Storage Item](#) is created we need to address and set the trigger for monitoring the database for changes.



Select **Edit trigger** from the **Automated printing** section of the **Print** tab. This will open the **Edit Trigger** window.



When the **Edit Trigger** window is opened you need to **Activate** the trigger to set all the properties. By checking the check box '**Activate trigger**' you will have access to three important properties. First you need to select the field where CardExchange® needs to trigger on. This can be selected from the drop down menu '**Associated storage item**', here will be all the created storage item presented.

The next step is to set the trigger condition. This condition is executed on the database field. In this case the record will be printed when the triggered database field (**Print count**) **IS NULL** (default).

The last step is to set the trigger interval. In this example, CardExchange® will look every 10 seconds if there are records in the database where the **Print count field is NULL**. When it finds a field that follows the trigger condition it will print that record.

It is also possible to define the Error behavior in case of something happens during the printing process. You have four different options:

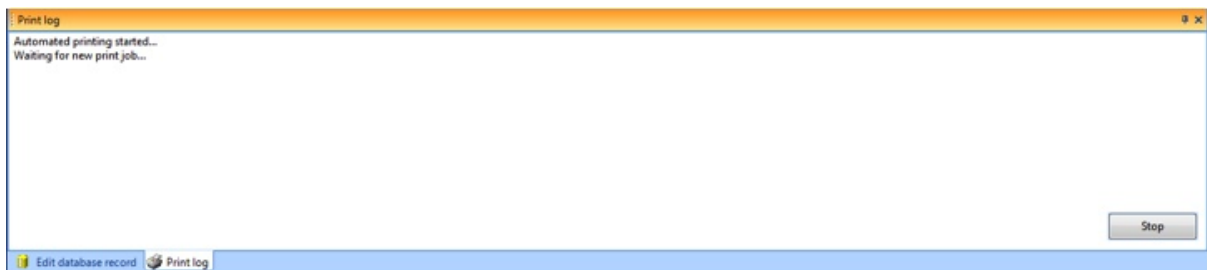
- **Do not process the storage item** - When an error appears, the storage item is not processed
- **Process the storage item as usual** - When an error appears, the storage item will be processed
- **Store this value** - When an error appears, the value entered in the text box will be stored
- **Store the error message** - When an error appears, the error message will be stored

Automatic printing can be configured for every connected card layout in CardExchange®.

9.6.2 Start and Stop

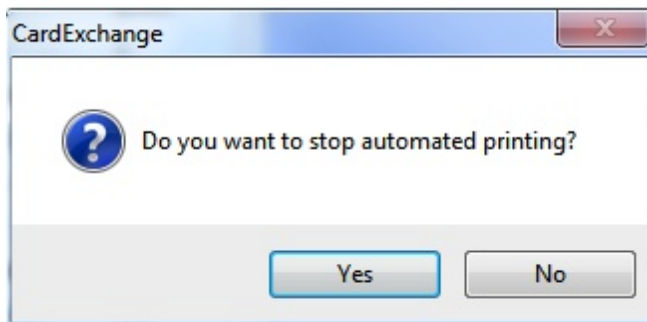


When all the triggers are set and activated we need to start the **Automatic Print Server**. Select from the **Automatic printing** section in the Print tab **Start printing**.



The **Print log** screen will be displayed and it will show all activity of the print server. CardExchange® is locked during the process of **Automatic printing**.

To stop the process just click on the **Stop** button in the **Print log** window and no triggers will be processed.



10 Using Data

The screenshot displays the CardExchange University software interface. The main window is titled "CardExchange University - CardExchange® Ultimate". The interface is divided into several sections:

- Top Menu:** Print, Data, Photos, Signatures, Configuration, Service center (5).
- Toolbar:** Edit options, Find name, Find next, Change sort order, Refresh data, Select all, Database data, Manual data entries, Edit level one filter, Edit level two filters, Enable level three filter, Filters.
- Loaded cards section:**
 - Names Table:**

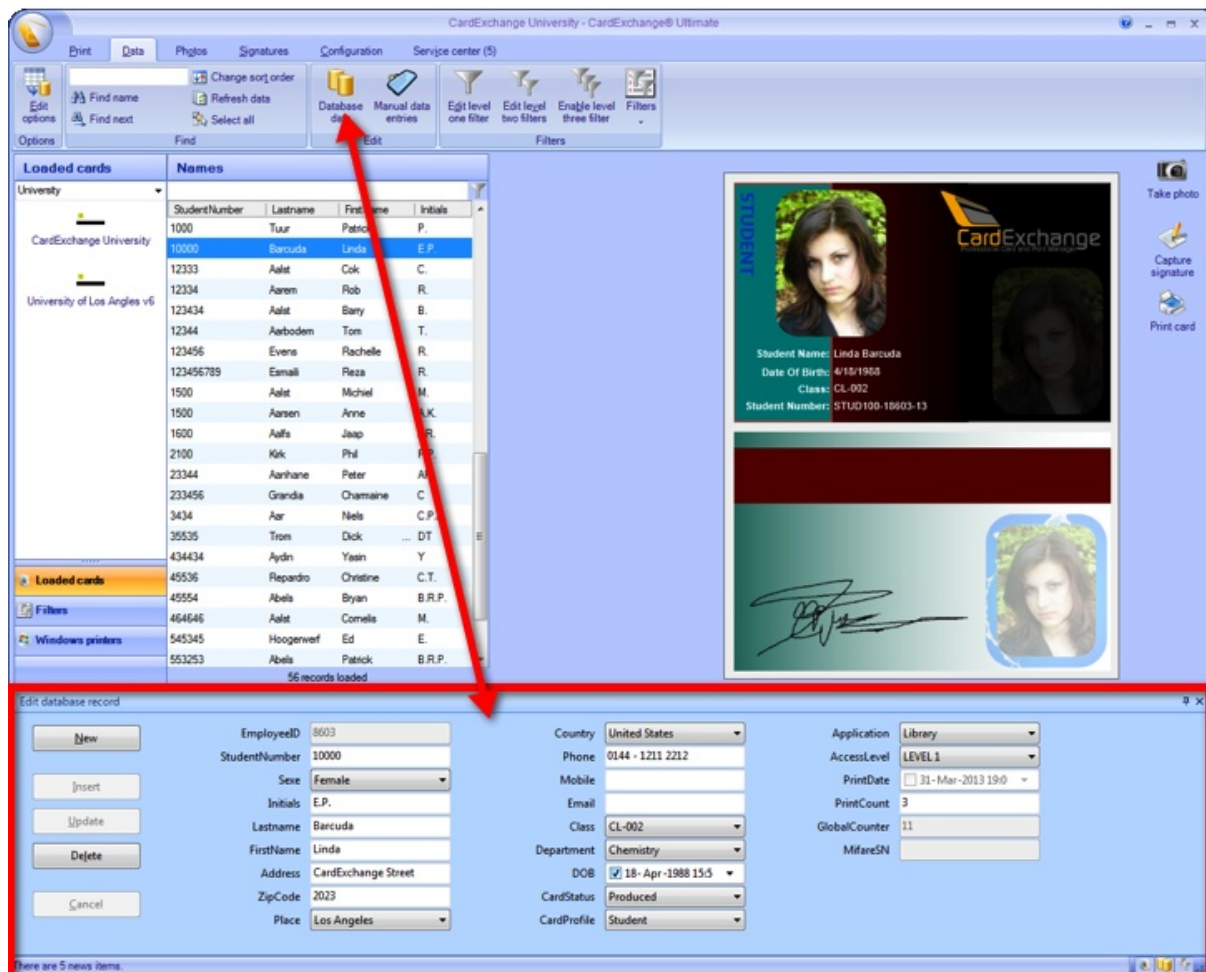
StudentNumber	Lastname	FirstName	Initials
1000	Tuur	Patrick	P.
10000	Barcuda	Linda	E.P.
12333	Aalst	Cok	C.
12334	Aarem	Rob	R.
123434	Aalst	Barry	B.
12344	Aarbodem	Tom	T.
123456	Evens	Rachelle	R.
123456789	Esmail	Raza	R.
1500	Aalst	Michiel	M.
1500	Aansen	Anne	A.K.
1600	Aalfs	Jaap	J.R.
2100	Kik	Phil	P.P.
23344	Aarhane	Peter	AP
233456	Granda	Charmaine	C.
3434	Aar	Niels	C.P.J.
35535	Trom	Dick	DT
434434	Aydn	Yasin	Y.
45536	Repardo	Christine	C.T.
45554	Abels	Bryan	B.R.P.
464646	Aalst	Cornelis	M.
545345	Hoogerwerf	Ed	E.
553253	Abels	Patrick	B.R.P.
 - Card Preview:** A preview of a student ID card for Linda Barcuda. The card includes a photo, the CardExchange logo, and the following details: Student Name: Linda Barcuda, Date Of Birth: 4/18/1988, Class: CL-002, Student Number: STUD100-18603-13. Below the card is a signature and another photo.
- Edit database record section:**
 - Buttons:** New, Insert, Update, Delete, Cancel.
 - Fields:**
 - EmployeeID: 8603
 - StudentNumber: 10000
 - Sex: Female
 - Initials: E.P.
 - Lastname: Barcuda
 - FirstName: Linda
 - Address: CardExchange Street
 - ZipCode: 2023
 - Place: Los Angeles
 - Country: United States
 - Phone: 0144 - 1211 2212
 - Mobile:
 - Email:
 - Class: CL-002
 - Department: Chemistry
 - DOB: 18-Apr-1988 15:5
 - CardStatus: Produced
 - CardProfile: Student
 - Application: Library
 - AccessLevel: LEVEL 1
 - PrintDate: 31-Mar-2013 19:0
 - PrintCount: 3
 - GlobalCounter: 11
 - MifareSN:

Viewing and Managing data from a connected database is very important to have a smooth production environment. CardExchange® offers many ways to look up data, enrich data, view data, etc.

In this section of the Help file we will go over all the functionality available like using Filters, Update your Database, etc.

10.1 Edit Data

The Edit database record window gives you direct access to the personal data stored in the database. Provided that the CardExchange® administrator has given you permission to do so, you also can edit these data and add or remove records.



You can open the **Edit database** record window by selecting **Database data** in the **Edit section** of the **Data** tab. A so called dockable window will appear in the lower part of the main window. By clicking on the bar with the text Edit database record, you can dock the window to the upper part or to the sides. You can even turn it into an independent window by dragging it to a position away from the edges of the main window. Clicking on the pin will cause the window to minimize. Clicking on the cross will close the window.

On the left part of the docked window, there are five buttons for performing database operations. On the right part, all names and values of the database records that apply to the selected person are displayed. If you select another record, the Edit database record will load automatically the data associated with the selected record.

With the buttons, you can perform three types of database operations: **Insert** records, **Update** records, and **Delete** records. The following sections will describe these actions one by one.

10.1.1 Insert Database Records

A database record can be inserted in four steps:

- Open the **Edit database** record window.
- Click on the **New** button in the **Edit database record** window. Note that all fields will be cleared in order to enable you to enter new data. The cursor will be positioned automatically on the first field that can be edited. The buttons **Insert** and **Cancel** will be enabled.
- Enter the data you need into the empty fields.
- Click on the **Insert** button to load the data into the database, or on the **Cancel** button if you do not want that.

While inserting a new record, all functions of the main window are disabled. These will be enabled as soon as the **Insert** or **Cancel** button is clicked on. You can only insert a new database records if the administrator has given you permission to do so and if no more than one name has been selected in the name list.

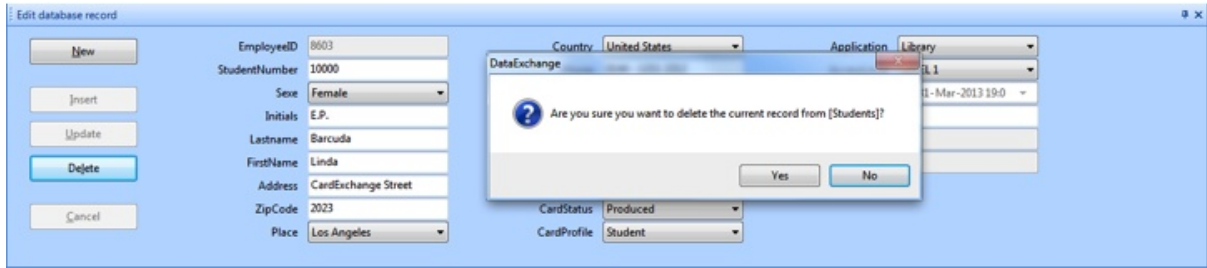
10.1.2 Update Database Records

A database record can be updated in four steps:

- Open the **Edit database record** window.
- In the [Data Record View](#), select the record you want to change.
- Click on the field you want to change and change it. Instead of using the mouse, you can also press **F2** to position the cursor on the first field that can be edited and use the Tab key to move to the desired field. The buttons **Update** and **Cancel** will be enabled as soon as you start typing.
- Click on the **Update** button to load the data into the database, or on the **Cancel** button if you do not want that.

While updating a new record, all functions of the main window are disabled. These will be enabled as soon as the **Update** or **Cancel** button is clicked on. You can only update a database records if the administrator has given you permission to do so and if no more than one name has been selected in the name list.

10.1.3 Delete Database Records



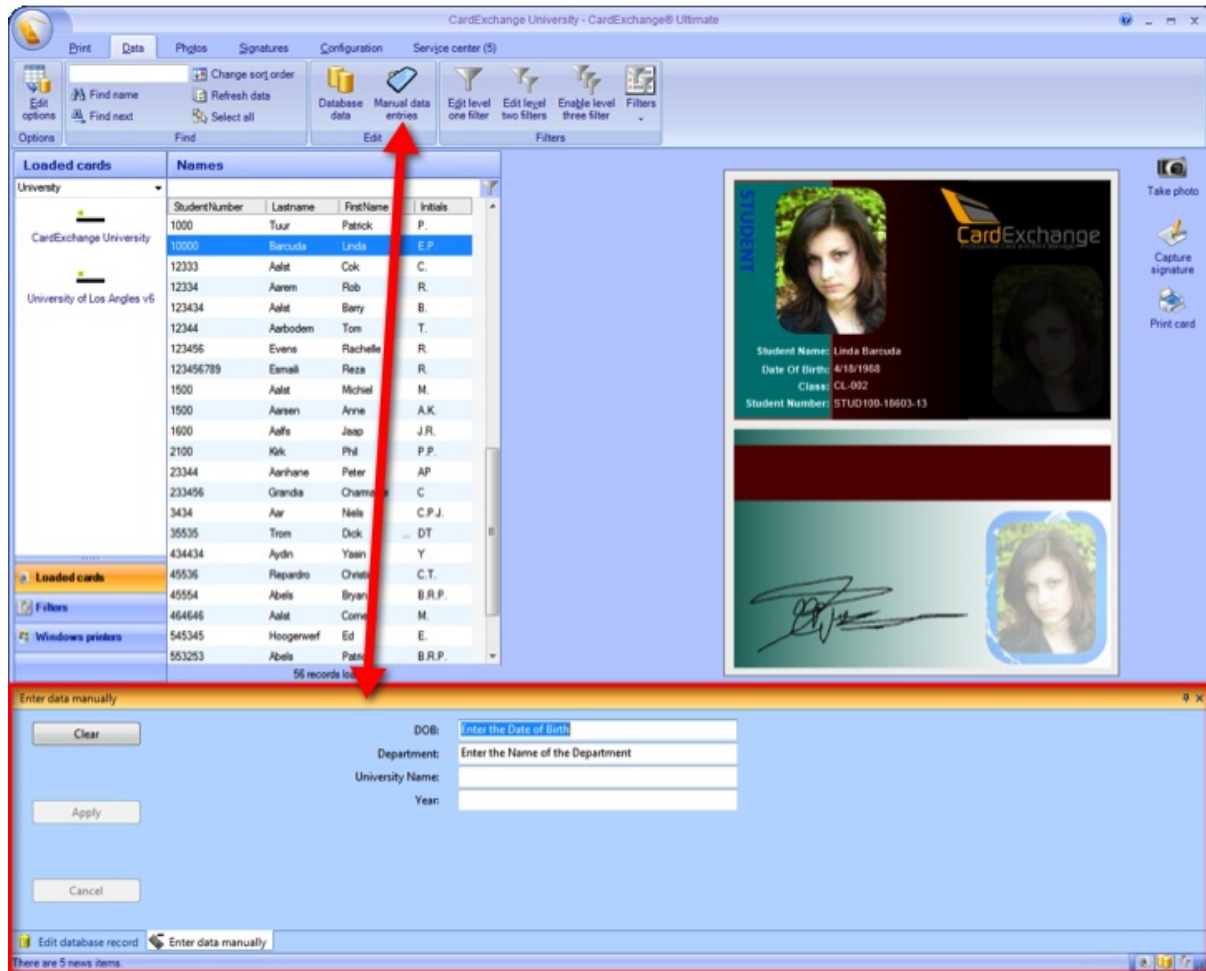
A database record can be deleted in four steps:

- Open the **Edit database record** window.
- In the [Data Record View](#), select the record you want to remove from the database.
- Click on the **Delete** button in the **Edit database record** window.
- Say **Yes** to the question if you really want to delete the record. Say **No** if you do not want that.

You can only delete database records if the administrator has given you permission to do so and if no more than one record has been selected in the [Data Record View](#). So you cannot delete more than one record at the same time.

Important! Deleting records from connected MS Excel files is not supported.

10.1.4 Using Manual Entries



The **Enter data manually** window gives you the possibility to enter data that should appear on the card without the intervention of a database. In order to enable this window, Manual Entries have to be defined. How to create [Manual Entries](#) can be learned in the [Manual Entries](#) section of this Help file. Only these created [Manual Entries](#) will appear in the **Enter data manually** window.

You can open the **Enter data manually** window by selecting the option **Enter data manually** in the **Edit** menu as shown in the screenshot. A so called **dockable window** will appear in the lower part of the main window. By clicking on the bar with the text **Enter data manually**, you can dock the window to the upper part or to the sides.

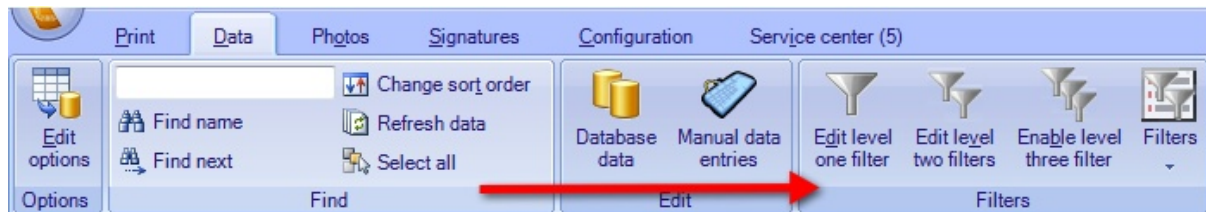
You can even turn it into an independent window by dragging it to a position away from the edges of the main window. Clicking on the pin will cause the window to minimize. Clicking on the cross will close the window.

In the example shown above, the administrator has defined four [Manual Entries](#). For each [Manual Entries](#) a text box appears where the operator can type data. The left part of the window shows a **Clear** button that can be used to clear all text boxes before typing new data. While typing data, the **Apply** and **Cancel** buttons are enabled. The **Apply** button should be pressed in order to confirm the data entered and display it on the print preview.

By pressing the **Cancel** button, the manual data entry is canceled and the former values are restored.

10.2 Filters

If you have a very large database, initial loading or refreshing the list of names can take some time. If the only reason to refresh the data is to retrieve the details of one person, you will probably consider it a nuisance to have to wait until the entire list of names has been loaded. Therefore, CardExchange® offers you the possibility of filtering out the data you do not need at the database level. To do this, you have to access the Data tab.



CardExchange® has three distinct filter levels. The **first level** is a filter that is defined by the administrator and that is always applied. Using this filter, the administrator can avoid that the user has access to certain records in the database. For example, if there is an employee table, this filter can be used to show only employees that are still in service and hide any historical information. It is very likely that the user is not even aware of the fact that a level-one filter is applied. However, it is useful to know that this filter type exists. It helps to understand, for example, why a certain record is visible in another application but not in CardExchange®.

The **second filter** level consists of a series of named filters that the operator can activate or deactivate freely in order to limit the number of names shown in the [Data Record View](#). The filters at this level are defined and named by the administrator. The filter names are shown as buttons in the [Filters Tab](#) of the [Explorer Menu](#). By clicking on a filter button or menu option, the filter in question is activated while all other filters are deactivated. By clicking the button or menu option with the text (no filter) all filters are deactivated. The status bar shows which level-two filter is active. In the above screen shot, one level-two filter called "No photo" has been defined and is shown in the tool bar.

Level-two filters are meant to divide the records in the [Data Record View](#) into logical groups. With a single mouse click, the operator can limit the records shown in the [Data Record View](#) to a specified logical group.

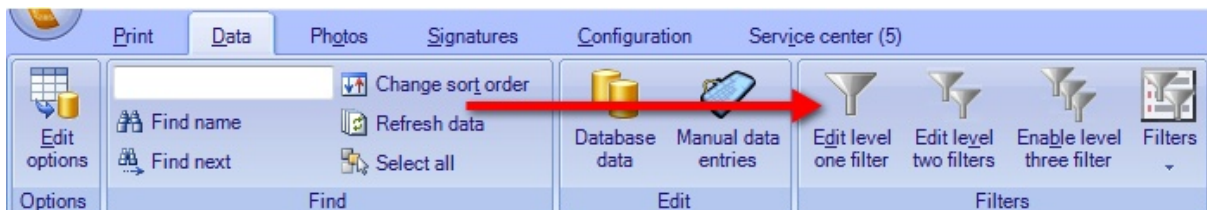
For example, one could define a level-two filter for each school class (if the card has been coupled to a students database). Other possibilities are creating a level-two filter for each employee for whom there is no photo in the database, or all employees for whom more than one card has been printed. It is not possible to activate two level-two filters at the same time, but you can use levels one and two simultaneously. After all, a user can never deactivate the first level, not even by selecting the button (no filter).

Finally, there is also a **third filter level**. This level can be switched on or off by the administrator. When activated, the user himself can determine in what manner he wants to filter his data. Every time he requests information from the database (for example, by selecting Refresh data under the Data ribbon tab section Find), a window prompts for the desired filter conditions.

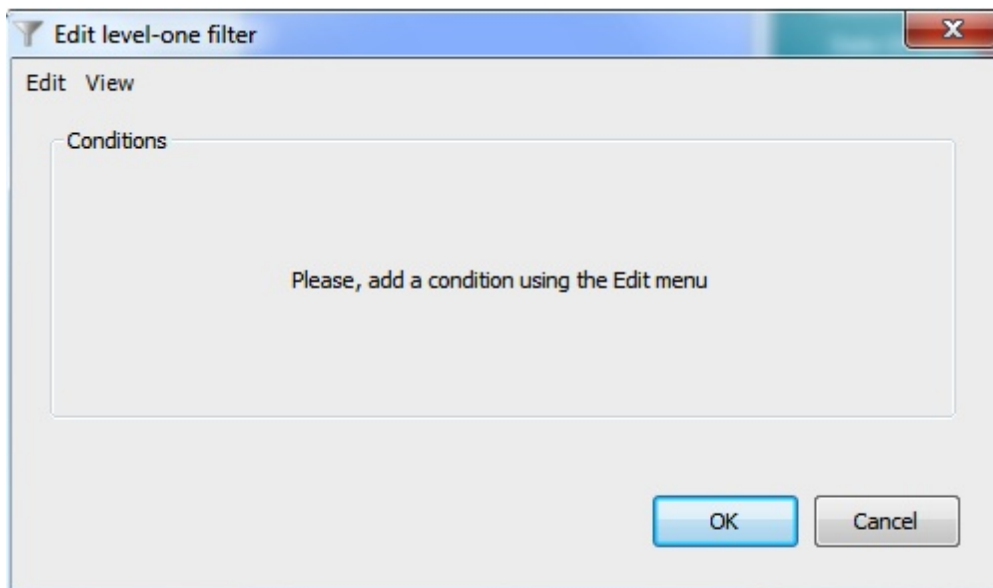
IMPORTANT! For using filters a Premium or higher edition is needed!

10.2.1 Level One Filters

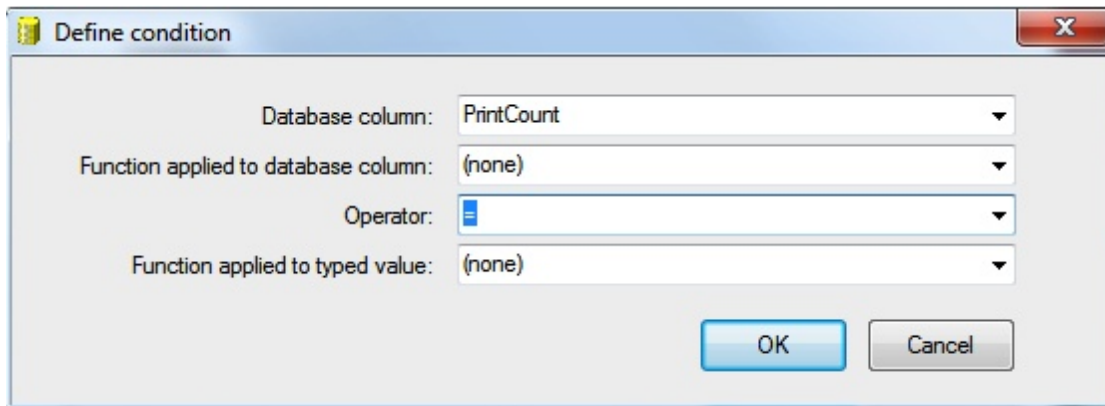
The level-one filter is normally defined by the administrator and is that filter that always applies. Using this filter, the administrator can avoid that the user has access to certain records in the database. For example, if there is an employee table, this filter can be used to show only employees that are still in service and hide any historical information. It is very likely that the operator is not even aware of the fact that a level-one filter is applied. However, it is useful to know that this filter type exists. It helps to understand, for example, why a certain employee is visible in another application but not in CardExchange®.



The **Level One** filter can be edited by choosing the option Edit level-one filter in the Filters section. If no filter has been defined before, the following window appears:

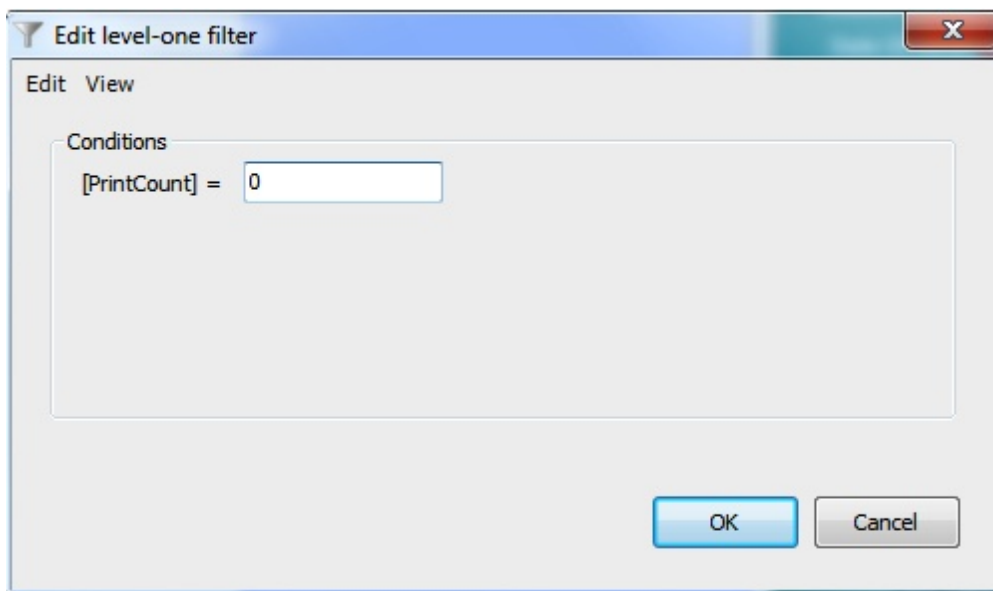


Now, you can add a filter condition with the menu option **Add conditions** in the **Edit menu** (you can also press the Insert key). A screen will be shown in which you can choose the database column and functions and operators to use in your filter. In the example below the column **PrintCount** is used for filtering, without applying any database function. The result is compared to the entered value using the is-equal-to operator.



Note! The functions and operators you can choose are database dependent.

Once you clicked **OK** to close the filter-definition window, the new condition will appear as follows. You can use the text box to enter the value to which you want to compare. In the example below the filter only passes records for which the field **PrintCount** is equal to zero.



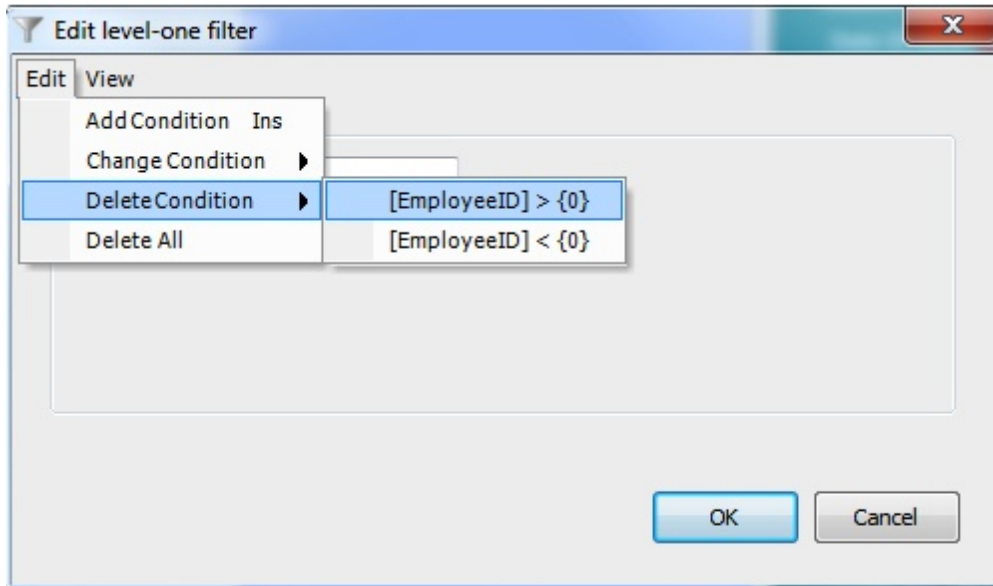
In the same manner, you can enter a second condition. In fact, there is no limit on the number of conditions. Each condition will have its own field in which values can be entered. When using multiple conditions, the following rules apply:

- If you leave a field empty, the condition will not be applied,
- If you enter values for more than one condition, only records are selected that meet both conditions,
- If you type null or NULL and the operator is = or LIKE, only records are selected for which the database column contains a null value,
- If you type null or NULL and the operator is <>, != or NOT LIKE, only records are selected for which the database column contains a value,
- If you type null or NULL with another operator, no records are selected.

When you click on the **OK** button, the **Level One** filter will be applied immediately. The

next time you choose **Edit level-one filter**, the conditions will displayed exactly as defined before. With the Edit menu, you can change or delete them, or add more conditions.

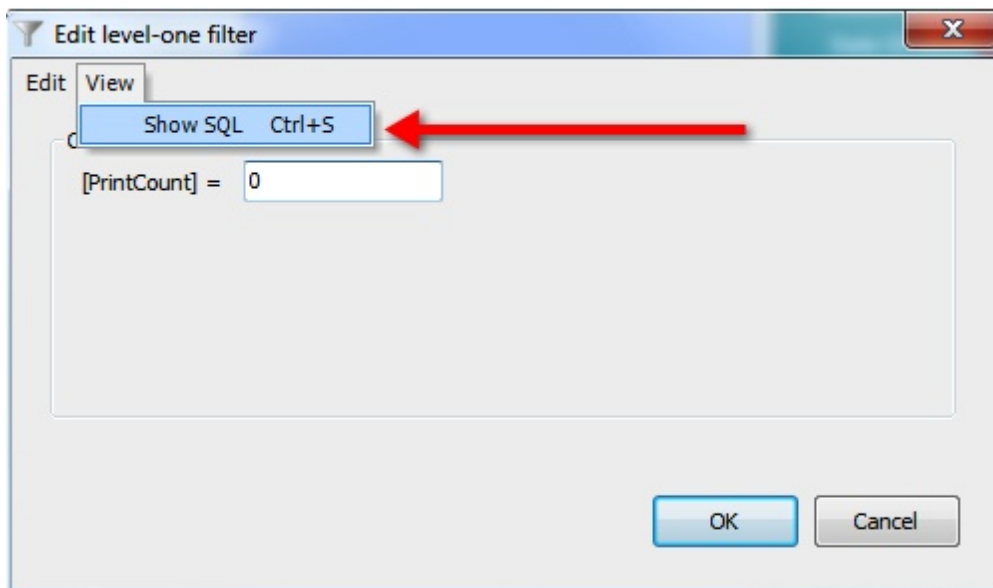
It is also possible to Change or Delete your conditions.



Just select **Change Condition** or **Delete Condition** from the Edit menu. You can also **Delete All** at once.

Please visit the ["Tips and Tricks"](#) section of this Help file for more information about configuring filters.

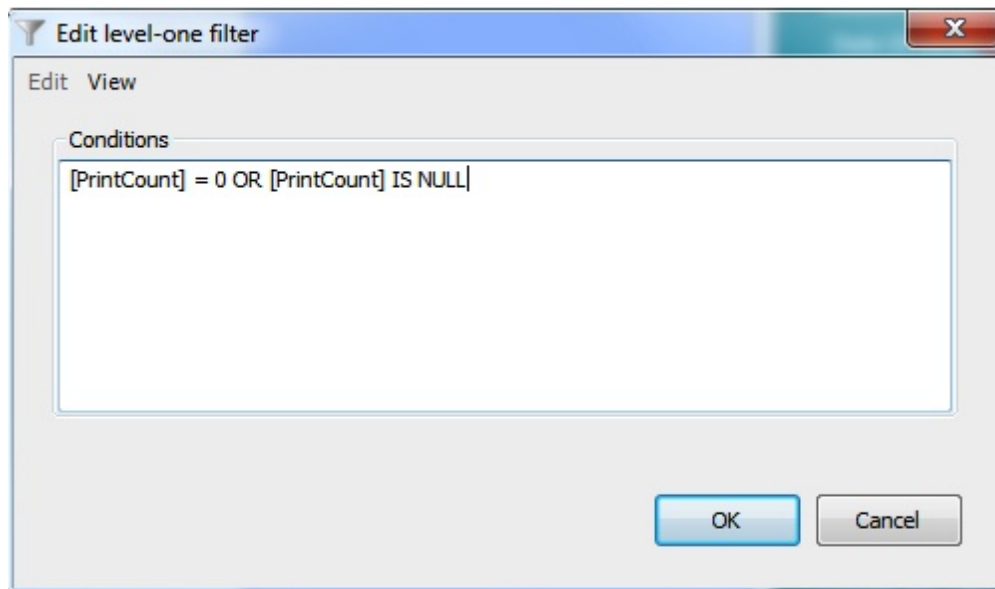
10.2.1.1 The SQL View



In a limited number of situations, the standard **Level One** filter described in the previous

section does not offer the flexibility needed to define the desired restrictions. In that case, you have the possibility to choose the option **Show SQL** in the **View** menu of the **Edit level-one filter** window.

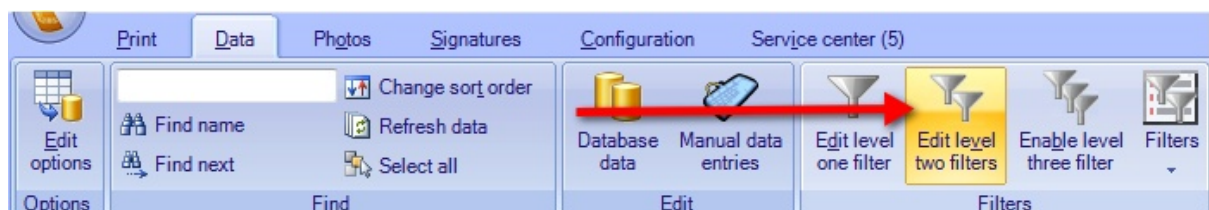
In this window, you can define your **Level One** filter using the SQL of the connected database. By default, you will see the SQL equivalent of the conditions defined in the standard view of the **Level One** filter, but you can change it the way you want.



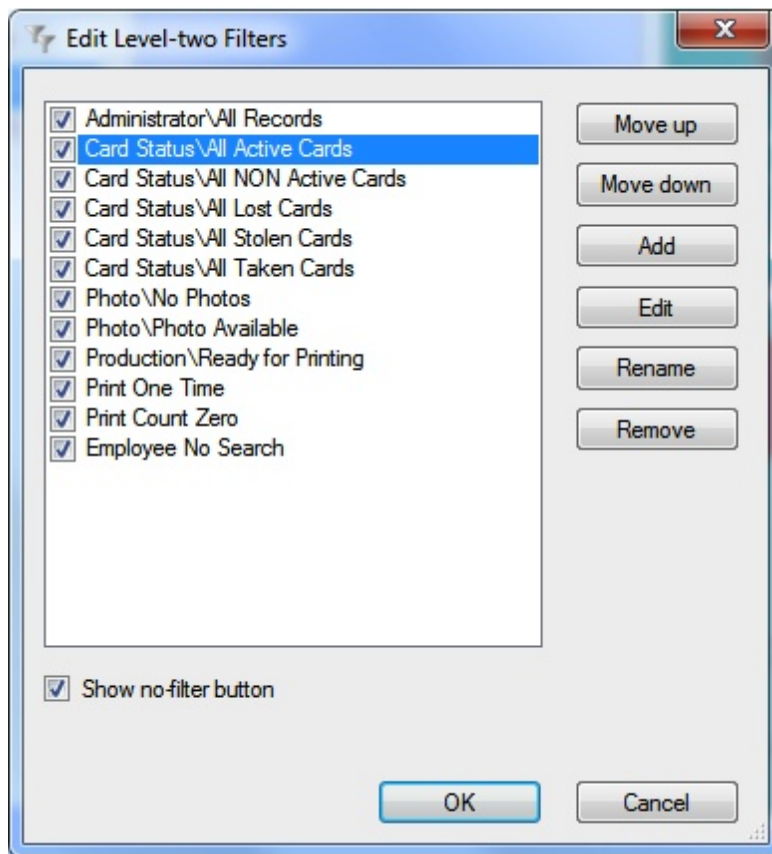
The SQL you enter will be stored in the internal database, but will be lost if you switch back to the standard view. In that case, you will see the conditions as you defined them before activating the **Show SQL** option.

10.2.2 Level Two Filters

Level Two filters are a series of named filters that the operator can activate or deactivate freely in order to limit the number of records shown in the [Data Record View](#). They are normally defined and named by the administrator. The filter names are shown as **buttons** in the [Filters Tab](#) of the [Explorer Menu](#). By clicking on a filter button with the text (no filter) all filters are deactivated. The status bar shows which Level Two filter is active.

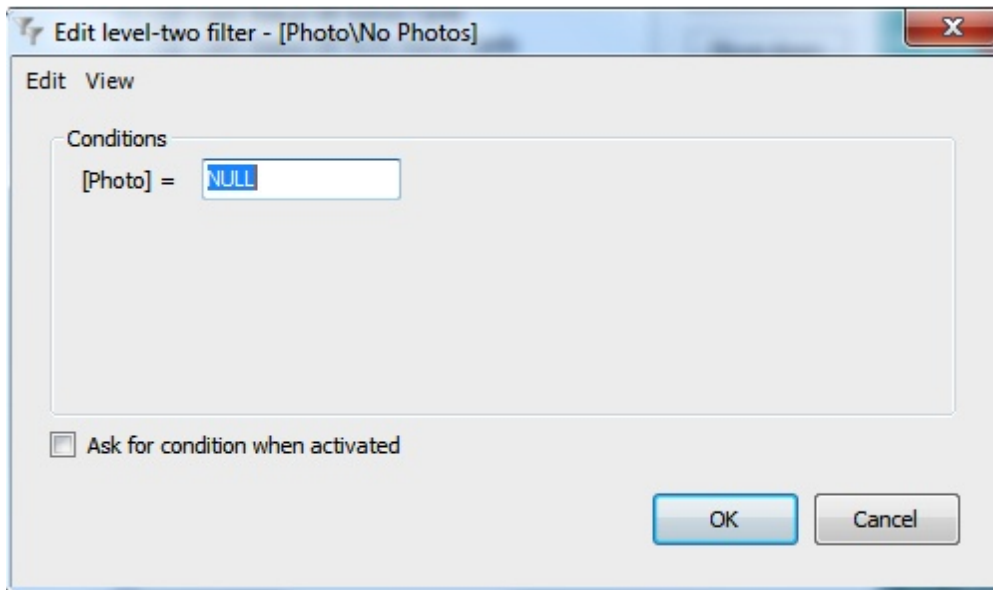


Adding **Level Two** filters starts by clicking on the **Edit level two filters** button in the Filters section of the Data tab.

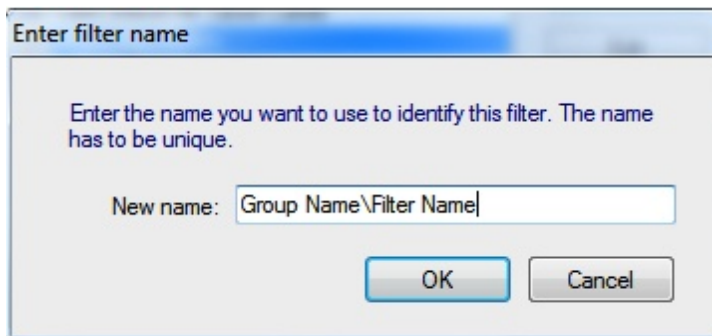


The Window that opens manages the different created **Level Two** filters. This manager offers you to add or edit new and existing filters, rename or remove them, or change the position in the [Filters Tab](#) of the [Explorer Menu](#) by moving them up or down. Administrators can protect normal operators to view all data by not presenting the No filter button to the user. By deselecting the 'Show no-filter button' the user will only have access to data that is offered when executing the defined **Level Two** filters.

Adding new filters works exactly the same as described in the section [Level One Filters](#). In fact, for adding a **Level Two** filter, you can follow the same procedure and there is no need to repeat the actions here. After adding a condition via the **Edit menu**, your window will look similar to the one shown below.

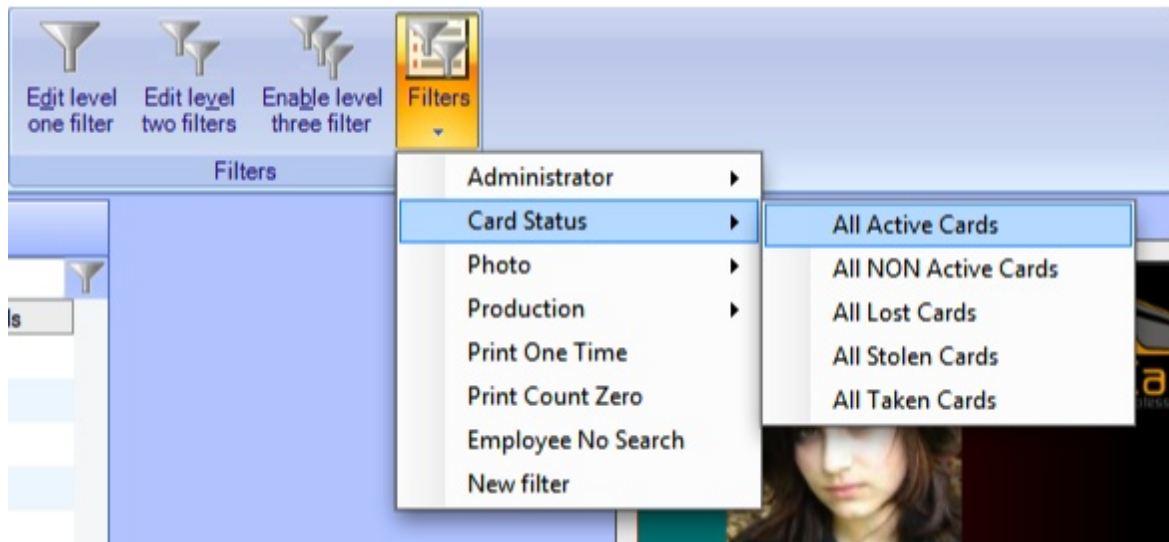


One major difference with the Level One filters is that with the Level Two filters you can define that a condition needs to be asked when the filter is activated. In the screenshot you see that "[Photo]=NULL". When we check "Ask for condition when activated", a window will pop-up asking you to enter the condition for the filter. This can be handy if you create a filter that looks up a employee or student numbers. After clicking **OK**, you will be prompted to enter a name for the filter.



When entering a name for the filter, just like with the card templates, also the filters can be divided into groups. As in the screenshot above, everything before the backslash '\' is considered to be the **Group Name** and is selectable in the drop down menu directly under the [Filters Tab](#) of the [Explorer Menu](#). Everything behind the "\" is considered as the name of the filter appearing as the **button**. Of course you can also directly enter only the name for this defined filter.

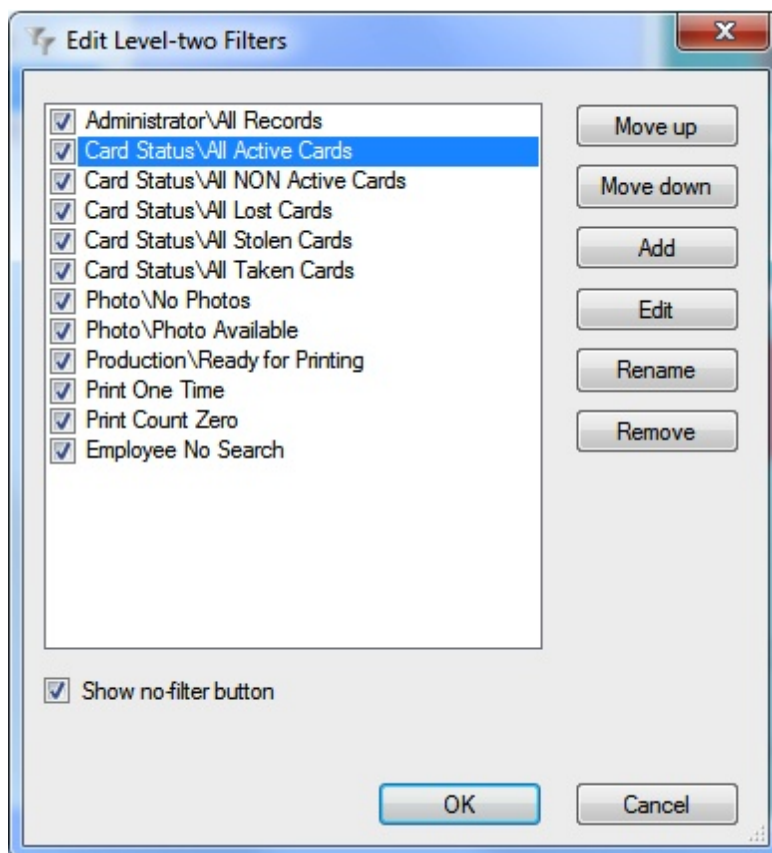
Click on OK to save the filter, the filter will be shown in the [Filters Tab](#) of the [Explorer Menu](#). The defined Level Two Filters are also available via the drop down menu in the **Filters** in the **Filters** section of the **Data** tab.



Furthermore, the filter will be applied, showing you how the defined conditions actually affect the data in the [Data Record View](#).

10.2.2.1 Edit Level Two Filters

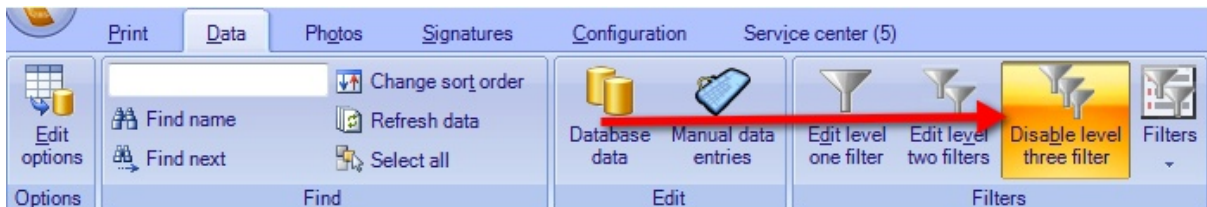
Existing **Level Two** filters can be **Edited**, **Renamed** and **Removed** by choosing Edit level-two filters from the Datatab, the following window appears:



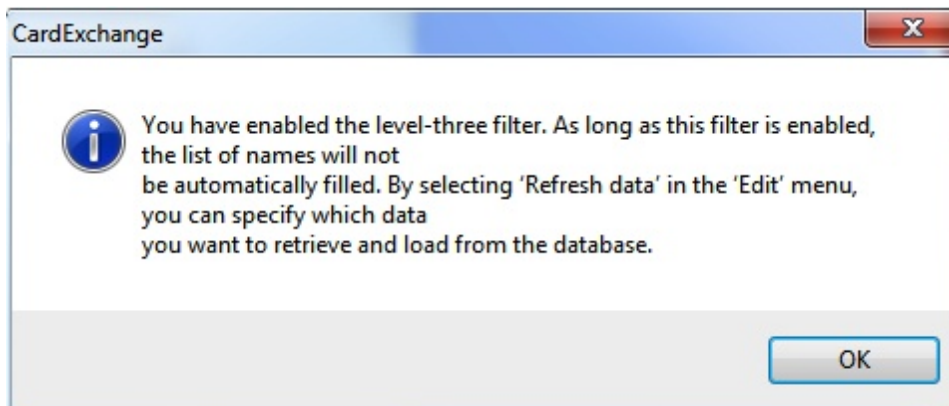
In the list box, you see all **Level Two** filters that have been defined. With each **Level Two** filter you can perform one of the following actions:

- Hide the filter (without removing it) by deselecting the check box that appears before the filter name.
- Change its position in the [Filters Tab](#) of the [Explorer Menu](#) by using the **Move up** and **Move down** buttons.
- Add a new **Level Two** filter by clicking on the **Add** button
- Edit the conditions that make up the filter by clicking the **Edit** button.
- Change its name by clicking the **Rename** button and entering another name.
- Remove the filter by clicking the **Remove** button and confirming that action by clicking Yes.
- Show or don't show the No filter button

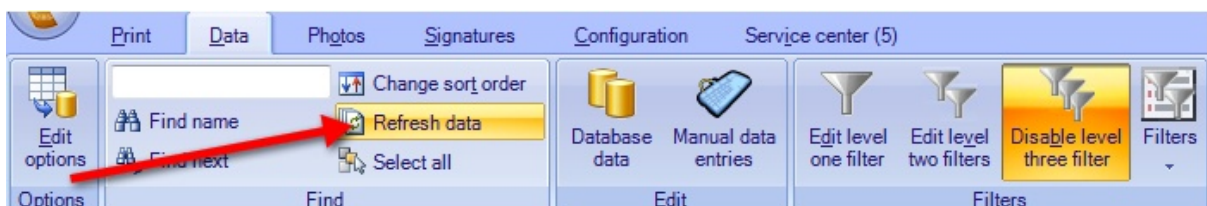
10.2.3 Level Three Filters



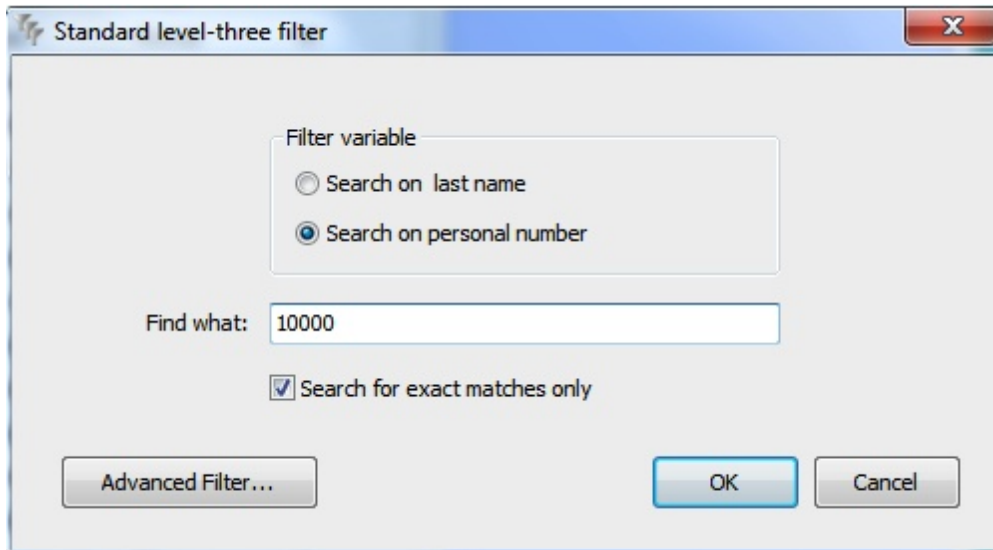
Generally, activating the Level Three filter can only be done by the administrator and is done via selecting the **Enable level three filter** button in the **Filters** section. If authorized, you can activate the **Level Three** filter by checking the **Enable level-three filter** option in the Data tab. CardExchange® will display the following warning message to make clear that the [Data Record View](#) will no longer be automatically filled.



So do not be surprised if you no longer see any records. When activated, the operator himself can determine in what manner he wants to filter his data.



Every time the operator requests information from the database, for example, by selecting **Refresh data** in the **Find** section or pressing **F5** on the keyboard, a window prompts for the desired filter conditions.



In this standard window you have two options you can search on. In the **Filter variable** group you can select:

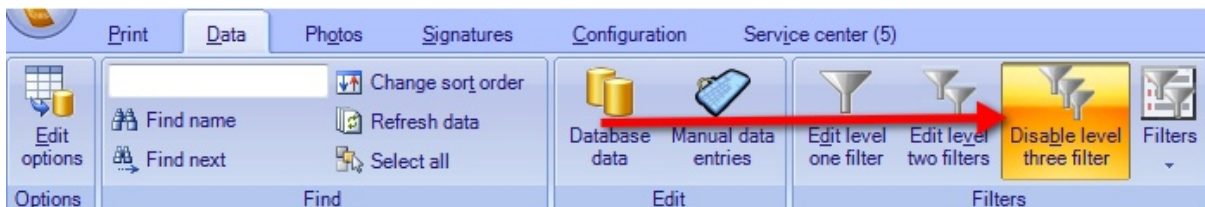
- Search on last name
- Search on personal number

In the **Find what** text box you enter the information you are looking for and if you want to find exact matches only, you have to select the '**Search for exact matches only**' check box.

Now if you click on OK, CardExchange® will execute the SQL directly to the connected database and will present the result in the [Data Record View](#).

The advantage of this filter is that when connecting to databases with hundred of thousands of records, you only load the information needed for your production without constantly loading the [Data Record View](#) with information that is not needed.

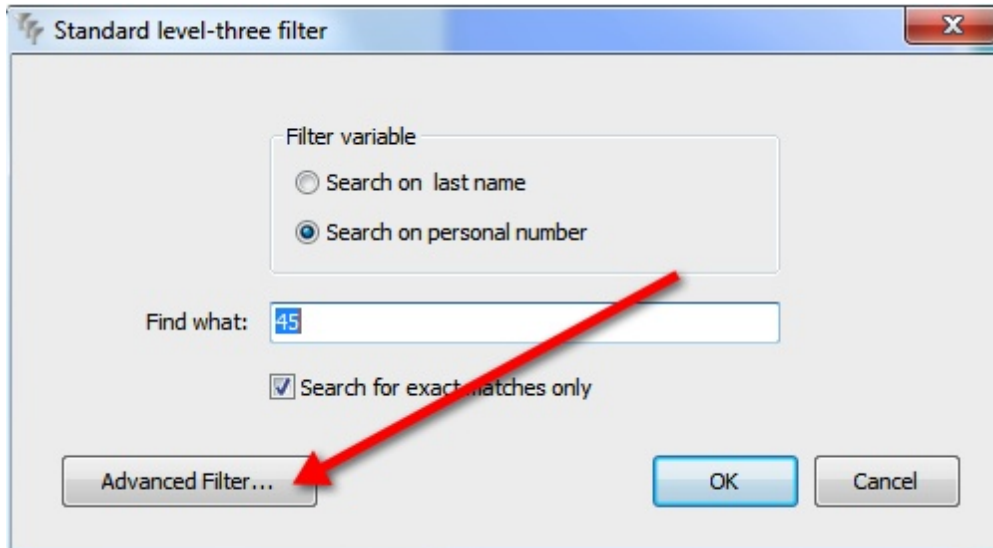
An example using this filter could be when taking pictures of students. The student enters the room, the operator enters the student number into the Find what field, hits OK to search, when the record is found, takes a photo of the student, and saves the record.



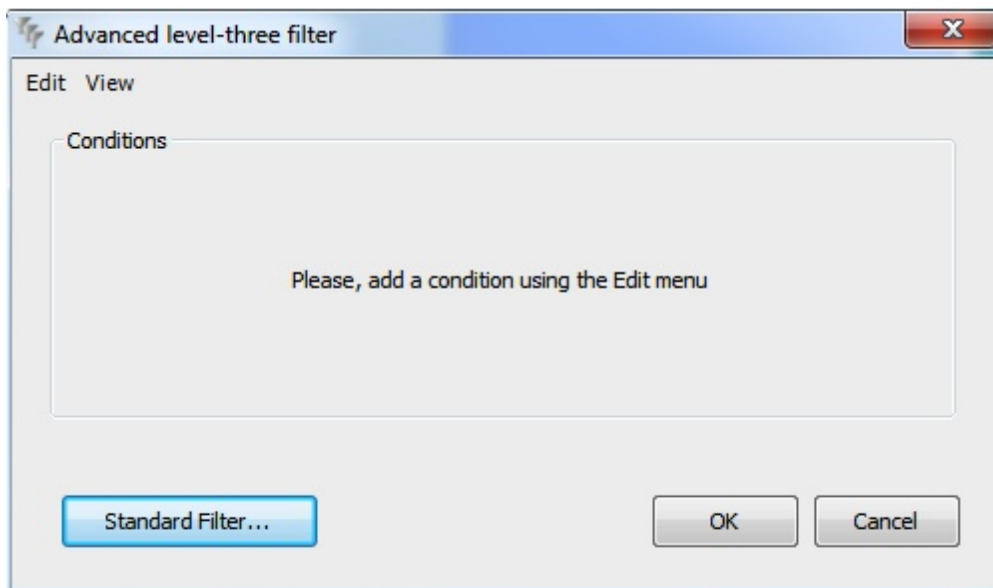
Disable the filter by clicking on the 'Disable level three filter' button and click on Refresh data or press F5 to reload the database data into the [Data Record View](#).

10.2.3.1 The Advanced Filter

In case the standard **Level Three** filter does not offer the functionality you need to select the desired records, you can switch to the **Advanced Level Three** filter.



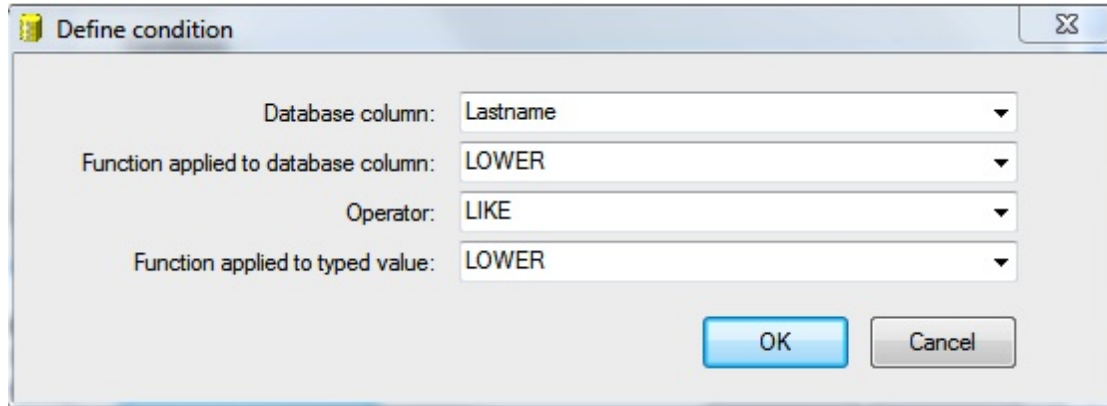
This is achieved by switching on the **Level Three** filter, calling the standard filter by choosing **Refresh data** or using the **F5** button on your keyboard, and clicking the **Advanced Filter** button and the following window will be shown:



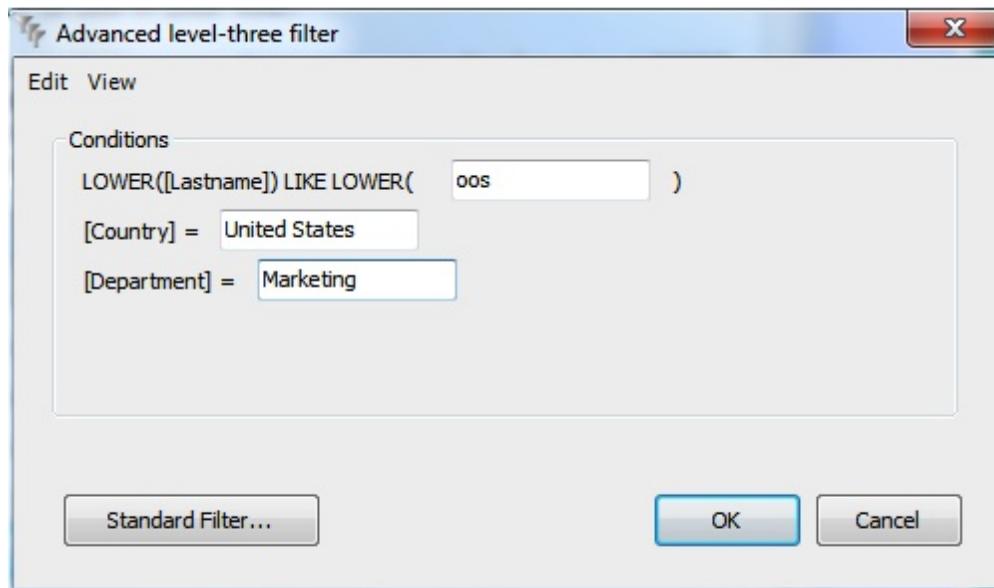
Now, you can decide yourself which database columns you want to use for filtering. You can add filter conditions with the menu option **Add conditions** in the **Edit menu**. A screen will be shown in which you can choose the database column and functions and operators to use in your filter.

In the example below the column **Lastname** is converted to lower case characters using

the function **LOWER**. The result is compared to the entered value using the **Like** operator. The functions and operators you can choose are database dependent. For example, the function **LOWER** exists in **SQL SERVER**, but not in **MS Access**. In the latter case, you can use the **LCase** function to convert the characters to lower case.



Once you have defined some conditions, the advanced database filter window will look something like screen shot shown below.



In the text boxes you can type the values that complete the conditions. These have to meet the following rules:

- If you leave a field empty, the condition will not be applied,
- If you enter values for more than one condition, only records are selected that meet both conditions,
- If you type **null** or **NULL** and the operator is **=** or **LIKE**, only records are selected for which the database column contains a null value,
- If you type **null** or **NULL** and the operator is **<>**, **!=** or **NOT LIKE**, only records are selected for which the database column contains a value,
- If you type **null** or **NULL** with another operator, no records are selected.

When you click on the **OK** button, all the records that meet the conditions are retrieved from the database.

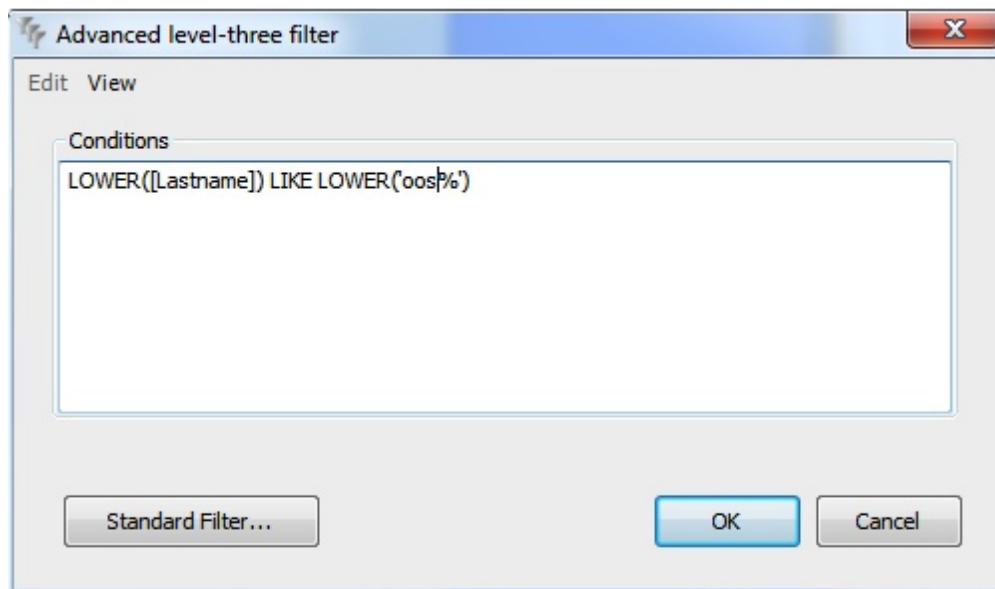
With the Edit menu, you can change and delete existing conditions. All definitions are stored in the internal database of CardExchange® and will be reloaded in the next session.

CardExchange® remembers that you want to use the advanced filter for the current database connection. The next time you refresh the data with **F5**, the advanced filter window will open immediately and there is no need to pass through the standard filter window.

With the button **Standard filter**, you can always return to the previous situation.

10.2.3.2 The SQL Filter

In a limited number of situations, even the advanced filter does not offer the flexibility needed to make the precise selection. In that case, you have the possibility to choose the option **Show SQL** in the **View menu** of the **Advanced database filter** window. The following screen will be shown:



In this window, you can define your filter conditions using the SQL of the connected database. By default, you will see the SQL equivalent of the conditions defined in the **standard view** of the **advanced filter**, but you can change it the way you want. The SQL you enter will be stored in the internal database, but will be lost if you switch back to the standard view. In that case, you will see the conditions as you defined them before activating the Show SQL option.

10.2.4 Tips and Tricks

Upper and lower case

When filtering on a string variable, like the last name of the persons in the database, you often do not want to care about whether you enter upper or lowercase characters. You can accomplish that by applying at both the left and the right hand side of the condition a function that converts the characters to lowercase (LOWER for Oracle and SQL Server

and LCase for Microsoft Access).

The Like operator

It is also possible that you do not want to enter the complete name or that you do not know how to spell a certain part of the name. By using the Like operator instead of the equal sign, you can realize that, since Like allows for the use of wildcards. The most important wildcards are the percent sign (%), that represents zero or more characters, and the underscore (_), that represents a single character. Furthermore, you can give alternative characters by putting them between square brackets ([]). Some examples of the use of wildcards are:

- **LOWER("LASTNAME") LIKE 's%'** selects all names that start with an s
- **LOWER("LASTNAME") LIKE 'cart%er'** selects both Carter and Cartner
- **LOWER("FIRSTNAME") LIKE 'Eri_'** selects all four character names that start with Eri
- **LOWER("FIRSTNAME") LIKE 'Eri[ck]'** selects all persons called Eric or Erik

Numeric values

When you want to filter on numeric values, you have to take care that you use the correct decimal separator (comma or point). In the advanced database filter, you have to follow the configuration of your operating system. However, in the SQL view, you always have to use a point.

Dates

Microsoft Access, SQL Server and Oracle store dates as date-time values. If you want to compare these values, not only the date part, but also the time part has to match. If you only want to check for equal date parts, you can achieve this by using the following conditions:

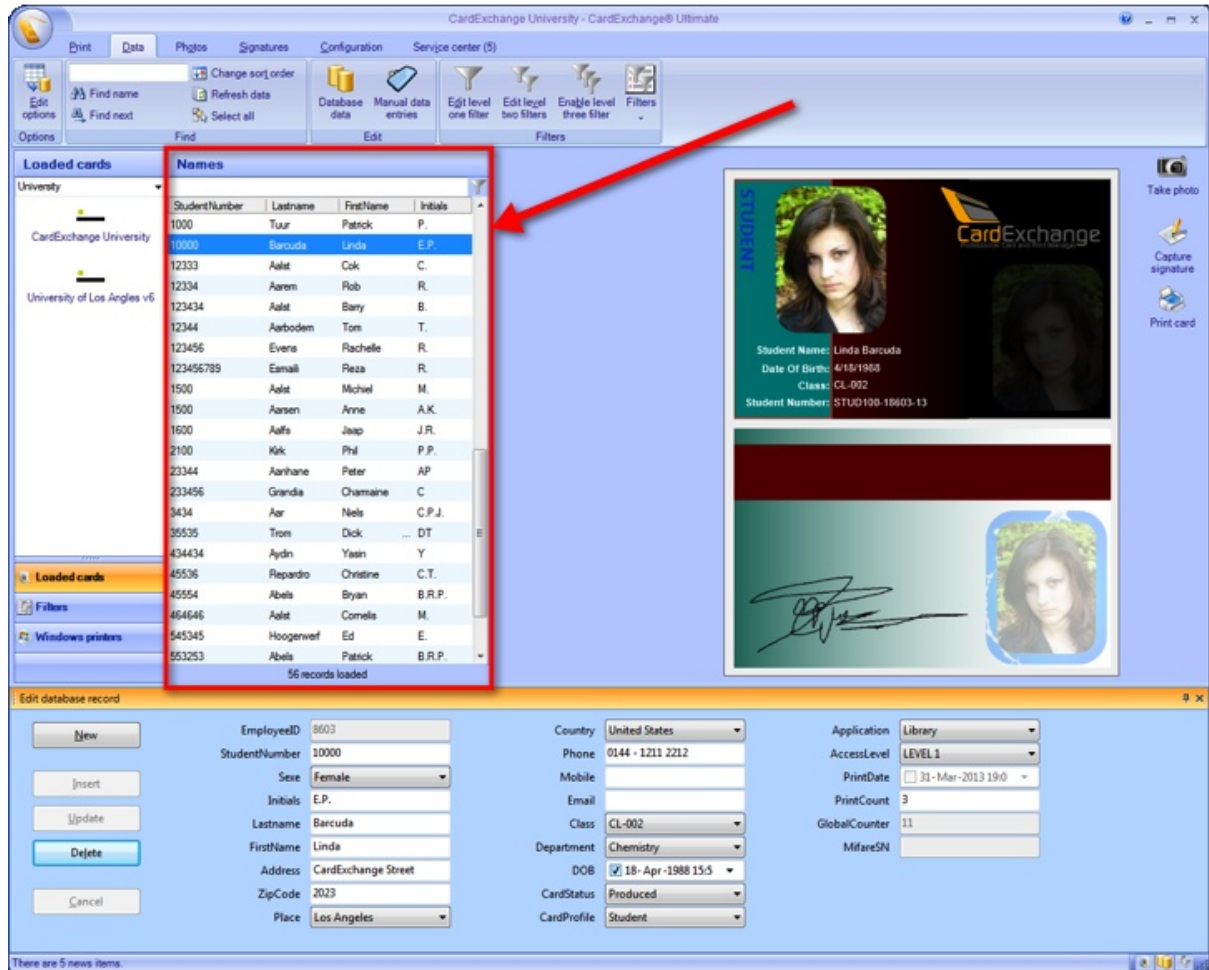
- Microsoft Access: **Int([BirthDate]) = DateValue('10-apr-1968')**
- SQL Server: **[BirthDate] >= '10-apr-1968' AND [BirthDate] < '11-apr-1968'**
- Oracle: **TO_DATE("BIRTHDATE") = TO_DATE('10-apr-1968')**

In all cases, BirthDate is a date-time field and only those records will be selected for which the date part is 10 April 1968.

Microsoft Access stores the date-time value as a floating point number. The part before the decimal point represents the date part, whereas the decimals represent the time part. The function Int removes the time part, setting it to 0:00:00 AM. The function **DateValue** always results in a date-time value whose time part is 0:00:00 AM, so that the condition above effectively compares only the date part of **BirthDate**.

In Oracle, the same effect can be achieved by using the **TO_DATE** function on both sides. In SQL Server, a similar function does not exist, but this can be circumvented by defining two conditions. In this way, all records are selected, for which **BirthDate** is between 10 April 1968 0:00:00 AM and 11 April 1968 0:00:00 AM.

10.3 Record Lookup



The simplest way of adding the correct record details to the card is to use the [Data Record View](#) that is displayed at the left-hand side of the main window. You can use the scroll bar to scroll through the list to find the correct record and then select it by clicking. The [Data Record View](#) may be sorted in various ways and is not necessarily alphabetical. You must take this into account when searching for a record.

In the [Data Record View](#) in the main interface of CardExchange® you see all the records presented that are available in your database. When you make a database connection, in the name list page you select the columns that are shown in the Data Record View. You can find everything about making database connections in the "[Using Databases](#)" section of this Help file.

Record Sorting

StudentNumber	Lastname	First Name	Initials
10000	Barcuda	Linda	E.P.
	B		H.J.
	B		J.

The Data Record View is a so called data grid showing all your available database records divided by columns. Sorting the records is just as simple as clicking on the column.

Record Look Up

Lastname	StudentNumber	First Name	Initials
Barcuda	10000	Linda	E.P.

It is very simple to search for records inside the Data Record Overview. Enter the text that you want to search for in the text box directly above the columns. The text you enter always applies to the first column in the Data Record View. If you want to look up records from the Lastname column, you have to drag the column to the front.

Loaded Record Information

Ba	M.L.
8442 records loaded	

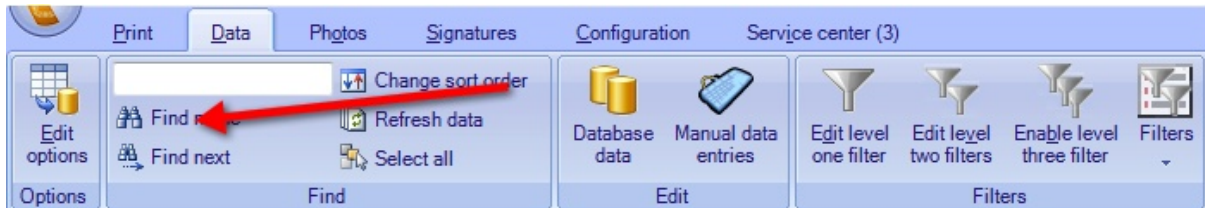
In the footer of the Data Record View the total amount of loaded records is shown.

You will notice that this method becomes less attractive if the list is very long and that you need a more directed manner of finding the correct data. The following alternative find methods are available:

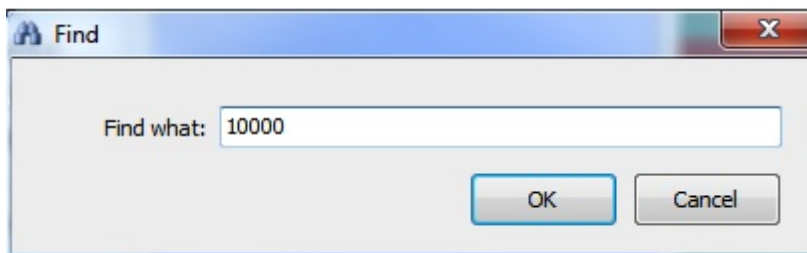
- Finding names using the **Find section** in the **Data** tab,
- Finding names using the **Keyboard**
- Finding names using the Database Filters

The first two methods will be explained in the following sections. For an explanation of the database filters, please refer to the section [Filters](#) of this Help file.

10.3.1 Using Find



In the **Find** section of the Data tab you can find the functionality **Find**. If you select this option, you enter a dialog window in which you can enter a combination of letters or digits to search on (only alphanumeric characters).



If you then click OK, the first element from the list of names that contains the requested combination is selected.

If the first match is not the one you are looking for, you can **search** on the same combination by selecting the Find next in the **Find** section of the Data tab. You can repeat this until you have found the correct person.

The advantage of searching in this way is that the text you enter does not need to be at the start of an element in the [Data Record View](#). The search does not make a distinction between upper- and lowercase characters.

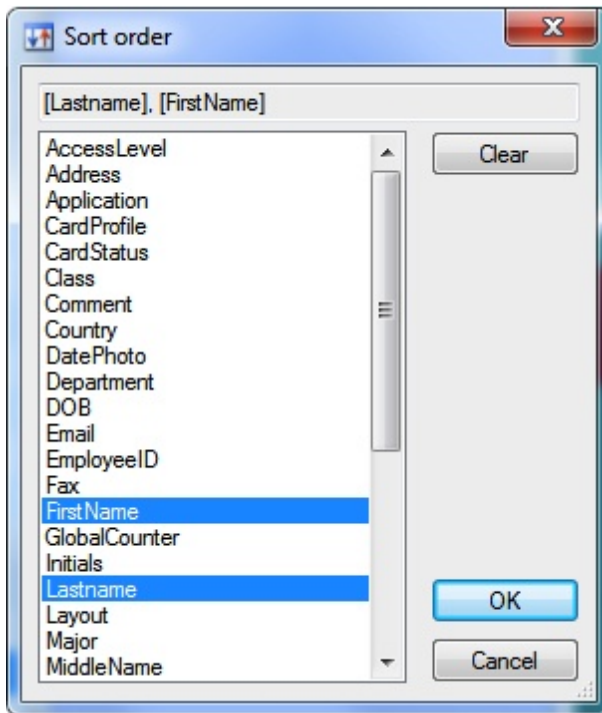
With this **Find** function, all elements in the [Data Record View](#) remain visible. Any restrictions to the number of records that are displayed, which would normally apply as a result of what you have entered in the text field, are overruled.

10.3.2 Using Keyboard

The **find** functions that have been discussed in the section [Using Find](#) are also available from the keyboard. You can display the window Find by simultaneously pressing the **control key** and the letter **f**. You can repeat the search as often as is required to find the correct person by pressing the **F3** function key.

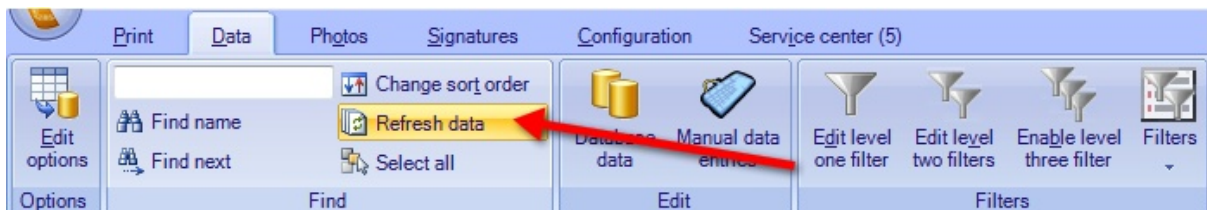
10.3.3 Changing Sort Order

To facilitate the selection of records, especially when making multiple selections in order to start a print batch, the order in which the names in the [Data Record View](#) appear can be changed. Choose Change sort order in the Find section of the Data tab to call the following window.



The text box at the top of the window shows the database columns on which the records will be sorted. In this particular case, the list is sorted on the field **FirstName** and then on the field **Lastname**. Up to **three** database columns can be selected to determine the sort order. To change the sort order, press the **Clear** button to remove any previous settings and then click the fields on which you want to sort, starting with the leading one.

10.3.4 Refresh Data



It is possible that you cannot find the intended record because it has only just been entered into the database. The details of the record in question have already been entered into the database, but CardExchange® has not yet, as it were, seen it. You can solve this problem by selecting the **Refresh data** option in the Find section (or by pressing the **F5** function key). CardExchange® will retrieve the list of records from the database again.

Doing this ensures that the most recent data for the record concerned is displayed.

11 Using Photos



In this section of the help file you can find all the information of how to use photos with CardExchange®.

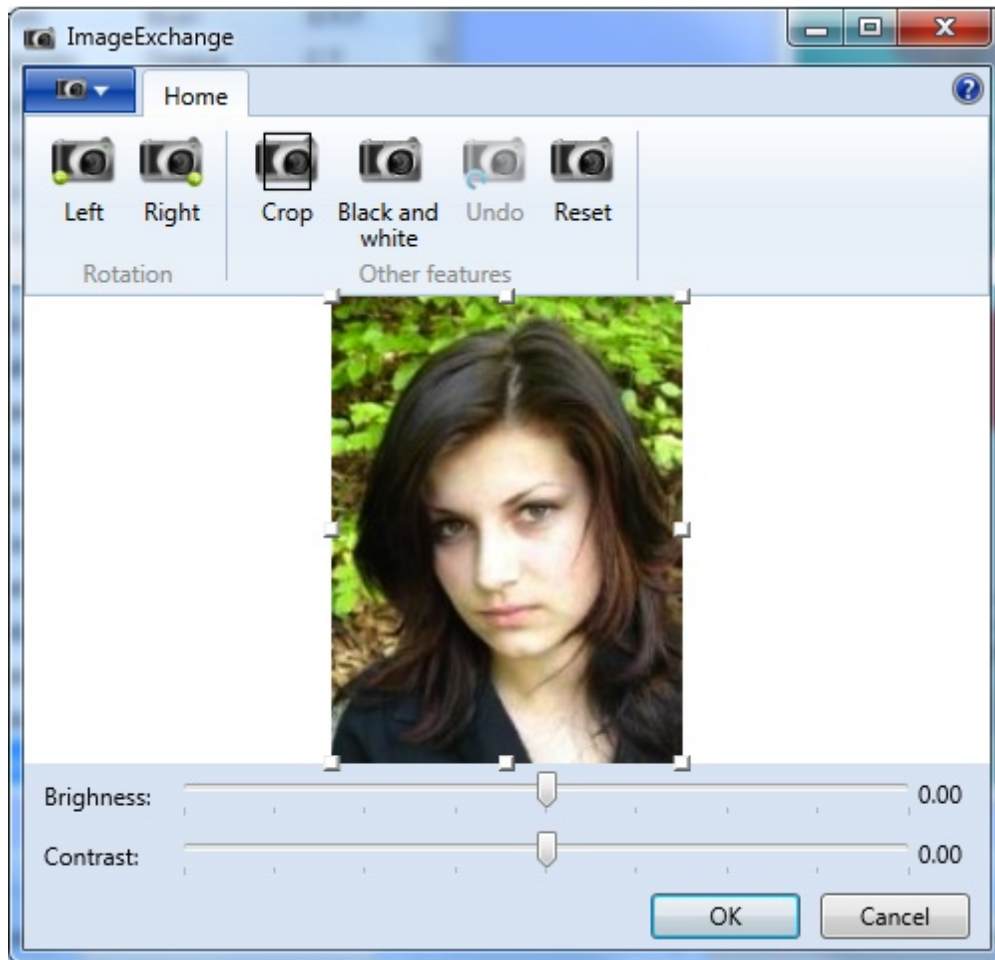
11.1 Take Photos



When you have selected the correct card template and the correct record, you can add a photo of the person to the database, or, if you want, replace the existing photo. This function is accessible in the following ways.

- Click **Take photo** button as indicated with the red arrow,
- Press the **F6** key.

After you have taken the photo, you will enter the Image Editor window of CardExchange®, the ImageExchange®.



Please see the [Using Image Tools](#) section of this Help file for more information about using this ImageExchange® Image Editor.

If you click on the OK button, the photo will be automatically cropped and the Image Editor will be closed. If a photo was already available in the database, CardExchange® asks whether you want to update it. If you click Cancel, the original photo will be restored on the print preview. You can disable this option in the Photo tab by unchecking the Use Image Tools check box.

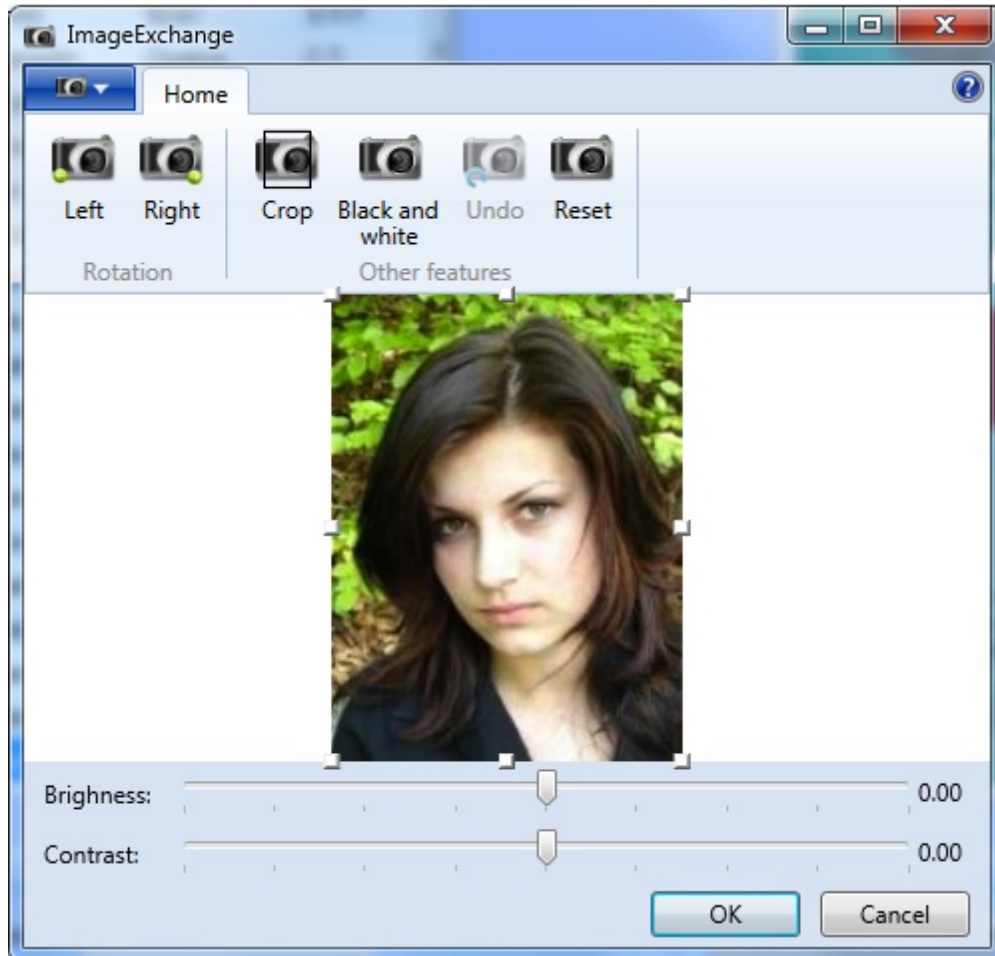
11.2 Edit Photos



Photos that were taken earlier can be edited using Image Editor. This function is accessible in the following ways.

- Click **Edit photo** button as indicated with the red arrow,

After you have taken the photo, you will enter the Image Editor window of CardExchange®, the ImageExchange®.



Please see the [Using Image Tools](#) section of this Help file for more information about using this ImageExchange® Image Editor.

If you click on the **OK** button, the photo will be automatically cropped and the Image Editor will be closed. If a photo was already available in the database, CardExchange® asks whether you want to update it. If you click **Cancel**, the original photo will be restored on the print preview. You can disable this option in the Photo tab by unchecking the Use Image Tools check box.

11.3 Copy and Past



The **Actions - Copy photo** option allows you to copy the photo displayed on the Page preview to the photo clipboard of CardExchange®. You can then choose another record (or even another card that is linked to another database) and, by using the **Paste photo** option, link the photo on the clipboard to the selected record.

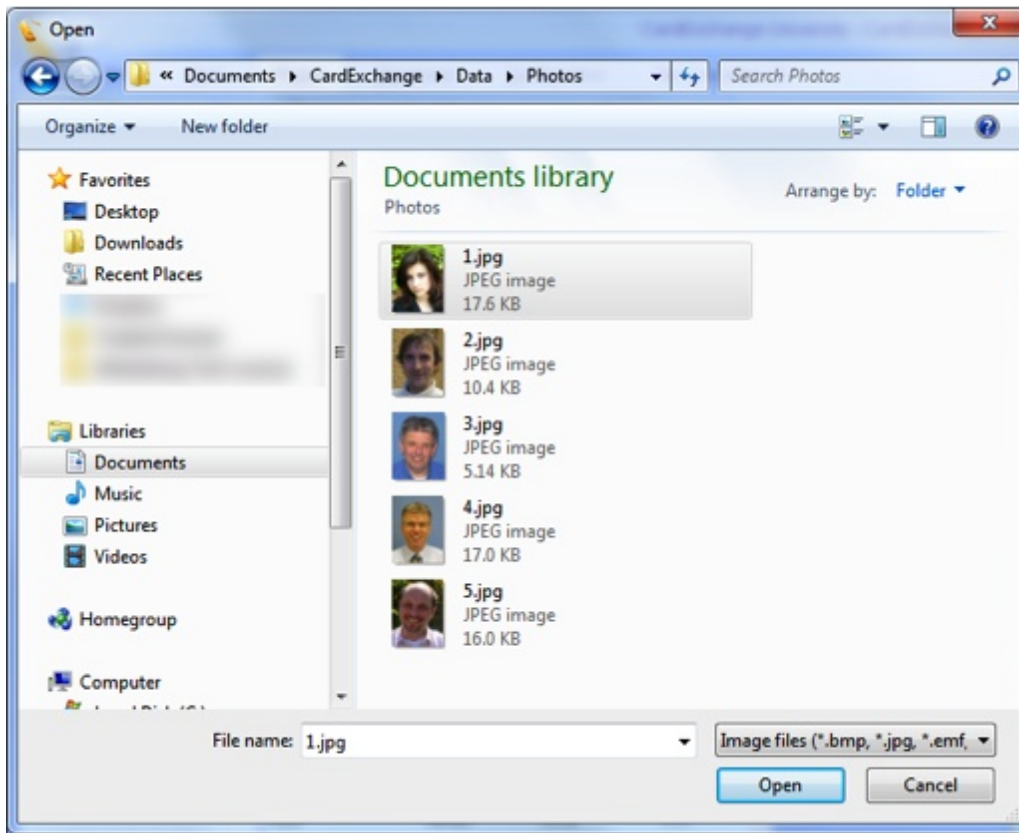
This function can be handy if the same record must be entered under a different name or personnel number in the database. You do not need to take a new photo. As long as you do not copy another photo and do not shut down CardExchange®, the copied photo will remain on the clipboard.

11.4 Import Photos



It is possible that you do not want to take a photo of someone because you already have his/her photo. If this photo is in one of the usual formats (bitmap, jpeg, png, etc.), you can use the **Import photo** function indicated with the **red** arrow to import it and display it on the card that you have opened in CardExchange®. You can then save the photo in the database.

If you click **Import photo**, you enter a dialog window that allows you to select the photo file.

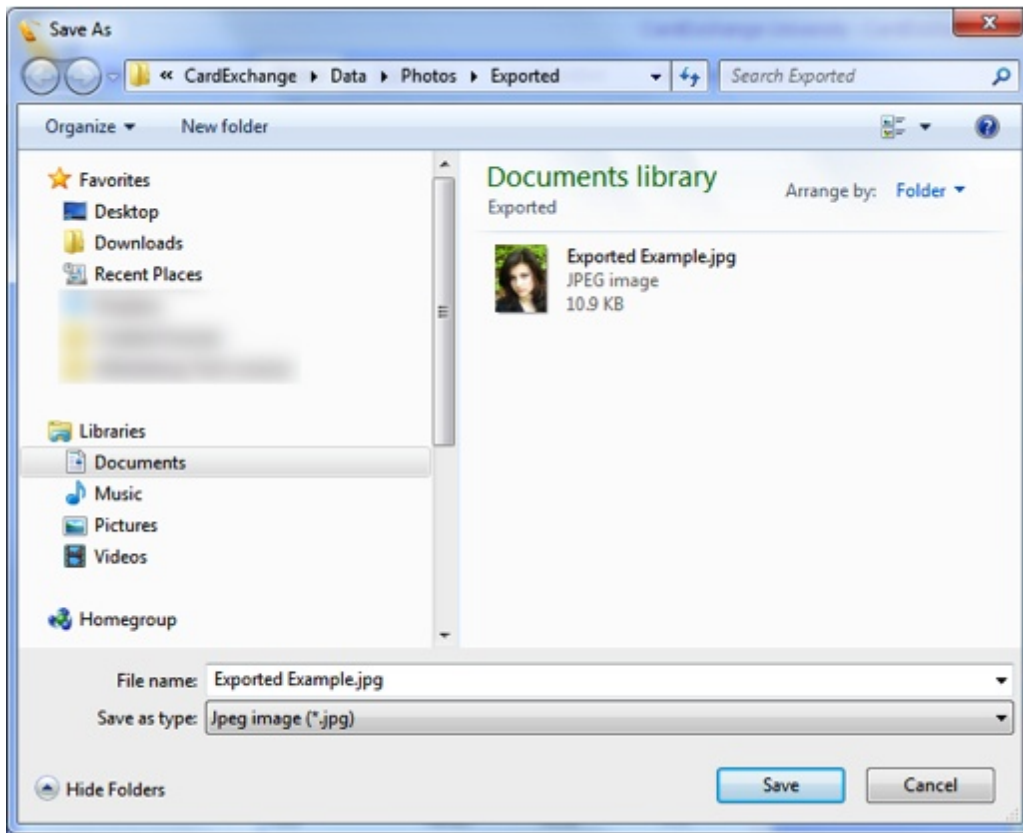


If you have found and selected the file, click **Open** and the photo will be displayed in the [Image Editor](#) window. Here you can crop the photo to the right size and perform any other editing operations.

11.5 Export Photos



The opposite to import photo is also possible. You can export an existing photo from the database to a file. To do this, click the **Export photo** button indicated with the **red** arrow in the **Actions** section. Once more a dialog window will be displayed in which you can specify the name and location of the file that must contain the photo.



You can choose between two supported file formats: **Bitmap**, **jpg**, **emf**, **gif**, **png**, and **tiff**.

Click on **Save** and the photo is exported to the selected location.

11.6 Remove Photos

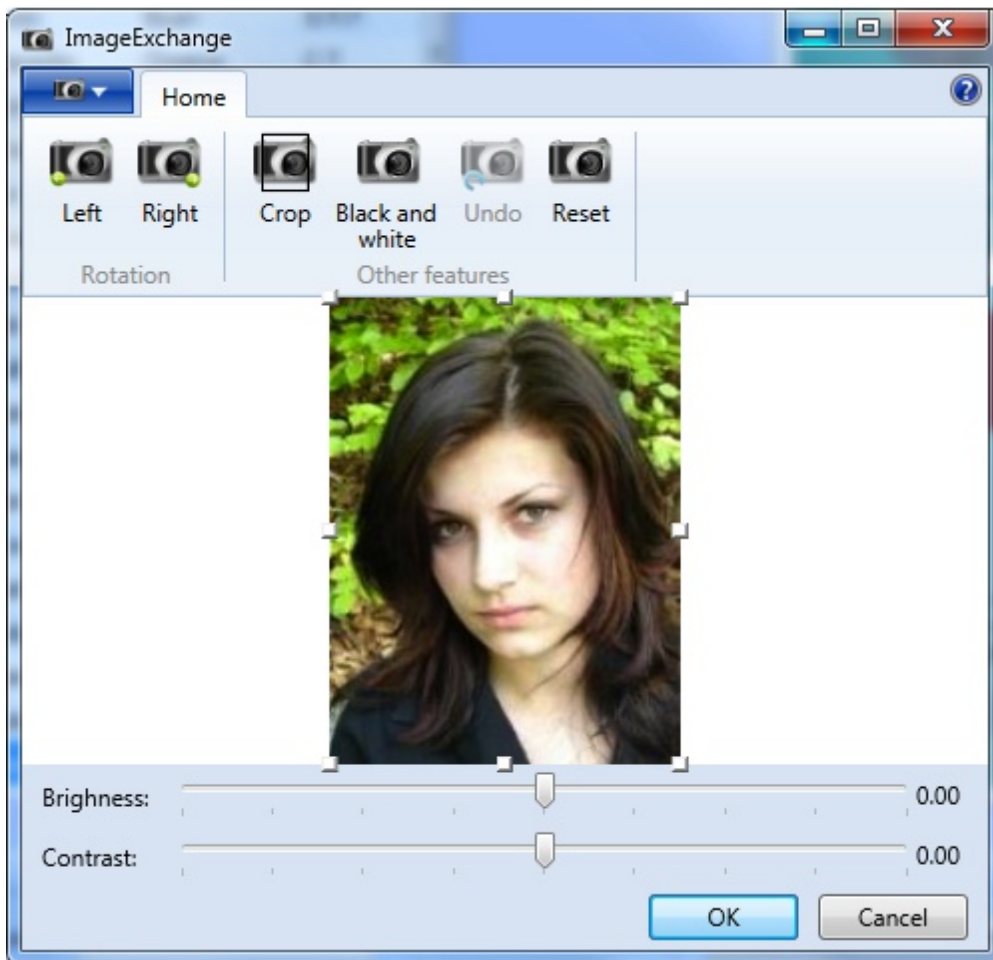


Photos can be removed from the database by clicking the **Remove photo** button from the **Actions** section indicated with the **red** arrow. The user will be asked to confirm the remove operation with the following question.



When you click **Yes**, the photo will be removed from the database.

11.7 Using Image Tools

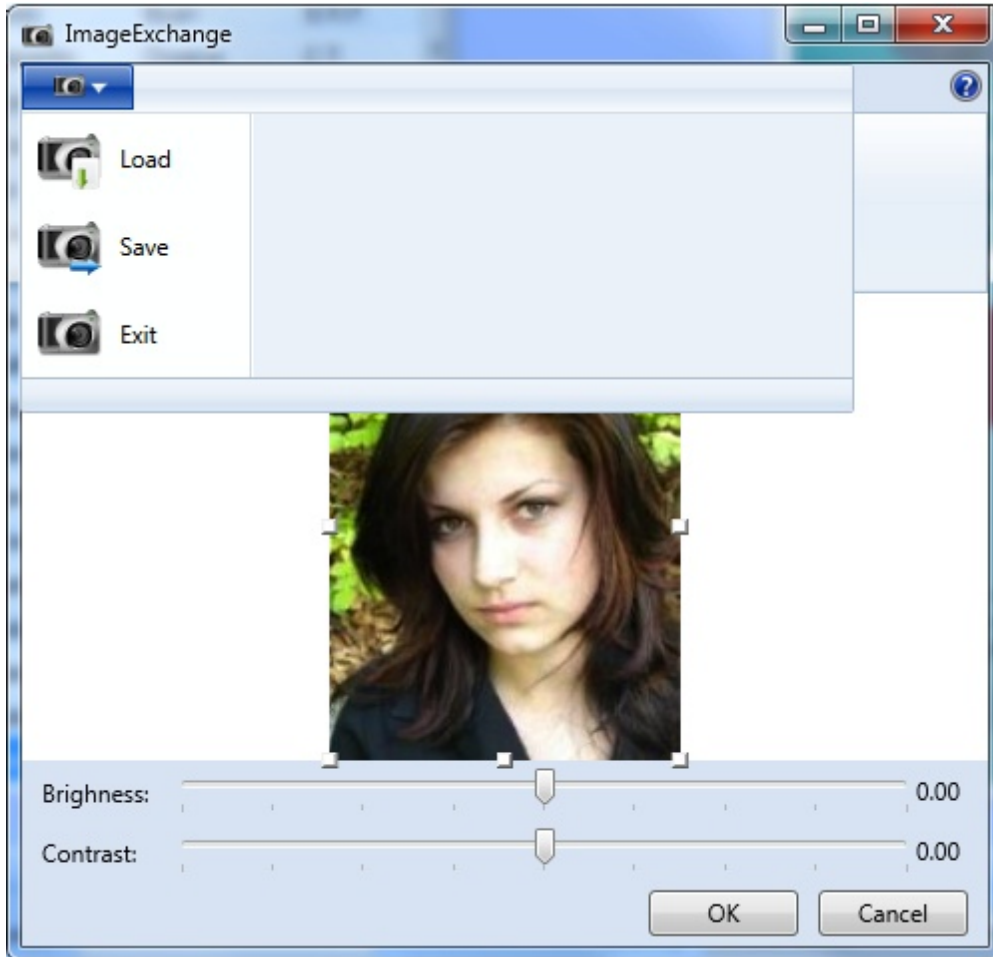


CardExchange® offers for all editions an Image Editor tool, ImageExchange®. The ImageExchange® tool offers some interesting functionality to help you upscale your photos or images.

When you **take a photo** or **capture a signature** and the **Use Image Tools** option is checked, this ImageExchange® tool will open. It also opens if you click on the **Edit photo** button.

ImageExchange® has functionality available via the File menu and the ribbon.

The File Menu

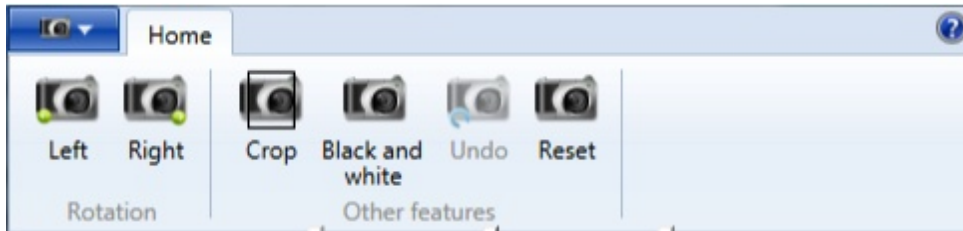


When you take a photo, capture a signature, etc., the image will be automatically be show in the ImageExchange® tool. It is also possible to Load another image via the **Load** function in the **File menu**.

When the image is edited and you click on **OK**, the image will be saved automatically. If you want to store the image to another location just click on **Save** and select the destination in the **File Explorer** and click on **Save**.

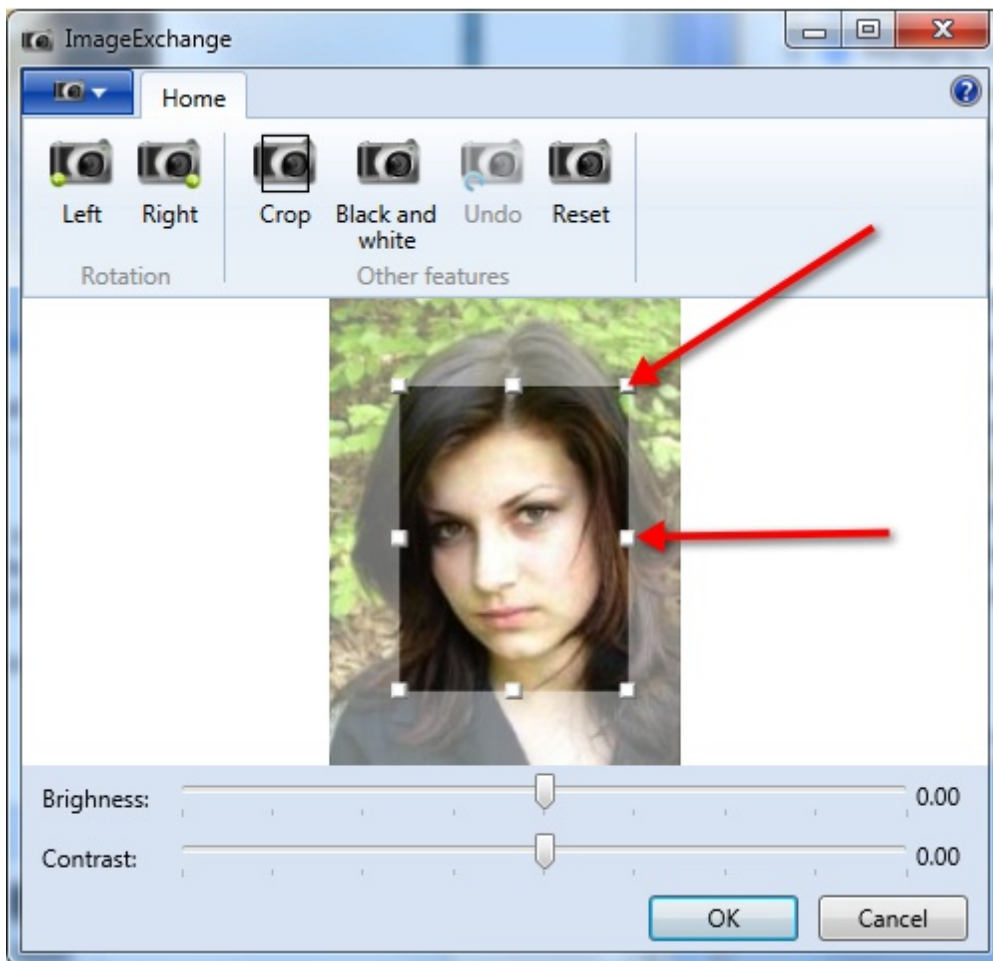
Exit just closes the ImageExchange® tool without saving and works as the **Cancel** button.

Overview of the Ribbon



When the image is loaded, you can apply some standard functionality to it. If the image needs to be rotated, just click on the Left or Right buttons in the Rotation section.

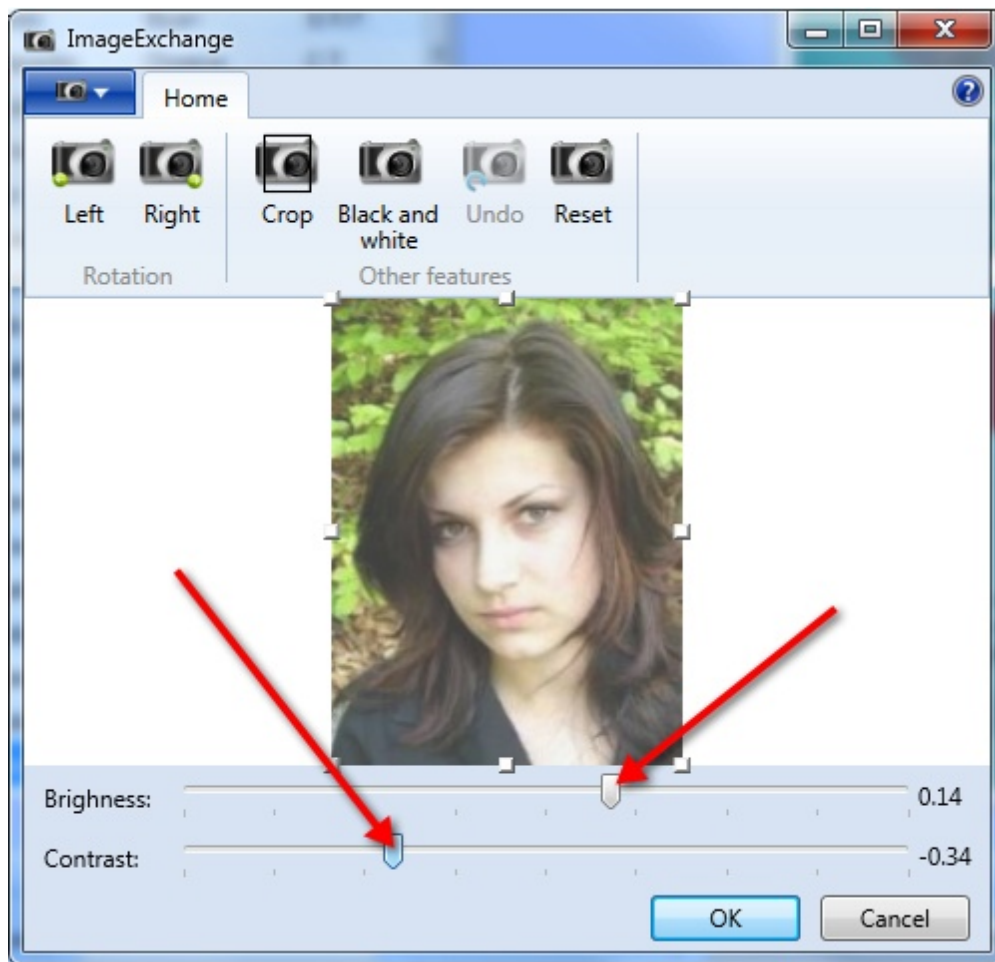
You can also crop the loaded image when you have adjusted the size.



When you move the rectangle to required size, as indicated with the **red** arrows, and you click on **Crop**, the image will be cropped according to the settings made.

When you click on the **Black and white** button, the whole image is converted to Black and White and of course you can undo all your settings by clicking on the **Undo** button or click on **Reset** to go back to the original loaded image.

Brightness and Contrast



Move the sliders, indicated with the **red** arrows, to change the **Brightness** and/or **Contrast** of the loaded image.

Click on **OK** to store the image or click on **Cancel**.

12 Using Signatures



IMPORTANT! Signatures are supported starting from Premium and higher editions!

In this section of the help file you can find all the information of how to use signatures with CardExchange®.

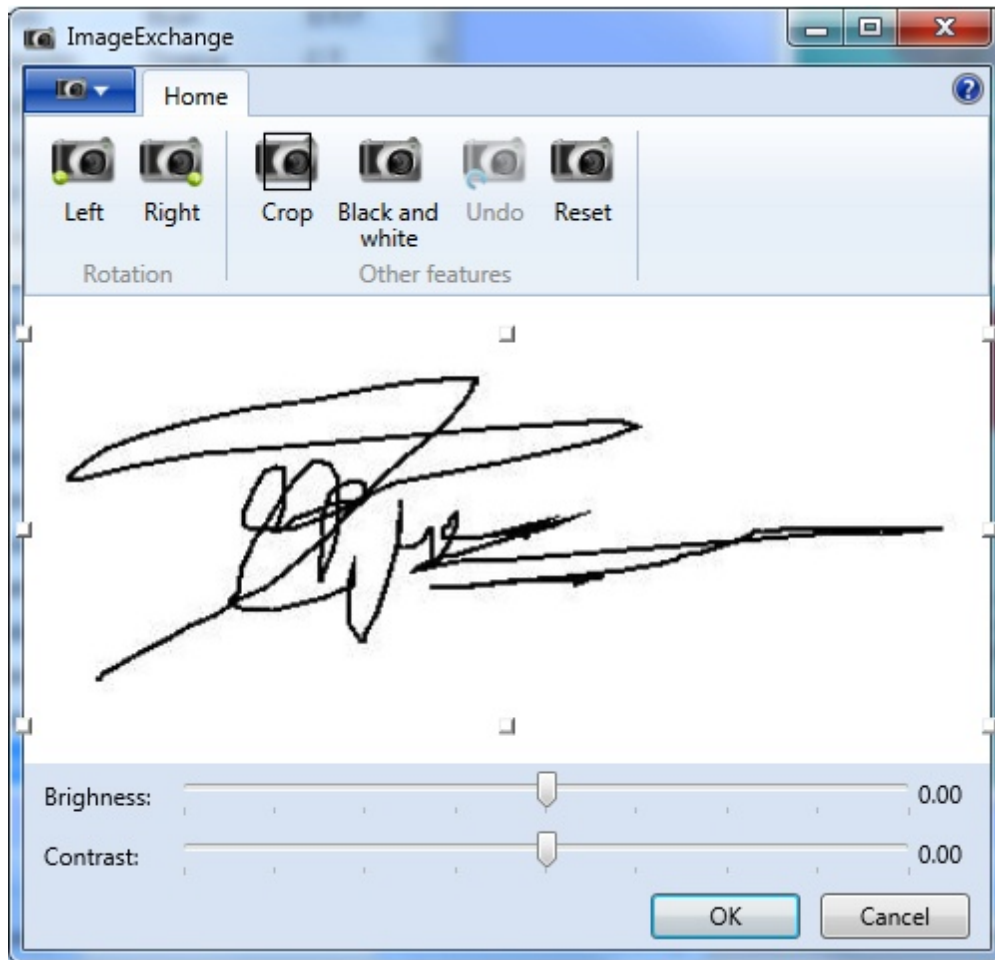
12.1 Capture Signatures



When you have selected the correct card template and the correct record, you can add a signature of the person to the database, or, if you want, replace the existing signature. This function is accessible in the following ways.

- Click **Capture signature** button as indicated with the red arrow,

After you have captured the signature, you will enter the Image Editor window of CardExchange®, the ImageExchange®.



Please see the [Using Image Tools](#) section of this Help file for more information about using this ImageExchange® Image Editor.

If you click on the OK button, the signature will be automatically cropped and the Image Editor will be closed. If a signature was already available in the database, CardExchange® asks whether you want to update it. If you click Cancel, the original signature will be restored on the print preview. You can disable this option in the Signature tab by unchecking the Use Image Tools check box.

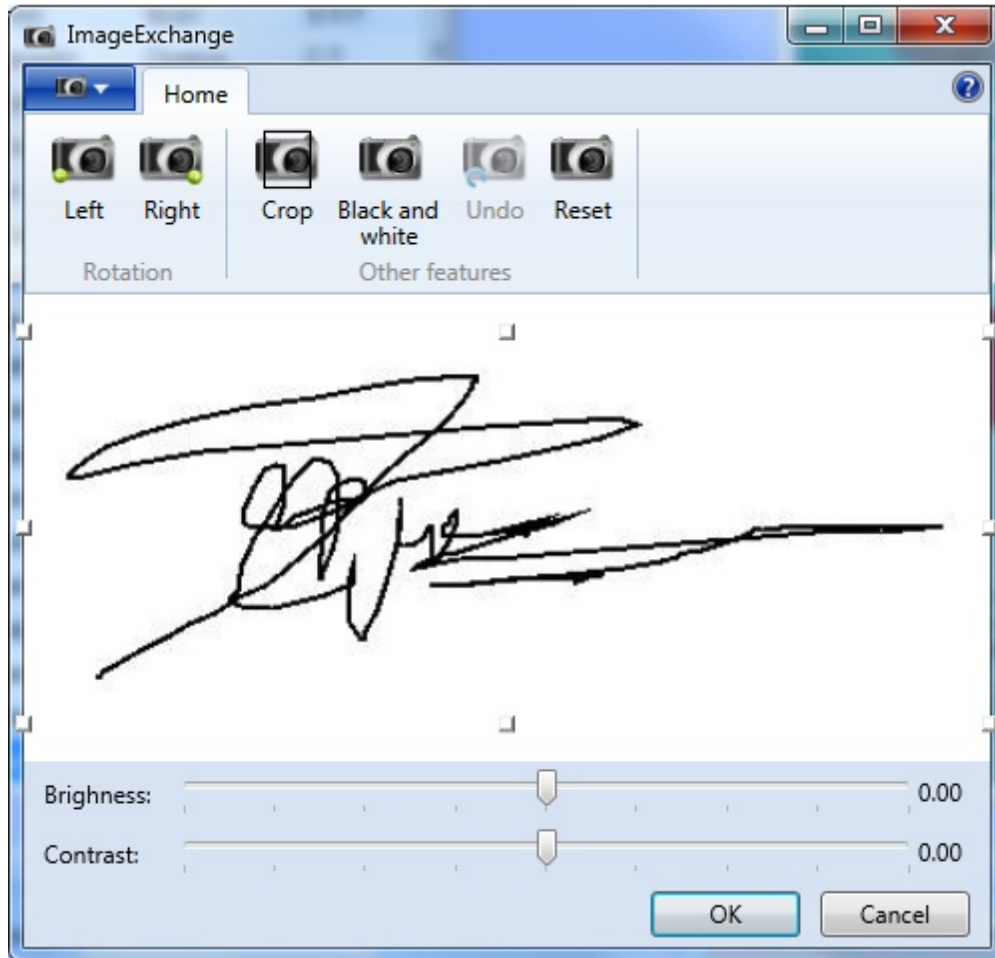
12.2 Edit Signatures



Signatures that were captured earlier can be edited using Image Editor. This function is accessible in the following ways.

- Click **Edit signatures** button as indicated with the **red** arrow,

After you have captured the signatures, you will enter the Image Editor window of CardExchange®, the ImageExchange®.



Please see the [Using Image Tools](#) section of this Help file for more information about using this ImageExchange® Image Editor.

If you click on the **OK** button, the signature will be automatically cropped and the Image Editor will be closed. If a signature was already available in the database, CardExchange® asks whether you want to update it. If you click **Cancel**, the original signature will be restored on the print preview. You can disable this option in the Signature tab by unchecking the Use Image Tools check box.

12.3 Copy and Past



The **Actions - Copy signature** option allows you to copy the signature displayed on the Page preview to the signature clipboard of CardExchange®. You can then choose another record (or even another card that is linked to another database) and, by using the **Paste signature** option, link the signature on the clipboard to the selected record.

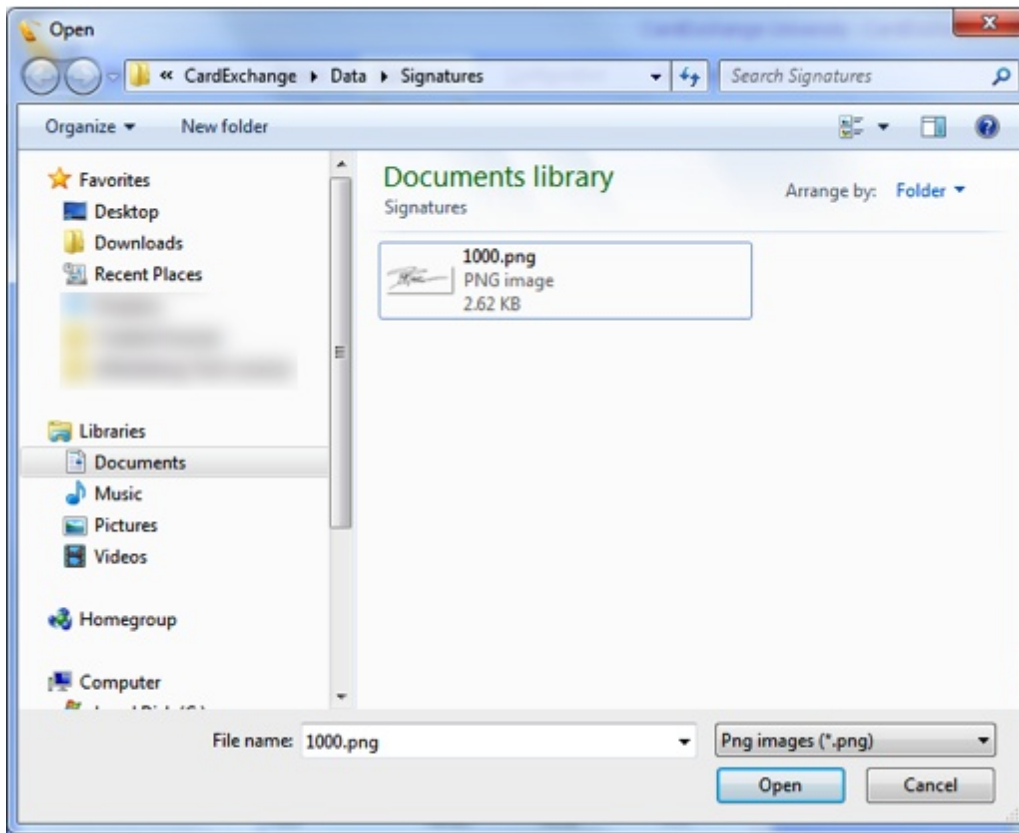
This function can be handy if the same record must be entered under a different name or personnel number in the database. You do not need to capture a new signature. As long as you do not copy another signature and do not shut down CardExchange®, the copied signature will remain on the clipboard.

12.4 Import Signatures



It is possible that you do not want to capture a signature of someone because you already have his/her signature. If this signature is in one of the usual formats (bitmap, jpeg, png, etc.), you can use the **Import signature** function indicated with the **red** arrow to import it and display it on the card that you have opened in CardExchange®. You can then save the signature in the database.

If you click **Import signature**, you enter a dialog window that allows you to select the signature file.

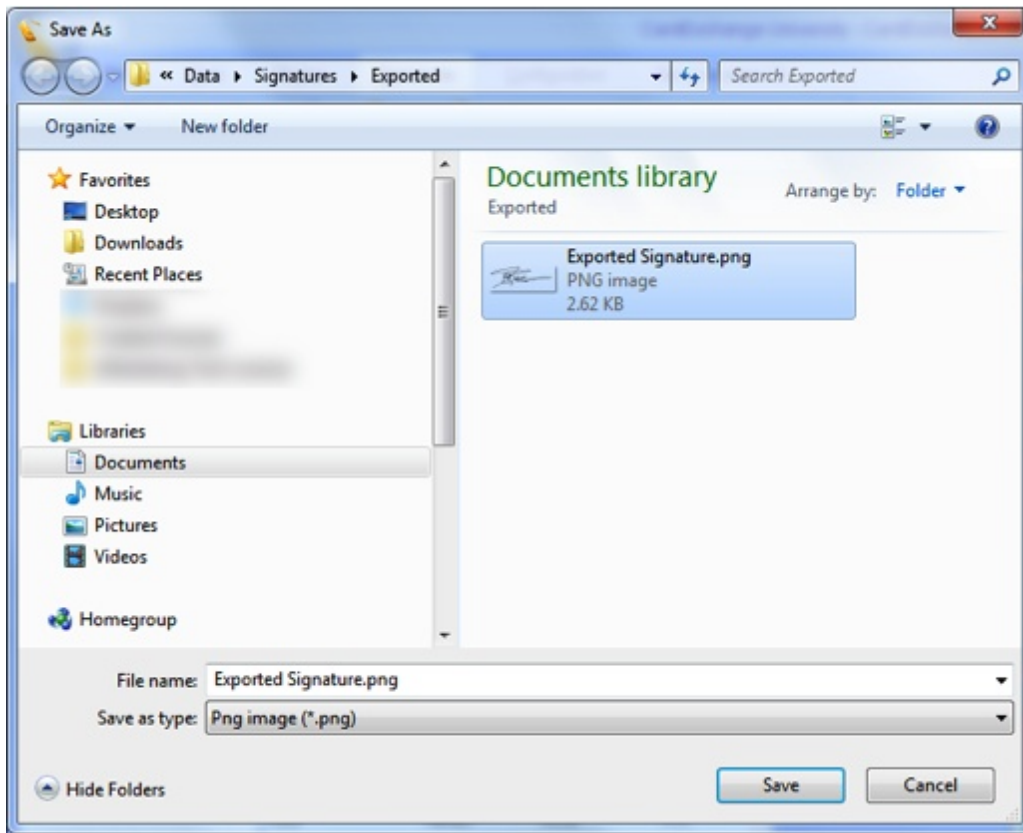


If you have found and selected the file, click **Open** and the signature will be displayed in the [Image Editor](#) window. Here you can crop the signature to the right size and perform any other editing operations.

12.5 Export Signatures



The opposite to import signature is also possible. You can export an existing signature from the database to a file. To do this, click the **Export signature** button indicated with the **red** arrow in the **Actions** section. Once more a dialog window will be displayed in which you can specify the name and location of the file that must contain the signature.



You can choose between two supported file formats: **Bitmap**, **jpg**, **emf**, **gif**, **png**, and **tiff**.

Click on **Save** and the signature is exported to the selected location.

12.6 Remove Signatures

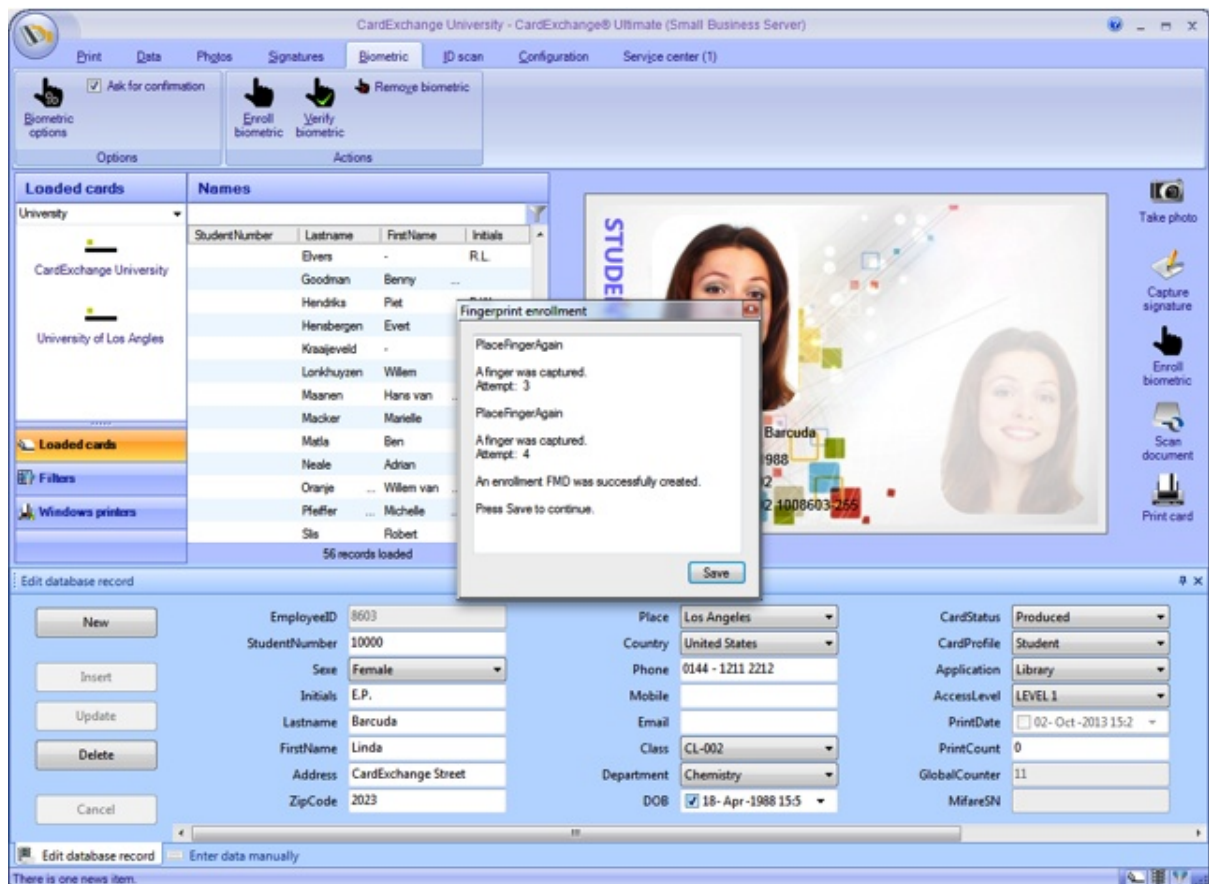


Signatures can be removed from the database by clicking the **Remove signature** button from the **Actions** section indicated with the **red** arrow. The user will be asked to confirm the remove operation with the following question.



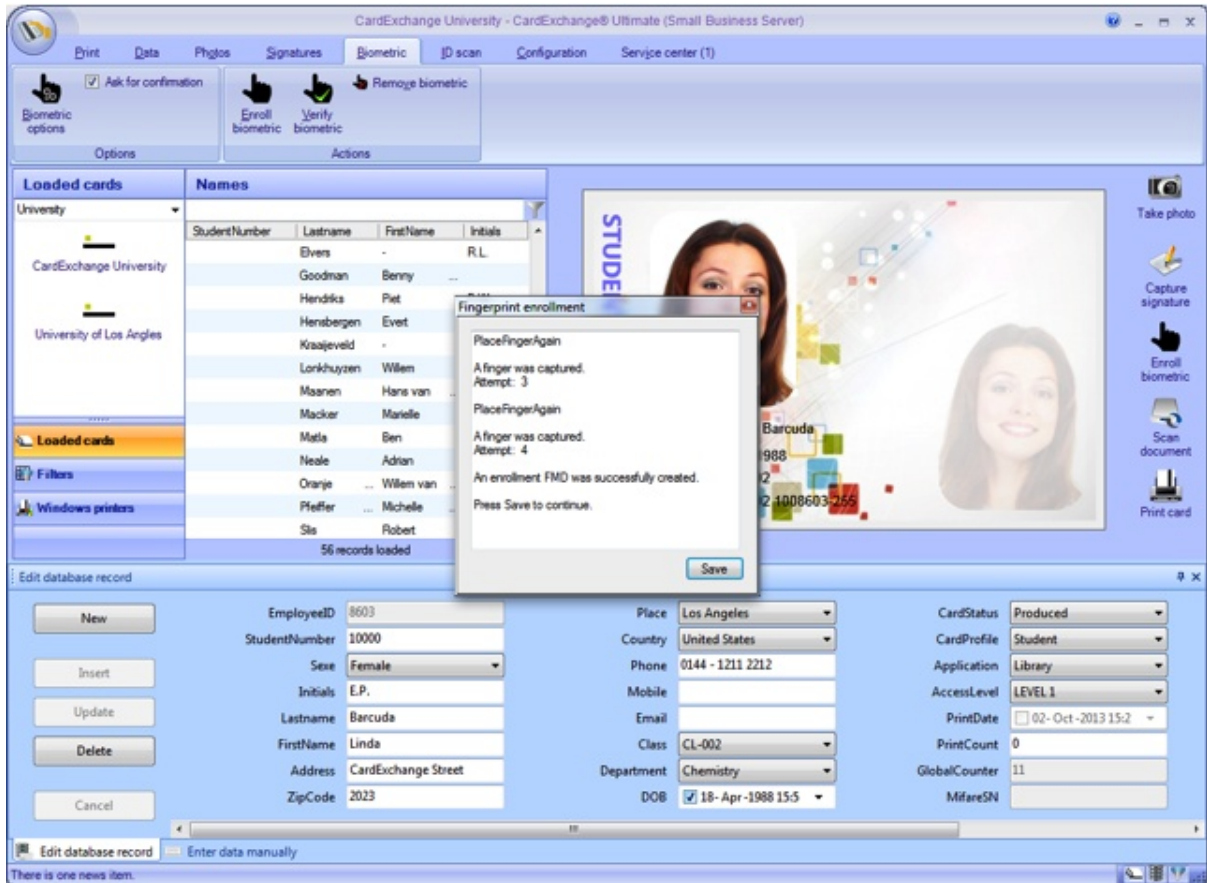
When you click **Yes**, the signature will be removed from the database.

13 Using Biometric



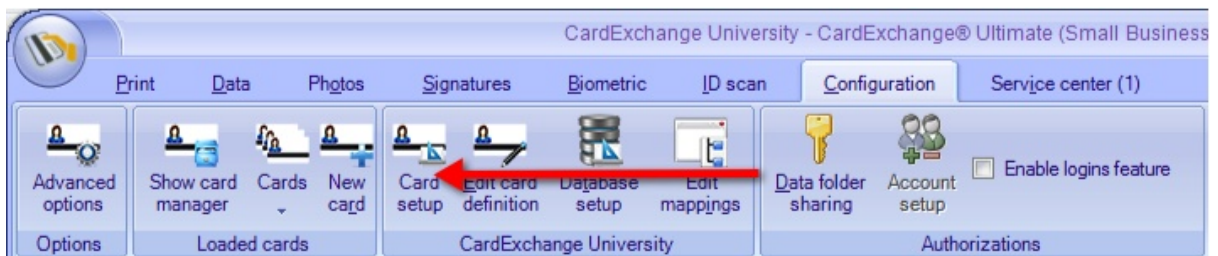
With CardExchange® Ultimate edition you have access to using biometric devices. You can do complete enrollments of biometric and we offer verify functionality to make sure all your stored data is correct. In this section of the help file you can see how this works.

13.1 Biometric Setup

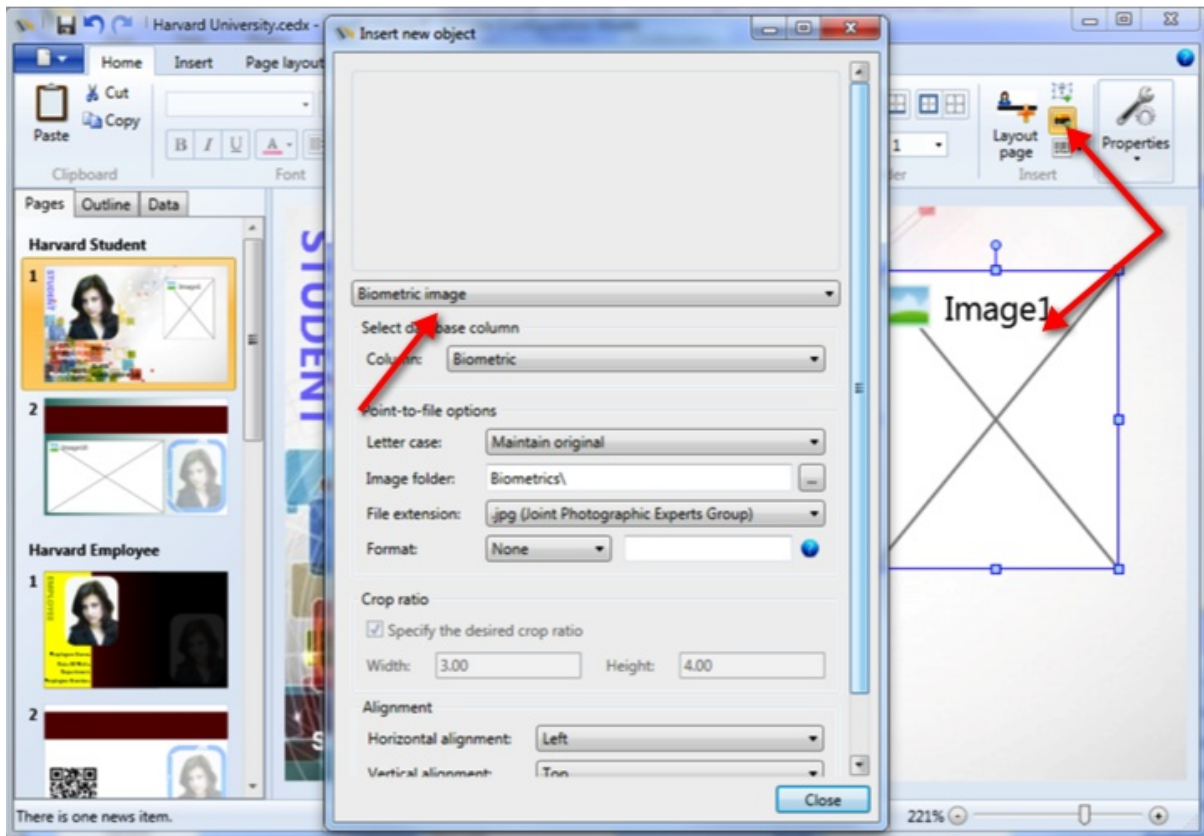


When a biometric device is connected to CardExchange® you have the possibility to print the biometric image on the card or store it into the connected database. You can also store the biometric template into the database. In this section we will explain how to do this.

13.1.1 Printing the Image



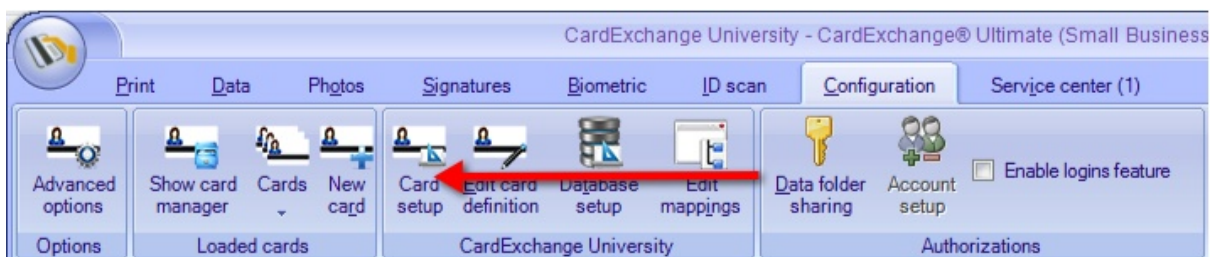
When you want to print the scanned biometric image on your ID card you will have to add an object to your Page design. Click on Card Setup in the Configuration tab in the Main window to start the Designer.



When the Designer is opened, select the Image object from the Home menu and drag and drop an image box on the design page. When the Insert new object window appears, select Biometric image from the drop down menu, as indicated with the red arrow, and select the database column from the Database column selection drop down menu.

Click Close to add the object to the design, Save the template, and close the Designer.

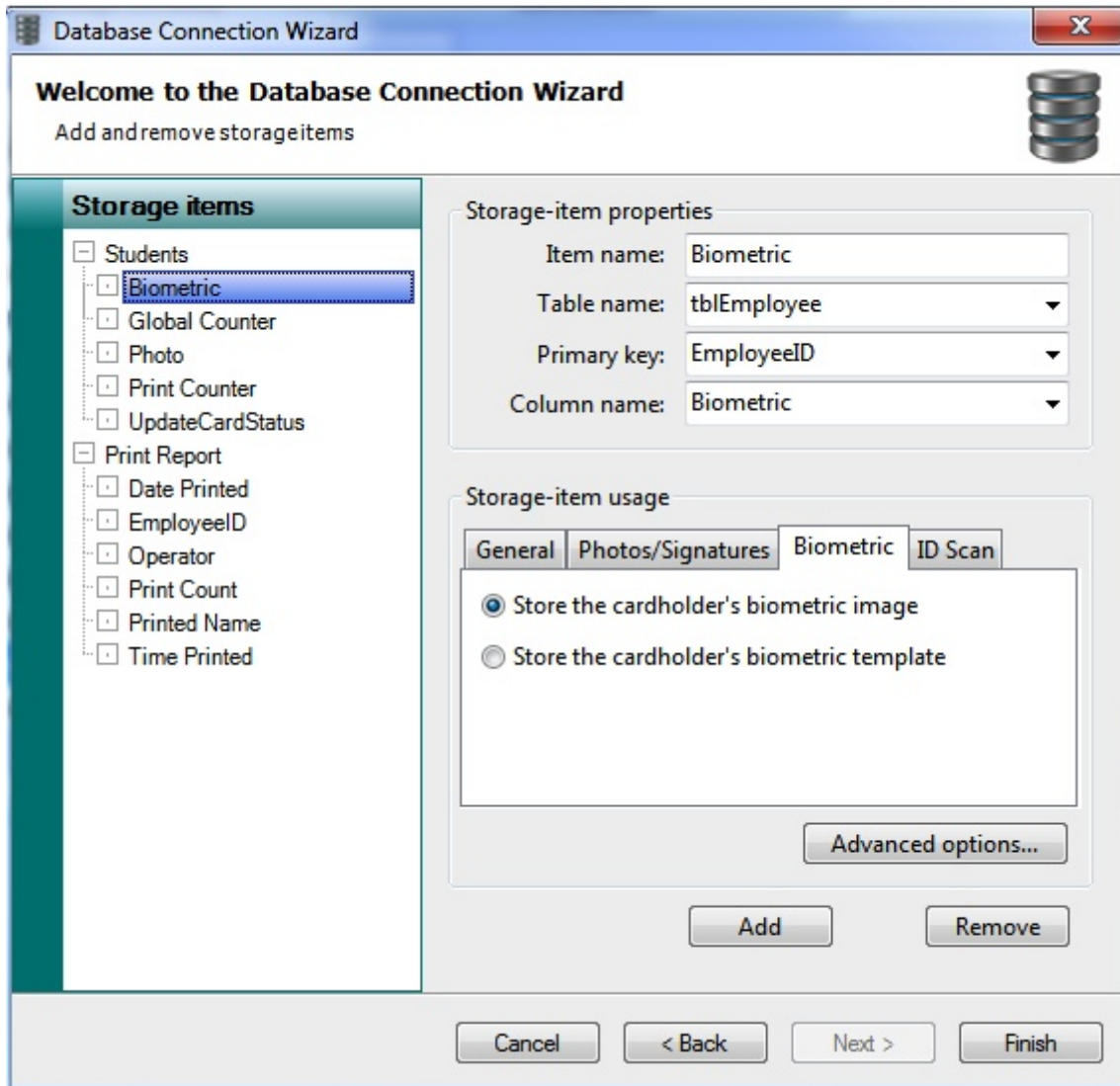
13.1.2 Storing Biometric Data



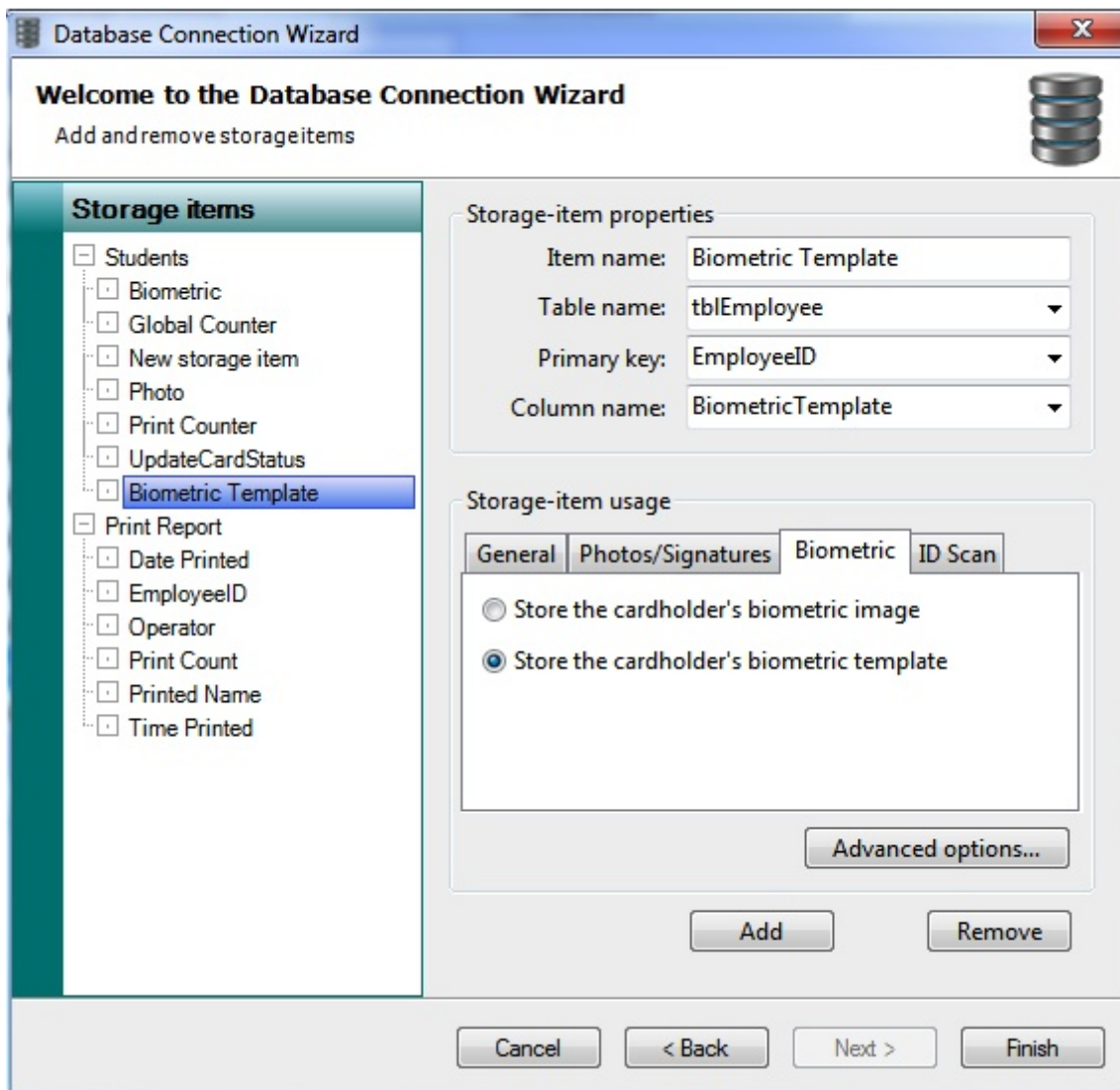
Biometric data can also be stored into the database. You can store the image data and the template. The template is based on ISO standard and can be used to create verify processes, also supported by CardExchange®. You can find more information about this in the [Verify Biometric](#) section of this Help file.

To store information in the database we need to create [storage items](#). How to use database and creating of storage items is explained in the [Database](#) section of this help file.

When you have opened the Designer and started the Database Connection wizard, you navigate to the last page of the Database Connection wizard, the Storage Items.



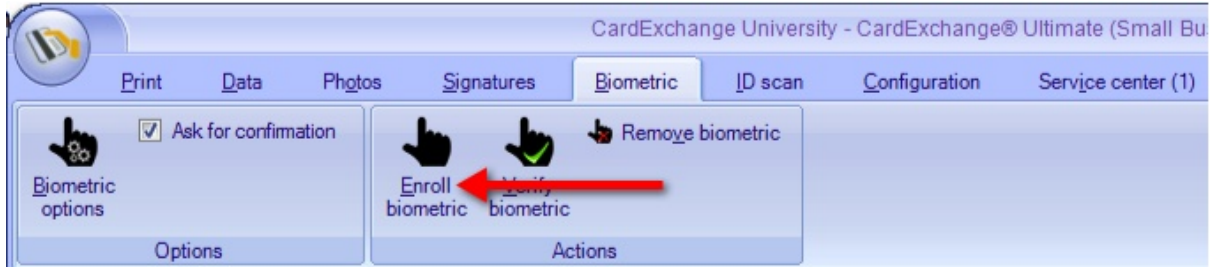
First we add a storage item named "Biometric". Select the Biometric tab and select "Store the cardholder's biometric image".



If you also want to store the template, add a storage item named Biometric Template. Select the Biometric tab and select "Store the cardholder's biometric template". The template is an XML file so make sure that the database column type is big enough to store a large text file.

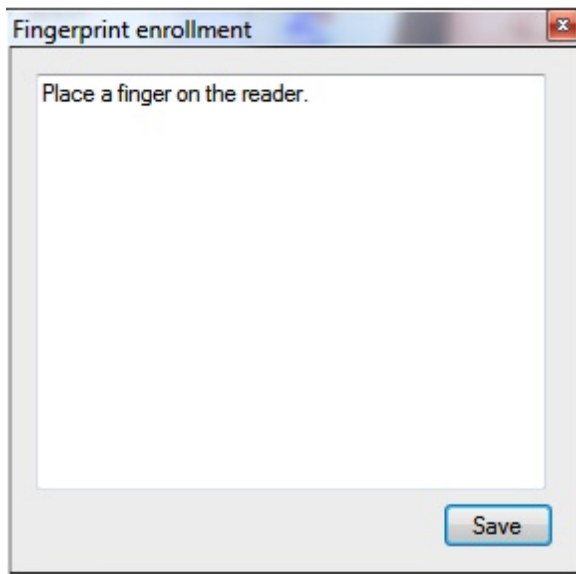
When you are done you click on Finish to save all settings and close the Database Connection wizard.

13.2 Biometric Enrollment

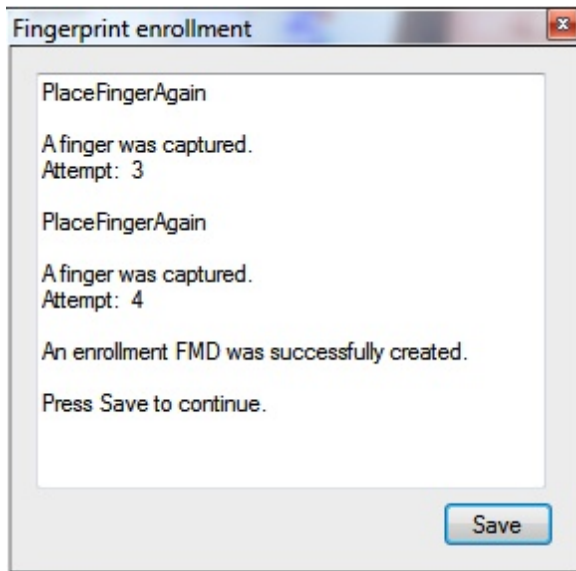


To get your biometric information into the database or on your card design, you will have to do the enrollment. The enrollment of biometric is on this moment fixed on four (4) readings. If these readings match, you will be able to store the information.

To enroll a fingerprint select the record that you want to do the enrollment for and click on the **Enrollment biometric** button in the Biometric tab of the main window, indicated with the red arrow.

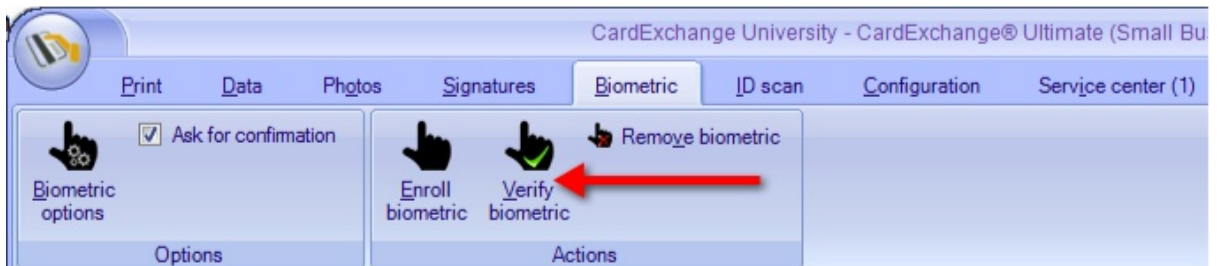


When you clicked on the button, the enrollment window appears requesting you, in this example, to place your finger on the reader.



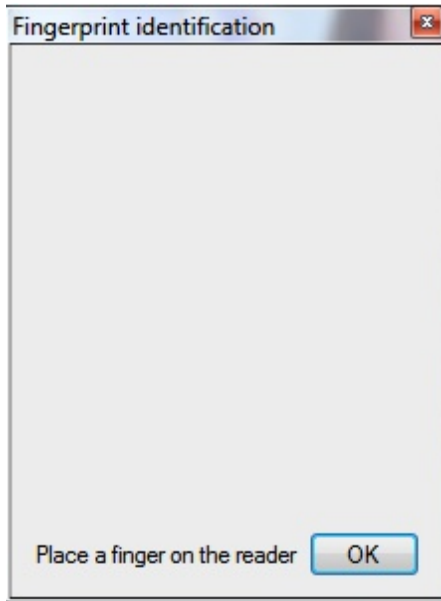
When you have finished the full enrollment you can click on Save to store all the information into the connected database and/or show as an image on the card.

13.3 Verify Biometric

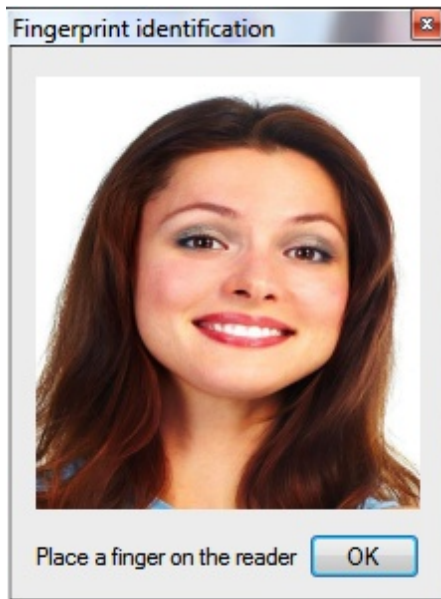


CardExchange® does not only offer functionality to enroll your biometric but also offers functionality to verify your enrollment.

To verify your enrollment click on the **Verify biometric** button and the window below will appear:



To verify the enrollment, in this example, the finger needs to be placed on the reader. The moment that the finger is placed, the scan will verify this with the template information in the database. When the enrollment is succeeded and verified, the photo of the person will be shown, if applicable, in the window as shown below:



If there is no match the window below will be shown:

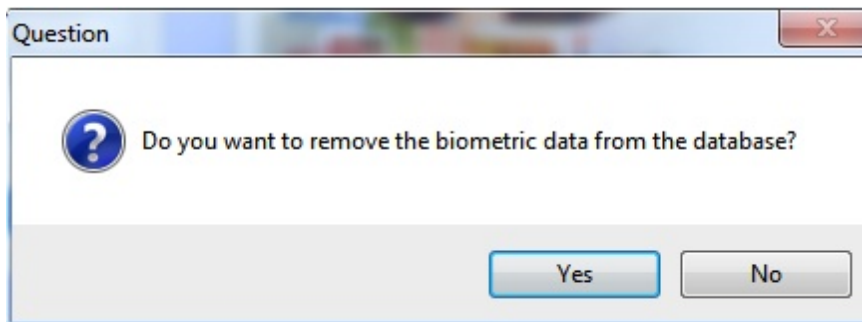


Please be aware that this functionality only works with the template of the scan, not with the image only. You need to store the biometric template into the connected database.

13.4 Remove Biometric

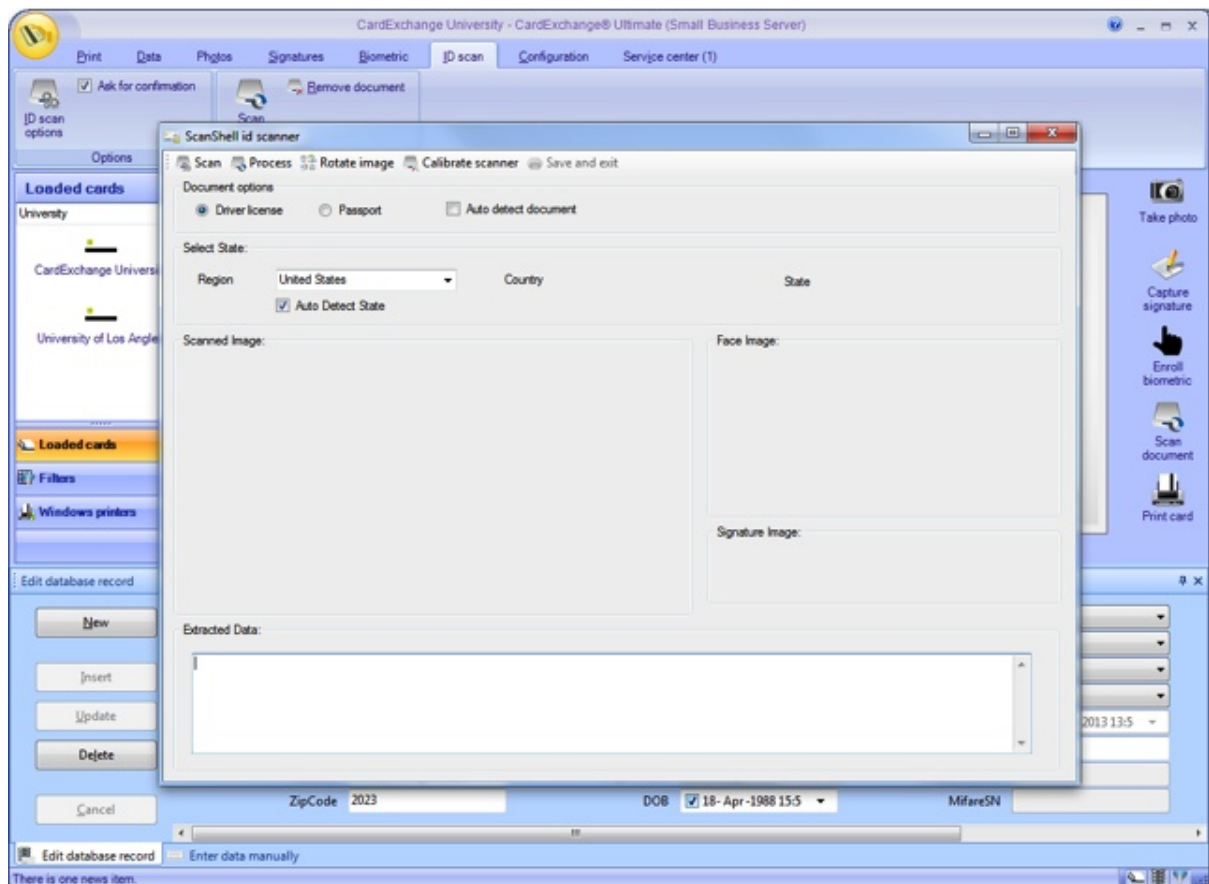


Biometric data can be removed from the database by clicking the **Remove biometric** button from the **Actions** section indicated with the **red** arrow. The user will be asked to confirm the remove operation with the following question.



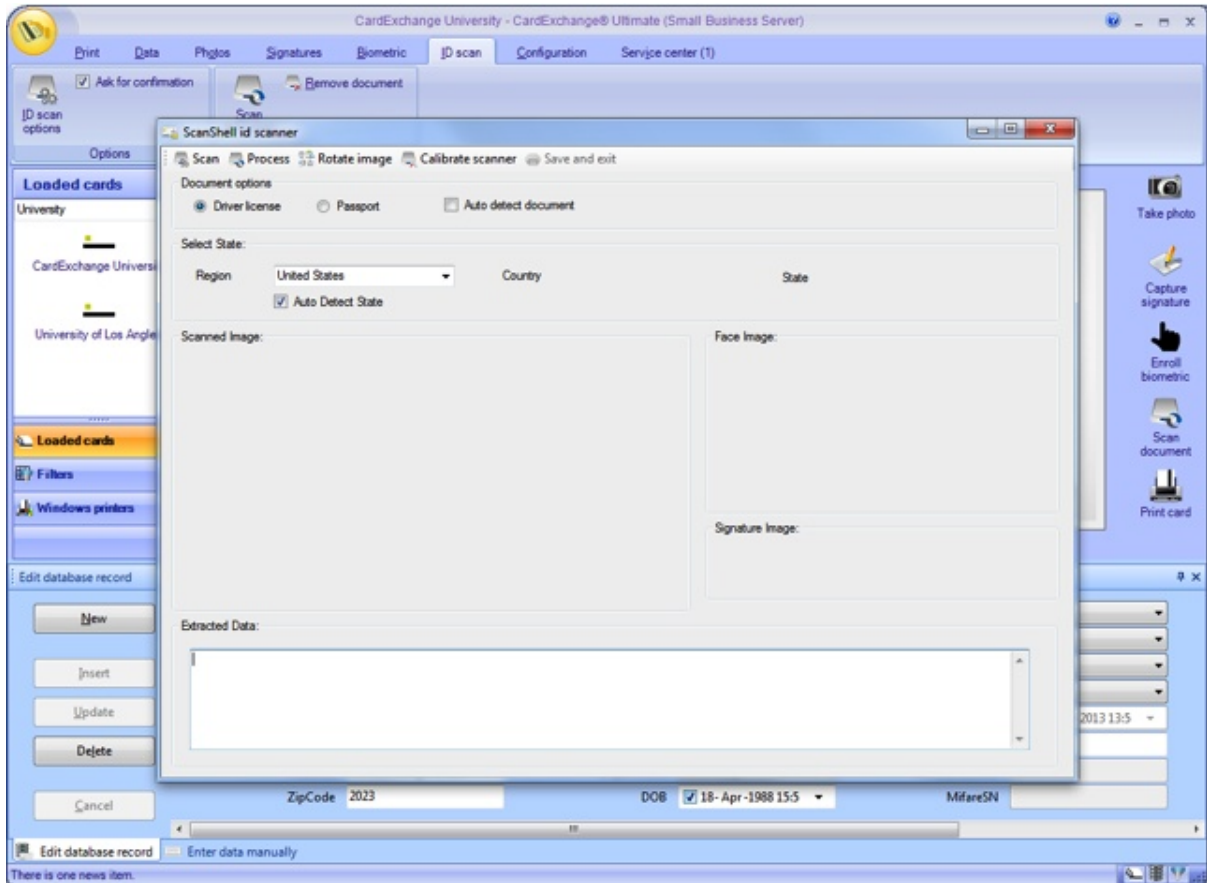
When you click **Yes**, the biometric data will be removed from the database.

14 Using ID scanners



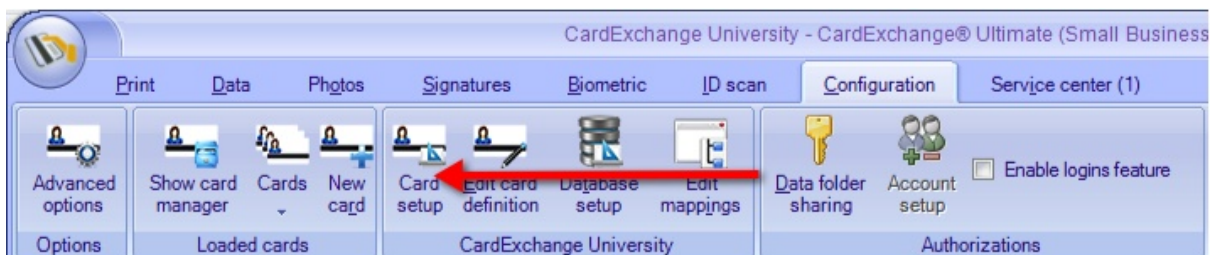
If you have an CardExchange® Ultimate edition you can use ID scanners. How to use these scanners is explained in this section of this help file.

14.1 ID Scanner Setup



When a ID scanner device is connected to CardExchange® you have the possibility to print the scanned document information on the card or store it into the connected database. In this section we will explain how to do this.

14.1.1 Printing Images

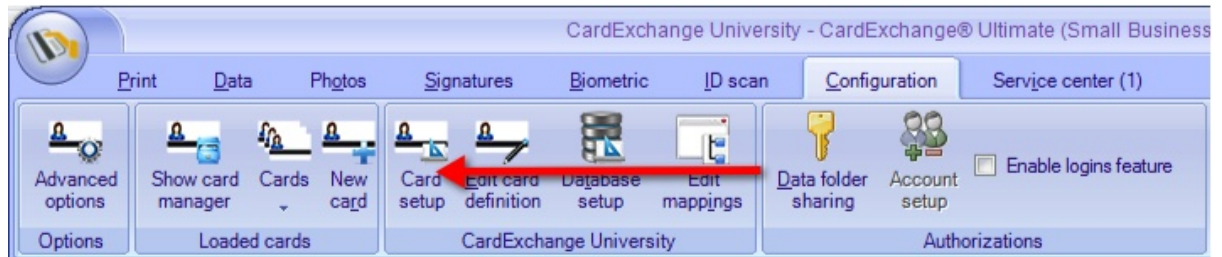


When you want to print the scanned document information your ID card you will need to have the information stored into your database.

Showing and printing data from the scanned document works the same as showing photos or text from a database as explained in the [Adding Card Templates](#) section of this help file.

Click Close to add the object to the design, Save the template, and close the Designer.

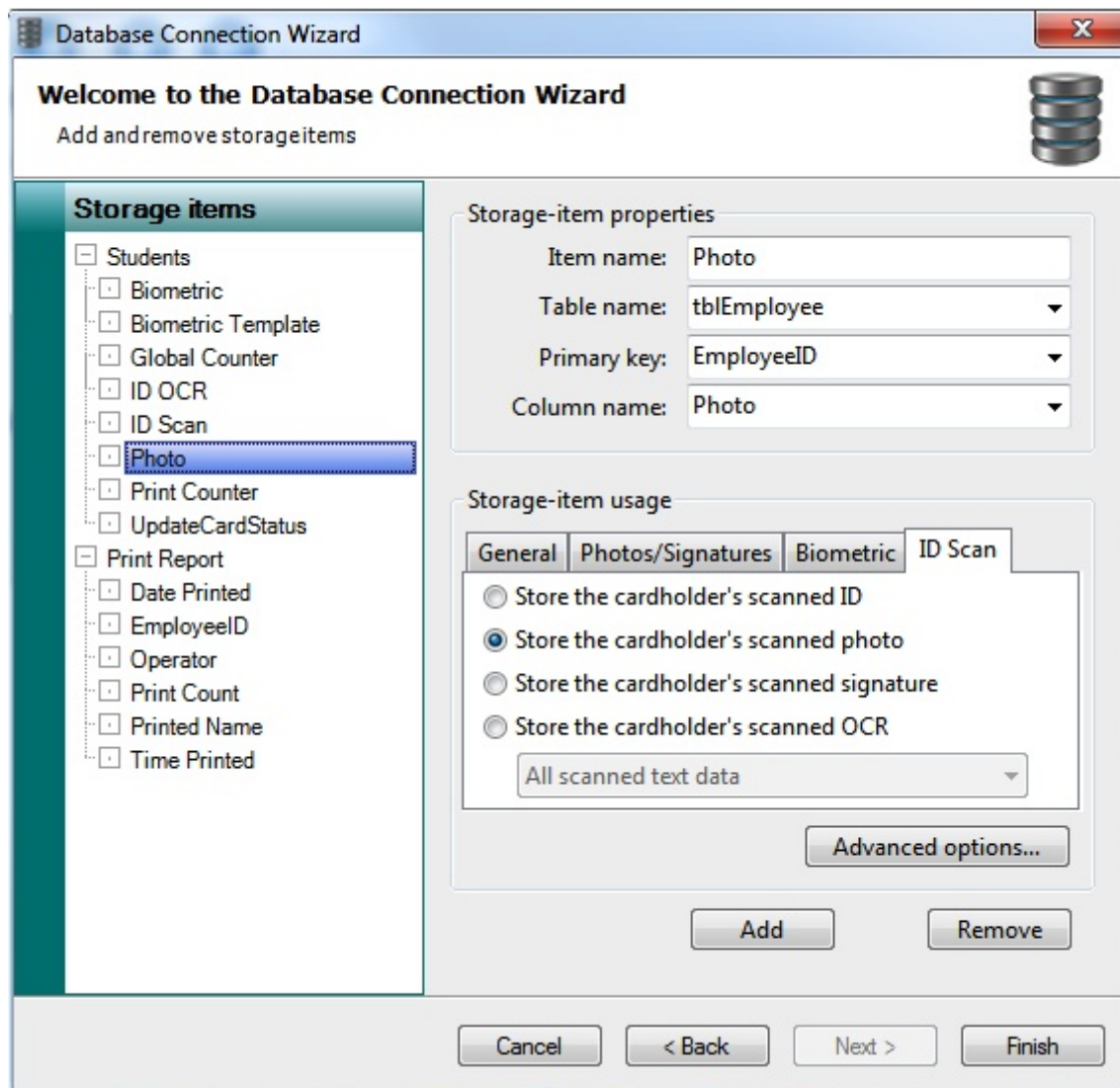
14.1.2 Storing ID Scanner Data



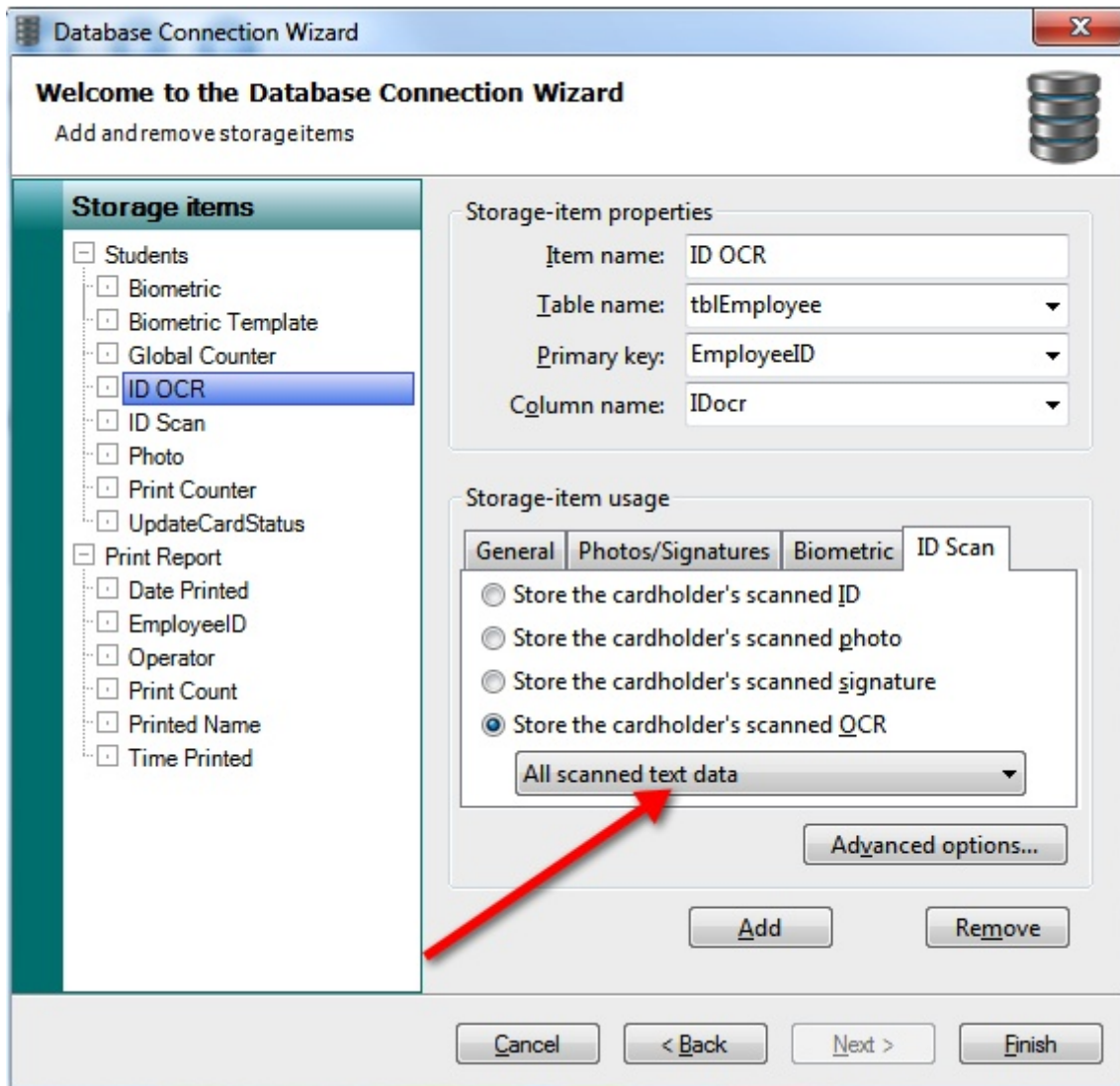
ID scanner data can also be stored into the database. You can store the image data like photos and signatures but also the OCR data or address information, etc..

To store information in the database we need to create [storage items](#). How to use database and creating of storage items is explained in the [Database](#) section of this help file.

When you have opened the Designer and started the Database Connection wizard, you navigate to the last page of the Database Connection wizard, the Storage Items.



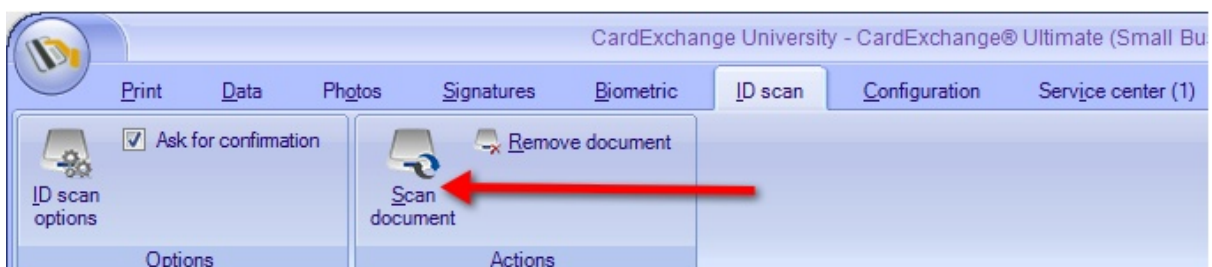
First we add a storage item named "Photo". Select the ID Scan tab and select "Store the cardholder's scanned photo".



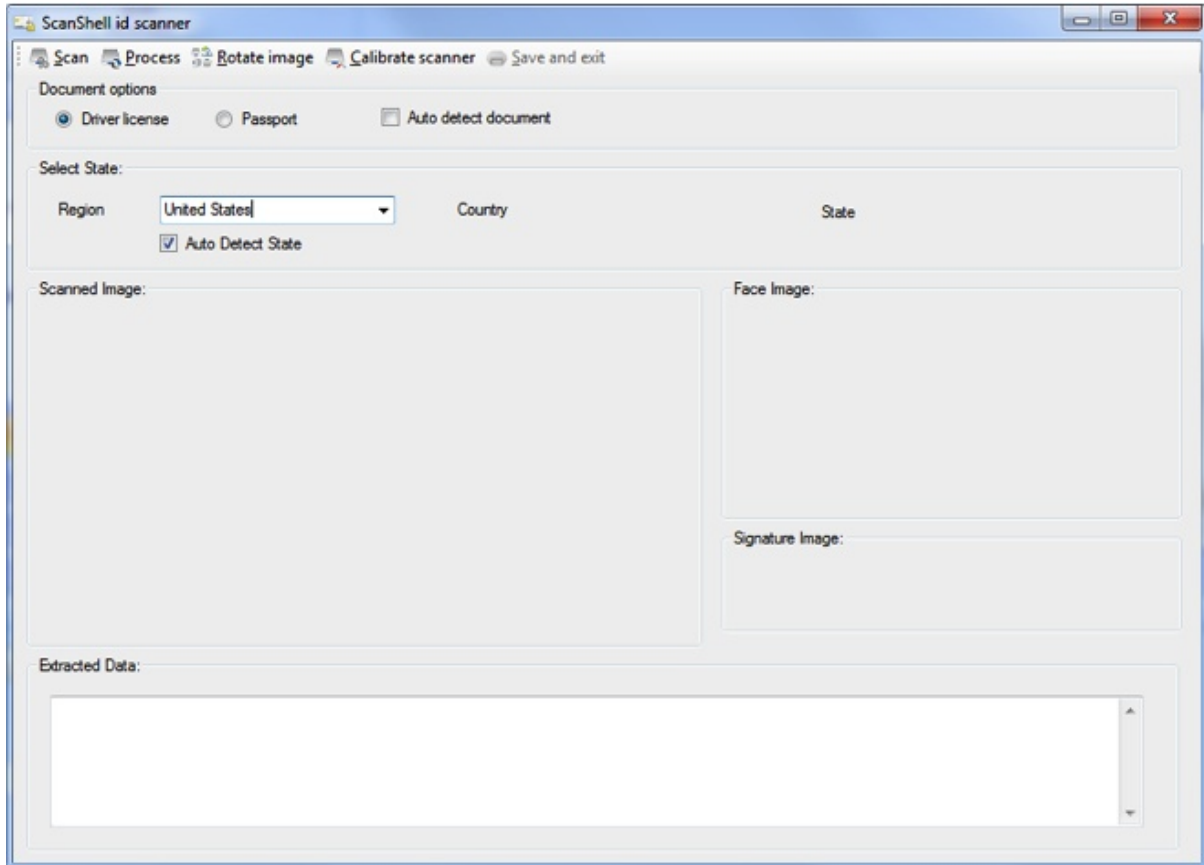
If you also want to store the OCR, add a storage item named ID OCR. Select the ID Scan tab and select "Store the cardholder's scanned OCR". Via the drop down menu you can select the data you want to store.

When you are done you click on Finish to save all settings and close the Database Connection wizard.

14.2 Scan Document



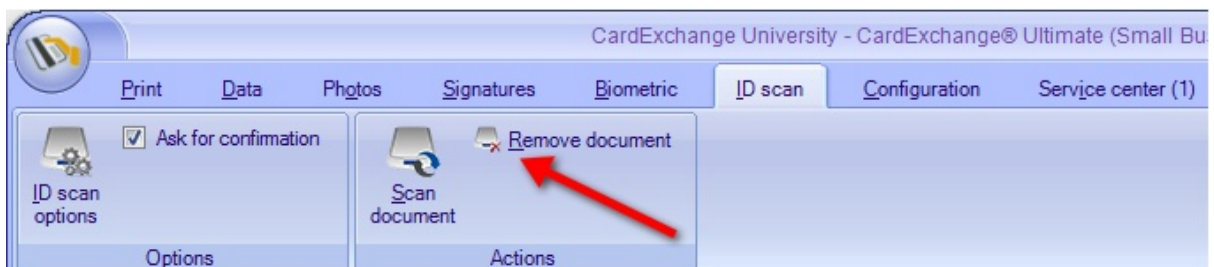
When everything is configured you can start scanning your documents. Click on the Scan document button in the ID scan tab as indicated with the red arrow which will start the scanner.



When the scanner interface is opened you need to select in the "Select State" group box the region as ID documents differ per country. In the Document options group you select what type of document you are scanning; Driver license or Passport.

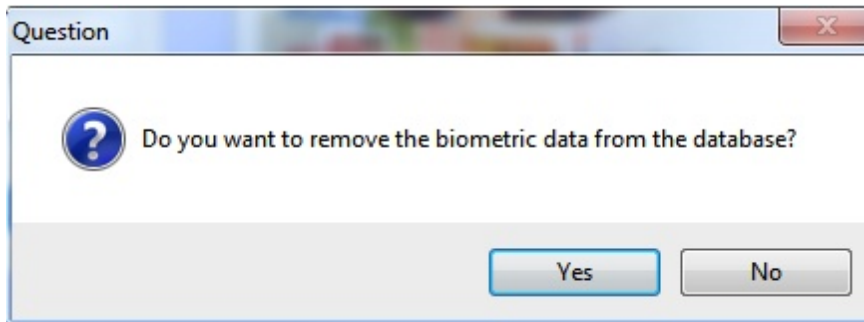
In the menu at the top you can click on Scan to scan the document. When the document is scanned you can rotate the image, and save and exit. The information will be stored into the database and the information will be shown on the card, if configured.

14.3 Remove Document



Your scanned document data can be removed from the database by clicking the **Remove**

document button from the **Actions** section indicated with the **red** arrow. The user will be asked to confirm the remove operation with the following question.



When you click **Yes**, the document data will be removed from the database.

15 Using Databases

Starting at the Premium edition, CardExchange® offers database connections. Database connections and the stability of these connections has always been one of the key factors for developing connections.

Besides the variety of offered connections, all the major database connections are created based on direct (native) connections. Therefore for all the major database systems, we have their native connectors embedded. That will ensure 100% stable and secure connections.

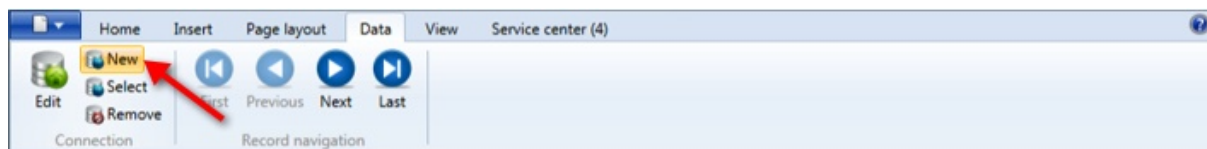
CardExchange® does not only offer these type of connections, it also offers multiple database connections with true Push-Pull technology. Sometimes there is some confusion about push and pull, but CardExchange® does not use internal database structures to transport data from one database to the other database. That ensures that with CardExchange® you never have to worry about the privacy of the information because it this information stays where it should be... in your database!

The different type of database connections offered, are available per edition as shown below:

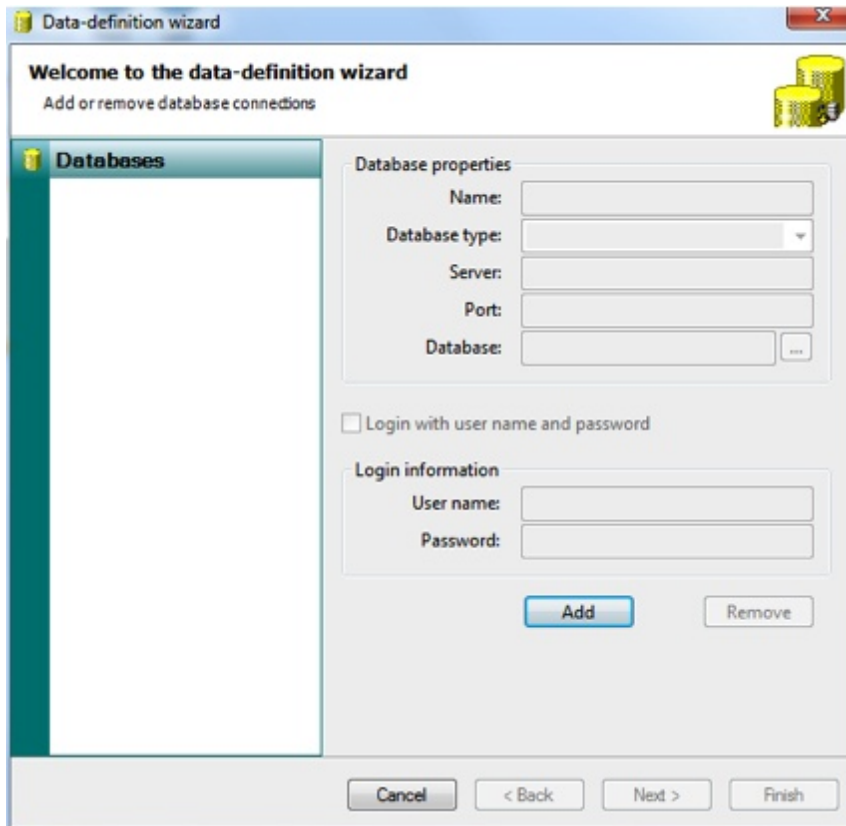
Edition	Supported Database Connections
Designer	No Database Support
Go	Internal MS Access Database
Premium	MS Excel (all formats), CSV, and TXT files, MS Access (all formats), Paradox
Professional	MS Excel (all formats), CSV, and TXT files, MS Access (all formats), Paradox, MS SQL, MySQL, Oracle, DB2, PostgreSQL, Ingris, ODBC, Multiple Databases
Ultimate	MS Excel (all formats), CSV, and TXT files, MS Access (all formats), Paradox, MS SQL, MySQL, Oracle, DB2, PostgreSQL, Ingris, ODBC, Multiple Databases

With CardExchange® your data is secured processed with 128 bit encrypted connections.

15.1 Add Database



Adding a database connection starts in the Configuration Mode of your Edition. Select the Data tab and in the Connection group you select New from the group to start the Database Connection Wizard.

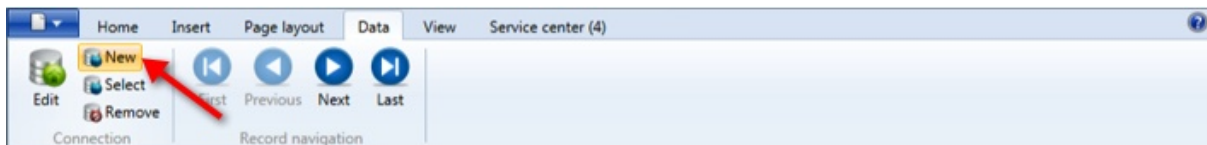


In the sections "[Using MS Excel](#)", "[Using MS SQL Server](#)", and "[Using Multiple Databases](#)" we will demonstrate how to configure a new database connection for the mentioned database structures.

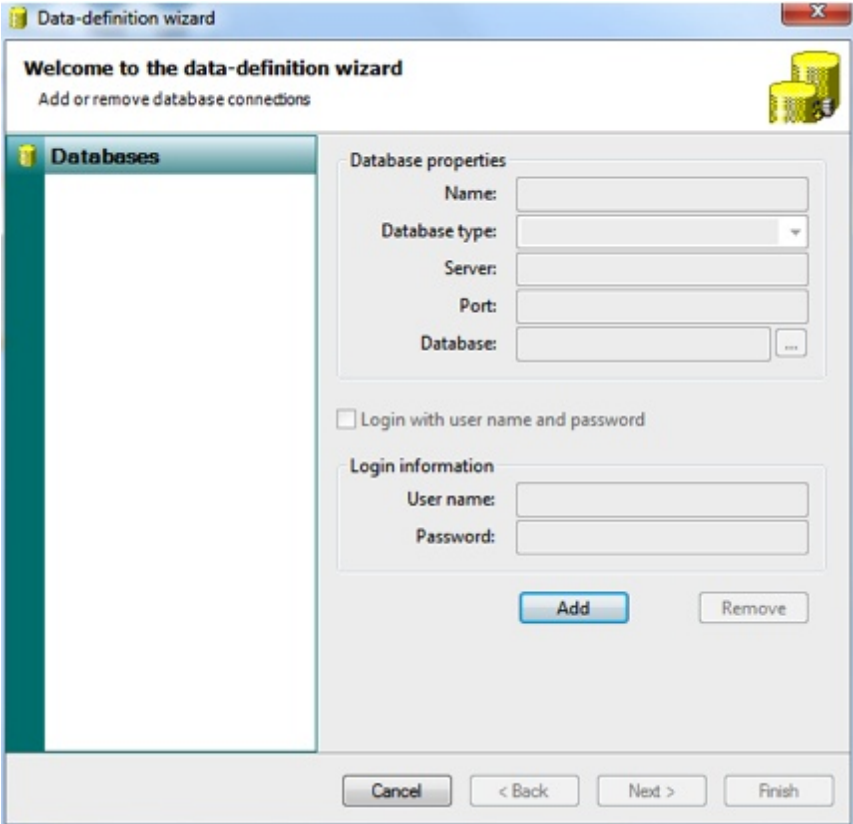
One of the most powerful functionality of the database connections are the Storage Items. Storage Items allow you to store any type of data back into the connected database. This can be Photos, Signatures, Print Dates, Print Counts, Environment Variables, etc. Storage Items are supported for Premium Editions and Higher. In the mentioned sections, we will use the Entry edition for demonstrating connecting to an MS Excel file. This wizard is shorter then the wizard in the higher editions.

15.1.1 Using MS Excel

Although it is not an database, MS Excel is one of the most used files to connect to ID Badging software, and that also goes for CardExchange®. We will demonstrate how to create a connection to an MS Excel file using the Entry edition of CardExchange®. With the Entry edition you create a database connection in four easy steps and make the information available for presenting and printing.

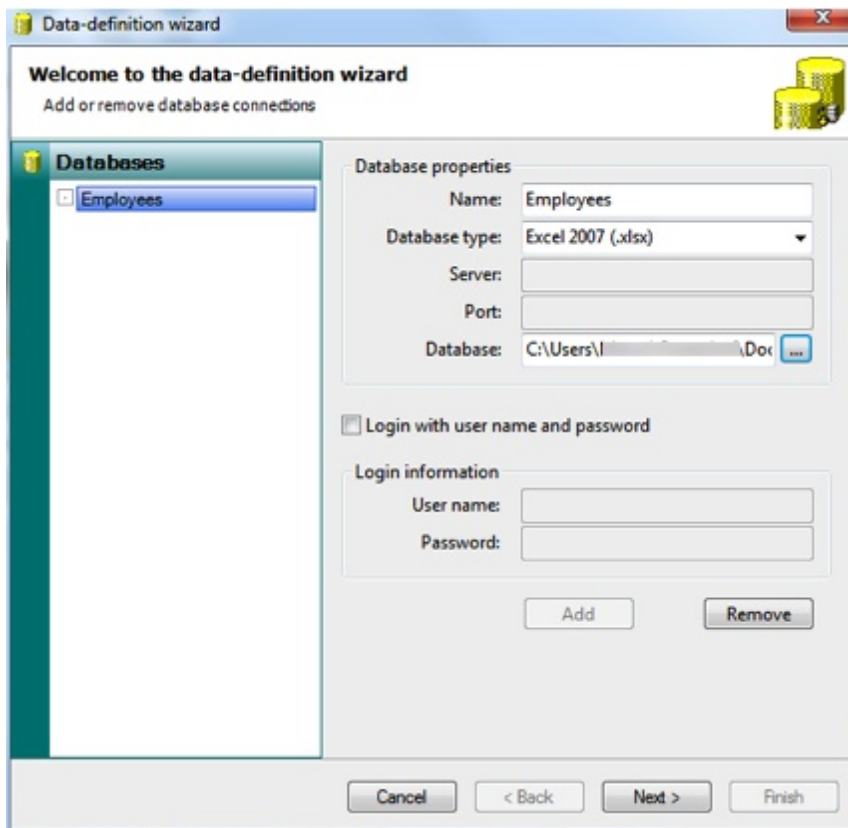



Click **New** to start the Database Connection Wizard.



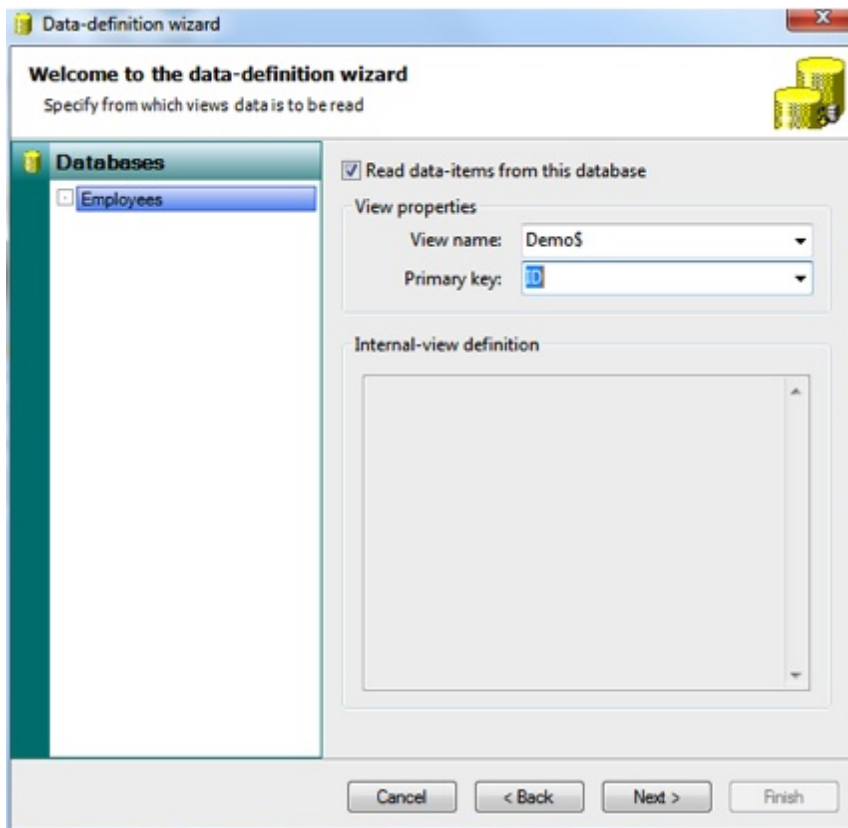
When the wizard opens you click Add to start making the connection.

Step 1



Enter a name for the database connection, select the correct database type, and select the database file by typing the whole path with extension into the Database text box or click on the  button to browse to the file location. Click Next to proceed. It is important to know that on the moment you click the Next button, the wizard will check the connection with the file or database. If all is correct, the wizard will enter the second page of the wizard. If a problem appears, and database error will be shown.

Step 2



Select the check box 'Read data-items from this database', select the corresponding sheet in the 'View name' drop menu, and select the 'Primary Key' from the drop down menu. The Primary Key is the unique identifier of the record in your database. Click Next to proceed.

Step 3

Data-definition wizard

Welcome to the data-definition wizard
Select where to retrieve the name info from

Data database

Database: Employees

Switch on level-three filter

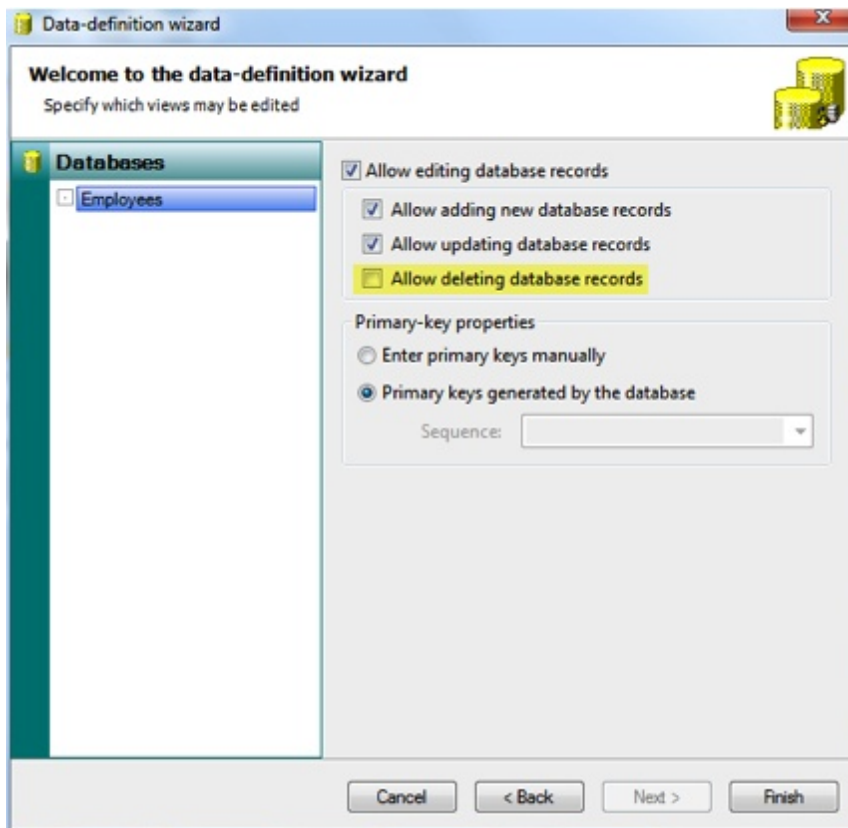
Data columns

Last name:	LastName	<input checked="" type="checkbox"/>
First name:	FirstName	<input checked="" type="checkbox"/>
Middle name:	(none)	<input type="checkbox"/>
Initials:	(none)	<input type="checkbox"/>
2nd Last name:	(none)	<input type="checkbox"/>
2nd Middle name:	(none)	<input type="checkbox"/>
Personal number:	ID	<input checked="" type="checkbox"/>

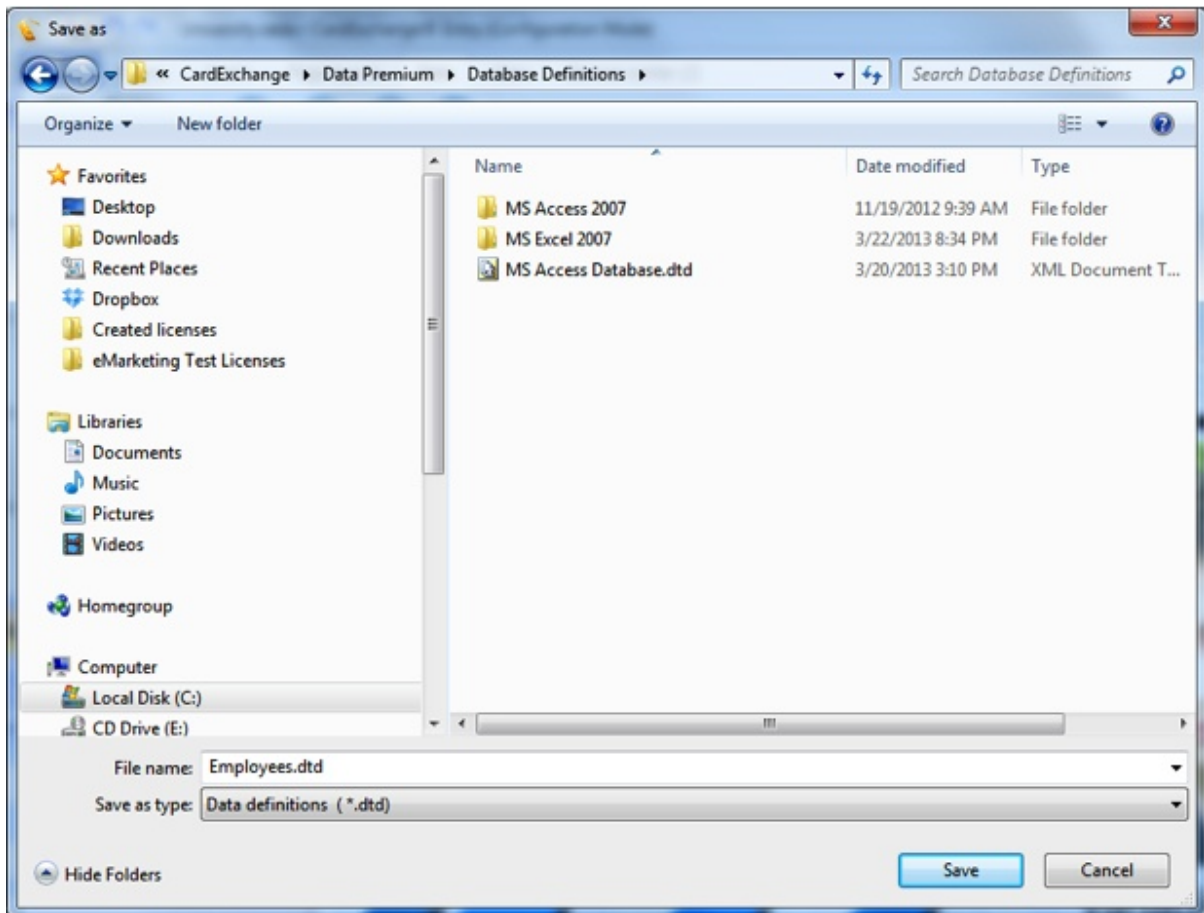
Cancel < Back Next > Finish

In the Main Interface of CardExchange® you find the [Data Record View](#) showing all the records available in the database in a so called data grid. In this page of the wizard we connect the columns of the database to the data fields. The first field always needs to be connected. All other fields are optional. If you connect the database column, left from the drop down menu you see the check box selected. If the check box is checked, the column will be shown in the [Data Record View](#). Click Next to proceed with the last and final step of this Database Connection Wizard.

Step 4

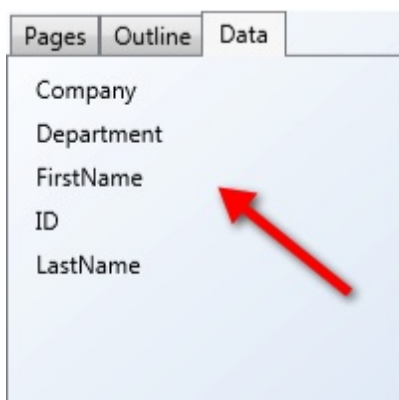


In this page of the wizard you can set the rights to edit the connected database, or in this case, the connected MS Excel file. Click on the check box '**Allow editing of the database records**' to enable this functionality. Separate from this selection you can set that the user is allowed to add new records to the database and update existing records. Deleting is deselected because deleting records in an MS Excel file is not supported. In the Primary-key properties section you can select to enter the primary keys manually. If you are not using numbers as primary keys, this check box needs to be selected but for each new record, a unique primary key needs to be entered by the user. We advice to use numbers and leave the check box as is by default, primary keys are generated by the database. Normally real databases support this functionality itself, but because MS Excel is not a database, we have embedded a unique number generator so your primary keys are taken care of by CardExchange®. Now click on Finish



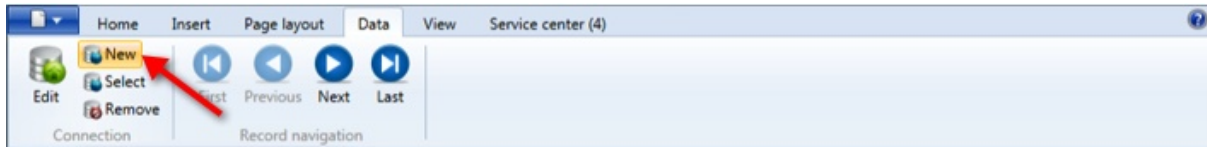
and save your database connection to a location on your computer. We advice to store your data in the [Data Folder](#) of CardExchange®.

Now in four simple steps you have created the connection to your MS Excel file and now the columns are available in the Designer for adding to your design.

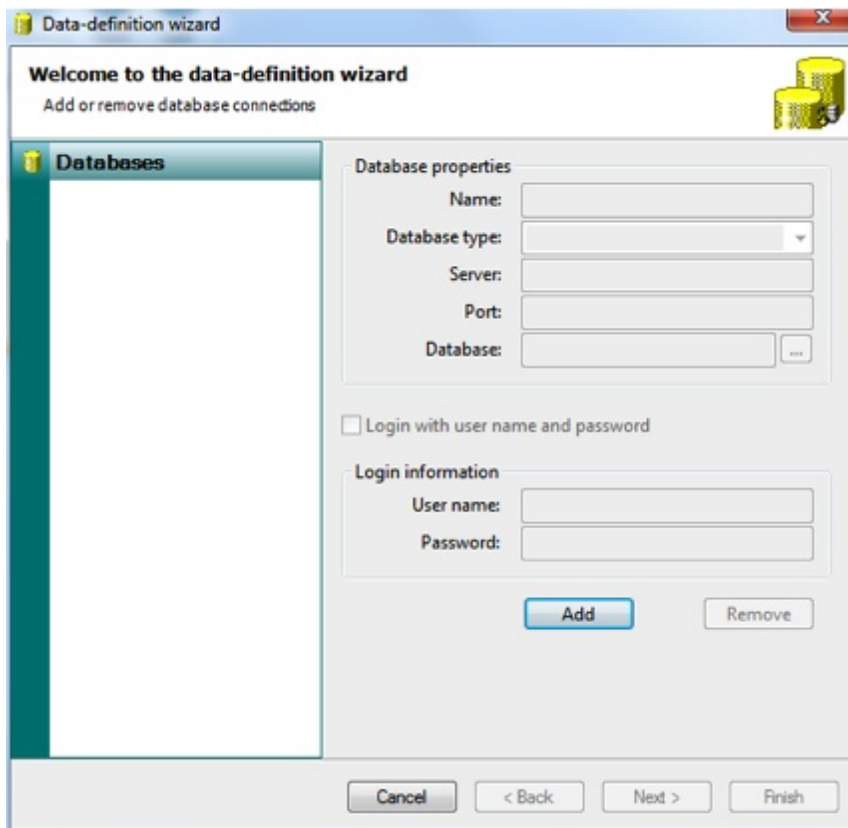


15.1.2 Using MS SQL Server

For using MS SQL Server connections a Professional or higher edition is needed. In this example we will demonstrate how to make a connection to the MS SQL Server database. For most of the database servers available, the setup for connecting works the same.

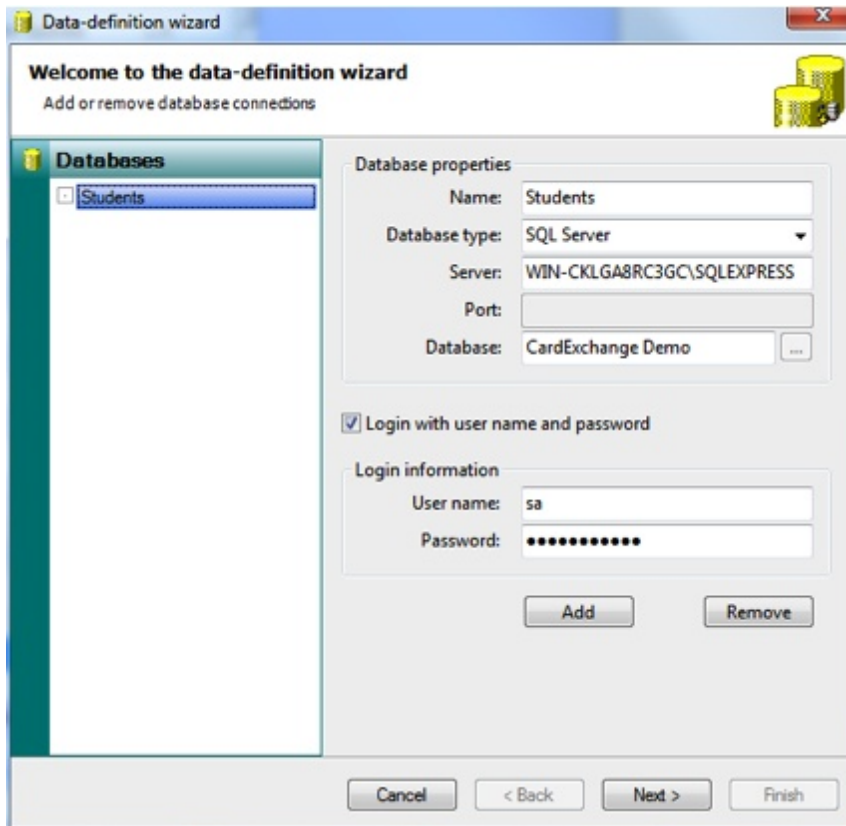


Click **New** to start the Database Connection Wizard.



When the wizard opens you click Add to start making the connection.

Step 1

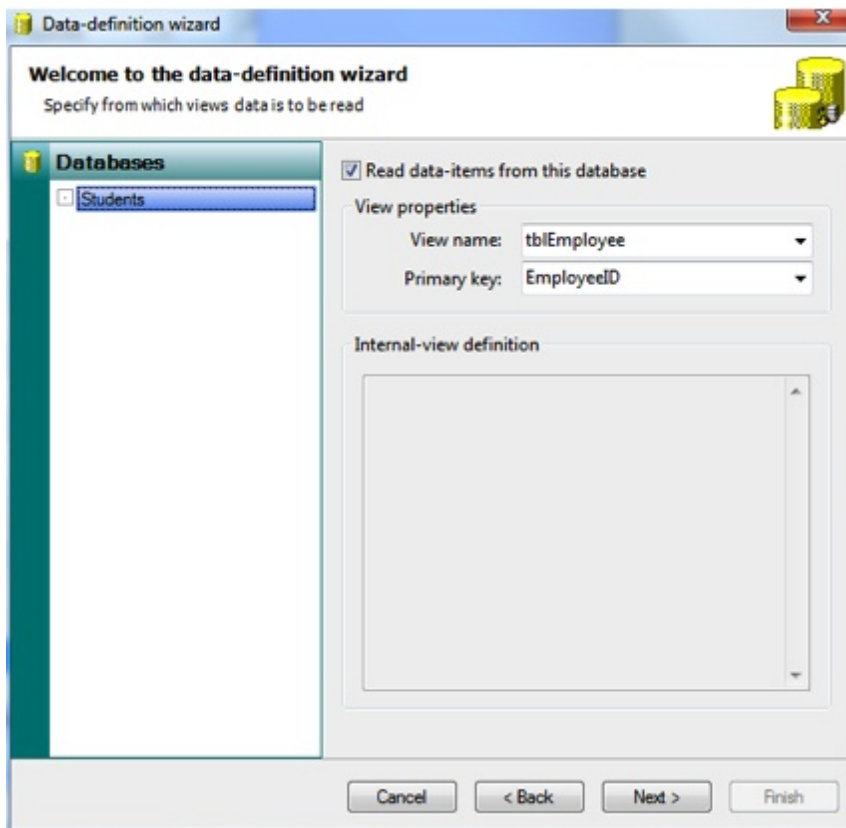


Enter a name for the database connection, select the correct database type, enter the name or IP address of the SQL Server. We advice to use the server name as CardExchange® supports Load Balancing via TNS. If used in your organization, you will always have access to your data if one of the servers goes down and the other takes over. Using IP is more static and you need to know for sure that IP addresses are not changing. Entering a port number with MS SQL Server is not needed. When you are using Oracle, a port number needs to be entered. Enter the name of the database running on the MS SQL Server.

If MS SQL Server is set to use Windows Authorizations, you can leave the Login option unchecked. If not, check this option and provide a user name and password so CardExchange® can log in to the database server. All user name and password information is encrypted with AES 128 bit technology.

IMPORTANT! If you are connecting to an Oracle Database Server make sure you have installed the Oracle.NET provider as described in the Quick Install Manual!

Step 2



Select the check box 'Read data-items from this database', select the corresponding sheet in the 'View name' drop menu, and select the 'Primary Key' from the drop down menu. The Primary Key is the unique identifier of the record in your database. Click Next to proceed.

Step 3

Data-definition wizard

Welcome to the data-definition wizard
Select where to retrieve the name info from

Data database

Database:

Switch on level-three filter

Data columns

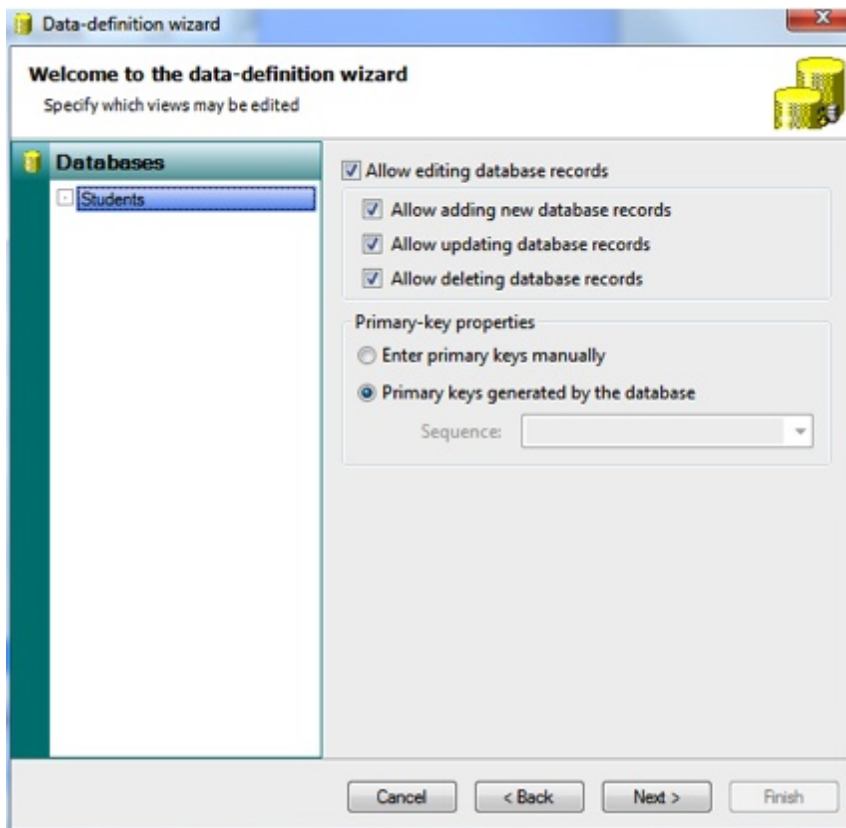
Last name:	<input type="text" value="Lastname"/>	<input checked="" type="checkbox"/>
First name:	<input type="text" value="FirstName"/>	<input checked="" type="checkbox"/>
Middle name:	<input type="text" value="MiddleName"/>	<input type="checkbox"/>
Initials:	<input type="text" value="Initials"/>	<input checked="" type="checkbox"/>
2nd Last name:	<input type="text" value="(none)"/>	<input type="checkbox"/>
2nd Middle name:	<input type="text" value="(none)"/>	<input type="checkbox"/>
Personal number:	<input type="text" value="StudentNumber"/>	<input checked="" type="checkbox"/>

Cancel < Back Next > Finish

In the Main Interface of CardExchange® you find the [Data Record View](#) showing all the records available in the database in a so called data grid. In this page of the wizard we connect the columns of the database to the data fields. The first field always needs to be connected. All other fields are optional. If you connect the database column, left from the drop down menu you see the check box selected. If the check box is checked, the column will be shown in the [Data Record View](#). Click Next to proceed with the last and final step of this Database Connection Wizard.

If you are connecting to a database with a huge amount of records and you want to prevent loading all these records directly after the connection is made, check the 'Switch on level-three filter' check box. This will prevent CardExchange® from loading all the records and allows you to first create all needed filters for your configuration. For more information about the [Level Three Filters](#) or any other filters, please see our "[Using Filters](#)" section of this Help file.

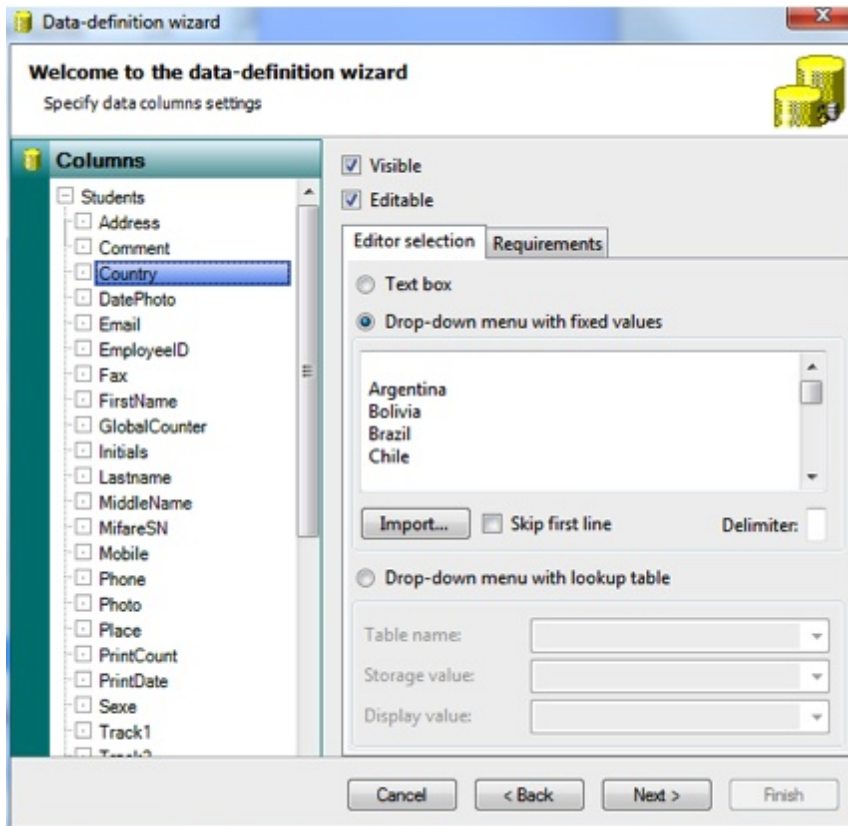
Step 4



In this page of the wizard you can set the rights to edit the connected database, or in this case, the connected MS SQL Server. Please be aware that this setting does not overrides the editing rights set by the DBA for record access.

Click on the check box **'Allow editing of the database records'** to enable this functionality. Separate from this selection you can set that the user is allowed to add new records to the database, update existing records, and Delete records. In the Primary-key properties section you can select to enter the primary keys manually. With real databases like MS SQL Server, Primary Key fields are always available and we advice not to enter keys manually. One not for Oracle users, when connecting to an Oracle Database Server, Primary Keys are generated based on created sequences. When Oracle is connected, select the correct Sequence from the drop down menu. If no Sequences are available, please contact your DBA (Database Administrator). Click Next to Proceed.

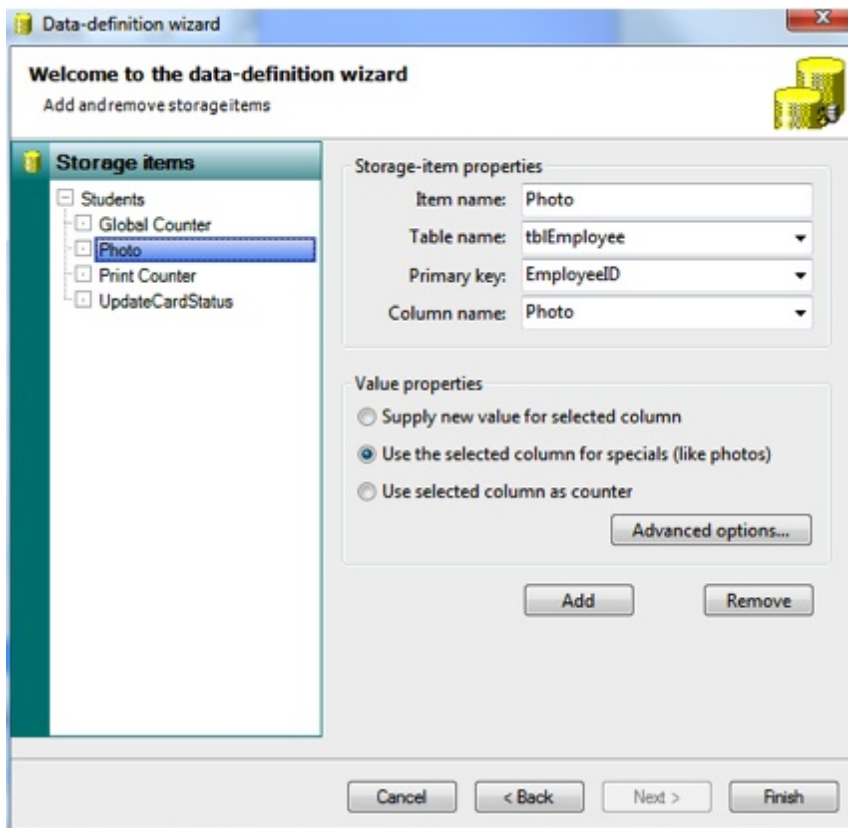
Step 5



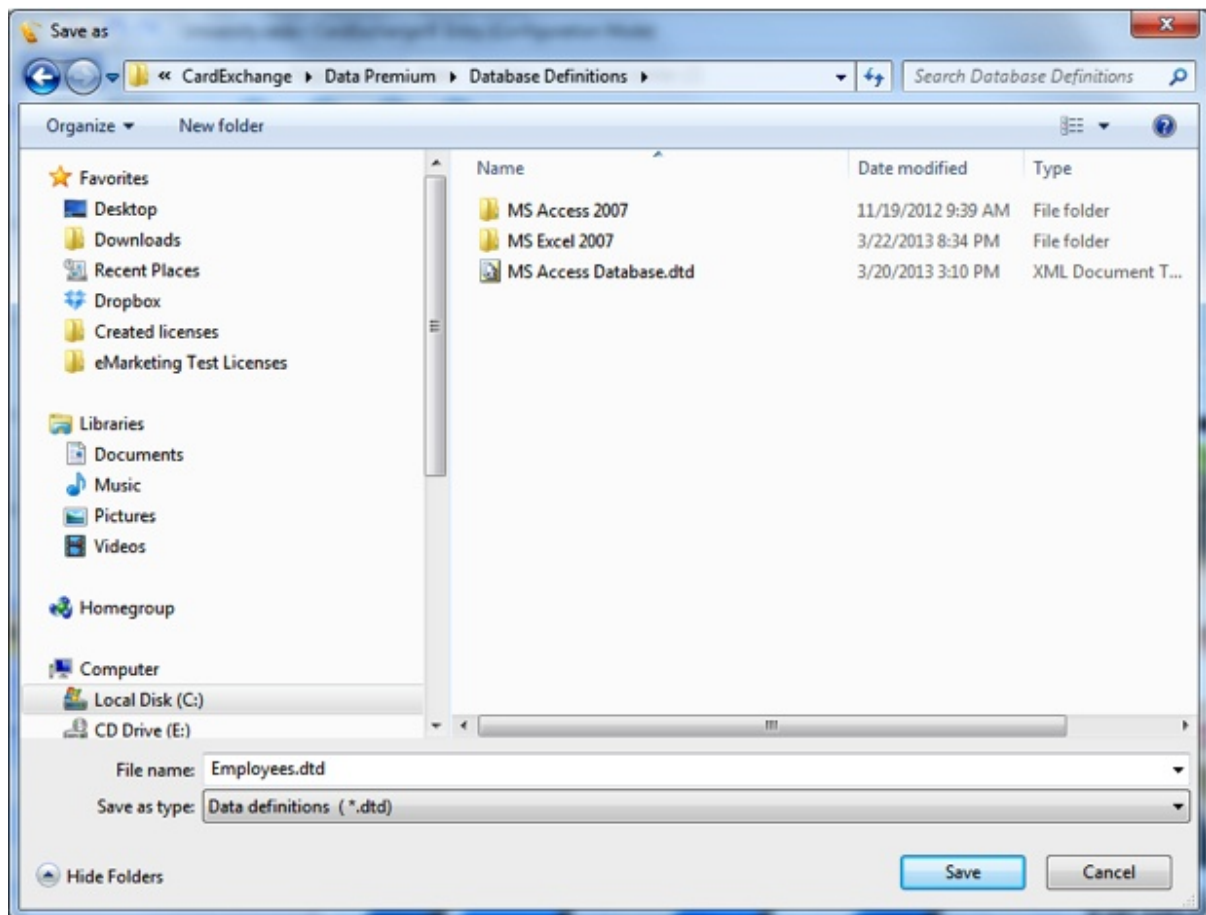
Starting from CardExchange® Premium edition, we offer advanced data column handling. With this functionality you can set per available column if it needs to be visible or not visible in the [Data Edit Window](#) or visible and not editable. In the Editor selection you can also define drop down menus. For more information about how to create drop down menu's, please see the "[Using Drop Down Menu's](#)" section of this Help file.

When you are using a Professional or higher edition you also will have access to functionality to set specific requirements per column like Column is required for printing, Halt batch when the column does not contain any data, etc. Wanna know how to use the requirements, please the "[Using Data Requirements](#)" section of this Help file. Click Next to Proceed.

Step 6

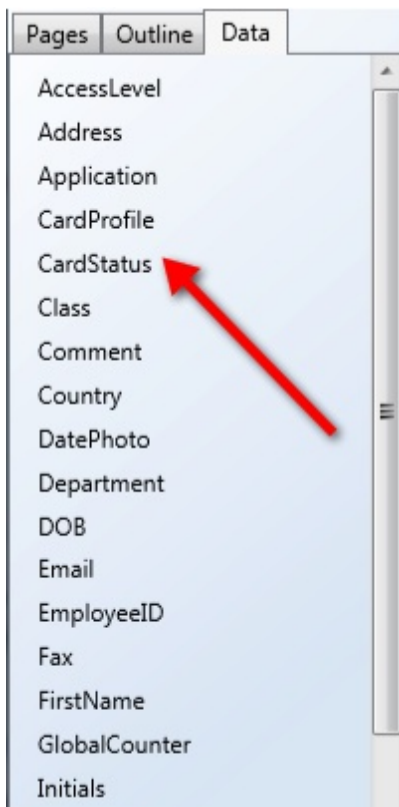


Starting from the Premium edition, CardExchange® offers Storage Items. Storage Items offers you the possibility to store any type of information that is important for your print process or production into your database. Print dates, Print counts, user information, photo's, signatures, etc. Everything you need to know about configuring Storage Items can be found in our "[Using Storage Items](#)" section of this Help file. Now Click Finish...



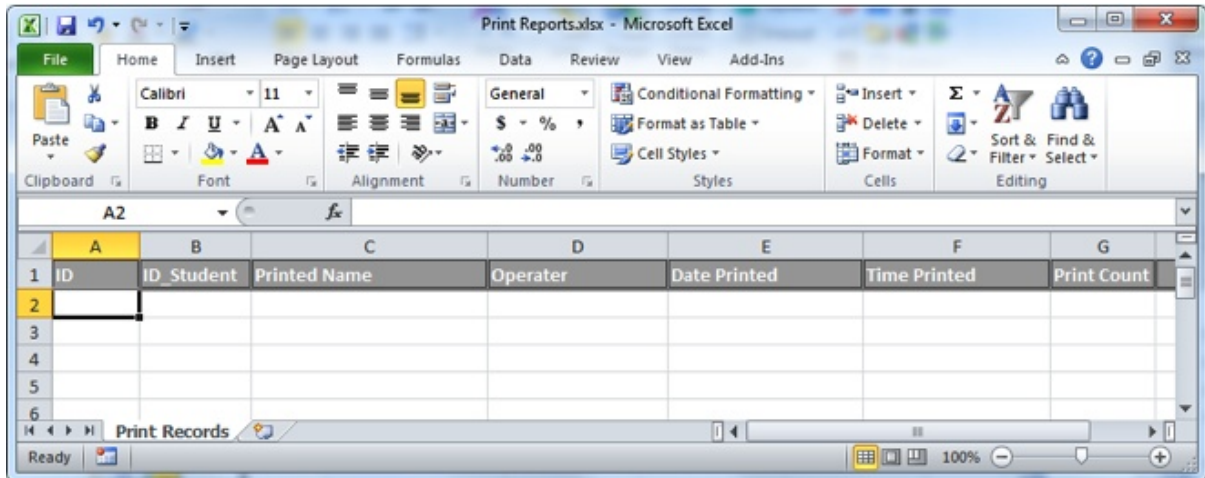
and save your database connection to a location on your computer. We advice to store your data in the [Data Folder](#) of CardExchange®.

In six steps you have created the connection to your MS SQL Server and made the columns available for adding them to your design.



15.1.3 Using Multiple Databases

For using Multiple Database connections a Professional or higher edition is needed. In this example we will extend the example we created with the [SQL Server](#) with a connection to an MS Excel file that is going to be used to report the amount of prints made for a record too. First we need to create an MS Excel file that is going to contain this information. As an example, below you can find a screen shot from an MS Excel created for this example.



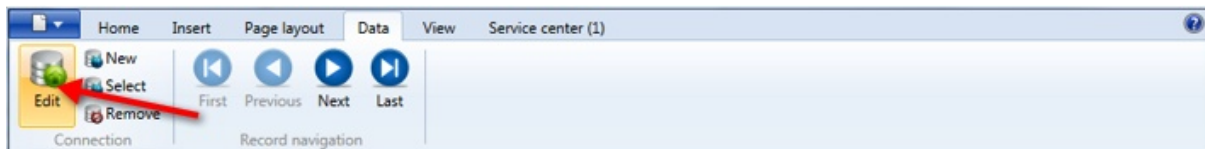
The first row is used for the columns and the following columns are created:

Column Name	Description
-------------	-------------

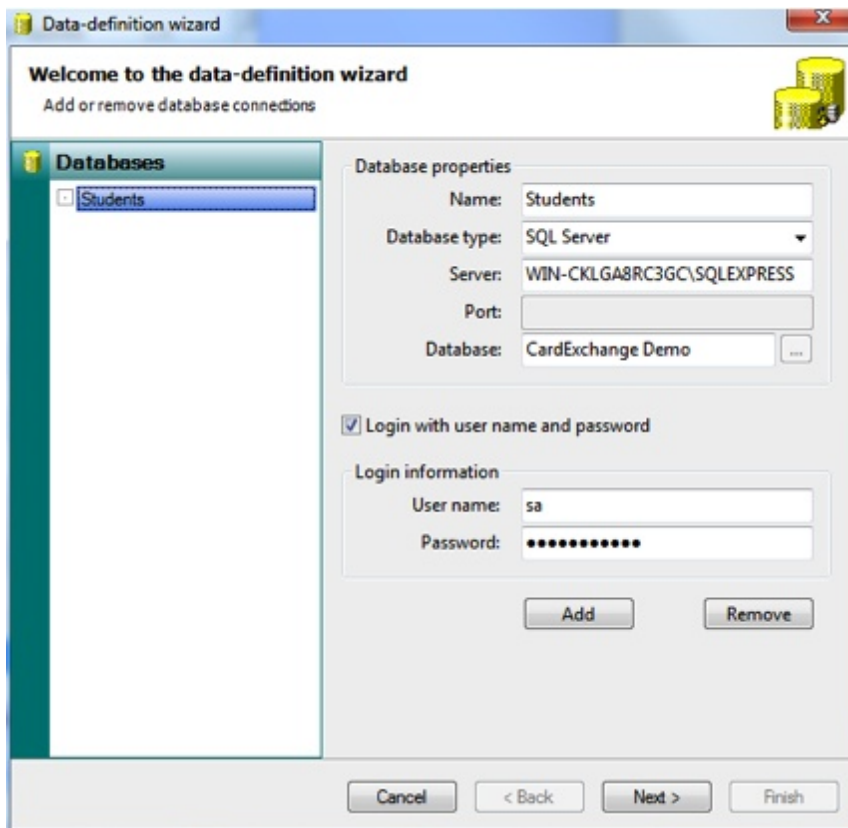
ID	Will be the unique field (Primary Key) for this connection
ID_Student	This will contain the unique ID (Primary Key) field from the Student Table
Printed Name	This field will contain the name of the student printed
Operator	This field will contain the name of the operator logged into CardExchange®
Data Printed	This field will contain the date the record is printed
Time Printed	This field will contain the time the record is printed
Print Count	This field will contain the amount of times the record is printed

The standard sheet name is renamed to "Print Records" and the other two sheets are removed. Of course this is not needed, but makes it more clear what you are doing.

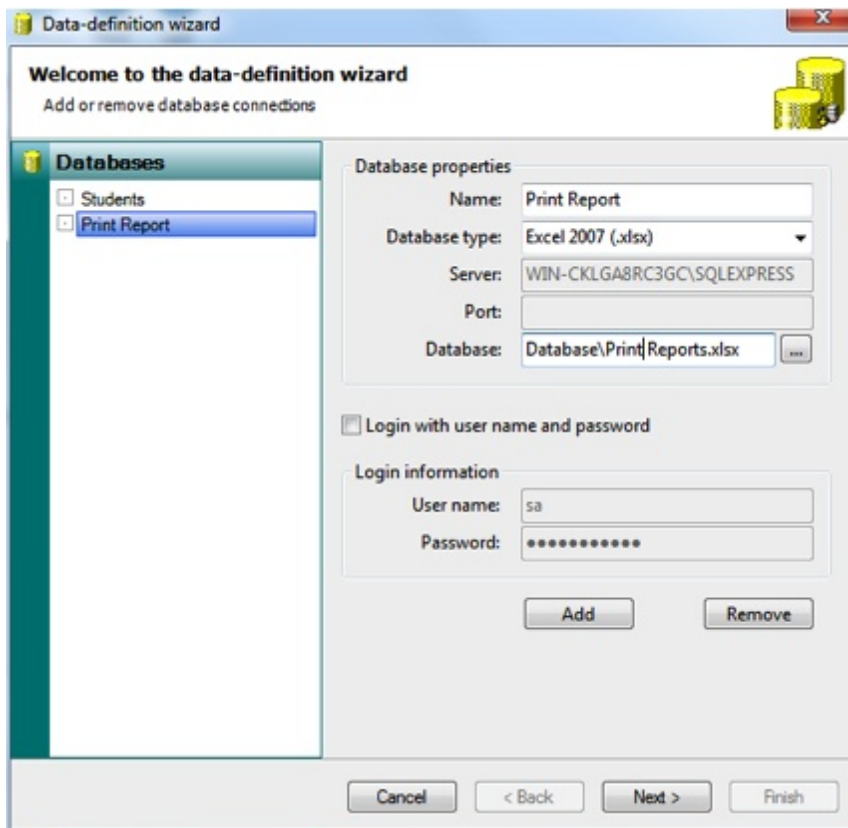
When done, save the created MS Excel file to a location, preferably in the Data folder of CardExchange®. Now we proceed with



Click **Edit** to start the Database Connection Wizard and open the connection made for MS SQL Server.

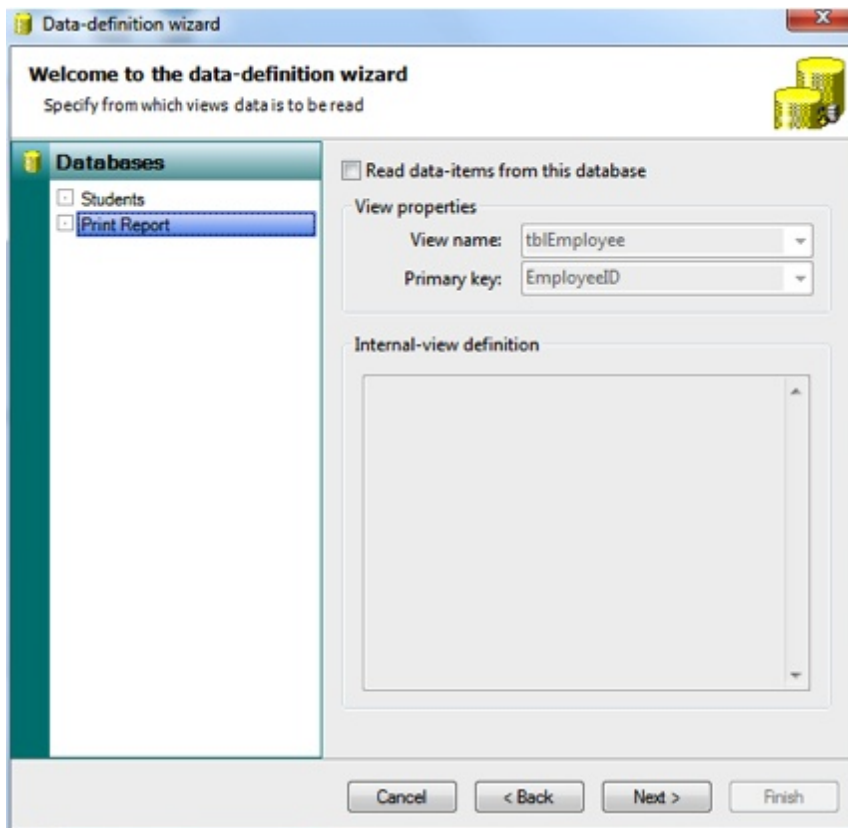


Step 1



Now click on Add to create an extra connection. Enter the Name field information select the correct database type, etc. It is basically the same setup as with the [Using MS Excel](#) example. Select the MS Excel sheet you have created for Print Reports and click Next to proceed.

Step 2



In this page you now see two database that can be selected. What is important to know is that you always read from ONE database only. All other connected databases are for writing only. So in this situation, make sure the 'Read data-items from this database' is unchecked and leave the Students database checked. This also shows why it is important when using multiple database connections, the naming chosen for the connections is important to be clear. Click Next to proceed.

Step 3

Welcome to the data-definition wizard
Select where to retrieve the name info from

Data database
Database:
 Switch on level-three filter

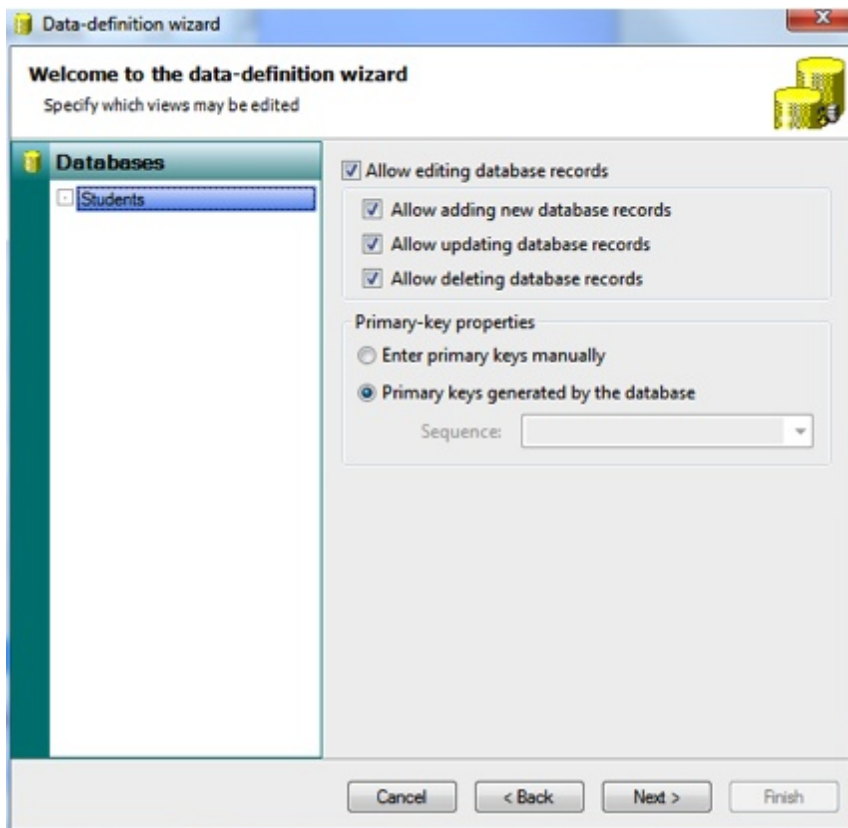
Data columns

Last name:	<input type="text" value="Lastname"/>	<input checked="" type="checkbox"/>
First name:	<input type="text" value="FirstName"/>	<input checked="" type="checkbox"/>
Middle name:	<input type="text" value="MiddleName"/>	<input type="checkbox"/>
Initials:	<input type="text" value="Initials"/>	<input checked="" type="checkbox"/>
2nd Last name:	<input type="text" value="(none)"/>	<input type="checkbox"/>
2nd Middle name:	<input type="text" value="(none)"/>	<input type="checkbox"/>
Personal number:	<input type="text" value="StudentNumber"/>	<input checked="" type="checkbox"/>

Cancel < Back Next > Finish

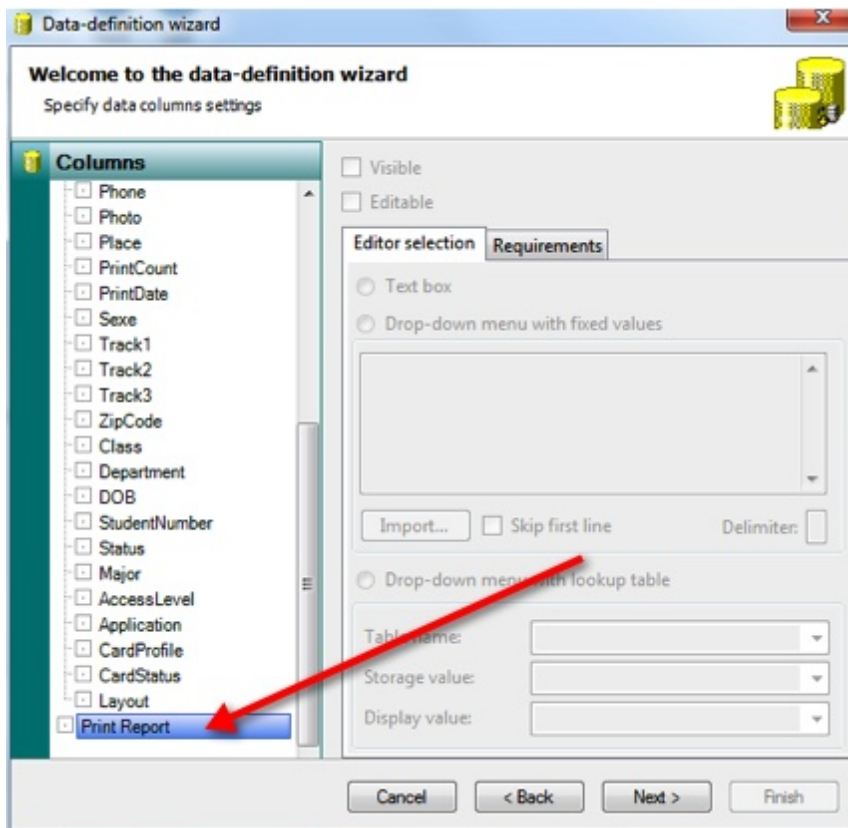
The page where the name information is set does not change and stays the same as in the [Using MS SQL Server](#) example. Click next to proceed.

Step 4



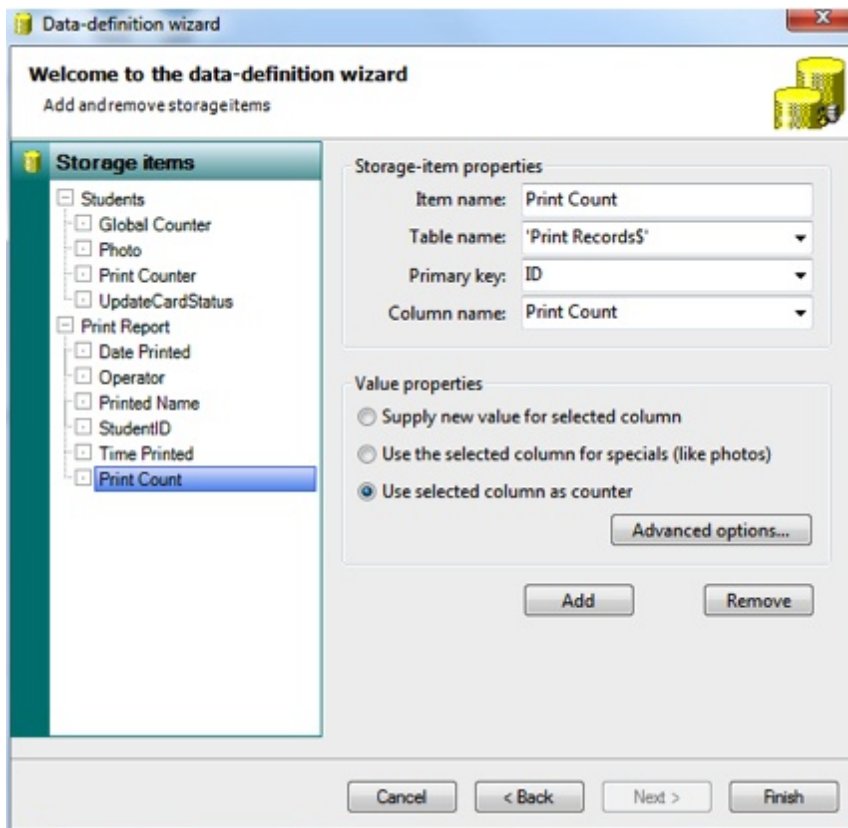
Also this does not change and stays the same as in the [Using MS SQL Server](#) example. Click next to proceed.

Step 5

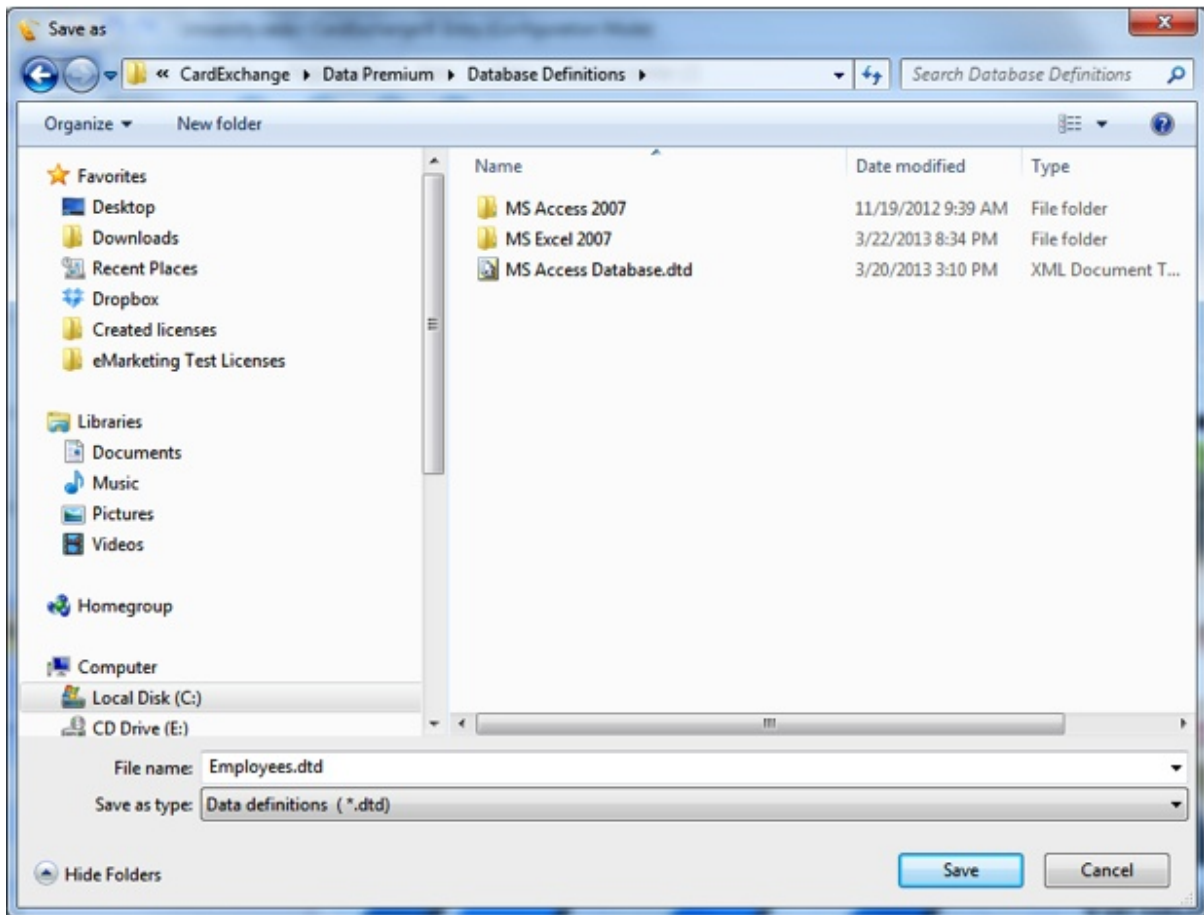


Also this page does not change. Although you can see that the new created database is available, we are only writing back to it so we cannot define any settings for the specific columns. Click Next to Proceed.

Step 6

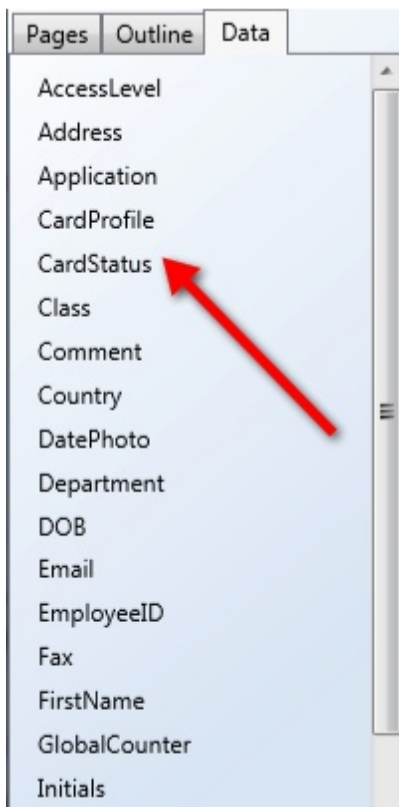


In the Storage Items section you now see the new database connection and you can start adding the items to the connected database. All the information about configuring the Storage Items can be found in our "[Using Storage Items](#)" section of this Help file. Now Click Finish...

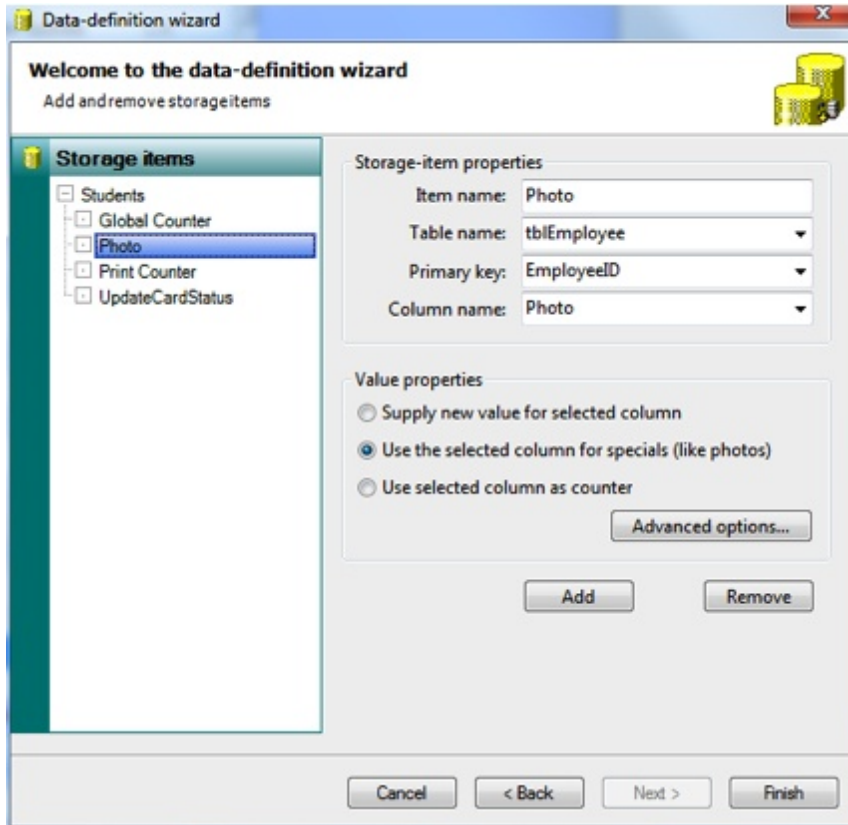


and save your database connection to a location on your computer. We advice to store your data in the [Data Folder](#) of CardExchange®.

In six steps you have created the extra connection and when configured correctly, every time you print, a record will be added to the MS Excel file connected.



15.2 Storage Items



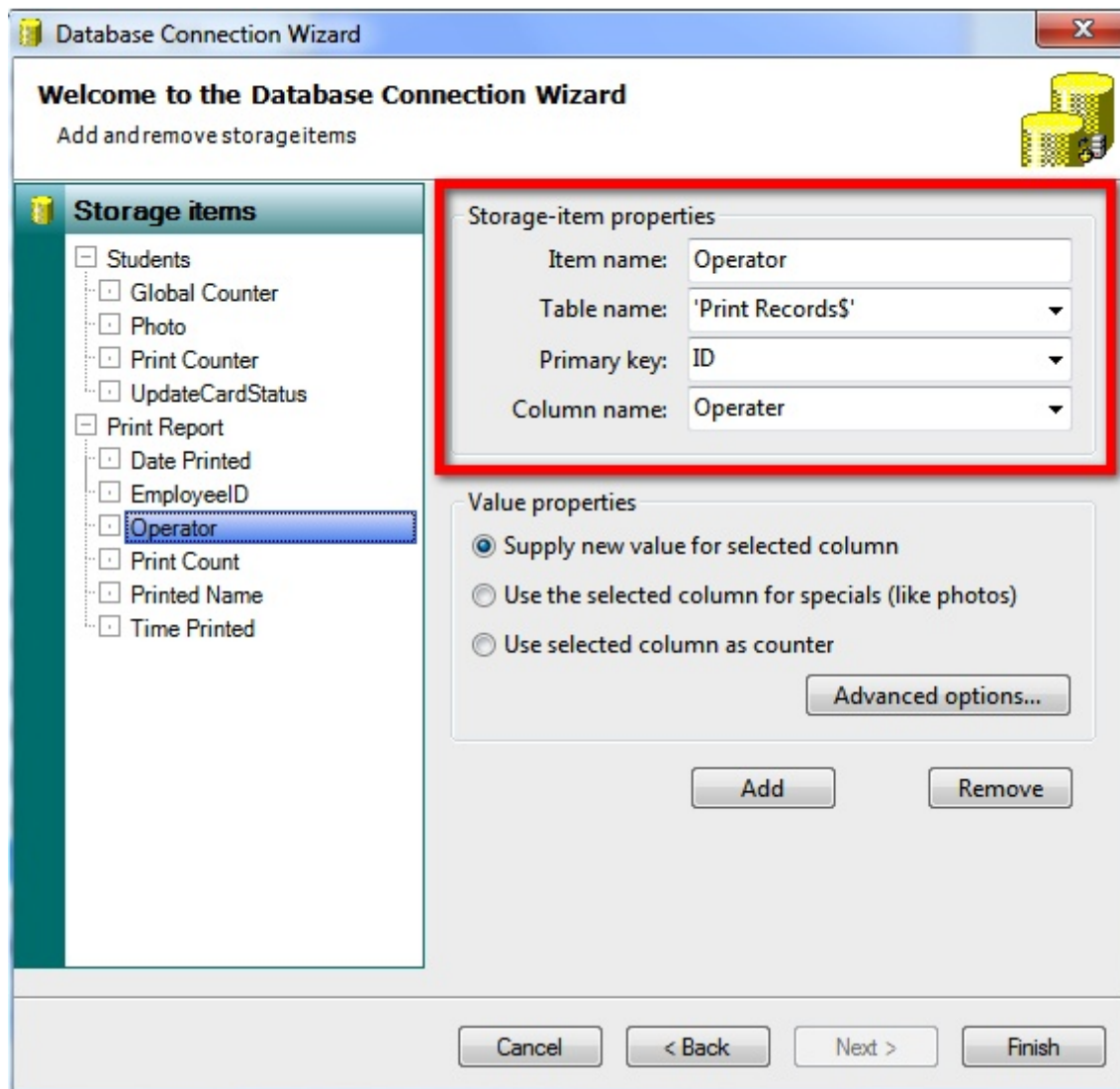
If you want to store data into the connected databases (with the database module) or database, you need to define **Storage Items**. **Storage Items** contains the information of the column name in which you want to save your information like **photos** or **print dates**. This **Storage Items** will be presented in the [Storage Items](#) section of the [Data](#) tab in the [Explorer Menu](#) of the Designer and where they will be connect to the right Object Type. See [Objects](#) and [Standard Object Types](#) sections of this Help file for more information.

For each connected database you can define storage items. Just click on the database name on the left site to select and click on Add to define a storage item. You can add unlimited storage item for each connected database.

Storage Items are supported starting from Premium and Higher Editions and are configured in the last page of the **Database Connection Wizard**. For more information about the Database Connection Wizard and examples of how to make Database connections, please see the [Databases](#) section of this Help file. In this section we will explain all the available functionality of the Storage Items section of the wizard.

The Storage Items section of the wizard is divided into three different sections which are the Available Storage Items section on the left side showing all the available databases and their created storage items, The Storage Items Properties group, and the Value Properties group.

The Storage Item Properties



This section, indicated with the **red** rectangle, shows four important properties:

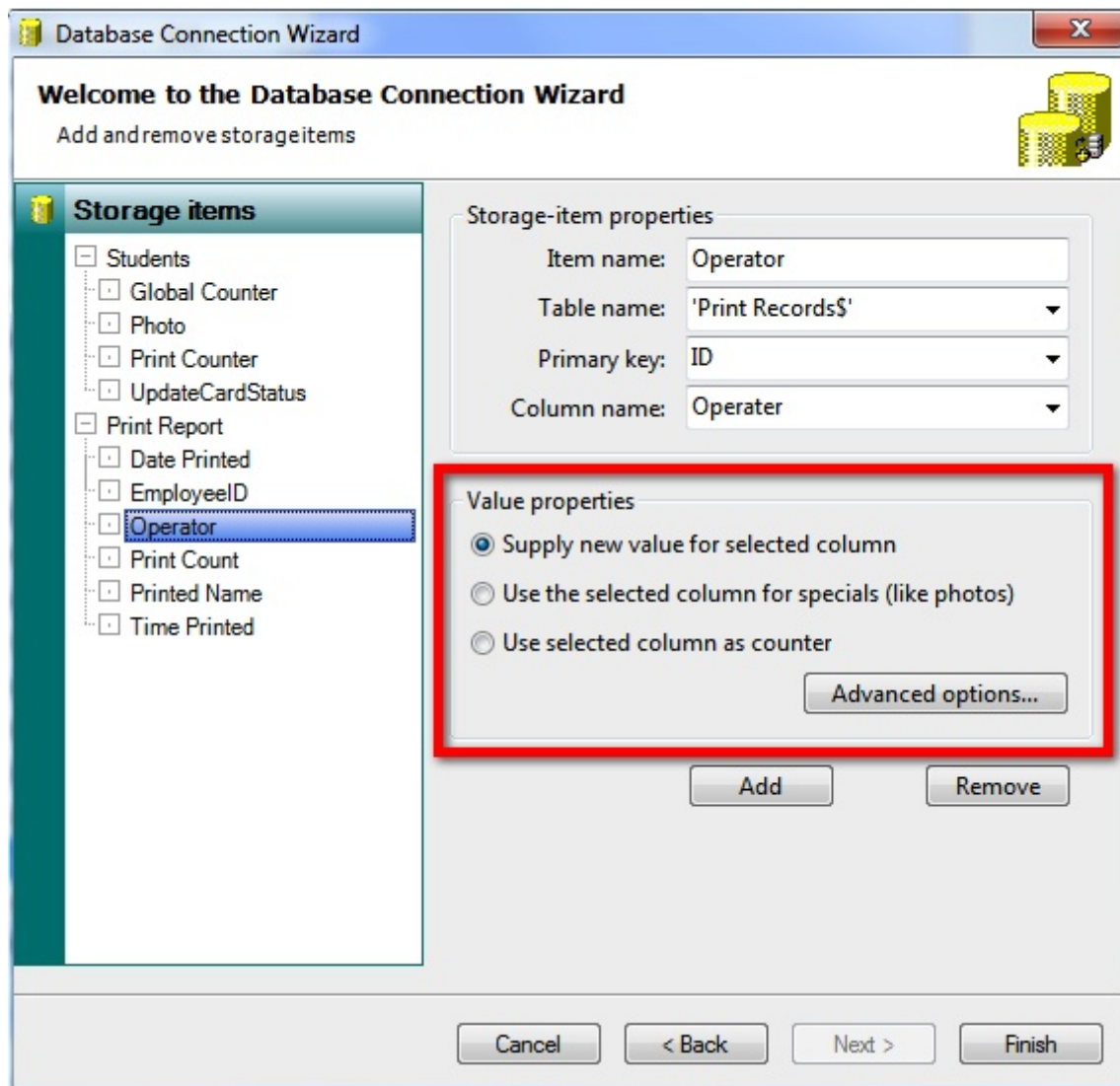
Storage Item Property	Description
Item name	Enter a name for the storage item like Photo , Print Date , etc.
Table Name	Select the table from the database where you are storing the data
Primary Key	Select the Primary Key from the selected database
Column Name	Select the column name from the selected table

CardExchange® not only offers storing data into multiple connected databases, you can also store data in multiple tables. That makes this section so powerful. For example, you are connected to a database containing a view that combines two tables, for example **Student** and **Student Photo**, with a so called **LEFT INNER JOIN** connection. **A LEFT INNER JOIN** view shows all the records of the **Student** table with the photos of the **Student Photo** table. Even if there is no photo for the **Student** available in the **Student Photo** table, the **Student** record will be shown.

Everybody knows that you cannot store data into the database via an **LEFT INNER JOIN** view because updating one record will update all records and therefore, in most of the competitive applications you simply cannot store information back into the database when connecting to a view like this.

With CardExchange® you select directly the **Table, Primary Key, and Column Name**. In this example we would select the **Table 'Student Photo'**, the **Primary Key 'StudentID'**, and the **Column 'StudentPhoto'**. Now when we store the photo, it will be stored directly into the correct column out passing the connected view.

The Value Properties



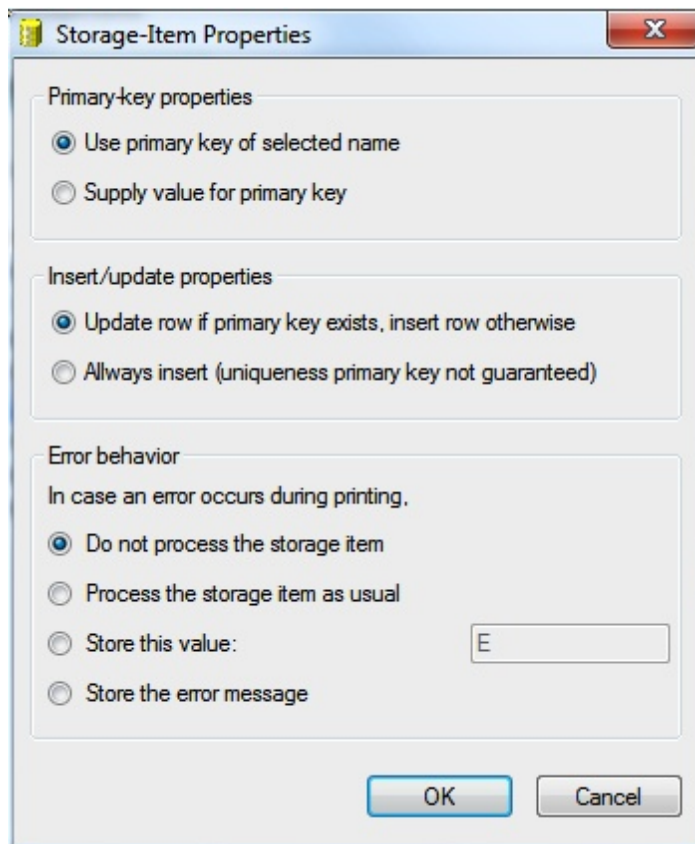
This section, indicated with the **red** rectangle, shows three properties. You can **Supply for a new value for the selected column** which means that the data will always be added to the table and will not only update the record. You can **Use the column for specials (like photos)** so CardExchange® knows that he will handle images in stead of

normal columns.

This is a very important setting because **Storage Items** are normally processed on the moment that the card is produced. Of course, when taking **photos** or **capturing** signatures, you would prefer to store the image directly and not at the end of the print process. When selecting this option, the **Storage Item** will be processed immediately.

You can also set the option **Use selected column as counter**. This will increase the column every time you print a record.

Besides these properties you can also set some advanced properties for the Primary key and Insert/update commands. Clicking on **Advanced** options will open the window below.



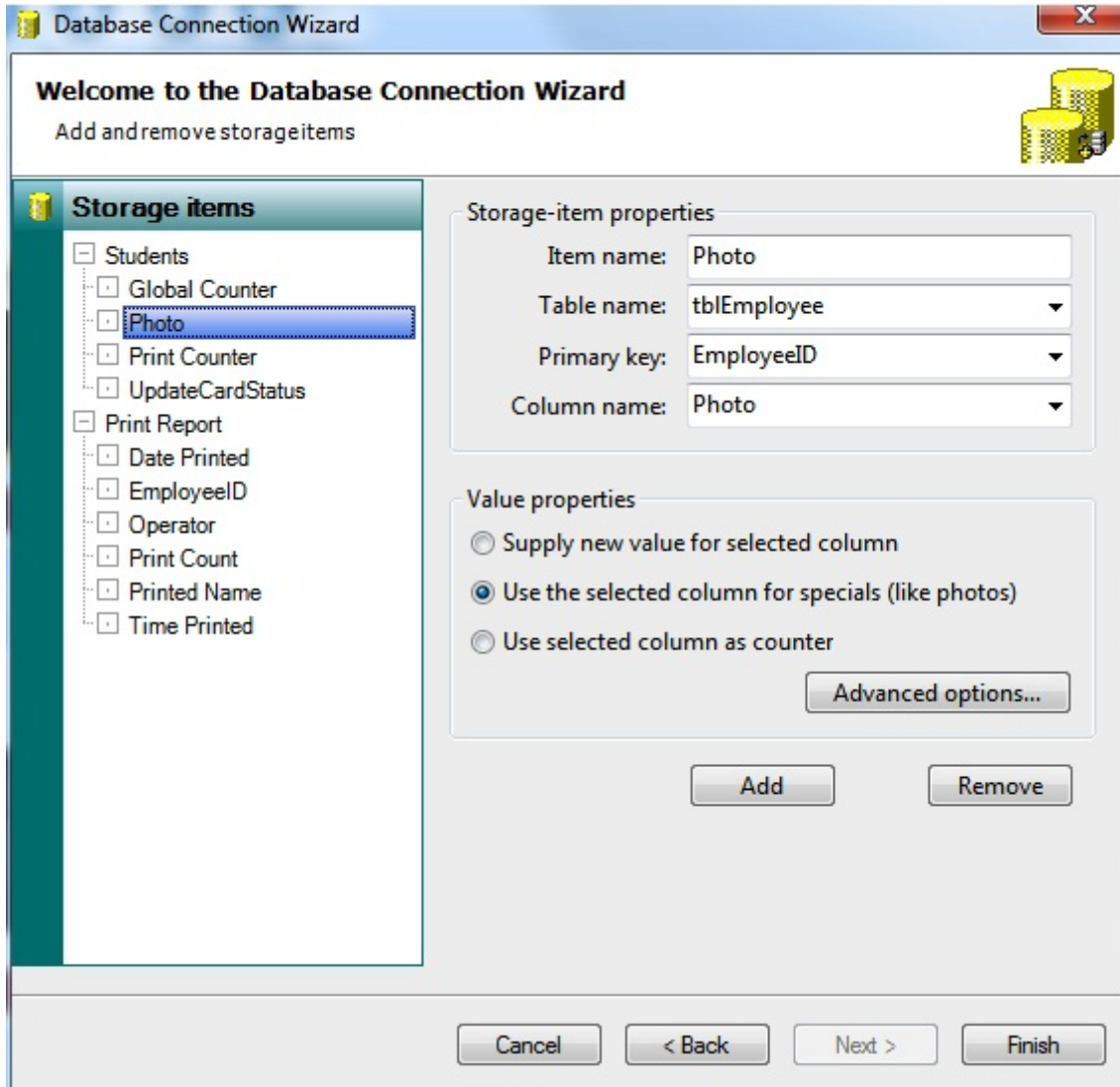
In the **Advanced Storage Item Properties** window you find three different groups that you can set. First group is the **Primary Key Properties** group. By default the system uses the **Primary Key** of the selected record for storing into the database. But it is also possible to supply the value for the **Primary Key**.

In the **Insert/Update Properties** group by default the row is always updated when the **Primary Key** exist. It will insert if not. You can also select to **Always insert**. That can be handy if, for example, the amount of prints needs to be reported with date and time. Be aware that the uniqueness of the **Primary Key** will not be guaranteed anymore.

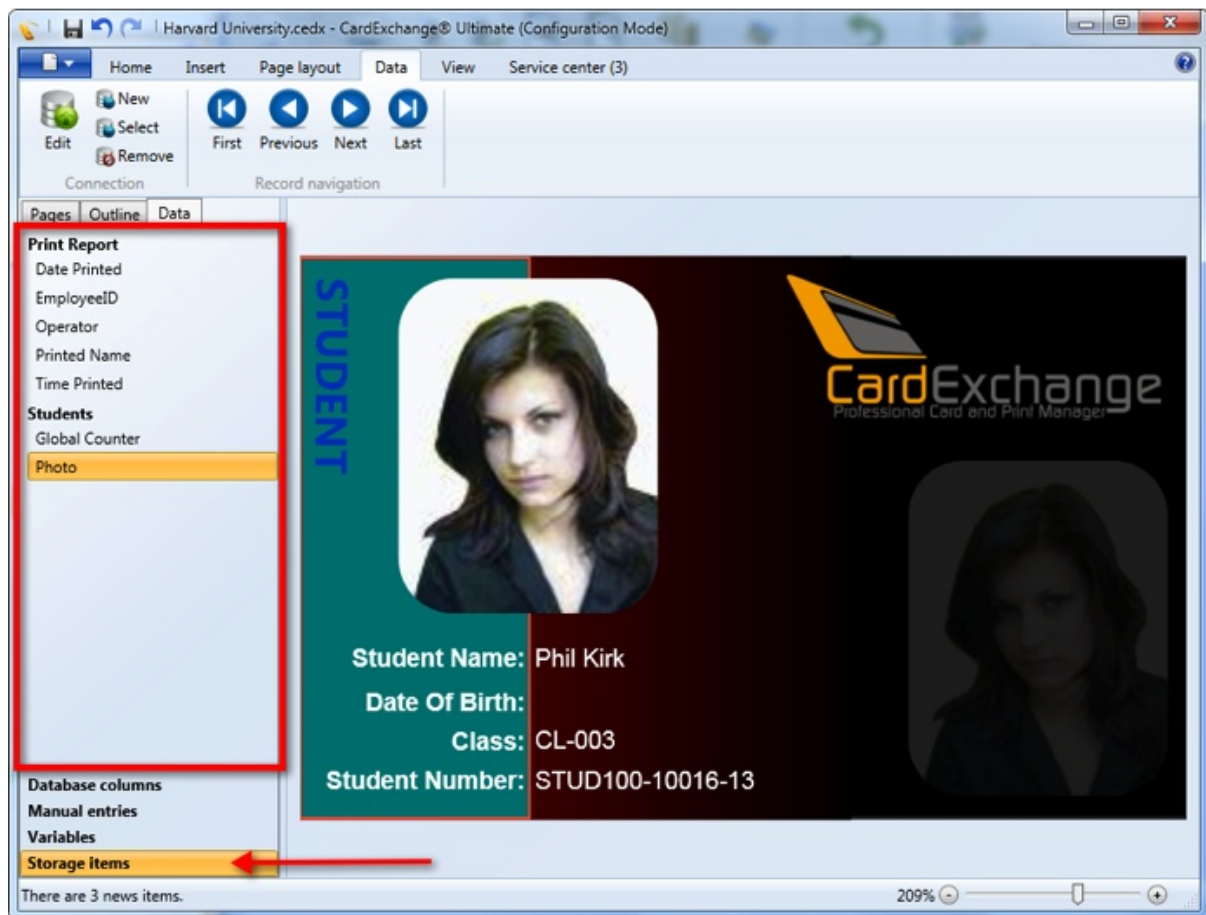
In the last group you can set the **Error behavior** of the **Storage Item**. By default, the **Storage item** will not be processed but you also select one of the other options like

process as usual, store a predefined value, or store the error message. Of course, in case of the last two choices it is important to make sure the database column can hold this type of content. Click on **OK** to return to the Wizard Page.

When you have created all your Storage Items, the Wizard page should look something as shown below:

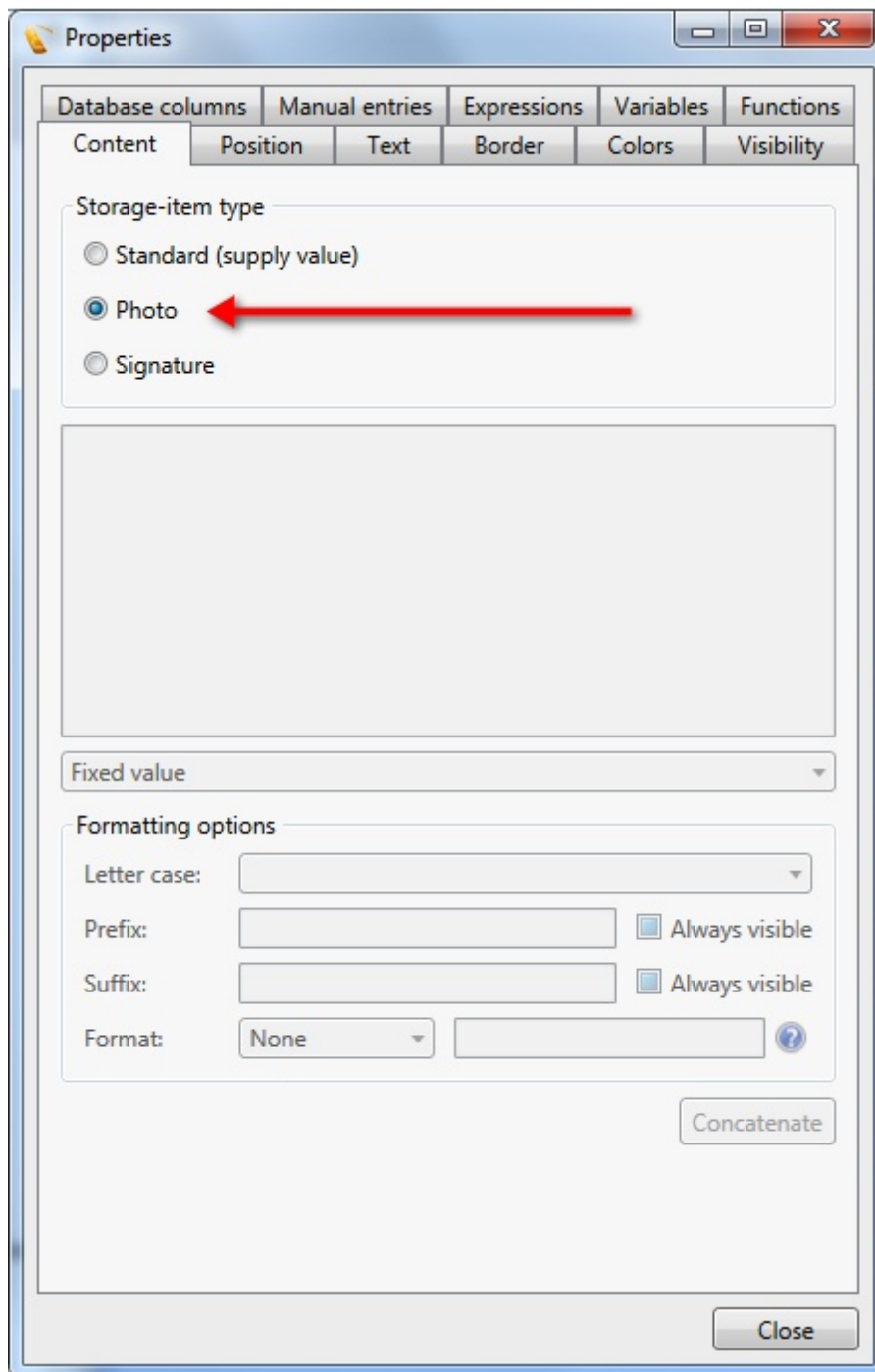


When you click on Finish, you will return to the Designer interface.



In the Designer Interface you click on the [Data](#) tab of the [Explorer Menu](#) and now you see the Storage Item tab, indicated with the **red** arrow. Click on this tab and all the created Storage Items will be shown as indicated in the area with the **red** rectangle. The **bold** name indicates the connected database and the indent are the created storage items.

Now make sure that you have the [Properties](#) window open and make sure the [Content](#) tab is selected. Select one of the Storage Items, in this example we selected the **Photo** item from the **Students** database.

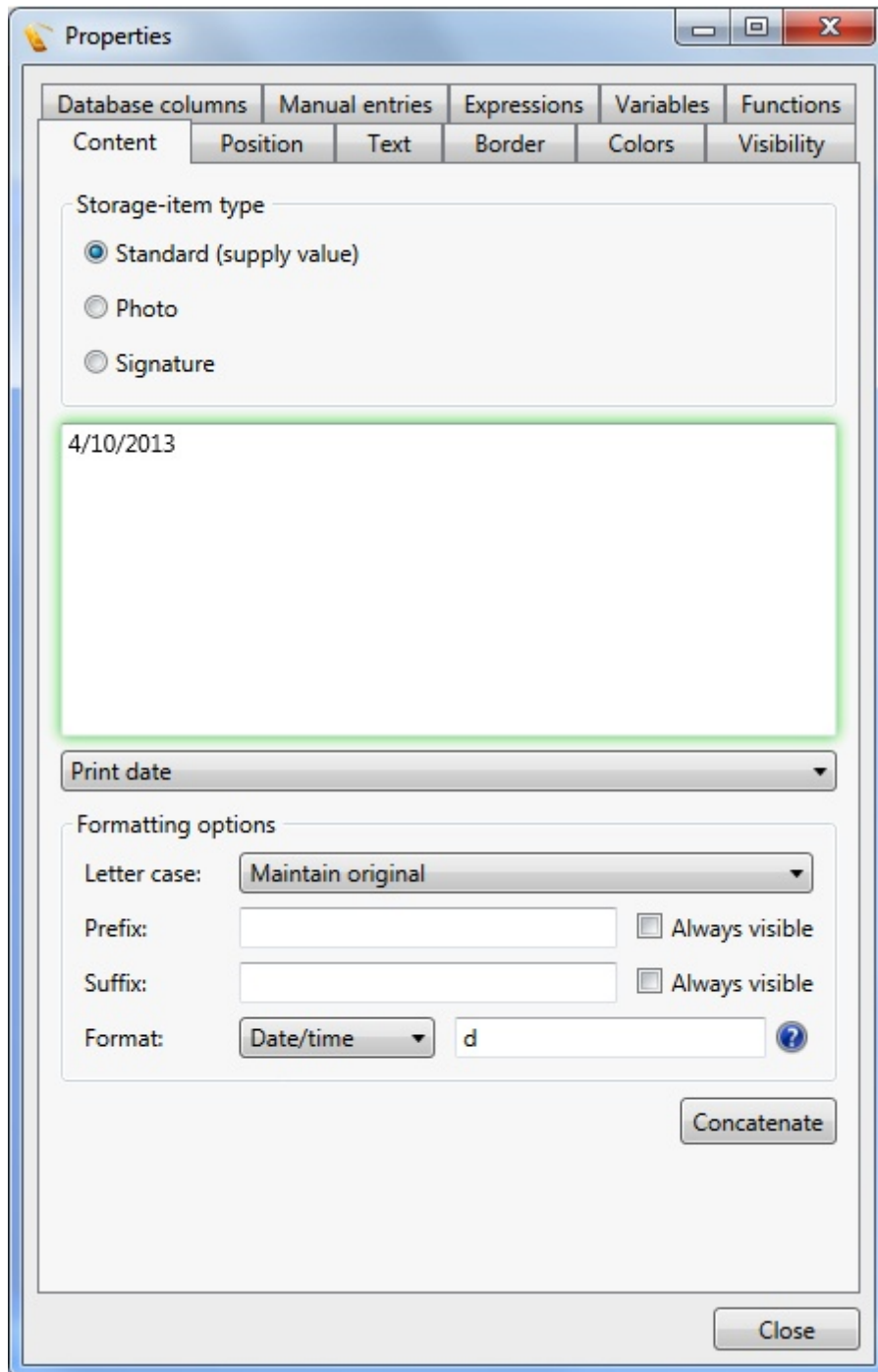


When the Photo Storage Item is selected, you see that you have a new group in the Content tab which is the Storage-item type. This group offers three selections;

- Standard (supply value)
- Photo
- Signature

Standard (supply value)

The Standard option offers you to connect to any object available and works exactly the same as explained in the section [Standard Object Types](#) of this Help file. For example we want to store the print date into the database so we select Date Printed from the Storage Item selection we created.

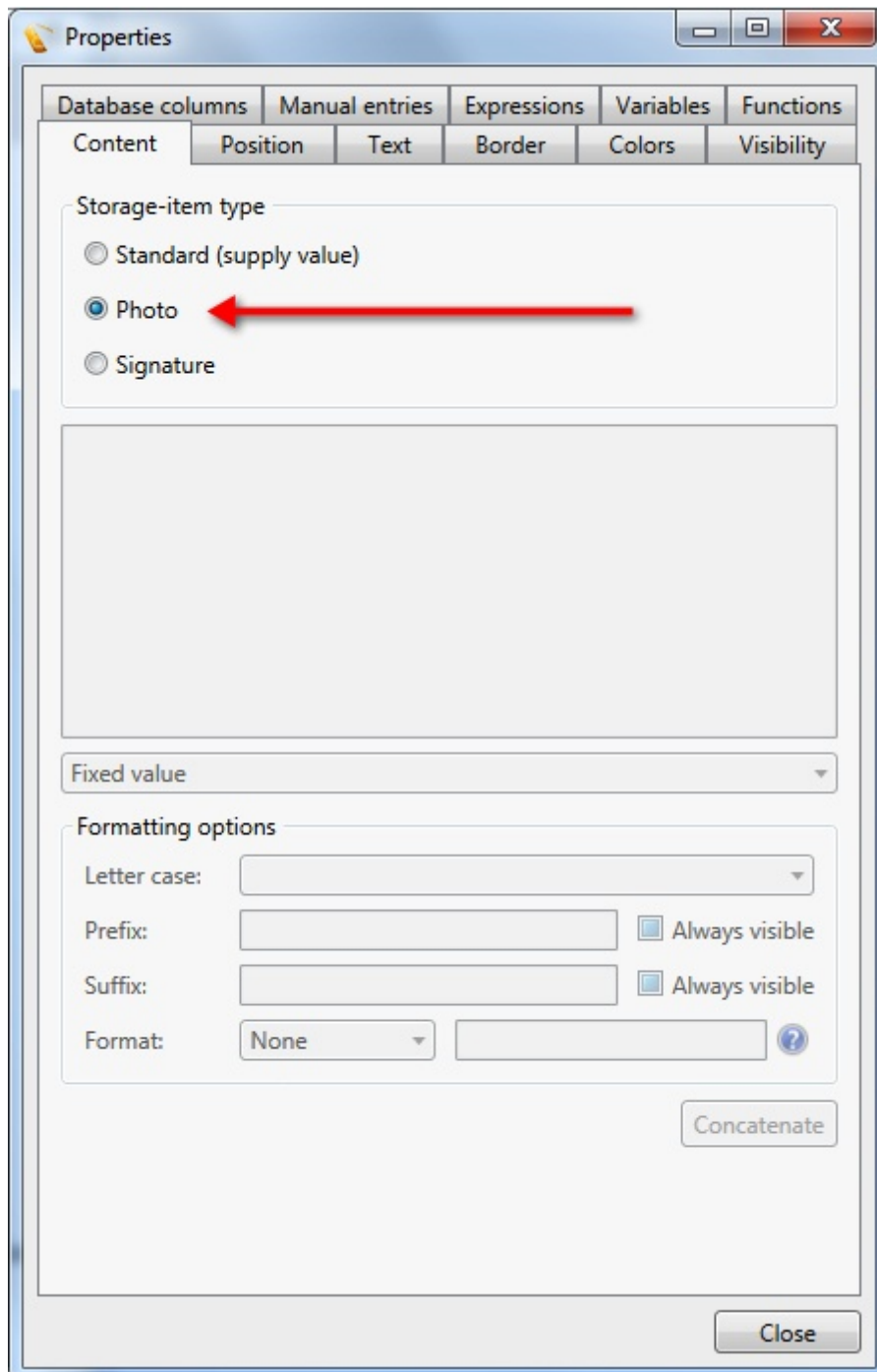


We select **Standard** in the **Storage-item type** group and select **Print date** from the [Standard Object Type](#) drop down menu. We set the **Format** option to **Date/time** and

enter the 'd' to make sure we store the short date only and not the time and you are good to go!

Photo

The **Photo** option is specifically designed to make your life easier. When you want to store the **Photo** into the database, just select the **Photo Storage** Item and select **Photo** from the **Storage-Item type** group.



CardExchange® automatically takes care of everything needed for storing the **photo**.

Signature

The **Signature** works exactly the same as the **Photo** option. Just select it and CardExchange® takes care of all.

15.3 Drop Down Menu's

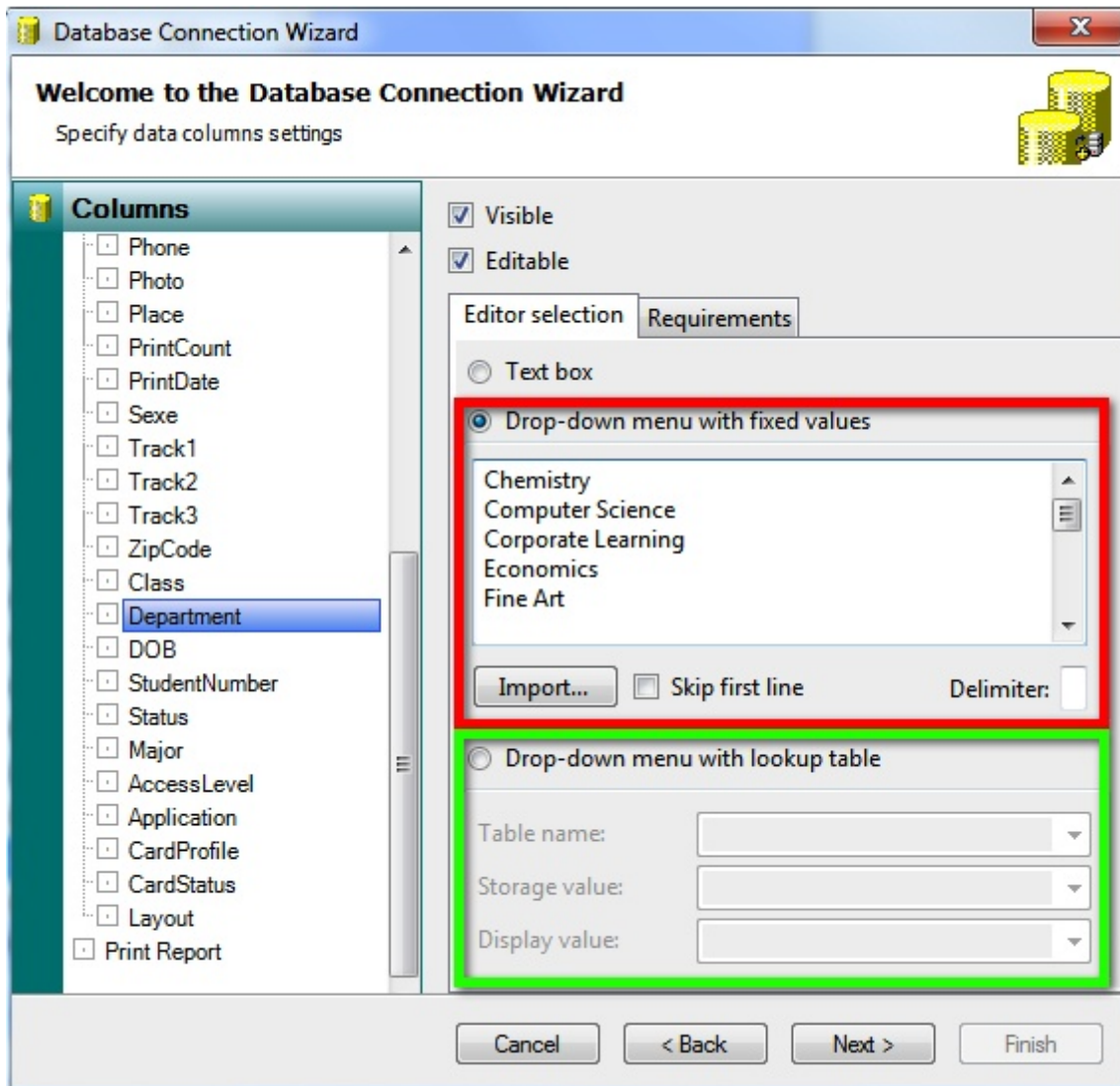


The screenshot shows a 'Data Edit Window' titled 'Edit database record'. It contains several input fields and dropdown menus. The fields are: EmployeeID (8603), StudentNumber (10000), Sex (Female), Initials (E.P.), Lastname (Barcoda), Firstname (Linda), Address (CardExchange Street), ZipCode (2023), Place (Los Angeles), Country (United States), Phone (0144 - 3231 2212), Mobile, Email, Class (CL-002), Department (Chemistry), CardStatus (Produced), CardProfile (Student), Application (Library), AccessLevel (LEVEL 1), PrintDate, PrintCount (LEVEL 2, LEVEL 3, LEVEL 4), GlobalCounter (FULL ACCESS), and MfareSN. The dropdown menus for Sex, Country, Class, Department, CardStatus, CardProfile, Application, and AccessLevel are highlighted with red boxes.

CardExchange® offers great functionality to add drop down menus to your Data Edit Window. Using drop down menus limits the user error while entering new or updating existing data.

Drop down menus are supported starting from Premium and higher editions and in this section we will explain how to configure these drop down menus.

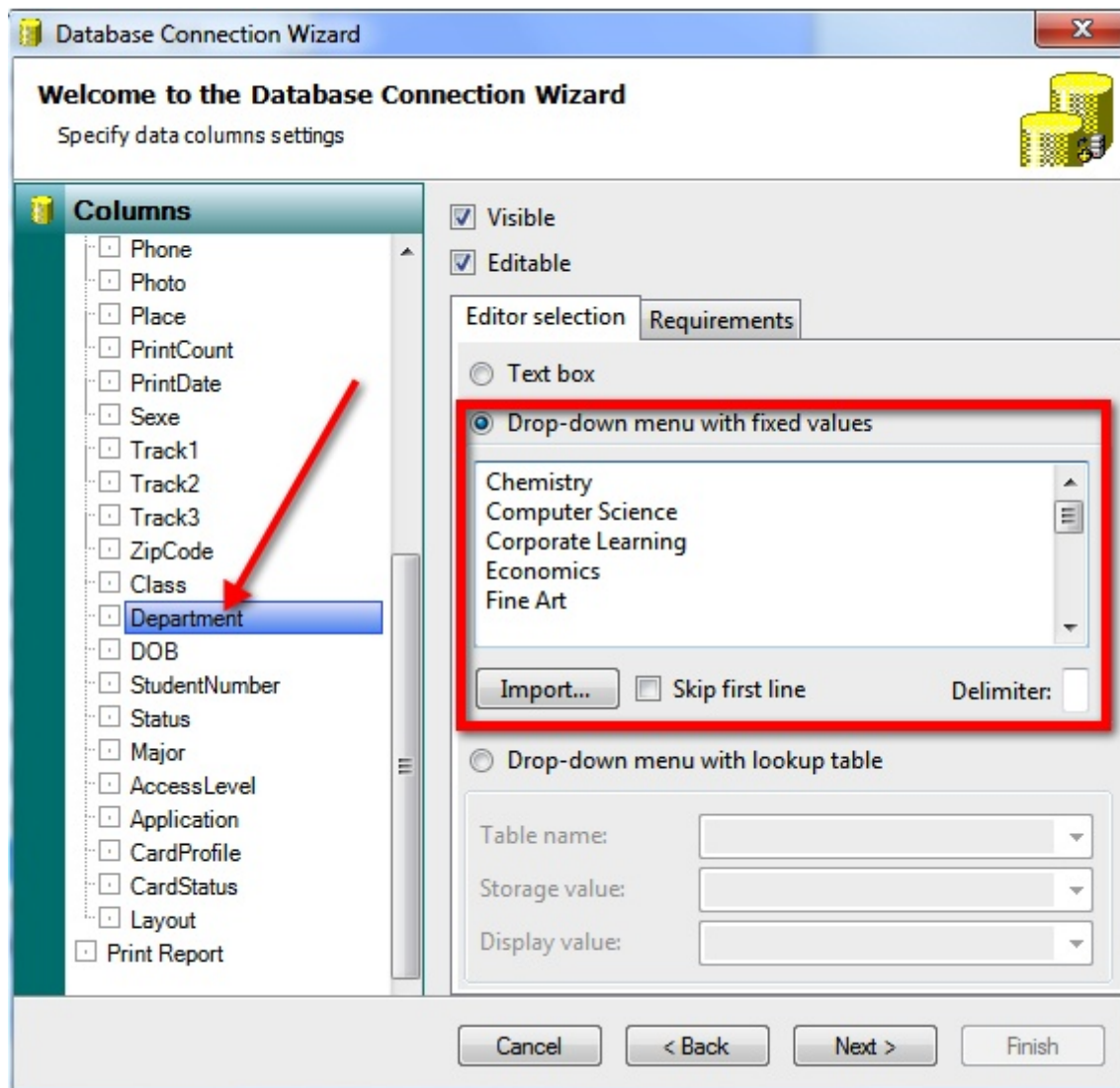
The creation of drop down menus is a part of the Database Connection Wizard.



When adding a database and using a Premium or higher edition, on the **fifth** page of the wizard, where you specify the data column settings, you see a tab called Editor selection. The Requirements tab is only available starting from Professional and higher editions and is described in the [Data Requirements](#) section of this Help file.

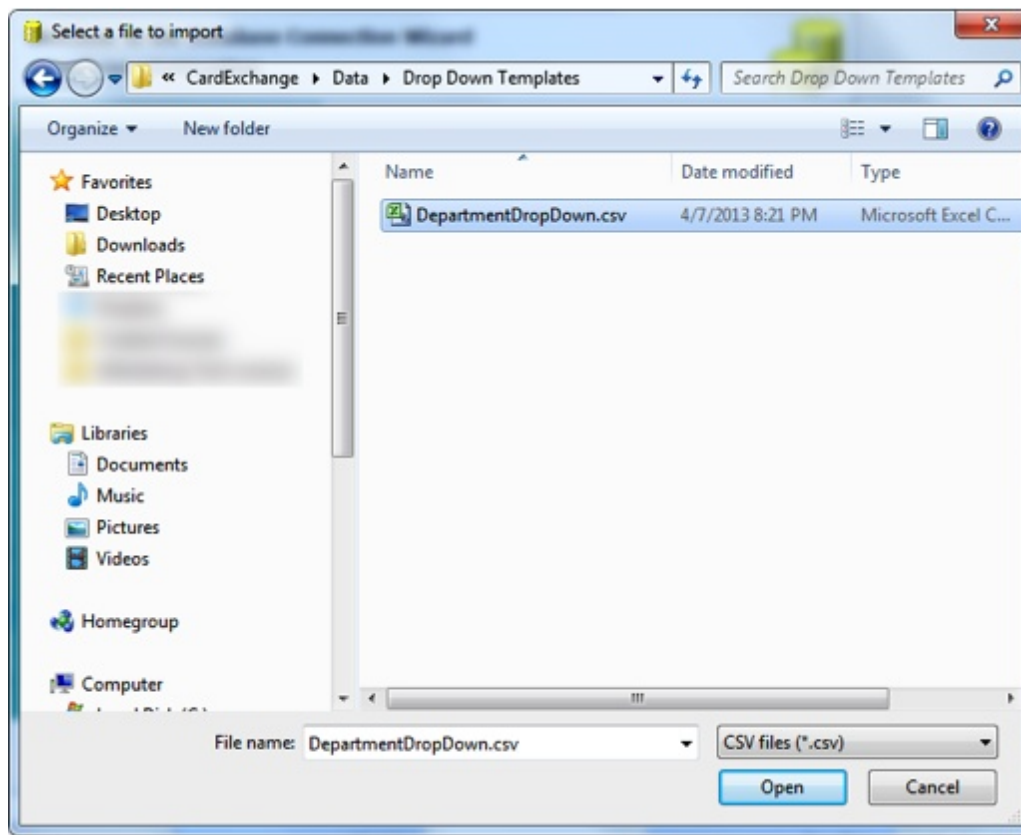
The **Editor selection** contains two different ways to create drop down menus. The first option is creating a menu based on **fixed values** indicated with a **red** rectangle. The second option is creating a drop down menu using a **look-up table** from the connected database as indicated with a **green** rectangle.

Creating Drop Down Menus with Fixed Values

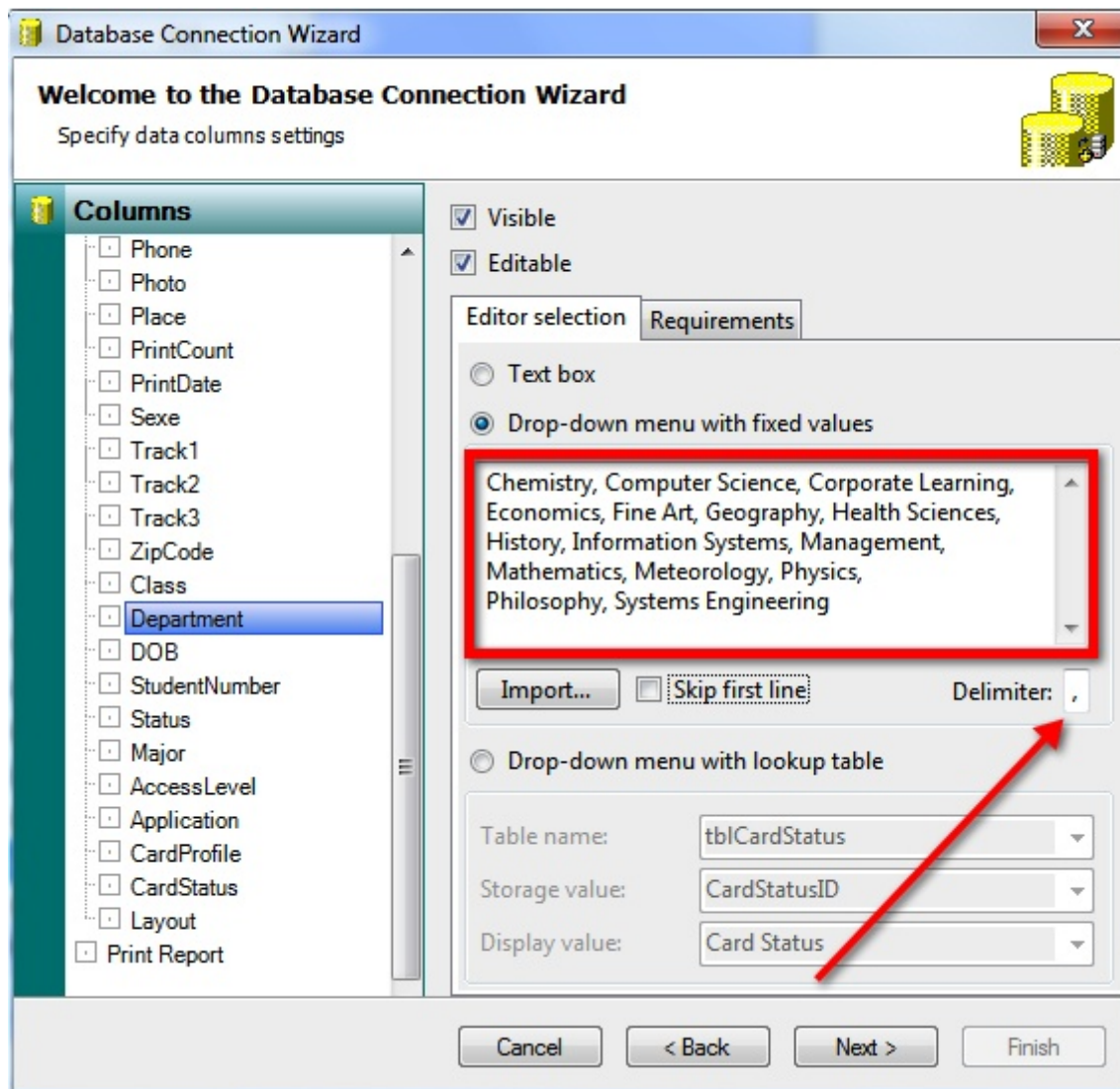


To create a drop down menu with fixed values, you first select the column from **Columns Explorer** on the left side as indicated with the **red** arrow and select the **Drop-down menu with fixed value** option from the **Editor selection** tab. The text box becomes available and you can simply add items for the drop down menu by entering them as text as shown in the screenshot above.

It is also possible to import a CSV file containing the items for the drop down menu. To do so, click on the **Import** button and browse to the file.

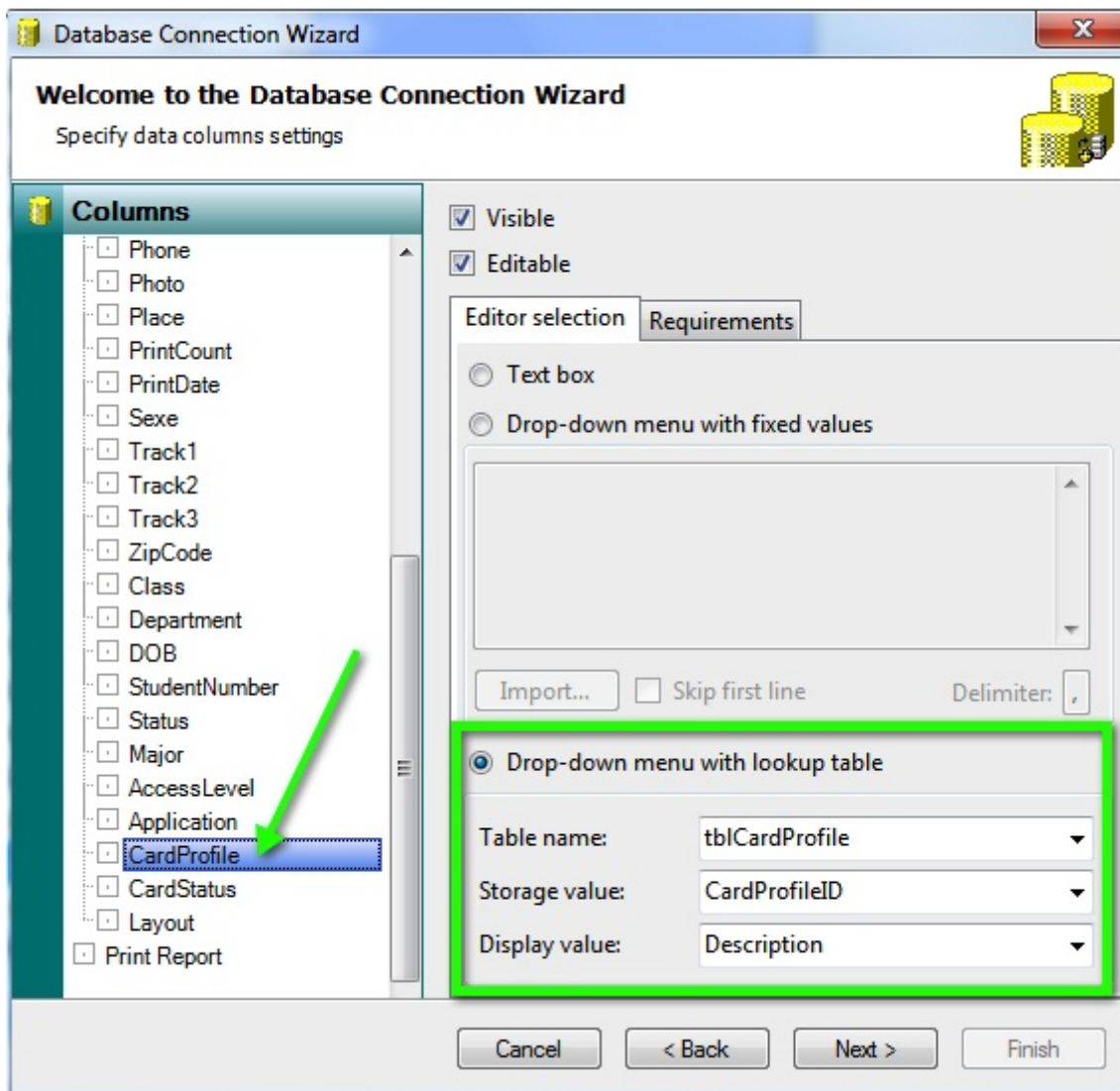


And click on Open to select the file for Import.

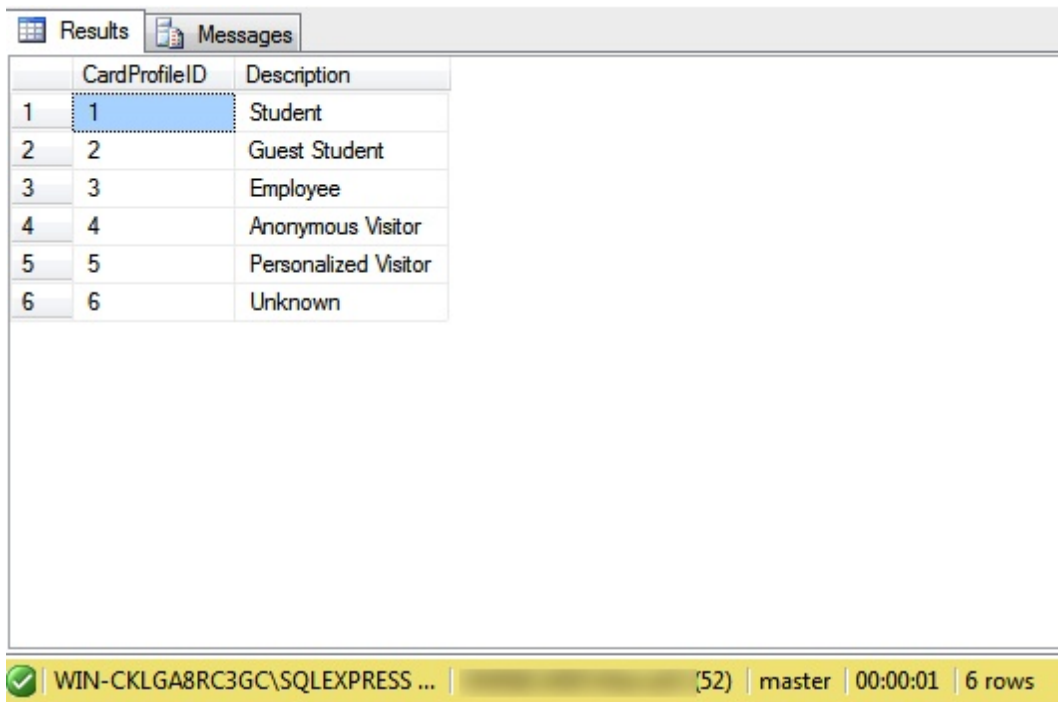


When the file is imported, the information of the file is shown in the text box indicated with the **red** rectangle. If the file contains a header, make sure the **Skip first line** is selected to make sure that it is not going to be a part of the drop down menu items, and select the **Delimiter** used for the the file, in this case a **comma**, as indicated with the **red** arrow.

Creating Drop Down Menus with Look Up Table



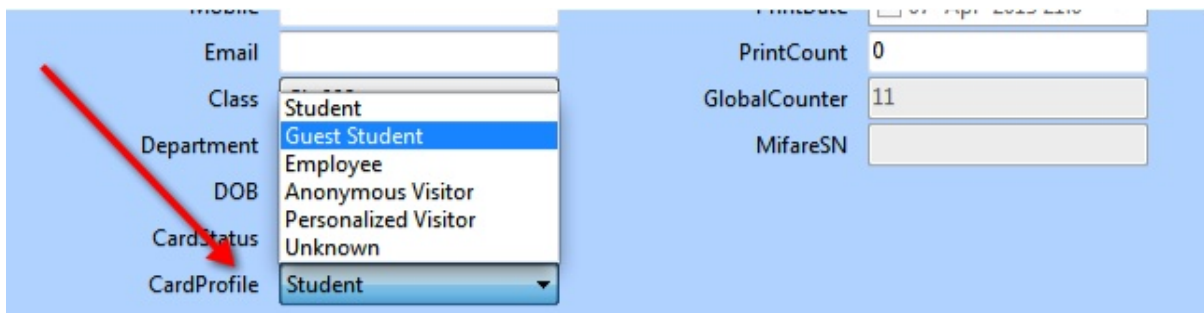
To create a drop down menu using a **Look Up Table**, you first select the column from **Columns Explorer** on the left side as indicated with the **green** arrow and select the **Drop-down menu with lookup table** option from the **Editor selection** tab. Now you see that three drop down menus become available. From the drop down menu of the **Table name** field you select the table that is containing the **Look Up** data. In this example we are using a table named **tblCardProfile**, which is shown below:



	CardProfileID	Description
1	1	Student
2	2	Guest Student
3	3	Employee
4	4	Anonymous Visitor
5	5	Personalized Visitor
6	6	Unknown

WIN-CKLGA8RC3GC\SQLEXPRESS ... | (52) | master | 00:00:01 | 6 rows

In the table content we see a **CardProfileID** and a **Description**. We would like to store the **CardProfileID** into the database when inserting and/or updating so we select from the **Storage value** drop down menu, **CardProfileID**. Because a number does not make any sense for a operator of the system, we would like to present the information from the **Description** column to the operator, therefore we select **Description** from the **Display value** drop down menu.



Form fields: Email, Class, Department, DOB, CardStatus, CardProfile, PrintCount (0), GlobalCounter (11), MifareSN.

Dropdown menu for CardProfile: Student, Guest Student, Employee, Anonymous Visitor, Personalized Visitor, Unknown.

15.4 Data Requirements

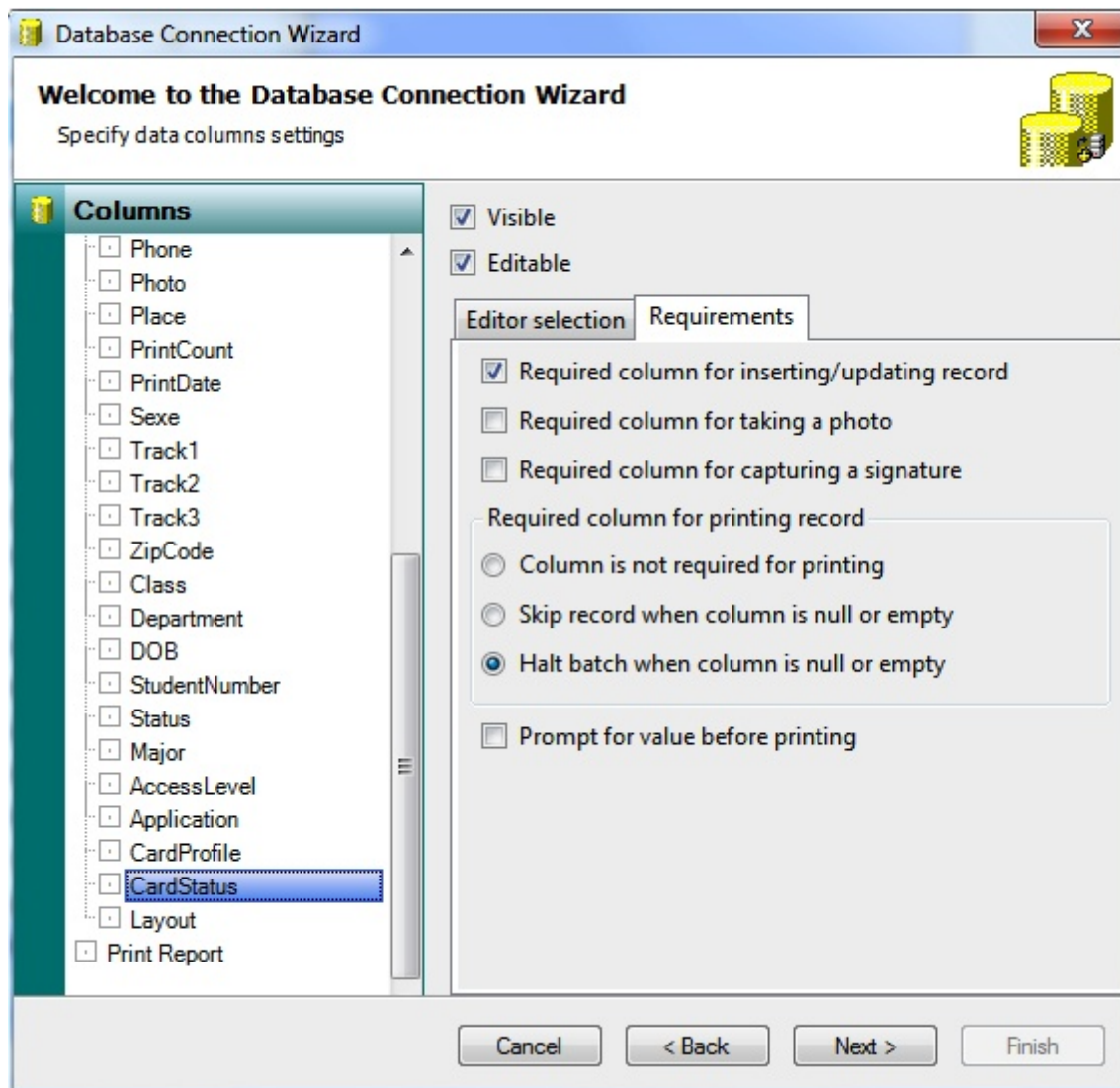
The screenshot shows a web-based form titled "Edit database record". On the left side, there are buttons for "New", "Insert", "Update", "Delete", and "Cancel". The form fields are organized into several columns:

- Employee Information:** EmployeeID (26), StudentNumber (55455), Sex (Female), Initials (T.), Lastname (Move), FirstName (Demy), Address (102 CE Street), ZipCode (95444), Place (San Francisco).
- Contact Information:** Country (United States), Phone (071 - -56 10 50), Mobile, Email.
- Academic/Departmental Info:** Class (CL-002), Department (Philosophy), DOB (03.10.1989 16:5).
- Card Information:** CardStatus, CardProfile.
- System/Device Info:** Application, AccessLevel, PrintDate (07. Apr 2013 21:0), GlobalCounter, MfareSN (916307576).


Two dropdown menus, "Application" and "CardProfile", are highlighted with red boxes, indicating they are the focus of the "Data Requirements" section.

When producing your cards, you want to make sure that all the data that is needed is entered and entered correctly to eliminate cards being wasted. CardExchange® Professional edition and higher offers great functionality to set specific requirements for the available columns from the connected database. In this section we will explain how to define the requirements for your connected database.

When using a Professional or higher edition, the **Data Requirement** option is a section available in the **Database Connection Wizard**.



When adding a database and using a Professional or higher edition, on the **fifth** page of the wizard, where you specify the data column settings, you see a tab called **Requirements**. The Editor selection tab is available starting from Premium and higher editions and is explained in the [Drop Down Menu's](#) section of this Help file.

When selecting the Requirements tab you find three check boxes that can be selected. These section effects the handling of the data creates the  indicator right from the text box in the [Data Edit Window](#) of the [Main Interface](#) of CardExchange®.

Selection 1 - Required column for inserting/updating record

When selected, the user will have to enter or select a value before the record can be updated to the database.

Selection 2 - Required column for taking a photo

Because photo fields are not visible in the [Data Edit Window](#) but only in the card preview,

this check box needs to be set to make sure that the operator is informed that a photo needs to be added before updating or inserting.

Selection 3 - Required column for capturing a signature

Just like the photo fields, signature fields are not visible in the [Data Edit Window](#), this check box needs to be set to make sure that the operator is informed that a signature needs to be captured before updating or inserting.

Required column for printing record

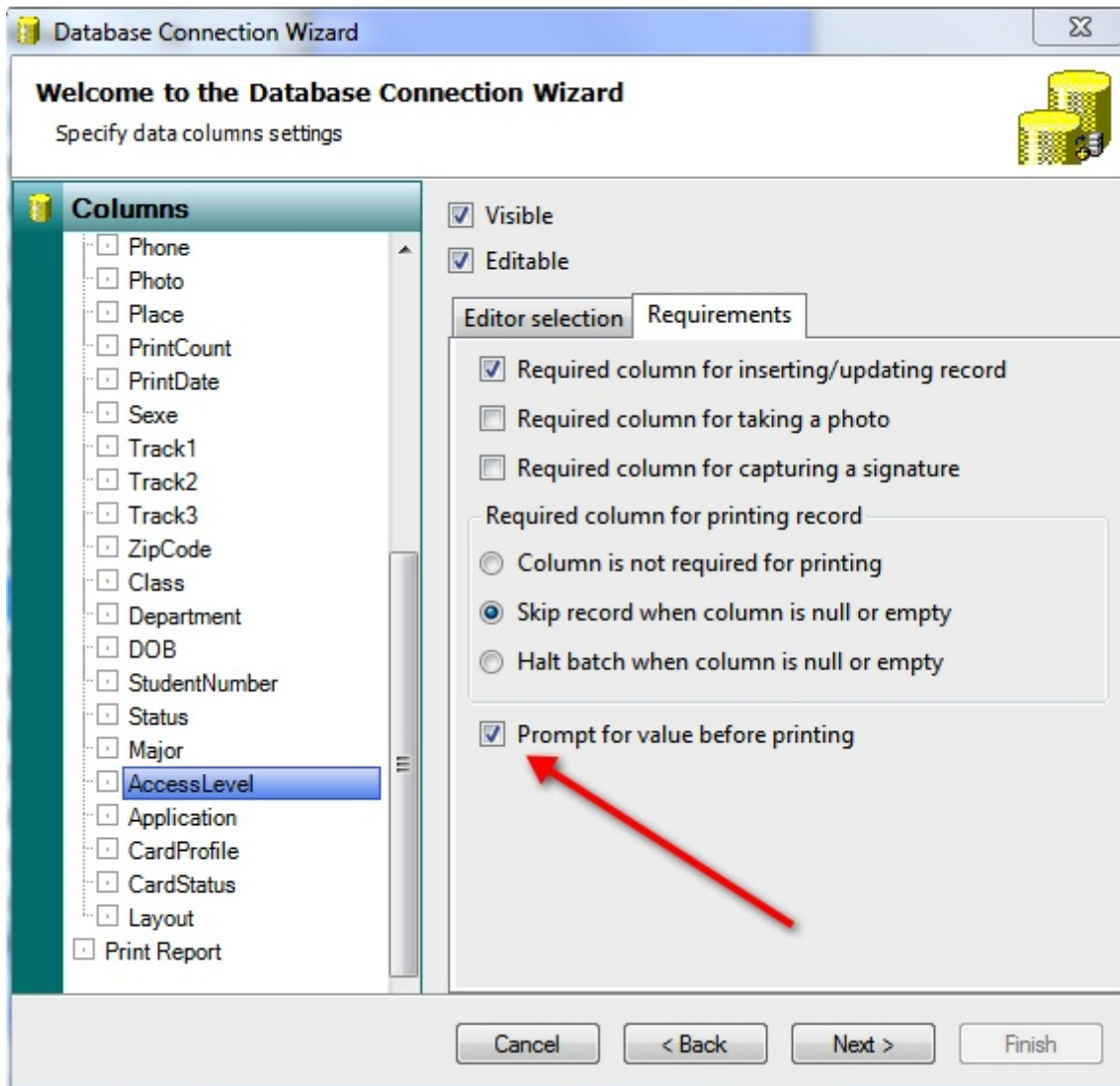
Besides the requirements for the data, these requirements do not always reflect the needs for print the record. It can be that a record is needed for showing in the [Data Edit Window](#) but because the field is not used on the card, it has not to effect the card production. In this group you can define the specific printing requirements for the selected column. First of all you can select the option **Column is not required for printing**. When this option is selected the card will be produced even if the column does not contain data or the requirement is set to **Required for inserting/ updating**.

Second option is to **Skip the record when column is null or empty**. When this requirement is selected, the record will not be printed and the system will continue printing the next record.

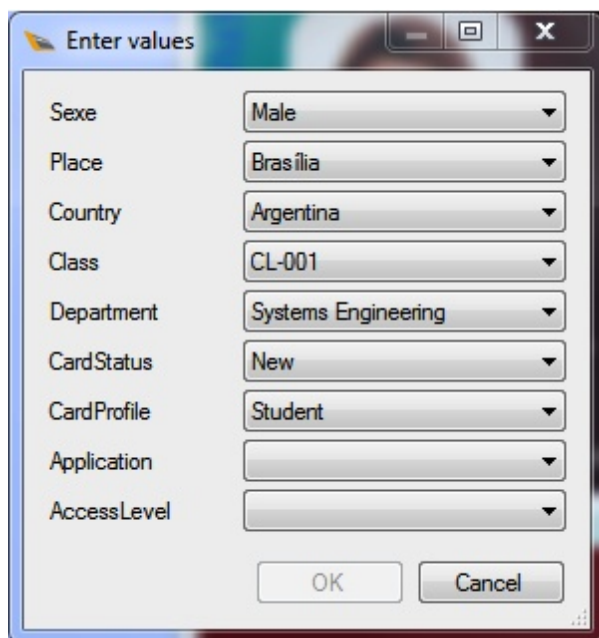
And the third option is to **Halt batch when column is null or empty**. When this option is checked and the column does not contain any data, the system will just stop the whole batch production.

Prompt for value before printing

Last but not least, it is also possible not to stop the whole batch production process but prompt for a value.



When the checked, every time the batch hits a record that has not all values needed for printing, it will prompt a dialog where the operator can select or enter the information needed for producing the card.



The screenshot shows a dialog box titled "Enter values" with the following fields and selected values:

Field	Selected Value
Sexe	Male
Place	Brasilia
Country	Argentina
Class	CL-001
Department	Systems Engineering
CardStatus	New
CardProfile	Student
Application	
AccessLevel	

Buttons: OK, Cancel

When the values are selected or entered and the operator clicks on OK, the selected or entered values will be stored into the database and the card will be produced.

16 Authorizations

User roles and **Authorizations** are created and setup for a reason, and that reason is **security**. From the Premium edition of CardExchange®, we offer advanced user authorizations with **login** functionality.

Because of the fact that CardExchange® is capable of handling multiple high level functions, such as advanced inline encoding, we need to consider that in a lot of cases we are working with information that is programmed into cards that may not be available for users of the CardExchange® system. This can also be true for security issues related to database connections. CardExchange® can be connected to applications such as Access Control, Payment, Time Attendance, etc. In most of these cases, the application provider has set strict rules regarding access to information that can be viewed and used within the CardExchange® application. To meet the demand for more efficient management of CardExchange®, ExchangeIt has introduced a strict policy regarding the security of the CardExchange® application.

In order to create more control for the Administrators of CardExchange®, we offer the ability to create user authorization levels. This helps limit user infractions and protect areas within CardExchange® that the common user should not be utilizing. This high level security allows you to protect the software connections and functionality from user errors.

During the installation of CardExchange®, CardExchange® creates a special file that contains all the security information called the UserAuth.dat file. This file is located in the Data folder of CardExchange®. Every time CardExchange® will be started, a backup is created automatically to **AppData** folder and contains the settings when closing CardExchange® the last time.

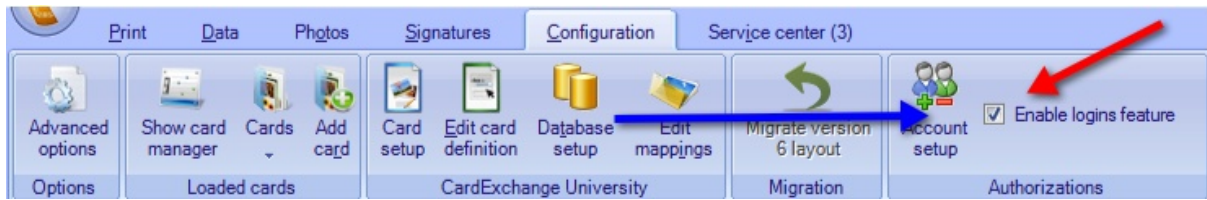
When the UserAuth.dat file is missing, CardExchange® will start up in locked mode. Why can cause CardExchange® to be locked?

There can be several reasons for having this situation, but the most important one is fraud. If somebody tries to get access to information that he or she is not allowed to see or access and delete the UserAuth.dat file on purpose, the system will automatically generate a response by locking itself.

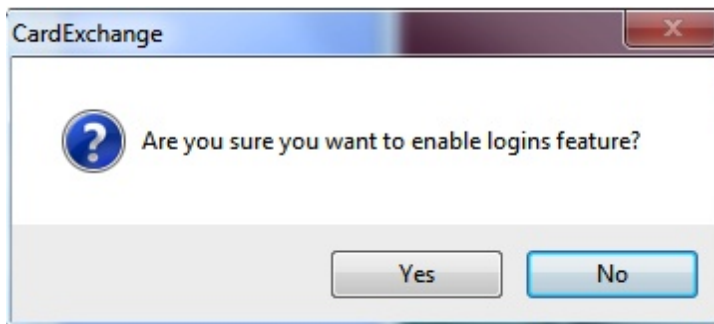
In the event you have a locked CardExchange® license you will have to send the Identification Code to CardExchange@ExchangeIt24.com. As soon as we receive this code, we will generate the Unlock Code that can be entered into the User authorizations file unlock window and send it back to the corresponding email address.

When the unlock code is entered and valid, CardExchange® will start again and the user authorizations can be created again by the user and/or the supplier that has setup the CardExchange® edition.

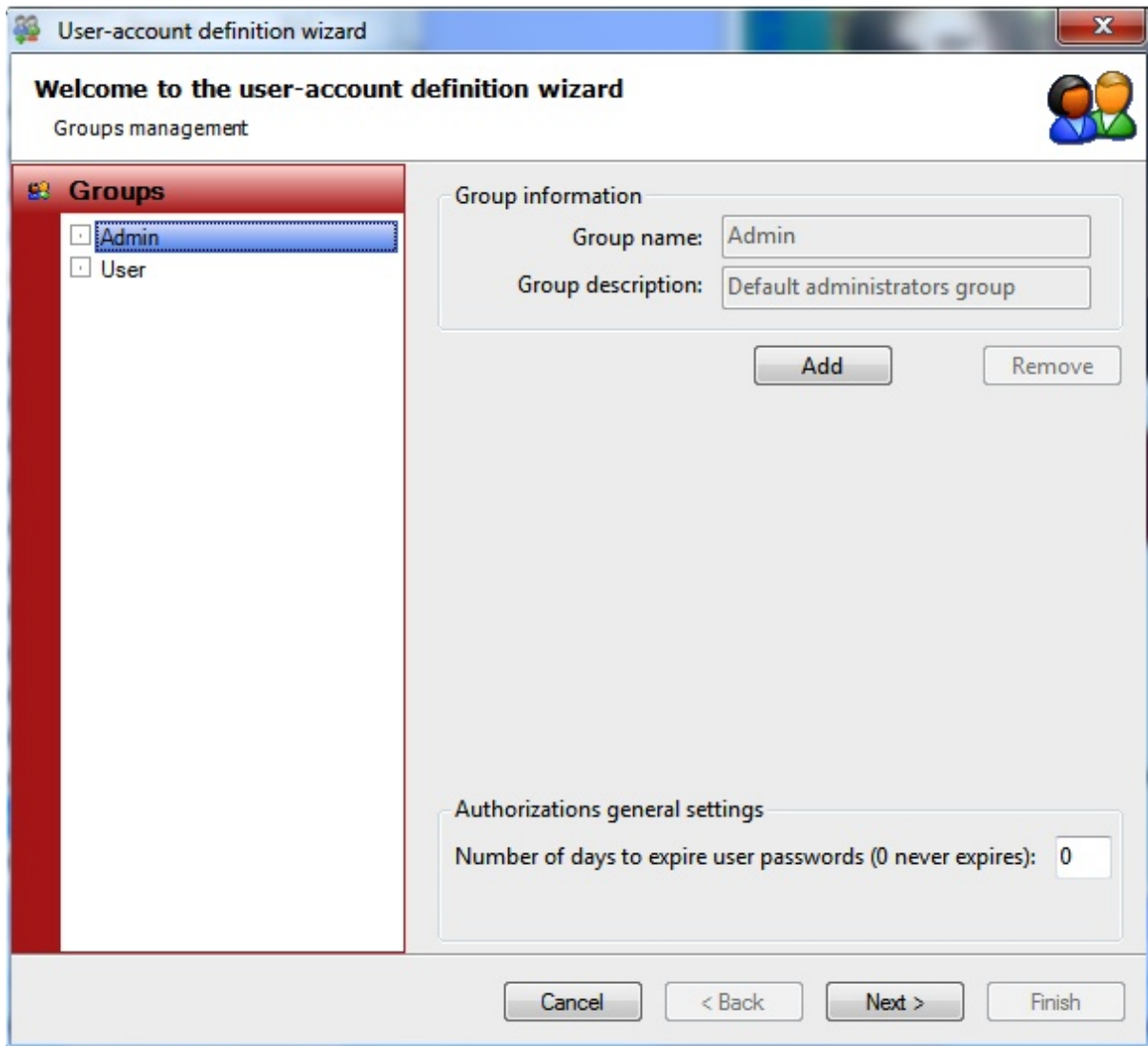
We will now continue with explaining the setup and use of the User Authorizations within CardExchange®.



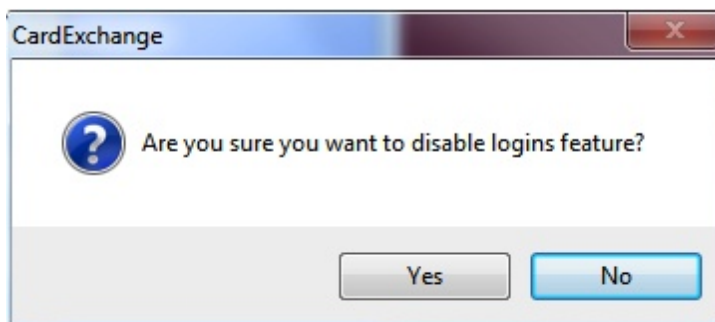
Setting up **User Authorizations** does not make any sense if you are not using a login mechanism therefore first select the **Enable logins feature** as indicated with the **red arrow**. When selecting a dialog will prompt for confirmation:



When you confirm this feature, the Account setup button will become available as indicated with the **blue arrow**. When you click on Account setup, the User **Account Setup Wizard** will start.

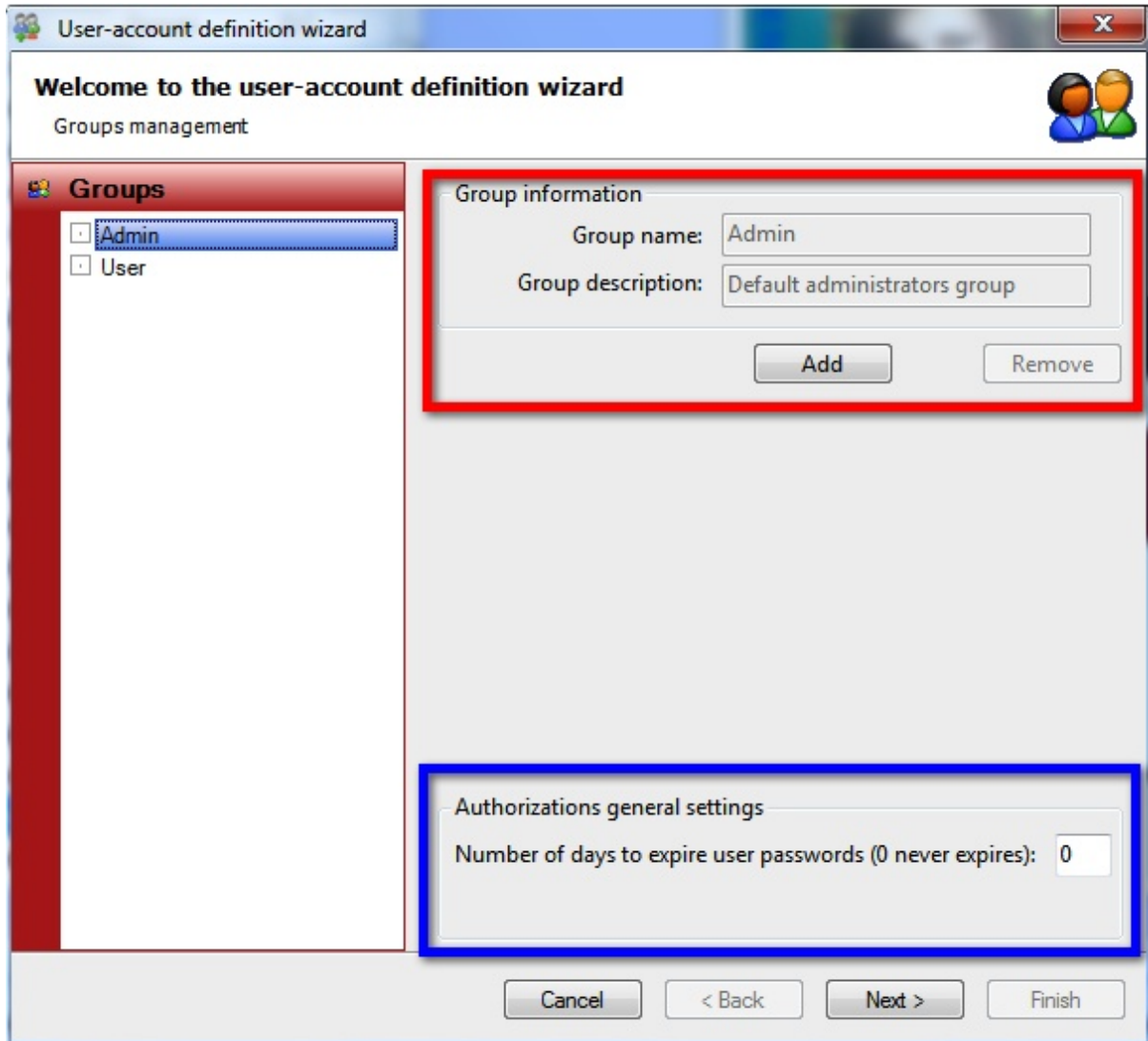


In the section [Create User Authorization](#) we will explain how to create the **user groups**, **profiles**, and **users**. To disable the **User Authorizations**, **uncheck** the **Enable logins feature** check box, a dialog will pop up:



And select **Yes** to disable the functionality.

16.1 Create User Authorizations

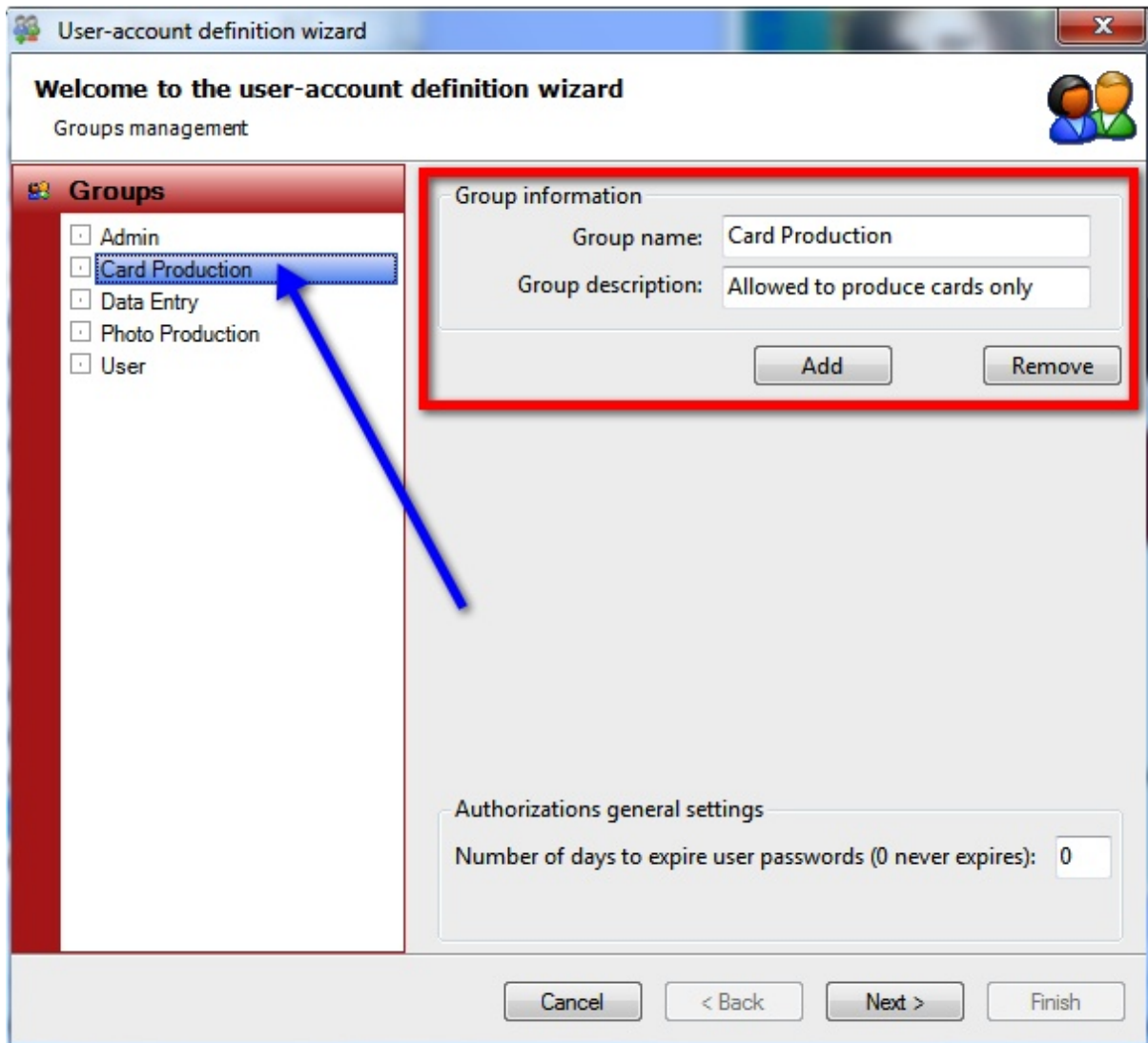


Creating **User Authorizations** starts with creating and/or managing groups. In this first page of the wizard you find two important areas; The **Group information** group, indicated with the **red rectangle**, and the **Authorizations general settings**, indicated with the **blue rectangle**. The explorer on the left side shows all the available and created groups.

Important! There are always two groups available; the **Admin** and the **User** group. Non of these groups can be removed.

With the **Authorizations general settings** group you can indicate when the passwords need to expire. For example, putting in **30** means that after 30 days all users, when they login, **are requested to change their password**. When leaving it to **0**, **passwords will not expire**.

In the Group information section you see the Group name and the Group description. It also contains the Add and Remove button. To Add a new group, click on the Add button.



When you have entered Group name, make sure you chose logical names, and entered a Group description, the new created group will appear in the explorer on the left side as indicated with the **blue arrow**.

In this example we have created groups for card production, data entry, and photo production. There are no limitations on the amount of groups you can create.

If you want to delete a created group, just select the group in the explorer on the left side and click on remove. Confirm with Yes to delete! Deleting a group does not delete your users!

When you are done adding groups you can proceed to the next level of the wizard by clicking **Next**.

User Management

Users

- Administrator
- Guest
- Production
- UserData
- UserPhoto

User information

User name:

Full name:

Password:

Confirm password:

User must change password at next login

User is disabled

Assigned	GroupName	GroupDescription
<input type="checkbox"/>	Admin	Default administrators g...
<input checked="" type="checkbox"/>	Card Production	Allowed to produce car...
<input type="checkbox"/>	Data Entry	
<input type="checkbox"/>	Photo Production	
<input type="checkbox"/>	User	Default users group

Add Remove

Cancel < Back Next > Finish

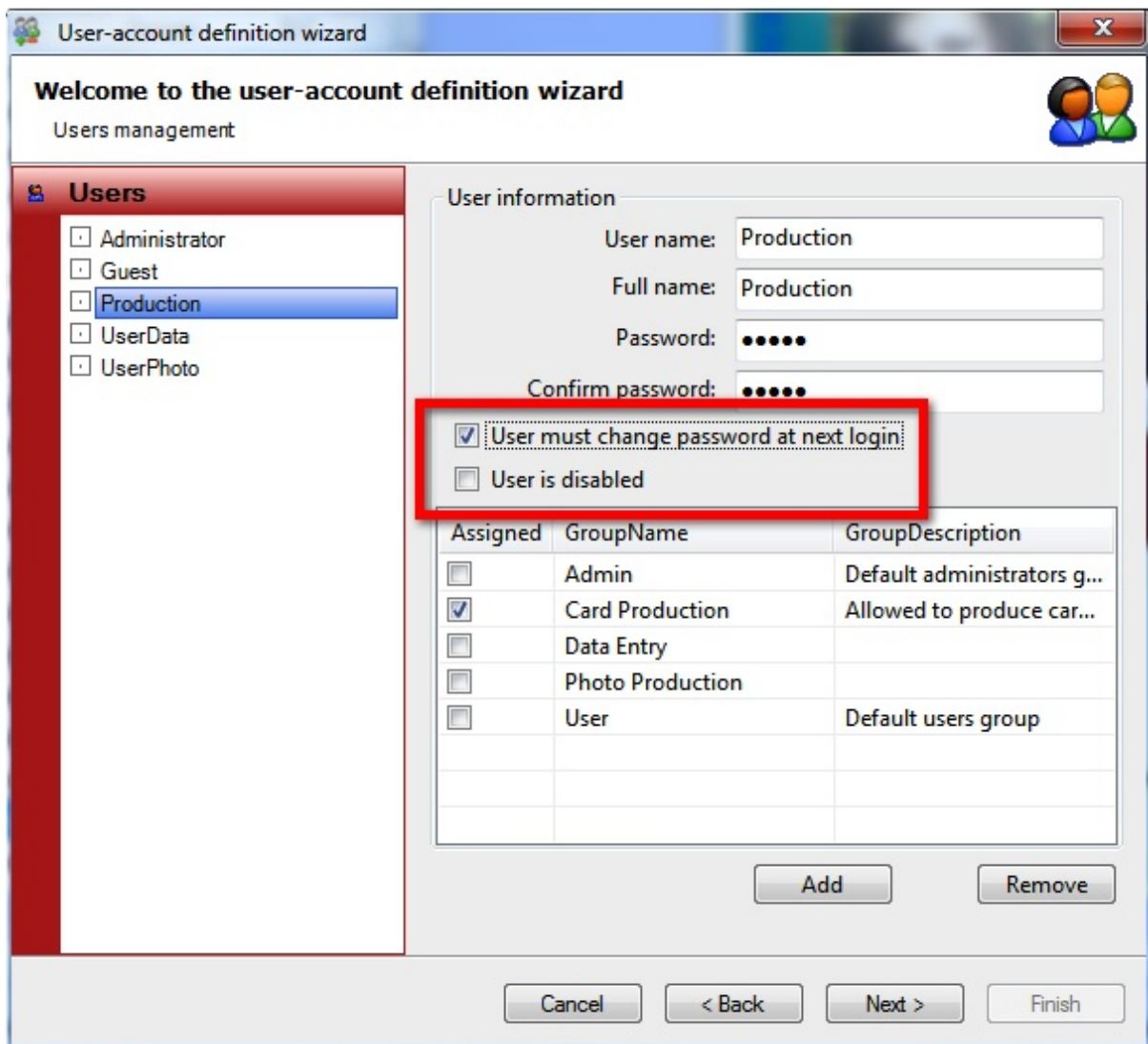
In this page of the wizard you can create new or edit existing users of the system. On the explorer on the left side you can find all the available users, on the right side you can find all the user information.

When you click on **Add**, to create a **new user**, you will need to provide a **User name**, this is the name used to login to CardExchange®, enter a **Full name** of the user, and enter a **Password** and **Confirm the password**.

Just like in the Group Management page of the wizard, we also have two special users; Administrator and Guest. The Guest account can be removed but the Administrator account cannot! What you can change is the password of the Administrator and we advice to do so but keep in mind changing the password means that you need to remember the password. There is no option to retrieve or reset the Administrator password... yet.

The **default user name** for the **Administrator** account is **Administrator** and the **Password** is **Administrator** too! For the **Guest** the **password** and **user name** are both **Guest**. Passwords are **case sensitive**!

Important! The Administrator has always access to all defined groups and users!



The screenshot shows the 'User-account definition wizard' window. The title bar reads 'User-account definition wizard'. The main window has a header 'Welcome to the user-account definition wizard' and 'Users management'. On the left, there is a tree view under 'Users' with items: Administrator, Guest, Production (selected), UserData, and UserPhoto. The main area is titled 'User information' and contains the following fields:

- User name: Production
- Full name: Production
- Password: •••••
- Confirm password: •••••

Below the password fields, there are two checkboxes:

- User must change password at next login:
- User is disabled

Below these checkboxes is a table with columns 'Assigned', 'GroupName', and 'GroupDescription':

Assigned	GroupName	GroupDescription
<input type="checkbox"/>	Admin	Default administrators g...
<input checked="" type="checkbox"/>	Card Production	Allowed to produce car...
<input type="checkbox"/>	Data Entry	
<input type="checkbox"/>	Photo Production	
<input type="checkbox"/>	User	Default users group

At the bottom of the wizard, there are buttons: 'Add', 'Remove', 'Cancel', '< Back', 'Next >', and 'Finish'.

In the area indicated with the red rectangle, you find two special options. If you want the user to generate their own password, just check the box **User must change the password at next login**. This can be handy if you have a lot of different users to create but you do not want to send out all these different passwords. When you select this option, you can simply use a standard password which first needs to be changed before the user can login to the system. If you have, like in this example, a group account it is better not to use.

Disabling the user is also a handy option. By checking this box, the user cannot login to the system anymore but is not removed from the system. If later the user needs to get access to the system again, simply uncheck the **User is disabled** box and access is granted again.

Welcome to the user-account definition wizard
Users management

Users

- Administrator
- Guest
- Production
- UserData
- UserPhoto

User information

User name:

Full name:

Password:

Confirm password:

User must change password at next login

User is disabled

Assigned	GroupName	GroupDescription
<input type="checkbox"/>	Admin	Default administrators g...
<input checked="" type="checkbox"/>	Card Production	Allowed to produce car...
<input type="checkbox"/>	Data Entry	
<input type="checkbox"/>	Photo Production	
<input type="checkbox"/>	User	Default users group

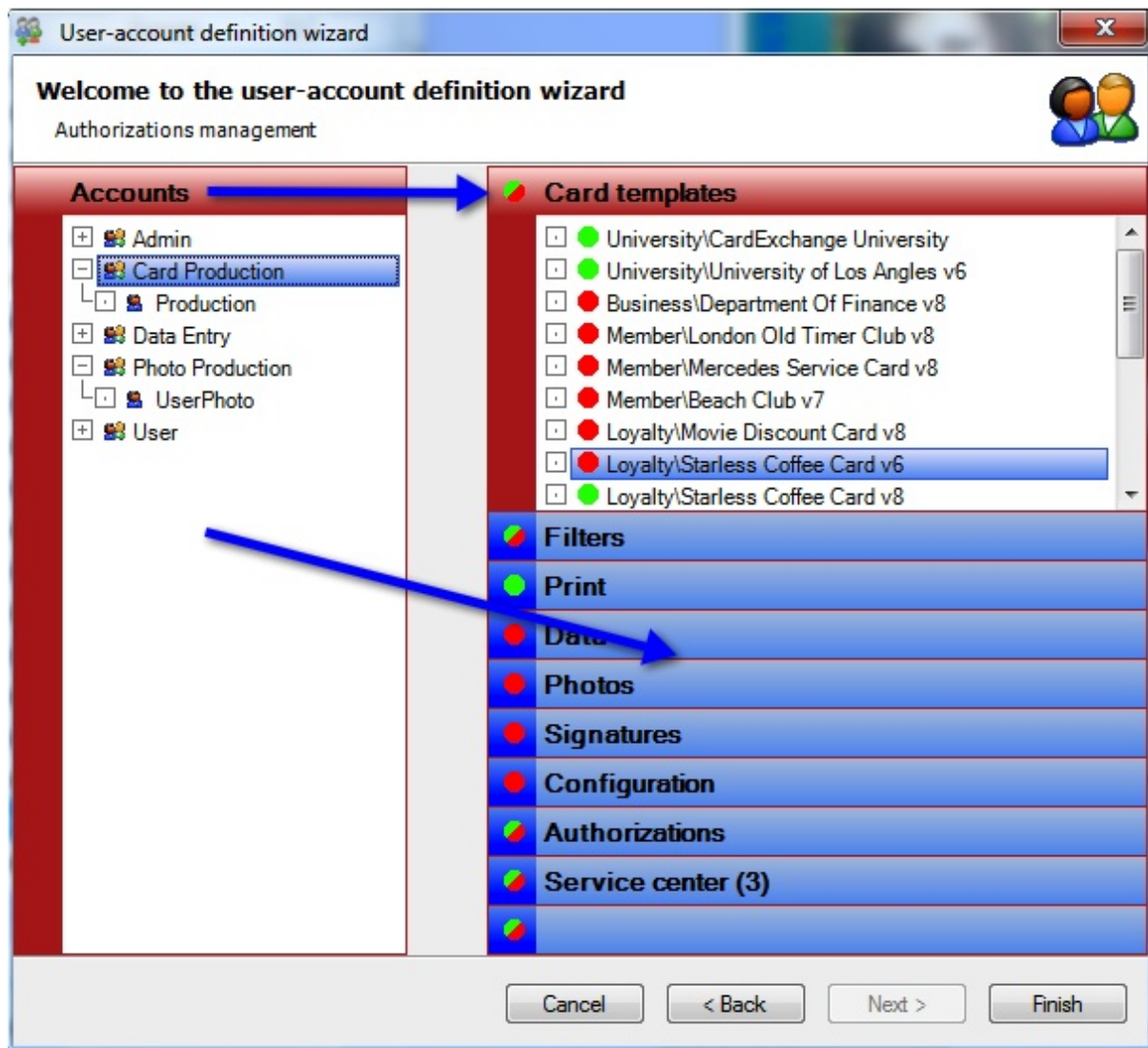
Add Remove

Cancel < Back Next > Finish

In the section indicated with the blue rectangle you can specify per user to which group it will be assigned. Each user can be assigned to one of multiple groups. In this example, it makes sense that the Production user is assigned to the Card Production group but you can imagine that a some users need to have access to multiple groups.

When you have created or edited all your users of the system and assigned them to the correct groups, you can proceed with the **Authorizations management** on the next and final page by clicking **Next**.

Authorizations management



In this last page of the wizard can assign and create the profiles per defined group or specific, per user. In the explorer on the left side you can see all the created groups. If you click on the expand sign \pm you can see the assigned user of the group.

On the right side, indicated with the blue arrow, you see nine separate tabs dividing the available CardExchange® functionality. When you click on each available tab, the corresponding functionality will be shown. For example, in the select tab, **Card templates**, all on the system available templates are shown. Each tab and each functionality has an colored indicator. There are basically three options

● **No access to functionality**

This means that the functionality is not available in the interface. It is not greyed out, it is totally removed.

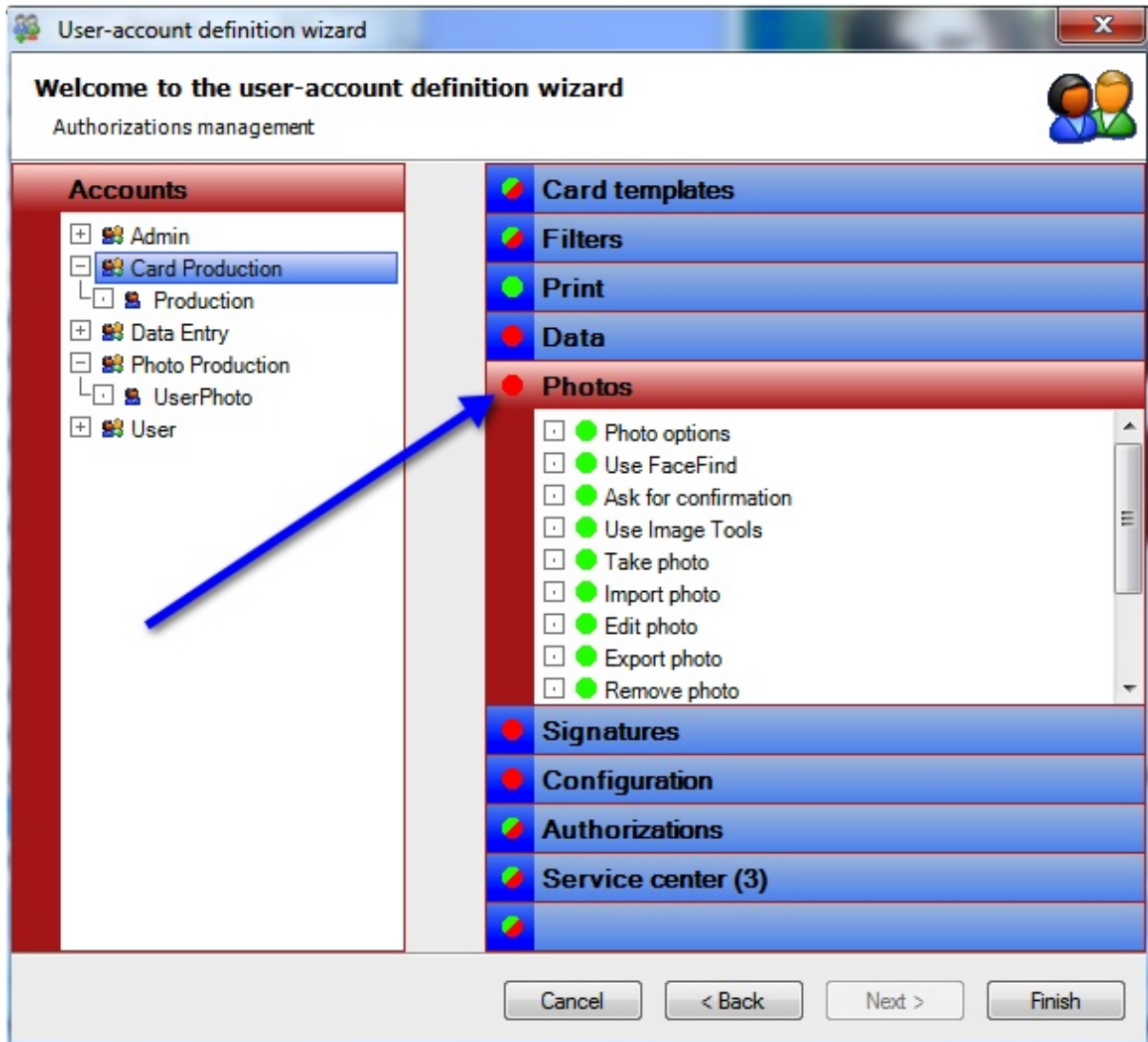
● **Access to functionality**

This means that the functionality is available for the user of the system.

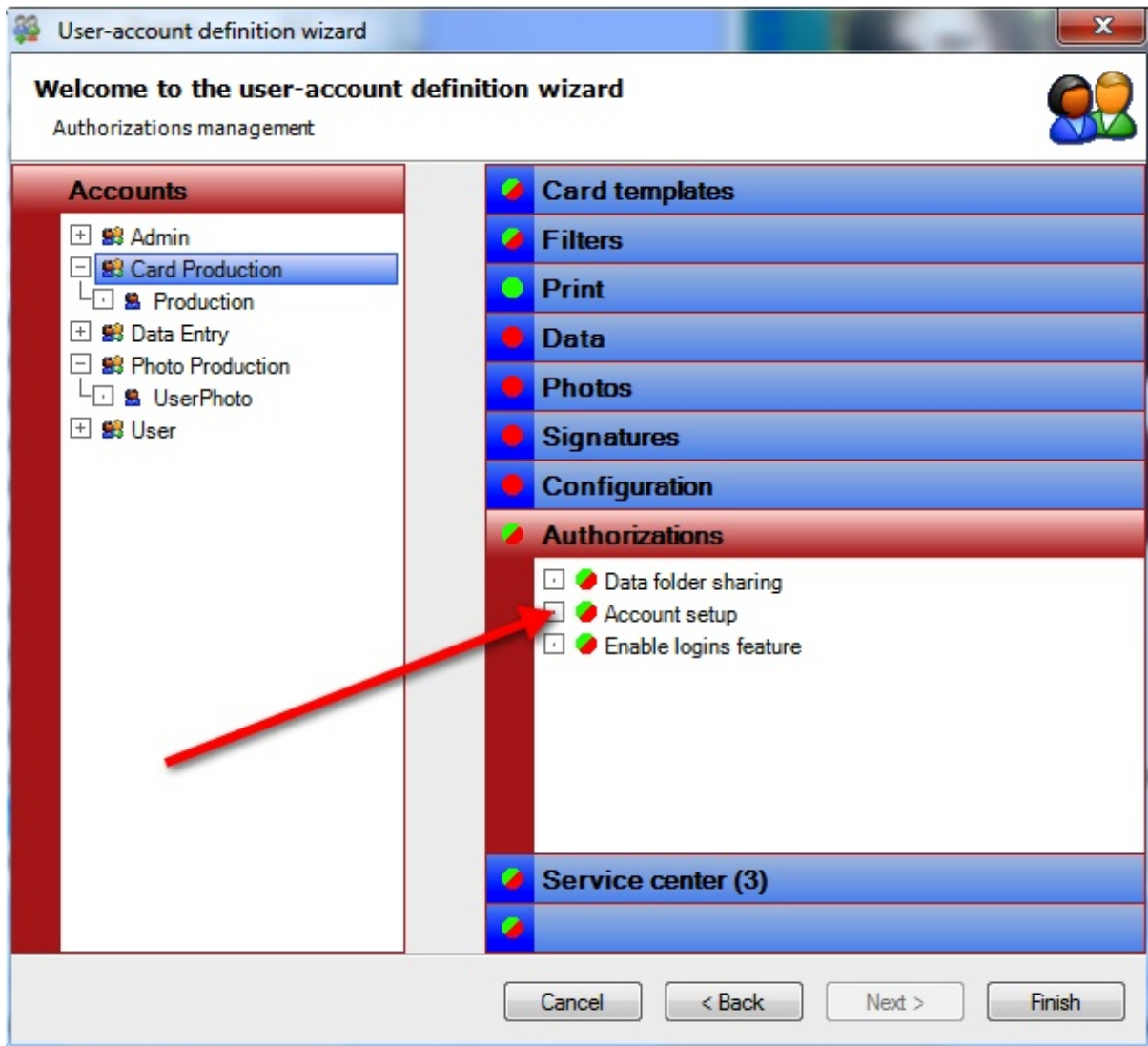
● Administrator or selected users and groups only


This means that all the functionality or selections of the functionality is only available for the Administrator.

For example:



For the group Card Production there is no need to do anything with the Photo functionality, Signatures, Configuration, etc. within CardExchange®. By clicking on the ● you can completely change the group to no access, even though the specific functionality in the group is indicated with ●.

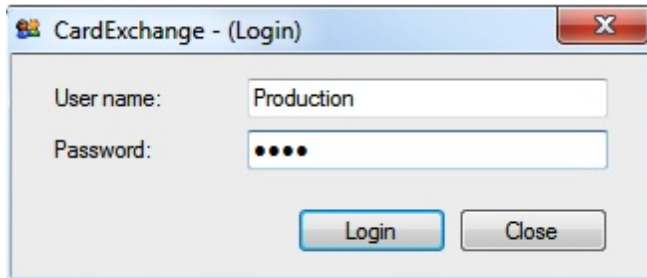


When the functionality is indicated with , only the Administrator will be able to see the functionality. Besides creating the policies for the groups, each separate user can have some different rights besides the group profile. Simple select the user name from the explorer on the left and set the correct authorizations for this user.

When you have defined all the groups, users, and assigned to the functionality allowed for this group and/or user, you can click on Finish to store your account definitions and close this wizard.

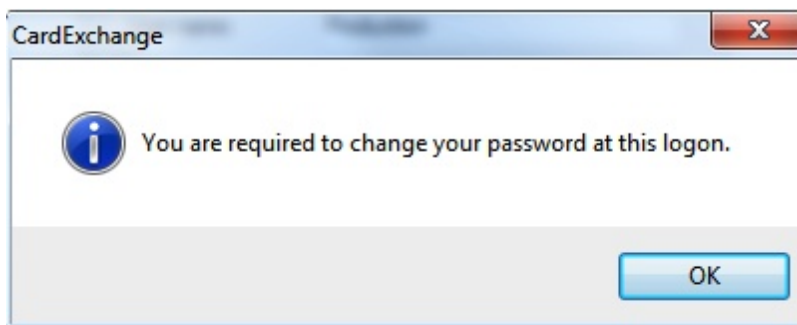
16.2 Users Login Access

When User Authorizations is enabled, every time CardExchange® starts, the user have to login. If it is a new account, it can be that the Administrator has set the option to change the password at first login. When that is the case, the the standard login window will appear as show below:



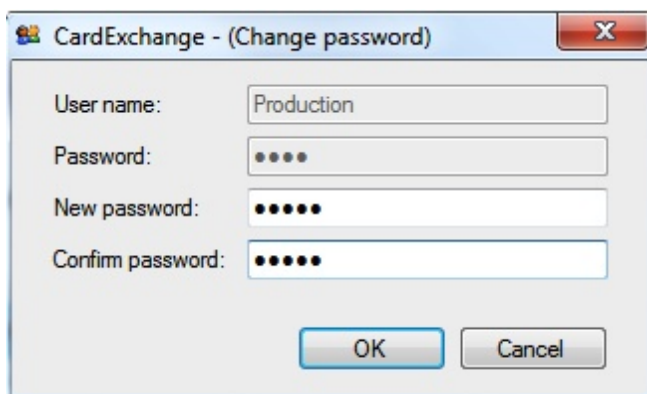
A screenshot of the CardExchange login window. The title bar reads "CardExchange - (Login)". It contains two text input fields: "User name:" with the text "Production" and "Password:" with four black dots. Below the fields are two buttons: "Login" and "Close".

When the user enters his User name and password, and the Administrator has set the option to change the password at first login, the message as shown below will appear:



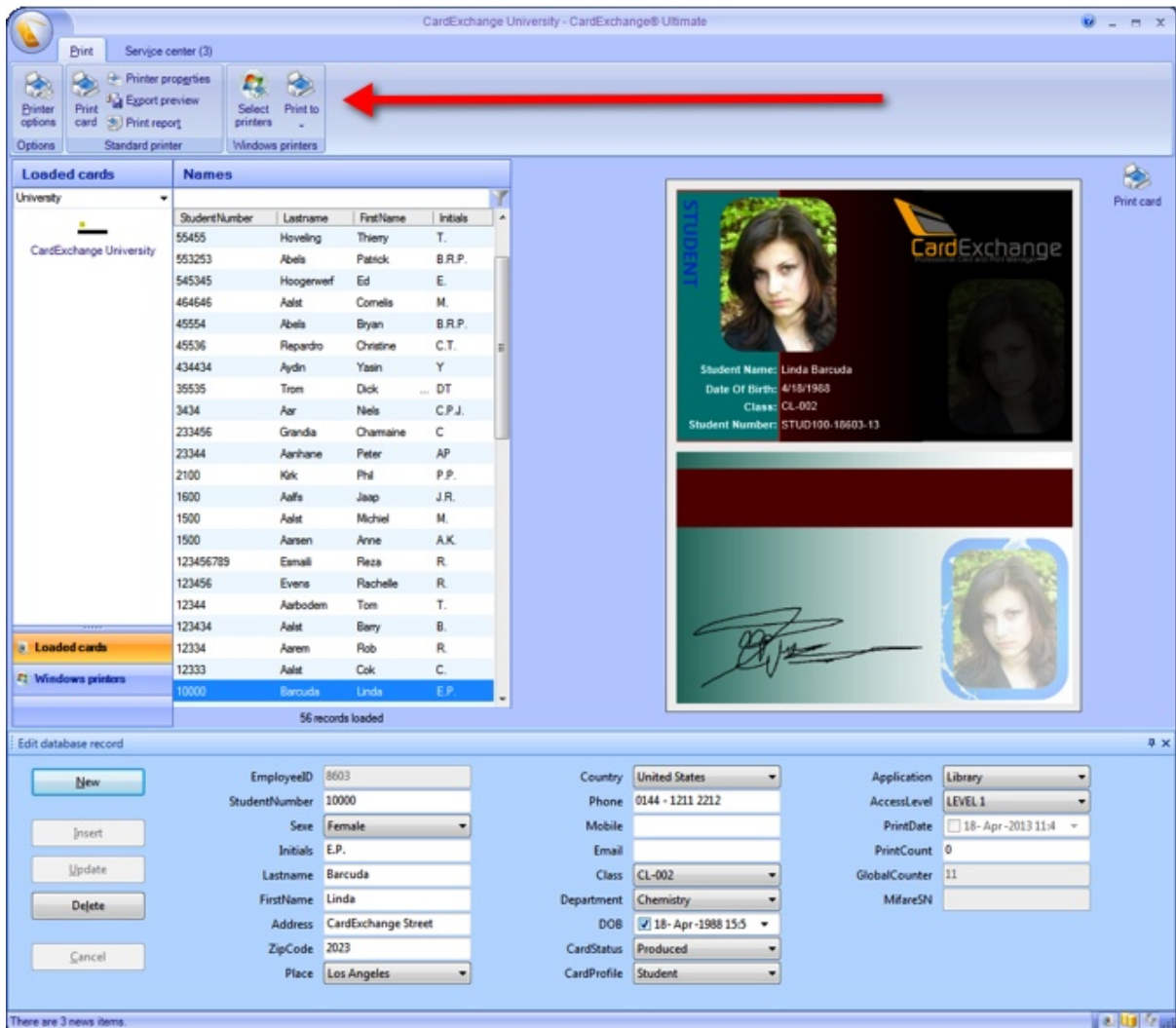
A screenshot of a message window titled "CardExchange". It features a blue information icon on the left and the text "You are required to change your password at this logon." on the right. An "OK" button is located at the bottom right of the window.

To confirm this action you have to click OK and the Change Password window will appear:

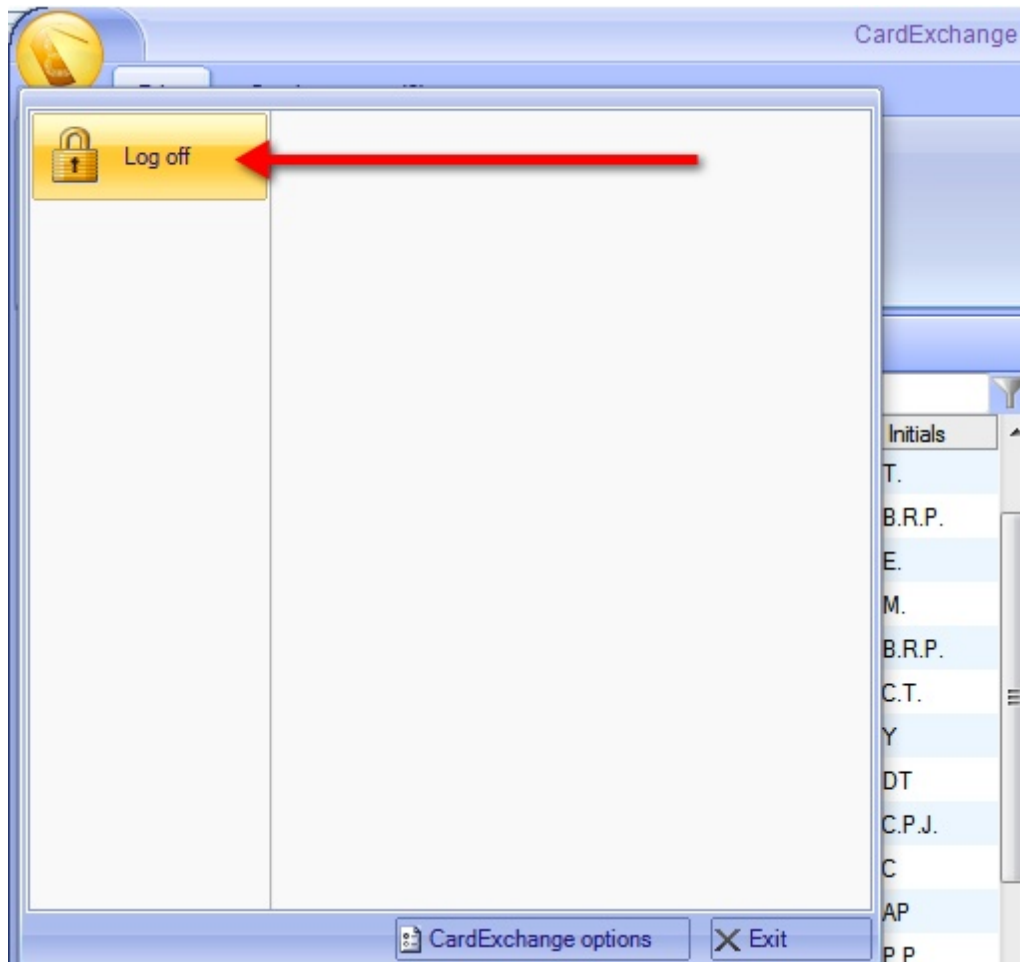


A screenshot of the CardExchange change password window. The title bar reads "CardExchange - (Change password)". It contains four text input fields: "User name:" with "Production", "Password:" with four black dots, "New password:" with six black dots, and "Confirm password:" with six black dots. At the bottom are "OK" and "Cancel" buttons.

Enter a new password and confirm the new password and click on OK. If the User name and Password match, CardExchange® will load.



When CardExchange® is loaded, you can directly see that things have changed. First of all, the ribbon has only the Print and Service center tab available as indicated with the **red arrow**. Also the filter section is removed.



When you are an **Administrator** and you need to do some maintenance on the users computer, just simple select **Log off** as indicated with the **red arrow** and enter your Administrator **User name** and **Password** to make changes.

17 Contactless Encoding

A contactless smart card is any pocket-sized card with embedded integrated circuits that can process and store data, and communicate with a terminal via radio waves. There are two broad categories of contactless smart cards. Memory cards contain non-volatile memory storage components, and perhaps some specific security logic. Contactless smart cards do not contain an ordinary read-only **RFID**, but they do contain a re-writable smart card microchip that can be transcribed via radio waves.

A contactless smart card is a card in which the chip communicates with the card reader through an induction technology similar to that of an **RFID** (at data rates of 106 to 848 kbit/s). These cards require only close proximity to an antenna to complete a transaction. They are often used when transactions must be processed quickly or hands-free, such as on mass transit systems, where a smart card can be used without even removing it from a wallet.

The standard for contactless smart card communications is **ISO/IEC 14443**. It defines two types of contactless cards ("**A**" and "**B**") and allows for communications at distances up to 10 cm.

A related contactless technology is **RFID** (radio frequency identification). In certain cases, it can be used for applications similar to those of contactless smart cards, such as for electronic toll collection. RFID devices usually do not include writeable memory or micro controller processing capability as contactless smart cards often do.

There are dual-interface cards that implement contactless and contact interfaces on a single card with some shared storage and processing. An example is Porto's multi-application transport card, called Andante, that uses a chip in contact and contactless (**ISO/IEC 14443 type B**) mode.

Like smart cards with contacts, contactless cards do not have a battery. Instead, they use a built-in inductor, using the principle of resonant inductive coupling, to capture some of the incident electromagnetic signal, rectify it, and use it to power the card's electronics.

CardExchange® Ultimate supports inline encoding and reading for three different type of contactless technologies;

- **MIFARE® DESFire**,
- **MIFARE® Classic**,
- and reading of **HID® Proximity** cards.

In this section of the Help file we will explain how to use these technologies with CardExchange®. It is however important to have at least basic knowledge of these technologies used by CardExchange®.

Please visit <http://www.nxp.com> for more information about **MIFARE®** technology.

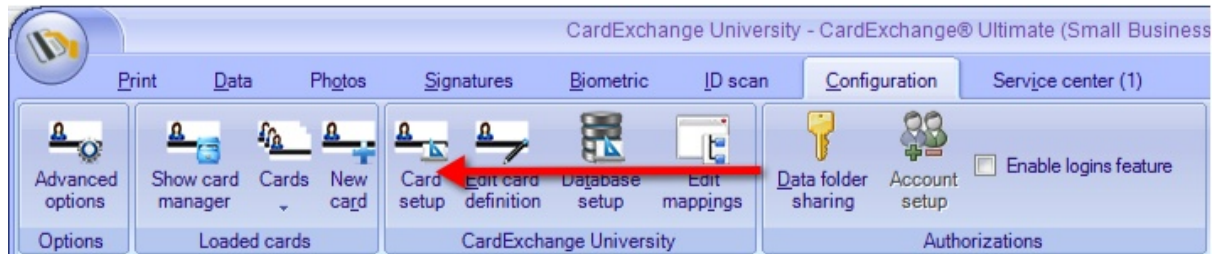
17.1 MIFARE® Classic

CardExchange® supports inline encoding and reading of **MIFARE® Classic 1K and 4K** cards. What information should be read or written can be configured by means of the **MIFARE® Wizard**, which will be the subject of this chapter. For a full understanding of the **MIFARE® Wizard**, it is essential to have knowledge about the functionality of the MIFARE® Classic chip. Please, refer to the MIFARE® Classic documentation published by NXP for more information

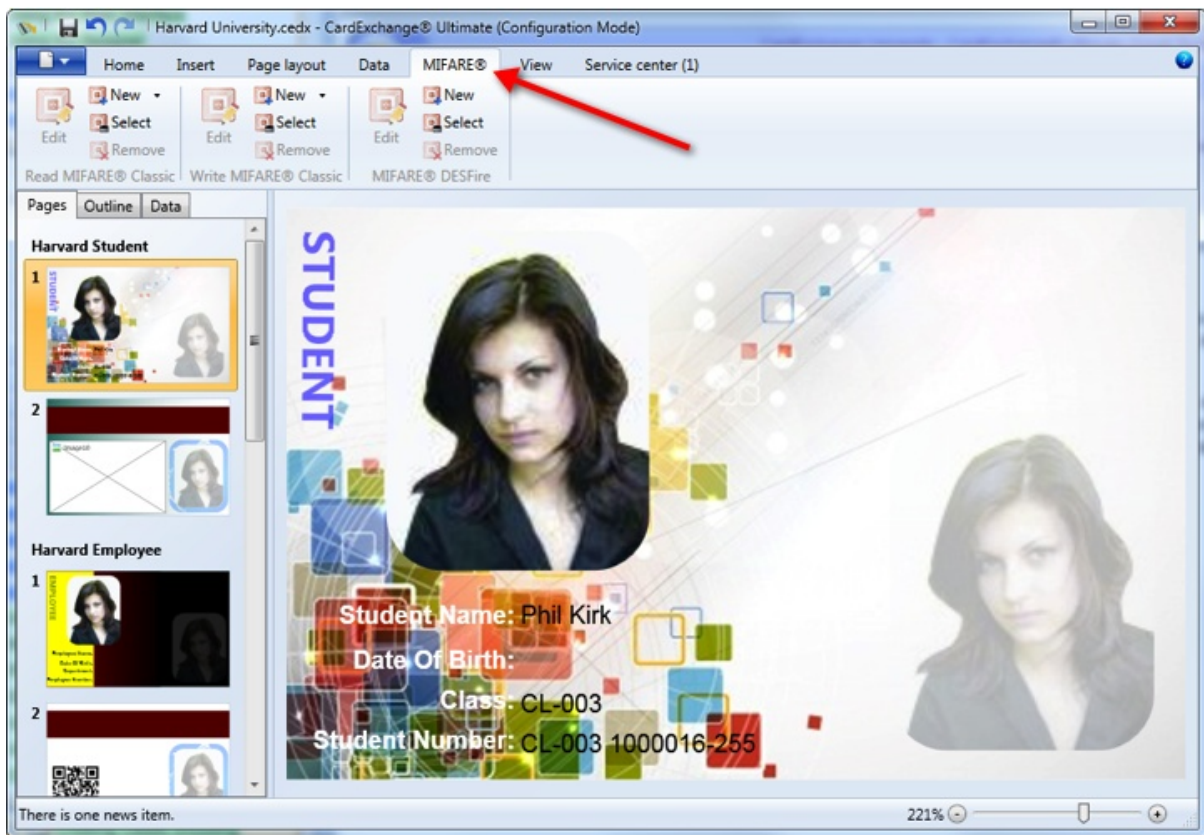
Please visit <http://www.nxp.com> for more information.

It is possible that the **MIFARE® Wizard** does not offer all functionality you need to achieve your goals. For example, you might need functionality of the **Classic** protocol that is not configurable via the wizard, or special transformations of the database data before they can be written to the chip. For this type of situations, we can offer a solution by means of an [External Plug In](#). Please, contact sales for more information about [External Plug Ins](#).

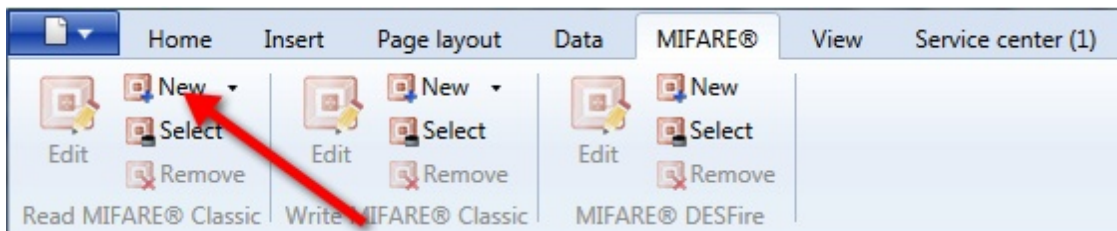
17.1.1 Creating Classic Encoding



To encode MIFARE® Classic encoding we have to set the system up for this. Encoding is setup via the Designer so click on **Card Setup** to start the Designer.



Select the MIFARE® tab as indicated with the red arrow.

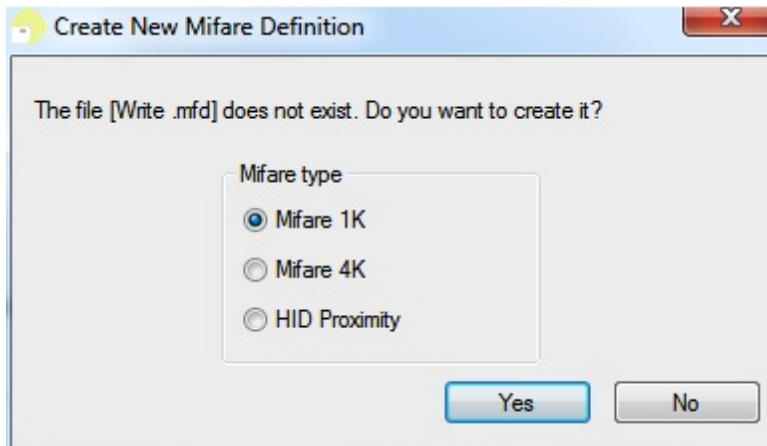


Click on New, as indicated with the red arrow to start the MIFARE® Classic Setup Wizard and follow the steps as described in the sub sections of this topic.

It is possible to select an existing **Classic setup** by clicking on the Select button. It is important to notice that, compared to using DESFire, for Classic you will need to create separate setups for **reading** and/or **writing** to the **Classic chip**. Read definitions are mostly only created if the **CSN** (Chip Serial Number) of the Classic card needs to read and stored into the database or printed on the card. In this section of the Help file we will explain how to create a definition for writing to a **Classic chip**.

17.1.1.1 Step 1: Selecting Memory Size

When we have entered a name for the definition into the text box and we click on **Create**, a dialog box '**Create New Mifare Definition**' will be shown asking to make a choice for the type of MIFARE® Classic chip.

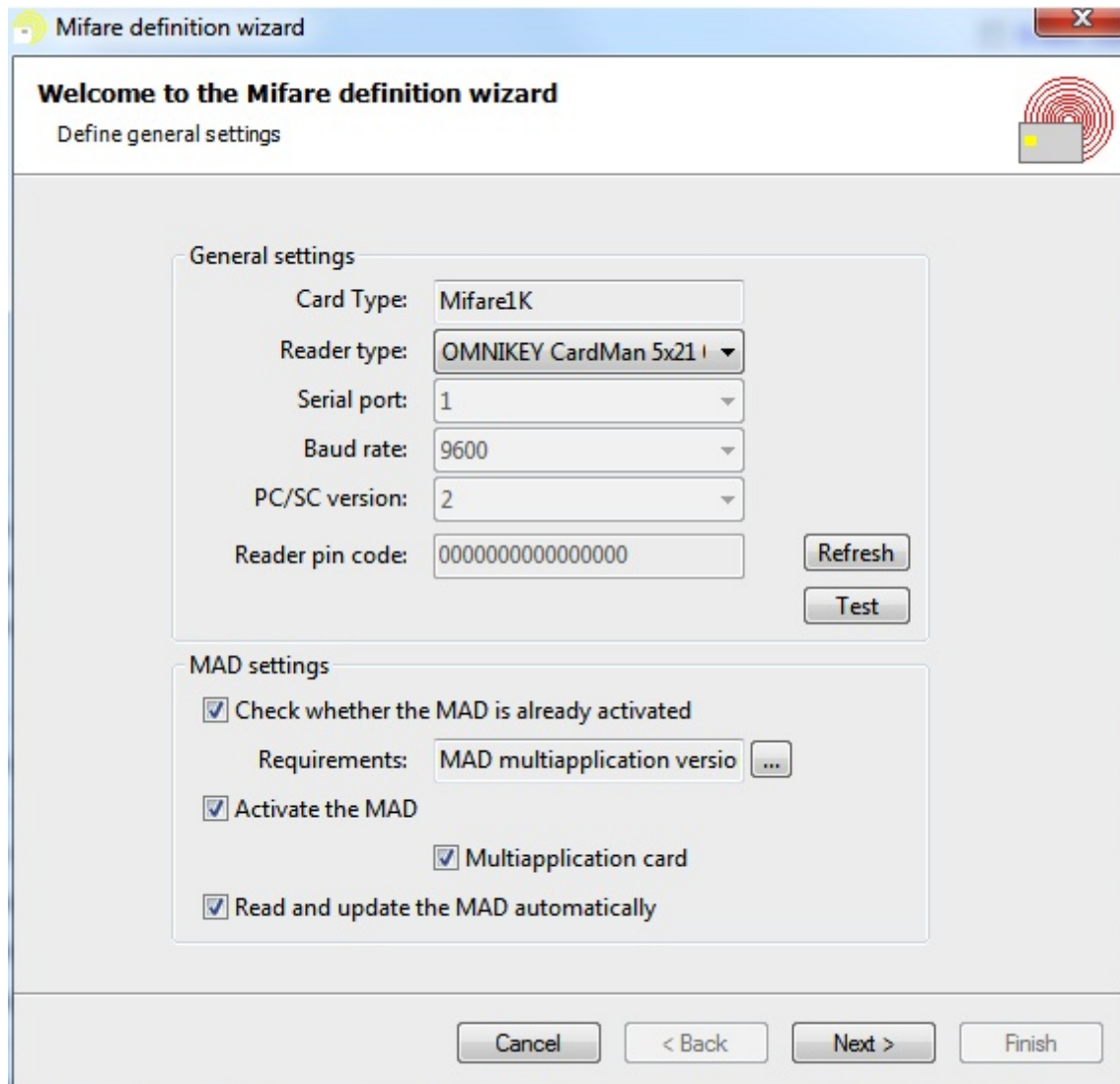


You can select to create a definition for a MIFARE® 1K or 4K card. As you can see, you can also select HID Proximity. This is because we also use the same wizard for defining HID® Proximity encoding. See our [HID® Proximity](#) section of this Help file for more information.

The most common used MIFARE® Classic chip is the 1K card, which we will use. The 4K chip basically works the same with exception of the size of the sectors starting from sector 16 and up, and it has two MAD sections.

In this case we select MIFARE® 1K and click Yes to confirm and proceed with [Step 2](#).

17.1.1.2 Step 2: Define General Settings



The screenshot shows a window titled "Mifare definition wizard" with a close button (X) in the top right corner. The main heading is "Welcome to the Mifare definition wizard" with the subtitle "Define general settings". In the top right corner of the window, there is a small icon of a red fingerprint scanner and a grey card with a yellow chip. The window is divided into two main sections: "General settings" and "MAD settings".

General settings

- Card Type: Mifare1K
- Reader type: OMNIKEY CardMan 5x21 (dropdown menu)
- Serial port: 1 (dropdown menu)
- Baud rate: 9600 (dropdown menu)
- PC/SC version: 2 (dropdown menu)
- Reader pin code: 0000000000000000
- Buttons: Refresh, Test

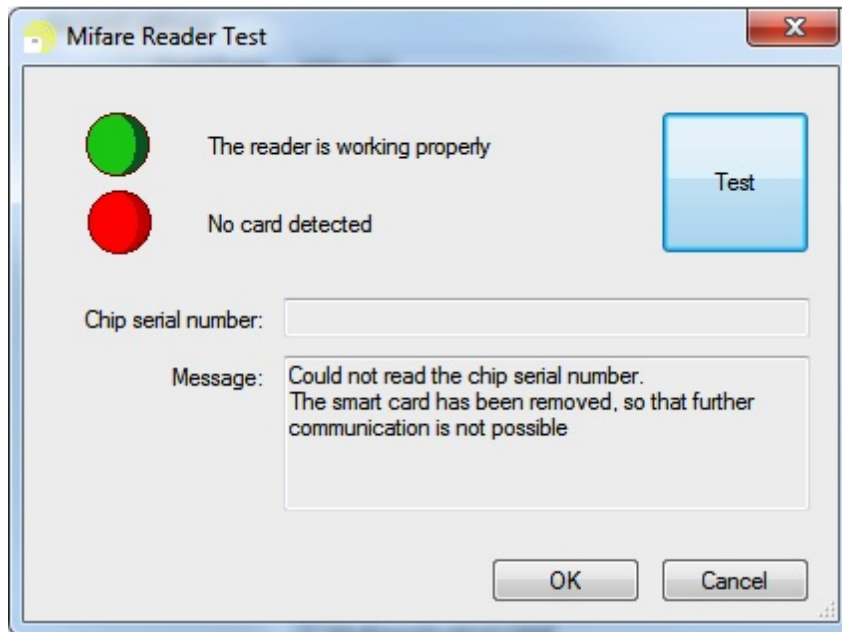
MAD settings

- Check whether the MAD is already activated
- Requirements: MAD multiapplication versio (dropdown menu with ellipsis)
- Activate the MAD
- Multiapplication card
- Read and update the MAD automatically

At the bottom of the window, there are four buttons: Cancel, < Back, Next >, and Finish.

The **General settings** group box allows choosing the **reader type**, the serial port to which the reader is connected and the baud rate to be used. CardExchange® supports a lot of readers for encoding MIFARE® Classic. Currently we support **DigiOn24**, **GemEasyLink 680**, **ACG**, **Zebra MIFARE®**, **Pro-Active**, **PPC/EI-Tech**, and **PC/SC 1 and 2** readers like **OmniKey** and **CrazyWriter**.

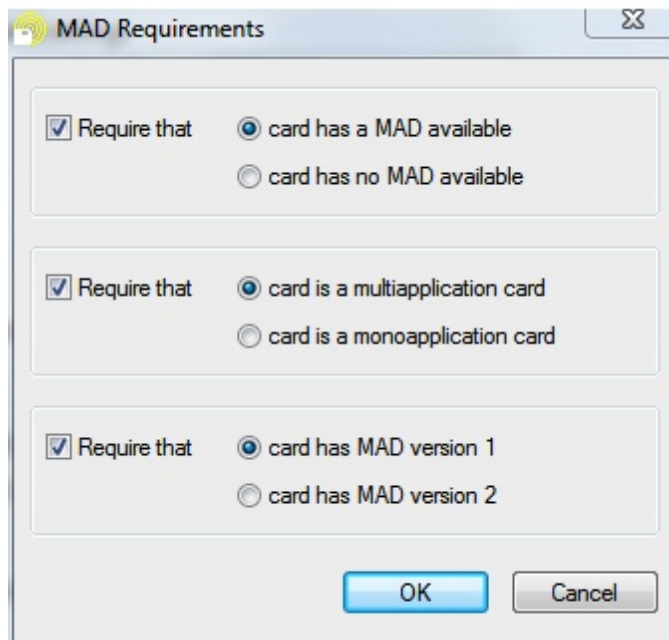
PC/SC readers are only available when installed on your system. If the reader is not available, please make sure it is installed properly. You can click on the **Refresh** button to reload the list with available readers. You are able to test if the connected reader is working and responding correctly. Click on the **Test** button to open the **MIFARE® Reader Test** window.




When pressing the **Test** button, CardExchange® will try to connect with the reader and, if a card is present, it will try to read the **CSN**. If the test succeed and the reader is working and a card is present on the reader, you will have two green lights.

The card type cannot be changed after the definition has been created, as the definition includes all information about the structure of the card memory. When reading the **CSN** from the first four bytes of block 0 of sector 0, the first byte is treated by default as the least significant byte. For example, the byte series 161 198 51 70 is interpreted as 1,177,798,305. This behavior can be changed by checking the option Invert chip serial number in the [Advanced Mappings](#), as explained in [Step 5](#). If checked, the first byte will be treated as the most significant byte and the same byte series will interpreted as 2,714,121,030.

The **MAD settings** group box makes it possible to activate the **MAD**-related functionality. Checking the first check box causes the general-purpose byte of the sector trailer of sector 0 to be read and interpreted. This byte contains information about the **MIFARE® Application Directory**.



Three types of requirements can be defined by clicking on the  button right from the **Requirements** text box:

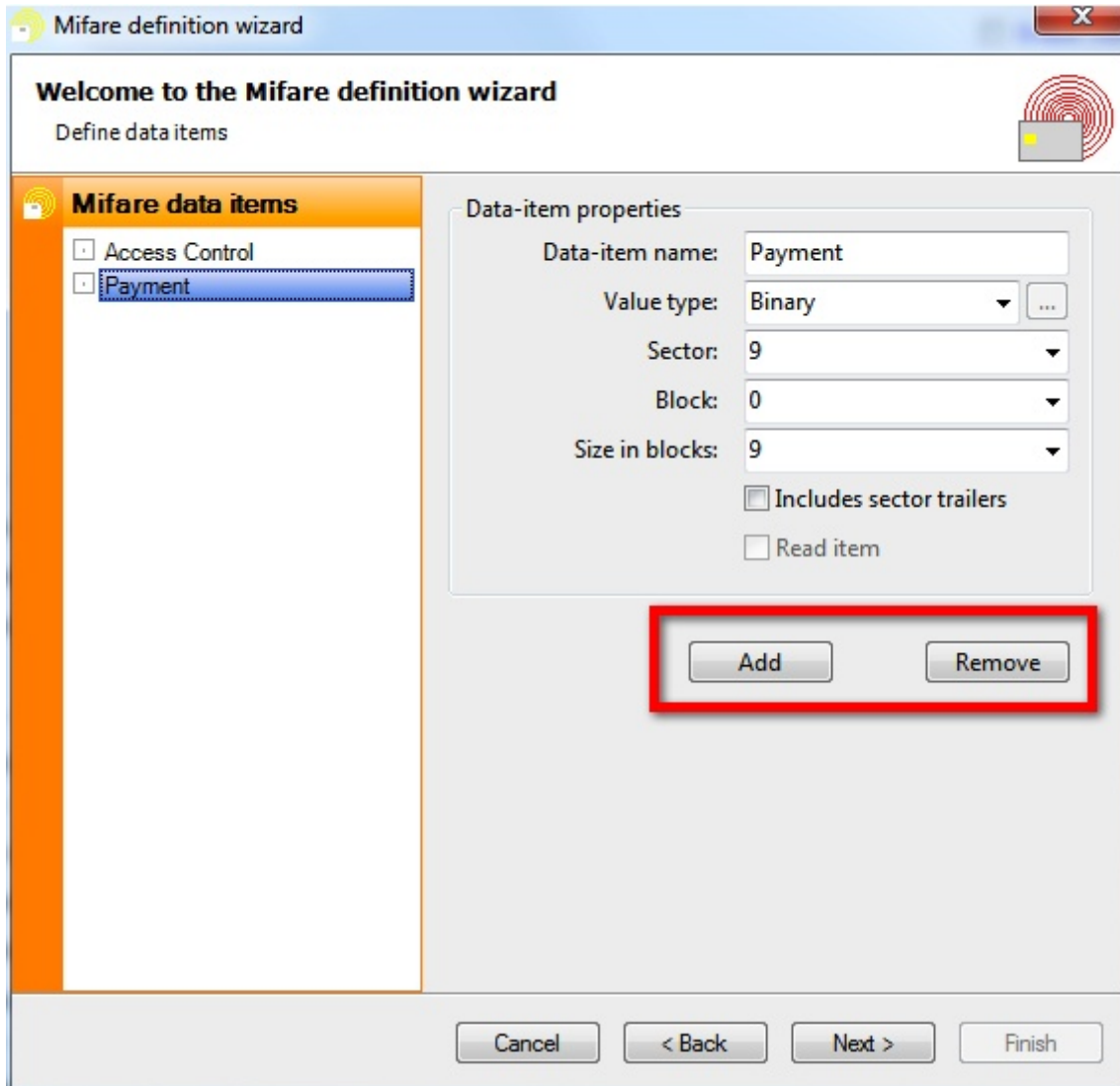
- whether the card has a MAD or not,
- whether the card is a multi- or a monoapplication card,
- and whether the MAD is version 1 (Mifare 1K) or version 2 (Mifare 4K).

The second check box makes it possible to **Activate** or change these MAD properties. If it is checked, the MAD will be **Activated**. The user can choose whether it should be a **multi-application** card or not. The **MAD** version written depends on the card type specified for this definition.

The last check box allows specifying whether the **MAD** should be **read** and **updated** automatically. If the card has a **MAD** or if the **MAD** is activated in the definition and the user does not check this option, he cannot use any **MAD**-related functionality other than setting the general purpose byte of sector 0 and he will have to define a data item to write the correct entries into the **MAD**.

Click **Next** to proceed with the creation of the **Classic Definition** and go to [Step 3](#).

17.1.1.3 Step 3: Define Data Items



The navigator object on the left-hand side of this page shows a list of all **Data Items** that have been defined. **Data Items** can be added and removed by using the respective buttons indicated with the **red rectangle**. By selecting a data item, its properties can be viewed and edited in the **Data-Item Properties** group on the right-hand side.

The **Data Item** name may include any character and can be freely chosen as long as the name is unique. The **Data Item** name is used in the [Advanced Mappings](#) window to uniquely identify the **Data Item**.

The **Value Type** determines which kind of data is **read** from or **written** to the data blocks. The options **Text**, **Binary**, **Hexadecimal**, and **BCD** treat the blocks as **read/write** blocks, whereas the option **Value** treats the blocks as value blocks. In the latter case, the size of the data item cannot be changed and is one by default. In the former case, data items can be an arbitrary number of blocks in size, as long as it does not exceed the size of the memory on the chip. The difference between the first three types is not in the way the data is stored, but in the way the data to be stored is provided.

Text items expect strings and will store the **ASCII** codes of the individual characters. **Binary** items expect binary data to be copied into data blocks. **Hexadecimal** items expect strings that contain the hexadecimal representation of the binary data to be copied into the data blocks. **BCD** items expect integers and will store them as binary coded decimals.

The **Sector** and the **Block** number indicate where on the **MIFARE® Classic** card the first block of data of this item is located. **Data Items** are allowed to span various blocks, but always consist of a whole number of blocks. If a write item does not supply sufficient data for all indicated blocks, the data is supplemented with zeros.

By default, items that span various blocks will skip sector trailers when distributing the data over the subsequent blocks. If for example the item size is four blocks and the item is written to sector 3 block 1, the data will be distributed over sector 3 block 1 and 2 and sector 4 block 0 and 1, skipping the sector trailer of block 3. However, if the information to be written to the sector trailer is contained in the data item, the option Includes sector trailers should be checked to force the data item to include the sector trailers.

Click **Next** to proceed with the creation of the **Classic Definition** and go to [Step 4](#).

17.1.1.4 Step 4: Configure Blocks and Sectors

The navigator object on the left-hand side shows all **blocks** and **sectors** grouped in various ways and in a hierarchical manner. It allows the user to select a single data block, but also entire sectors and groups of sectors. On the right-hand side the settings for the selected sector or group of sectors and the selected **block** or **group of blocks** can be modified, and can be viewed provided that all **sectors** or **blocks** in the group share the same setting. If any modification is done, it will apply to all selected sectors and blocks. For example, if in the above screen shot the access conditions are changed for the data blocks, this setting will apply to all data blocks of sector 10. After that, it is possible to select block 0 of sector 10 and change the access conditions for this block only, without affecting blocks 9 and 11. In general, it is advisable to start a definition with settings shared by many blocks and work down to the exceptions to the general rule.

The first group of settings are defined on the sector level and contain the keys to be used to logon to the sector(s). The keys are entered in hexadecimal format. If the fields do not contain a valid hexadecimal string or contain the wrong key values, processing the definition will result in an error. If one of the keys is not used, it is not necessary to enter

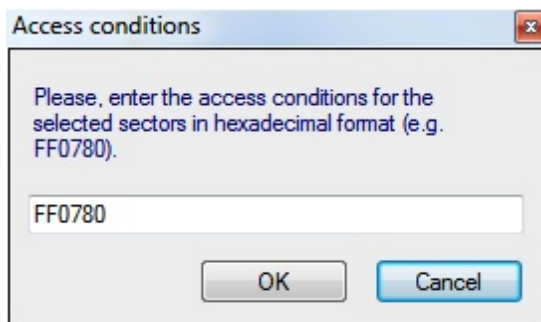
a specific value and the default value **FFFFFFFFFFFF** can be left unchanged. This group also contains a field called **Data AID**, that can only be edited when the selected sectors are referred to by one or more data items and when you are reading and updating the **MAD** automatically. This is the so-called **Application Identifier**, which is defined on a sector level to allow for optimal flexibility. It should be noted, however, that the **Data AID** essentially refers to the data of the **Data Items** defined for that sector and not to the sector itself. CardExchange® might be allowed to **write** application data to another **sector** than specified in the definition.

If one of the selected data blocks is the target of a **Data Item**, it has to be indicated whether the **logon** to the **sectors** of those **blocks** is to be done with **key A** or **key B**. This is a property that can be set for each **block** individually and is therefore found in the second group of settings, which contains all block-level settings.

Between the **sector-level** and the **block-level properties**, a check box allows the user to indicate whether he wants to **modify the sector trailers** of the **selected sectors**. If any of those has a trailer that will be written to by a **Data Item**, this option cannot be selected. Otherwise, the user should provide the necessary information for writing to the sector trailers, which is: the key to be used to **logon** to the sector before writing the sector trailer, the new key values to be written and the **access conditions** for both the data blocks and the sector trailer itself to be written.

The **login key** for the sector trailers, the **new key values** and the **access conditions** for the **sector trailers** are grouped in the third block of settings, which contain all **trailer-level settings**.

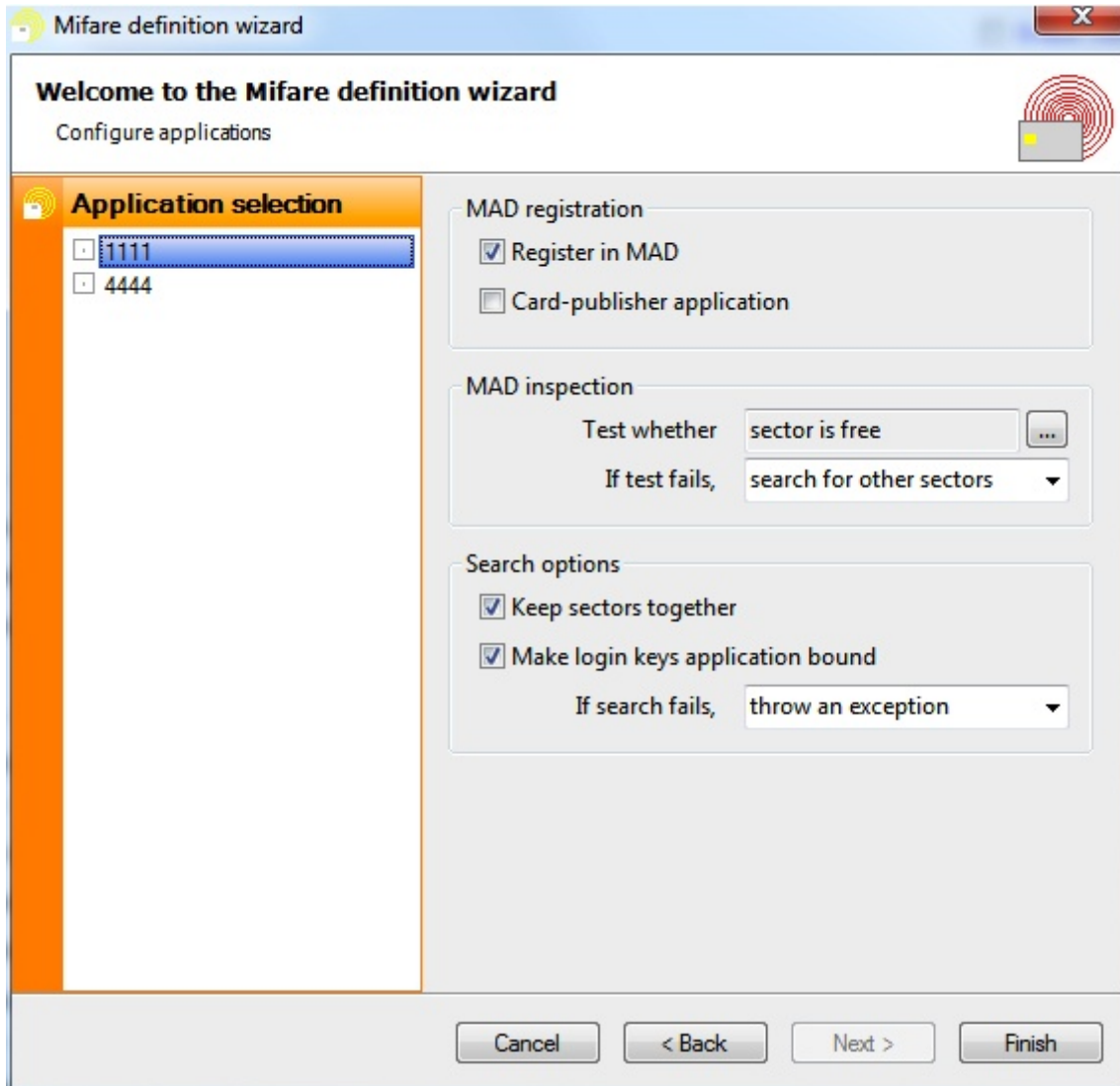
The **access conditions** for the data blocks can be set for each block individually on **MIFARE® Classic 1K**. For **MIFARE® Classic 4K**, the **access conditions** are shared between **five data blocks** and cannot be set for individual blocks. The small buttons right of the combo boxes allow the **access conditions** to be entered in hexadecimal format.



Setting the **access conditions** this way will always affect all blocks of the selected sector, even if only one of those blocks has been selected. A six-digit (three-byte) hexadecimal string that represents a valid set of access conditions should be entered. Byte nine of the sector trailer is not considered to be part of the access conditions and will always be set to zero, except for sector 0 if **MAD** is used.

Click **Next** to proceed with the creation of the **Classic Definition** and go to [Step 5](#).

17.1.1.5 Step 5: Configure Applications

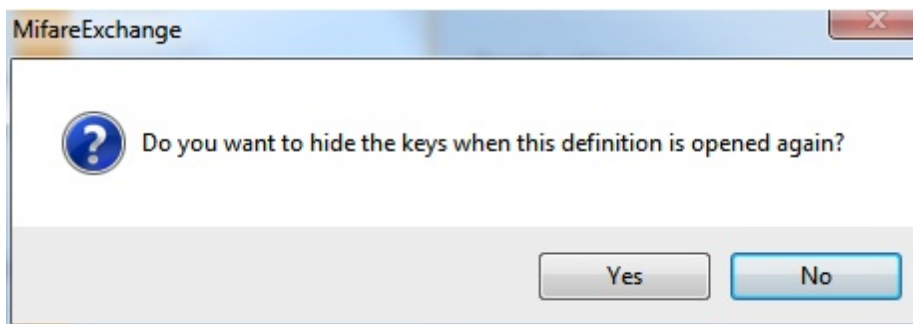


The last wizard page is only visible when **reading** and **updating** the **MAD** automatically. On the left hand side the user can select an **entire application** and then define **application-specific** settings on the right hand side. The first option determines whether the application should be registered in the **MAD**. Registration can be done for both writing and reading applications, although the latter case is somewhat awkward. At most one of the registered applications can be designated as card-publisher application. If this is done, a pointer the first sector of this application is written to the info byte in sector 0 block 1, as specified by the **MIFARE® Classic** protocol. Otherwise, the info byte will not be modified.

For each application, various tests can be performed on the **MAD** before any data item is read or written. If the test fails, the user can choose to **throw an exception**, to **skip this application** or to **search for sectors** that do fulfill the requirements. If the latter option is chosen, the search options in the second block have to be set correctly. If Keep sectors together is checked, CardExchange® will only search for contiguous sectors that fulfill the requirements.

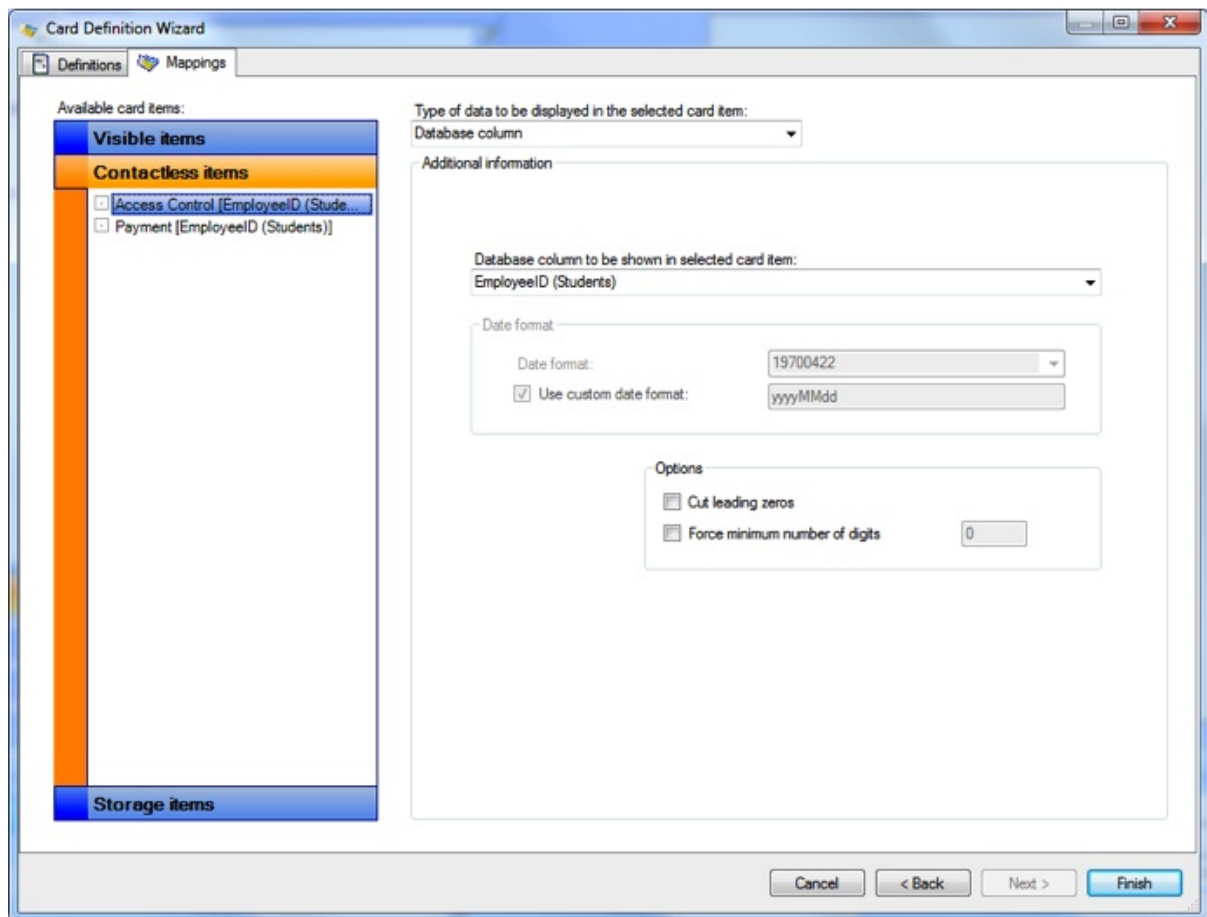
By default, CardExchange® uses the **login keys** that have been defined for the sector to which the application is actually written. In other words, by default, the **login keys** defined in the previous screen are sector bound. Generally, this is the desired behavior when writing data to empty **sectors**, because in that case the keys are known for each sector individually, provided that the **sector** is still free. When reading an application, the **login keys** are usually **application bound**, that is, it is known which keys belong to a the **application**, but it is not known in which sector that application resides. By checking the corresponding check box, the **login keys** can be made **application bound**. Note that the information written to the **sector trailer**, including the new **key values**, is always **application bound**. If an **application** is written to another sector than specified in the definition, the trailer data will also be moved to the alternative sector.

When clicking on **Finish**, the wizard will prompt whether you **want to hide the keys**.

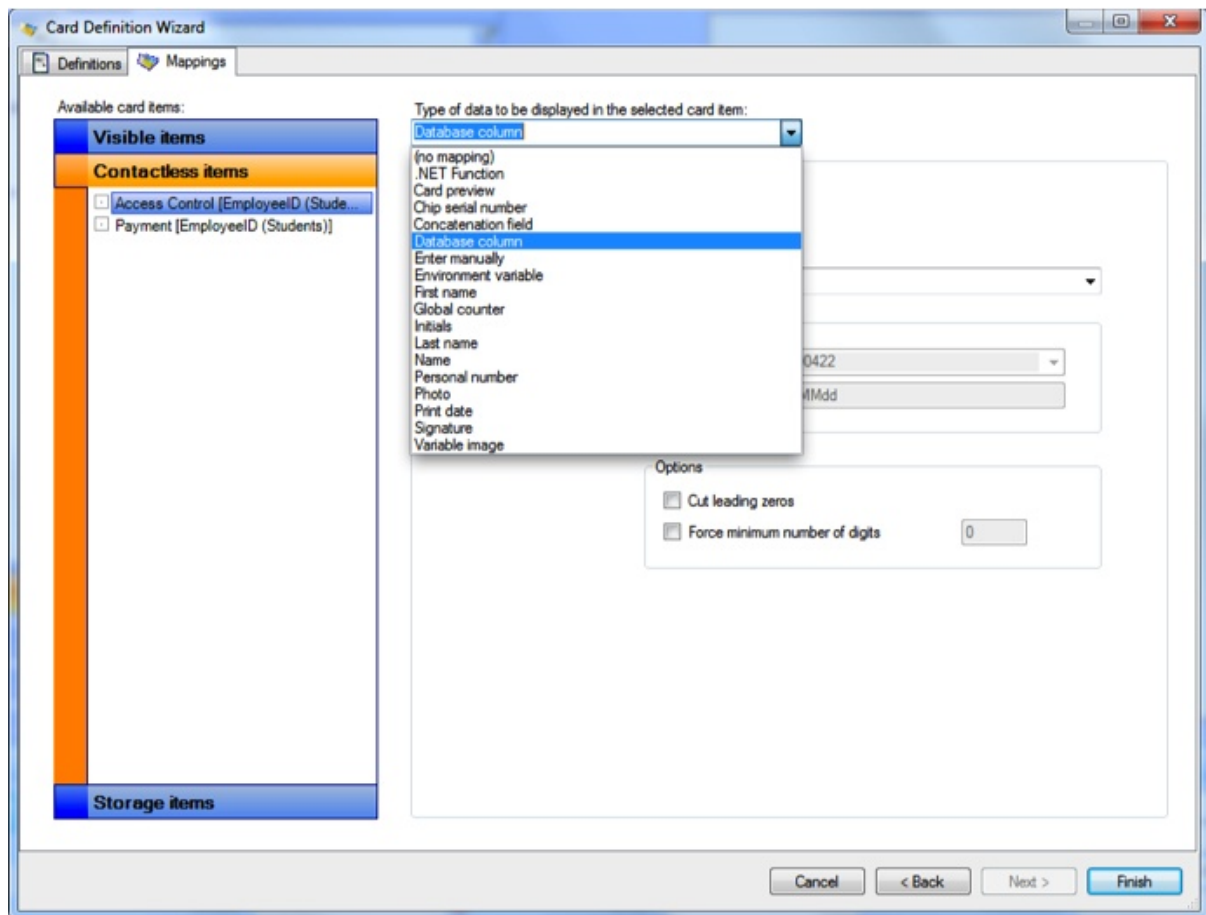


If you click **yes**, **the keys will not be readable anymore the next time you open the wizard**. We recommend waiting with hiding the keys until after finishing the test phase, when you are sure that all keys are correct. Once the keys are hidden, they **CANNOT** be made visible anymore.

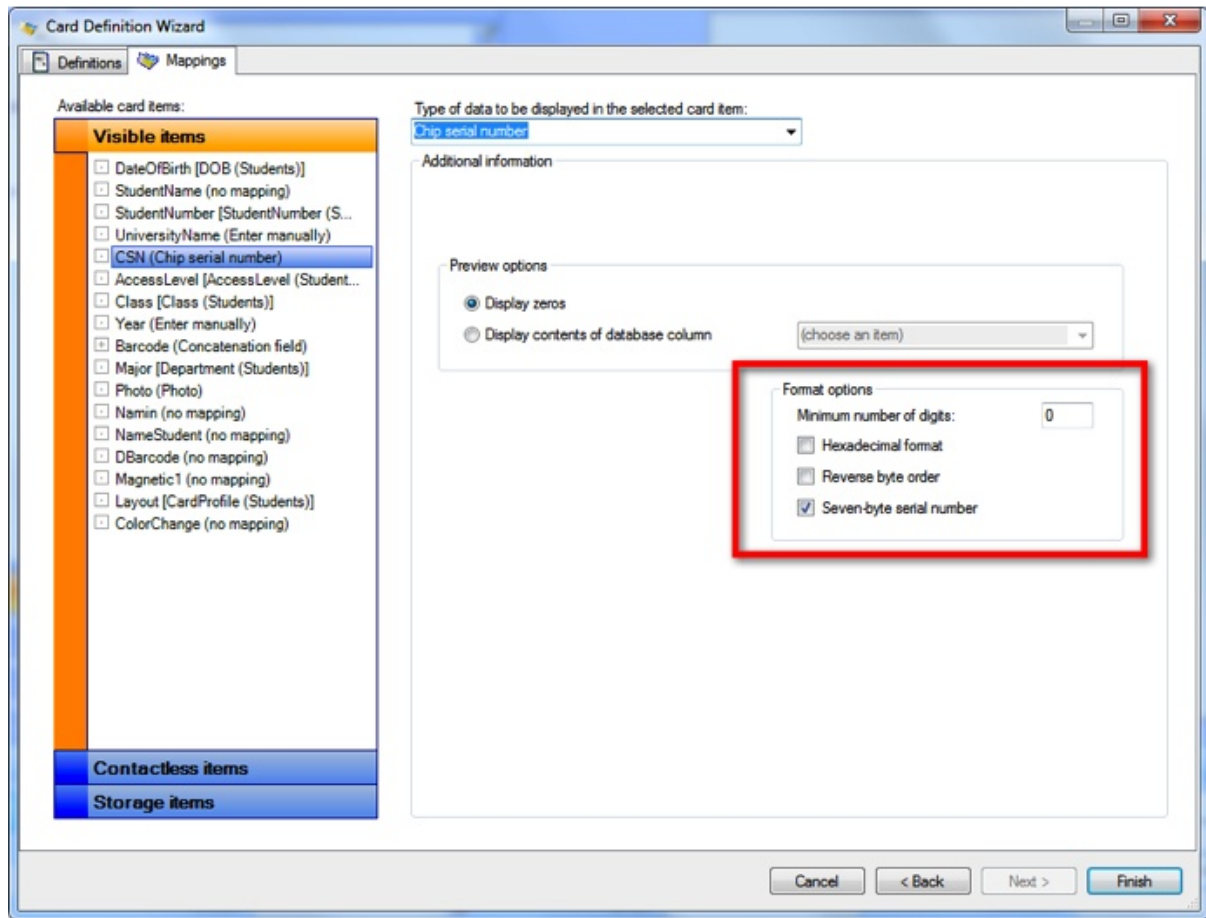
It is still necessary to map the data of the **Data Items** to **database fields**, **card objects**, **storage items**, etc. This can be done in the [Advanced Mappings](#) and we refer you to the corresponding section for more information. Once your **Classic definition** is configured, the **Data Items** will be available in the **card-items navigator** of the mappings window, as shown below:



In the drop-down menu **Type of data to be displayed in the selected card item**, you can now choose the **Database column** as data source.



The created **definition** always contains the possibility to read the CNS, it is possible to map those read items to a text object on the card or to a storage item.



Last but not least, as discussed in [Step 1](#), the CNS can be formatted with a Reversed byte CNS number. When selecting the Chip Serial Number from the drop down menu you will have access to some advanced Format options as indicated with the **red rectangle**. For the CSN you can assign a minimum number of digits, you can set the CSN to Hexadecimal, Reverse the byte order, and set it to Seven-byte serial number.

The last option is there because in the past MIFARE® Classic cards had a four-byte serial number. When they started running out of unique CNS numbers, NXP decided to start supplying Seven-byte serial number.

17.2 MIFARE® DESFire

CardExchange® supports inline encoding and reading of **MIFARE® DESFire** cards. What information should be read or written can be configured by means of the **DESFire Wizard**, which will be the subject of this chapter. For a full understanding of the **DESFire Wizard**, it is essential to have knowledge about the functionality of the MIFARE® DESFire chip. Please, refer to the MIFARE® DESFire documentation published by NXP for more information

Please visit <http://www.nxp.com> for more information.

It is possible that the **DESFire Wizard** does not offer all functionality you need to achieve your goals. For example, you might need functionality of the **DESFire** protocol that is not configurable via the wizard, or special transformations of the database data before they can be written to the chip. For this type of situations, we can offer a solution by means of an [External Plug In](#). Please, contact sales for more information about [External Plug Ins](#).

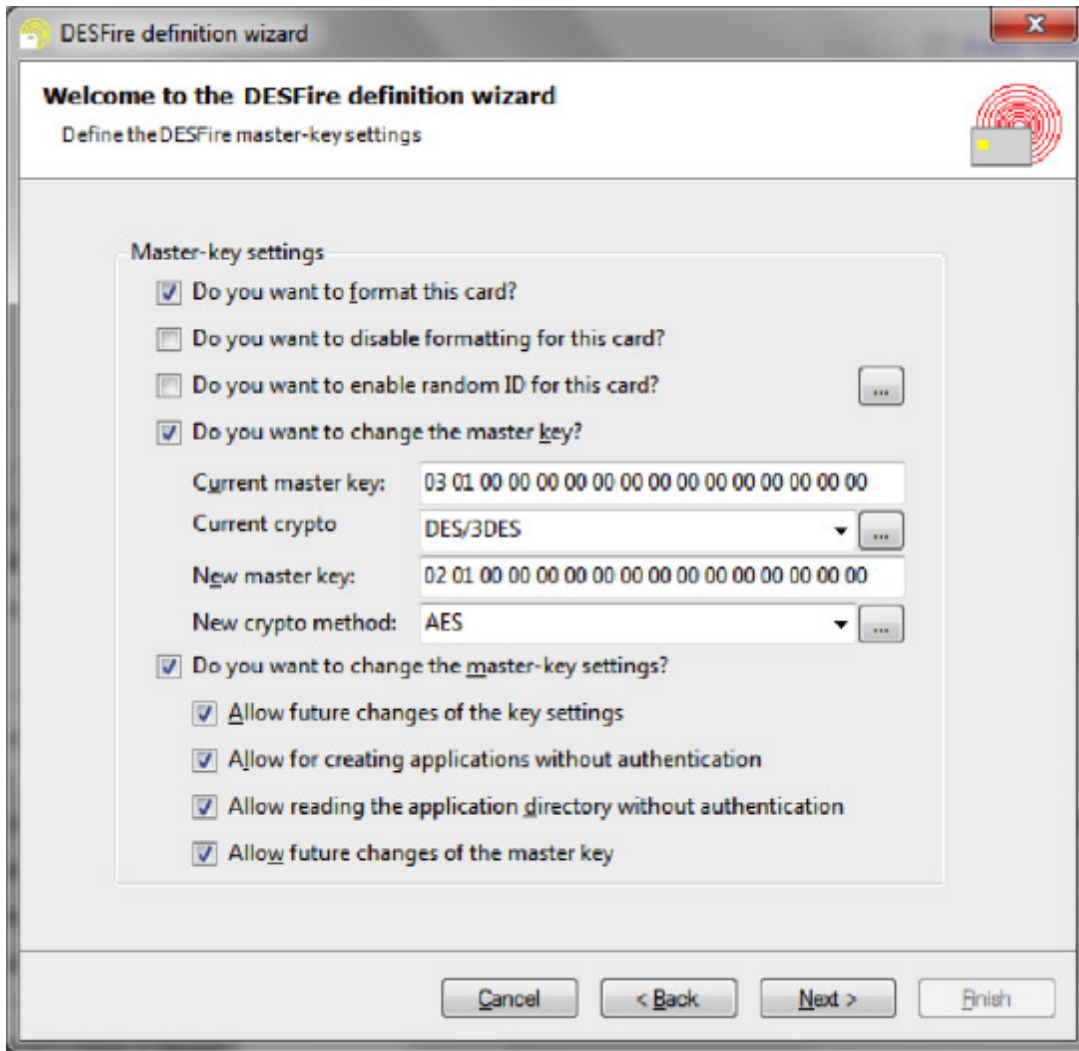
Please, note that currently the following limitations exist with respect to **MIFARE® DESFire** encoding:

- The supported readers are **DigiOn24**, **ProActive** and **OmniKey CardMan 5x21**.
- The supported file types are **Standard data files** and **Value files**.
- **MIFARE® DESFire EV1** is only supported on the **OmniKey CardMan 5x21**.
- **Value files** are only supported on **OmniKey CardMan 5x21**.
- **Key diversification** is only supported for **AES keys**.
- If a **MIFARE® SAM** is used for authentication, this should be a **MIFARE® SAM AV2** and it should be inserted in an **OmniKey CardMan 5x21** reader.

Note: *EV1 refers to the hardware version of the **MIFARE® DESFire** chips.*

Note: ***SAM** stands for **Secure Application Module**. It is a chip on which the **DESFire** keys can be stored in such a way, that nobody involved in the encoding process has access to the actual key values, not even when the **CardExchange®** software or computer would be hacked. **AV2** refers to the hardware version of the **MIFARE® SAM**.*

17.2.1 Read and Write Items



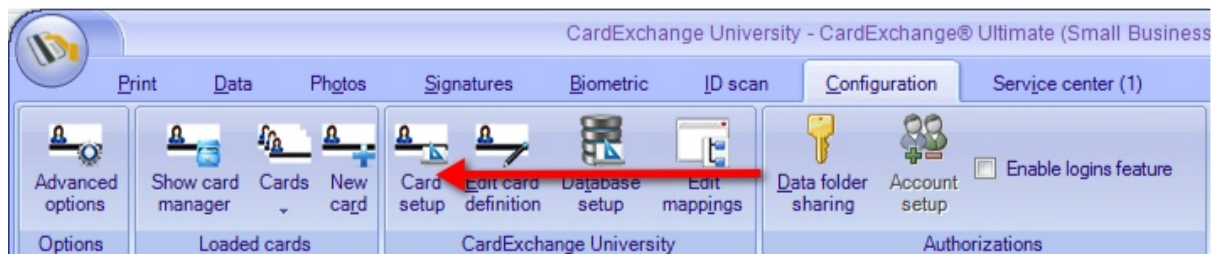
With the **DESFire Wizard** it is possible to define **DESFire read items** and **DESFire write items**. With read items, you can read data from **DESFire** and print it on the card or store it in the database. With write items, you can encode data from the database or other data sources on **DESFire**. Read and write items can be intertwined in a single **DESFire** definition, in which case it is important to realize the order of the different actions that make up the print process.

- Execute [External Plug Ins](#) with the evaluation moment '**Before moving the card into the printer**'.
- **Move** the card into encoding position.
- Execute [External Plug Ins](#) with the evaluation moment '**Before reading from MIFARE®**'.
- **Read** data from the **MIFARE®**.

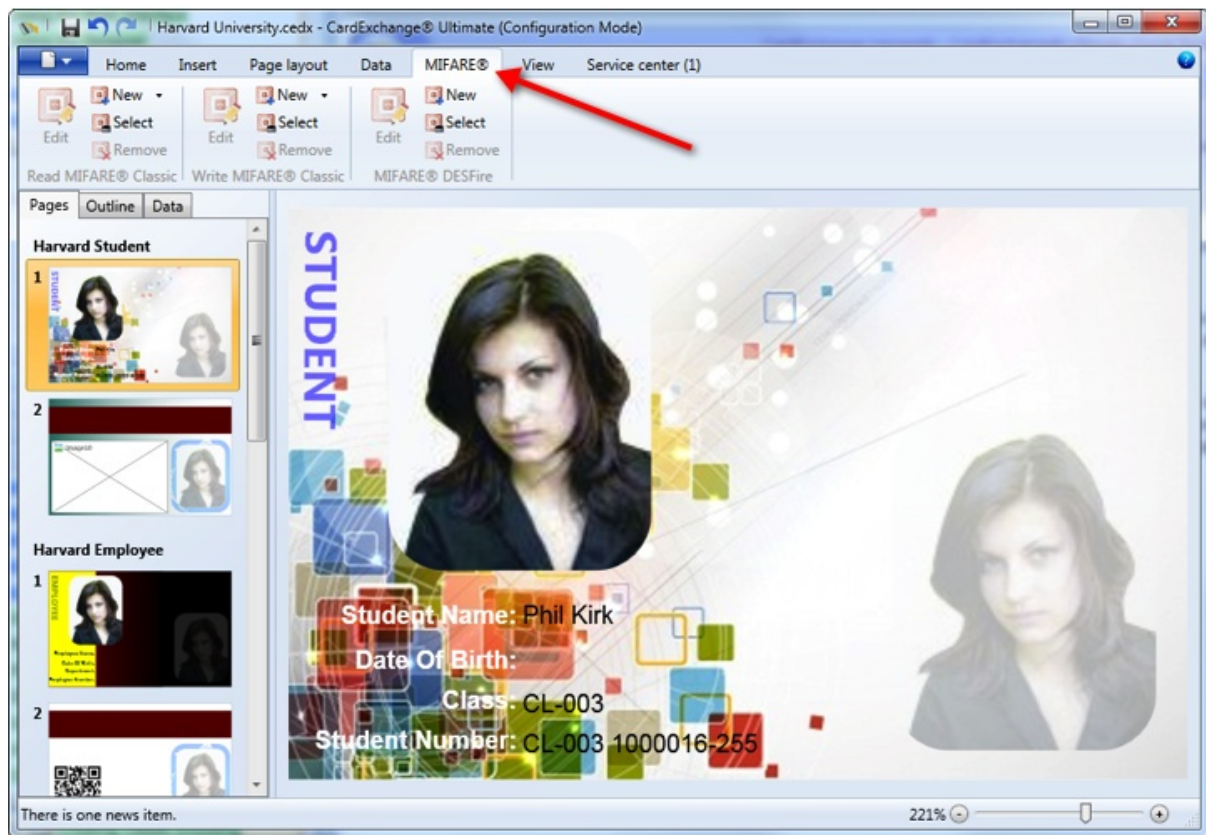
- Execute [External Plug Ins](#) with the evaluation moment '**Before writing to MIFARE®**'.
- **Write** data to **MIFARE®**.
- Execute [External Plug Ins](#) with the evaluation moment '**After reading/writing to MIFARE®**'.
- **Print** the card.
- Execute [External Plug Ins](#) with the evaluation moment '**After printing the card**'.
- **Write** data to the database ([Storage Items](#)).
- Execute [External Plug Ins](#) with the evaluation moment '**Before writing to the database**'.

It is possible to read data from the chip, manipulate it with an [External Plug In](#) and write it back to the chip.

17.2.2 Creating DESFire Encoding



To encode MIFARE® DESFire encoding we have to set the system up for this. Encoding is setup via the Designer so click on **Card Setup** to start the Designer.



Click on New, as indicated with the red arrow to start the MIFARE® DESFire Setup Wizard and follow the steps as described in the sub sections of this topic.

17.2.2.1 Step 1: Define Reader Settings

DESFire definition wizard

Welcome to the DESFire definition wizard
Define the DESFire reader settings

Reader settings

Reader type: OMNIKEY CardMan 5x21-CL 0 with SAM

Serial port: 1

Baud rate: 0

Test

SAM settings

Does the SAM AV2 module require host authentication?

Key number: 1

Key version: 1

Key value: 5E 55 58 75 44 97 30 F5 BC 01 CC 80 F8 64 9C E5

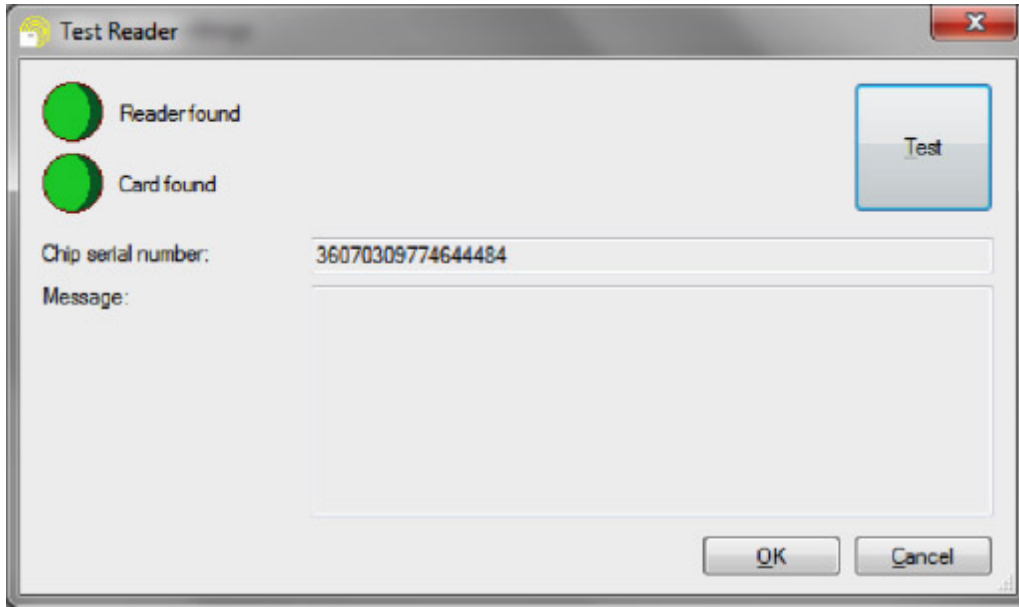
Cancel < Back Next > Finish

The first wizard page allows for choosing the contactless reader and setting the **SAM-authentication** settings in case a **Secure Authentication Module** is used. Use the **Reader type** drop down menu to select the contactless reader you want to use for reading/writing the DESFire card.

CardExchange® supports the **DigiOn24**, **ProActive** and **OmniKey** CardMan 5x21 contactless readers. The **OmniKey** readers are only shown in the menu, if they have been connected to the system and are accessible by CardExchange®. The contactless readers "with **SAM**" are only listed if an **OmniKey** CardMan 5x21 reader is attached to the system and a **MIFARE® SAM AV2** card is inserted in the contact slot of the reader.

For **DigiOn24** readers, it is necessary to specify the **Serial port** to which the reader is connected and the **Baud rate** at which the reader operates. For **ProActive** readers, you can either specify the correct serial port, or set the serial port to zero in order to have the CardExchange® search for the first available ProActive reader.

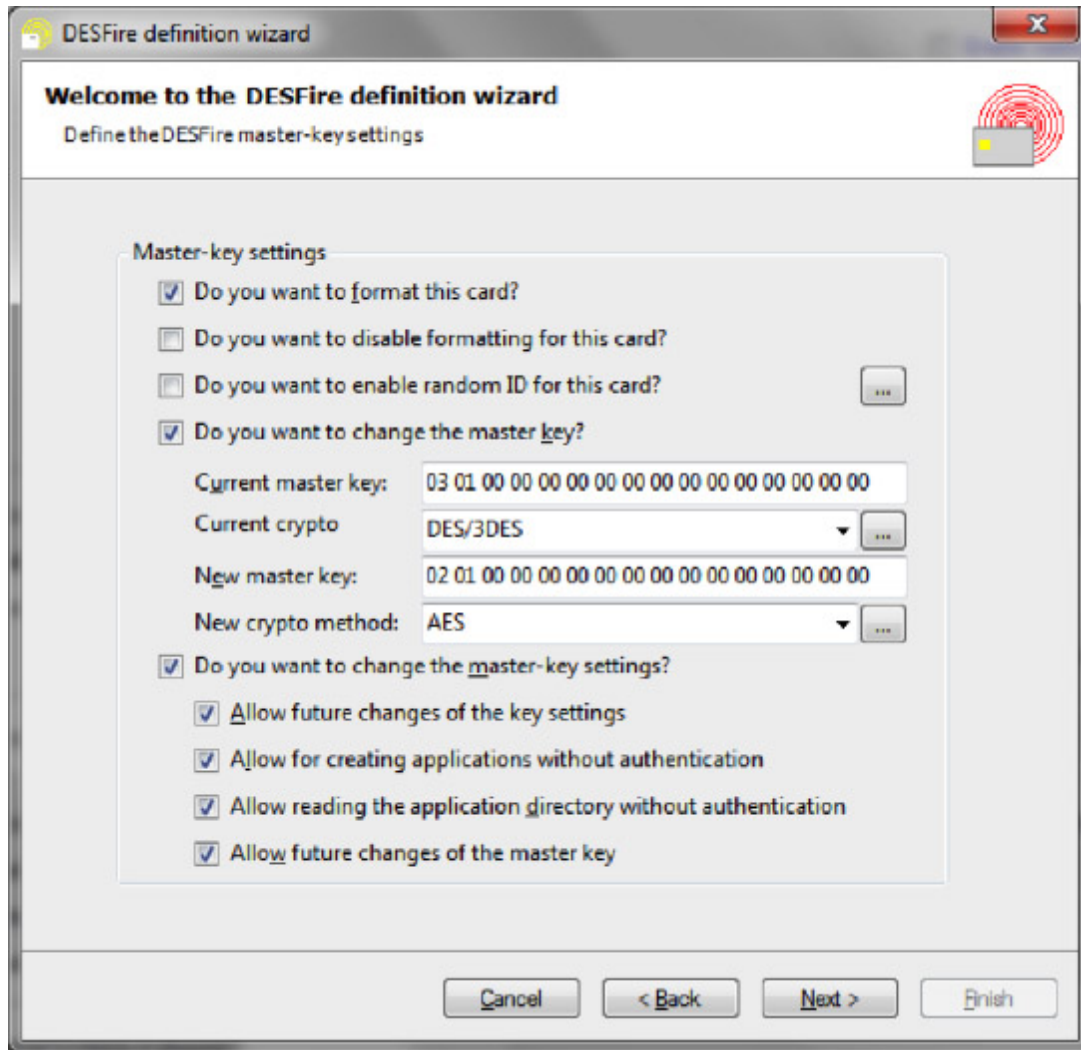
You can use the **Test** button to check whether the reader is operational and whether it recognizes a card placed on the reader. In case the card is recognized correctly, the chip serial number or unique identifier (UID) will be shown (see screen shot below). Otherwise, an error message will be shown in the **Message** box.



In case you have selected a reader "with SAM", you have to specify whether the SAM requires host authentication (**Does the SAM AV2 module require host authentication?**). If so, specify the correct **Key number**, **Key version** and **Key value** of the hos-authentication key on the SAM. The key value should be a 16-byte hexadecimal string, with optional spaces between successive bytes, as in the above screen shot.

Click **Next** to proceed with the creation of the **DESFire Definition** and go to [Step 2](#).

17.2.2.2 Step 2: Define Master Key Settings




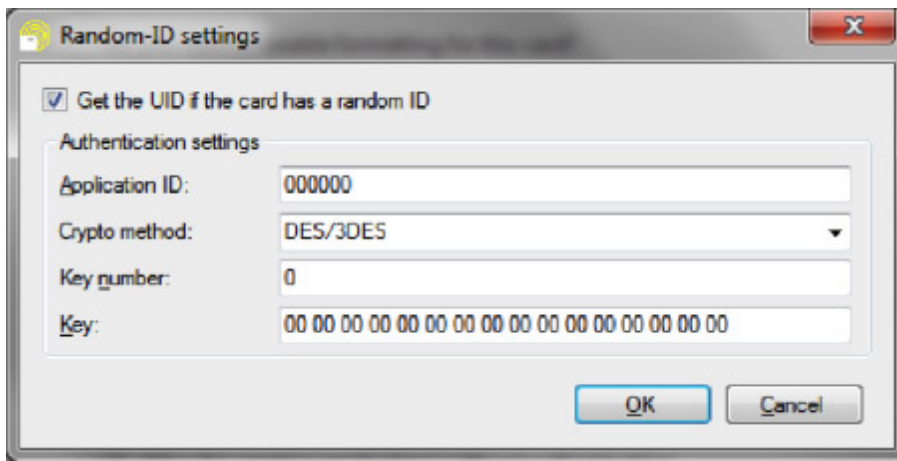
This wizard page allows for defining **PICC-level** settings. The **acronym PICC** refers to **Proximity Integrated Circuit Chip** and is used to designate the entire chip, in contrast to specific files of applications on the chip. Enabling the option **Do you want to format this card?** (*only available on DESFire EV1*) will remove all files and applications from the card before starting the encoding. It does not reset the **PICC master key** and **key settings**. Formatting the card is only possible if you know the **PICC master key** and if the **PICC master-key** settings allow this operation. The option is mainly meant for reusing cards in a test situation.

Please, note that formatting the card does not recover the memory space used by the files and applications. Repeatedly formatting a card will end up in exhausting the available memory space.

The option **Do you want to disable formatting for this card?** (*only available on DESFire EV1*) disables the possibility to format the card in the future irreversibly.

The option **Do you want to enable random ID for this card?** (only available on *DESFire EV1*) offers an extra security layer for the card. It makes sure that in the future, the chip serial number or **UID** of the card can only be read after a successful authentication with either the **PICC master key** or one of the application keys. Once this option is set, selecting the card will return a random **4-byte UID**, instead of the real **7-byte UID**.

Special care has to be taken when reading cards that have the **Random ID** already enabled. If you want to store the **DESFire UID** in the database or use it for key diversification, you need instruct CardExchange® to perform an authentication and retrieve the **Real UID**. This can be done with the  button next to the **Random-ID** option. It will open the following dialog box and allows you to specify the **key** and **key value** to be used for **authentication**. This key should **not be diversified**, as **diversified** keys can only be calculated when the real **DESFire UID** is known.



When selecting the option **Do you want to change the master key?**, CardExchange® will change the **PICC master key** after encoding all files and applications, but before changing the **PICC master-key** settings. The new **master key**, as well as the **key's crypto method**, will need to be specified. Without this option, only the current master key and its crypto methods need to be specified.


When selecting the option **Do you want to change the master-key settings?**, CardExchange® will change the PICC master-key settings as specified, after optionally changing the master key. Both for changing the master key and the master-key settings, it is necessary that the original master-key settings allow for such a change.

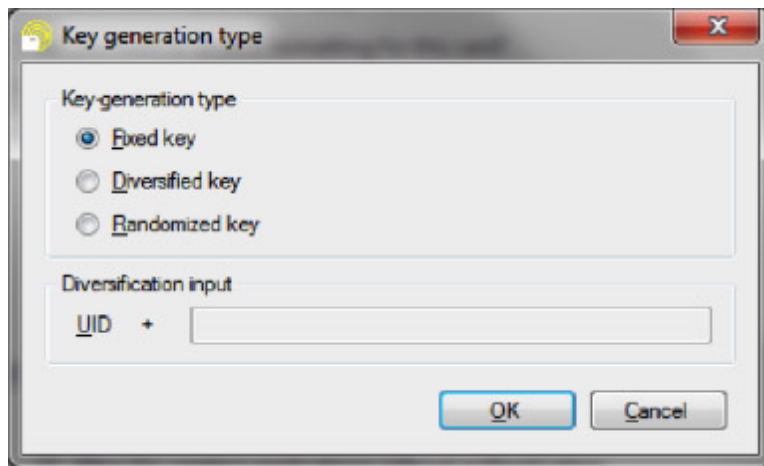
Click **Next** to proceed with the creation of the **DESFire Definition** and go to [Step 3](#).

17.2.2.2.1 Specifying Key Values

Each **key value** is entered as a **16-byte hexadecimal string** with optional spaces between successive bytes, except when choosing the **3K3DES** (*three-key triple DES*) encryption method, in which case the key has **24 bytes**. The crypto methods **3K3DES** and **AES** are only available for **DESFire EV1**. Note that **AES** is the recommended crypto method, as it complies with the internationally recognized security standards. **3K3DES** is

known to give technical problems with the **OmniKey** CardMan 5x21 readers and is **NOT** recommended.

By the default, the key specified in the key-value text boxes are the **DESFire keys** themselves. However, CardExchange® offers the possibility to use **diversified** or **randomized keys**. Next to the **crypto-method** drop-down menu, a  button allows for choosing between these options.



Diversified keys are a protocol in which the actual DESFire keys are different on all cards, thus offering an extra security layer. The actual keys can be calculated by using a master key and a diversification input. The diversification input contains the card's UID, which ensures that the results of the calculations are different for every card. When diversified keys are enabled, CardExchange® expects you to specify the diversification master key, rather than the DESFire key itself.

In case of diversified keys, it is necessary to specify the diversification input. The diversification input always starts with the DESFire UID and can be followed by any data the user desires (like the application AID and/or the key number). Note that key diversification has only been implemented for AES keys and follow the application note AN10922 published by NXP. In this document the byte 0x01 that precedes the diversification input is not considered part of the diversification input, but it is important to realize that CardExchange® does actually add this byte to construct the CMAC input parameter D.

When **randomized keys** are enabled, CardExchange® will use a random key value rather than the one you typed. This option should only be used for new keys, as the result will never coincide with an existing key, and you should only use it if you are sure that you never want to use that key again. It is a way to lock the possibility to make certain changes to the card, in addition to the key settings.

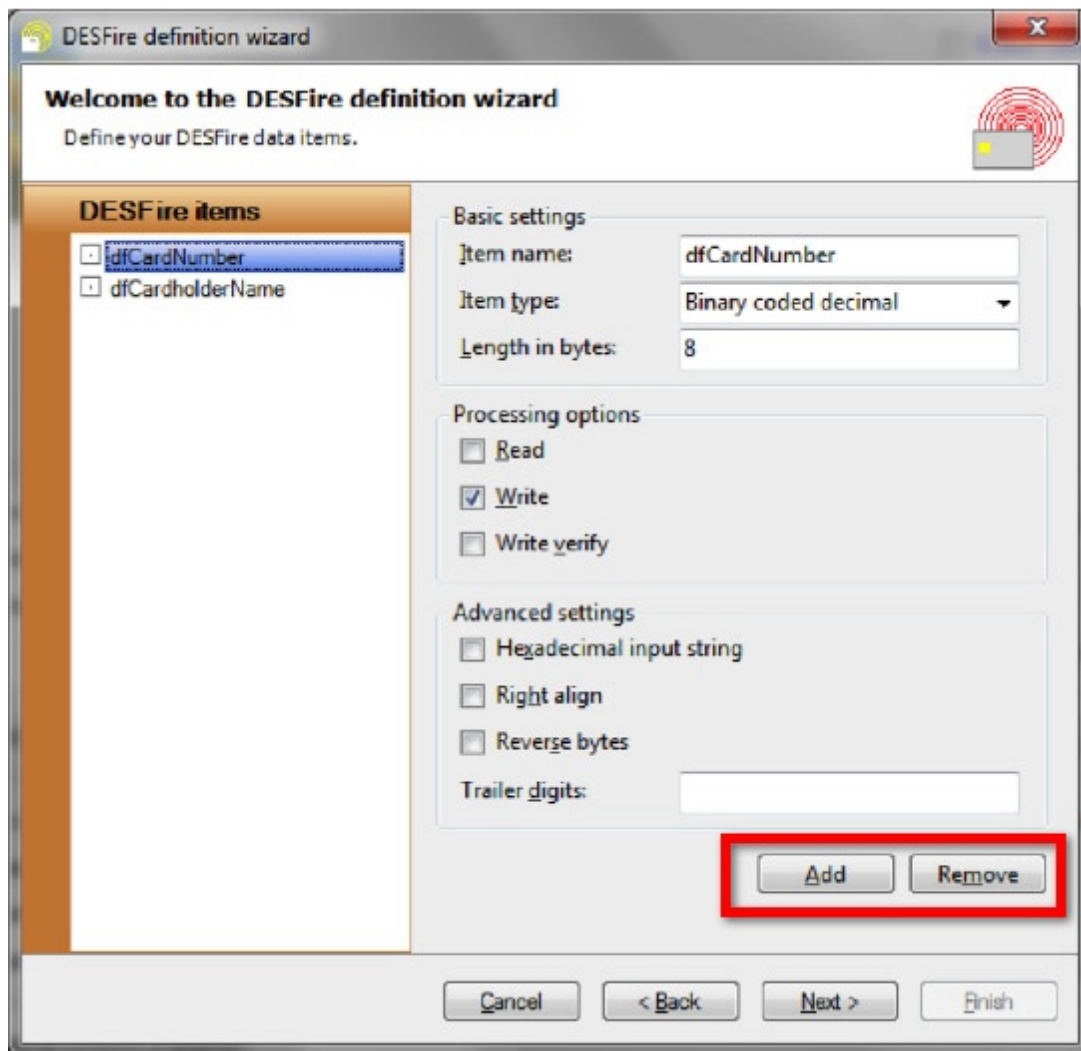
Using the **MIFARE® SAM AV2** secure application module is another case in which you will not supply the real DESFire keys either. Instead, you will need to use the key-value box to supply encoded instructions about how to authenticate with the SAM. You have to specify the following information:

- Byte 0 contains either the SAM key number or the application key number.
- Byte 1 contains the key version.
- Byte 2 contains the authentication mode, which can have the following values (other options are not supported by the DESFire-definition wizard):
 - 0 when the key is not diversified and byte 0 contains the SAM key number.
 - 2 when the key is not diversified and byte 0 contains the application key number.

Key diversification can be used in combination with the SAM AV2 module. CardExchange® will always use the MIFARE® SAM AV2 mode diversification and set the corresponding bits of the authentication mode automatically.

17.2.2.3 Step 3: Defining Data Items

All data transfers between DESFire files and CardExchange® is done through DESFire items. A DESFire item is considered to be a meaningful piece of data that is readily available in the database (in case of write items) or can be printed or stored in the database without further transformations (in the case of read items). DESFire items can combine data of several DESFire files into a single value, whereas multiple DESFire items can be stored in a single DESFire file. DESFire items can convert data back and forth between binary and other representations of the data, like ASCII text, integer values, binary coded decimals and hexadecimal strings. The possibility to define DESFire items makes the DESFire-definition wizard particularly flexible.



With the **Add** and **Remove** buttons DESFire items, indicated with the **red rectangle**, can be added and removed. There is no other limit with respect to the number of items you define than the amount of memory available on the **DESFire chip**.

Each item is characterized by an **Item Name**, which can be any text string that explains the meaning of the data.

The **Item Type** determines what data transformations are performed between the **binary data** in the **DESFire files** and the **External Data** mapped to the **DESFire items**. These are the available options, with an explanation of the data transformations in case the **DESFire item** is a write item:

Text The input data is *ABC becomes 41 42 43 00 00 00 00 ...*
 interpreted as ASCII
 encoded text and
 the ASCII values

are stored in the
DESFire file.

Binary The input data must
be binary data and
will be encoded as
such in the DESFire
file, without any
data transformation.

Hexadecimal The input data is *412143 becomes 41 42 43 00 00 00 00 ...*
decimal interpreted as a
hexadecimal string
and can only
contain the
hexadecimal
characters and
spaces. The input
data will be
transformed to
binary data byte per
byte.

Binary integer The input data is an *414243 becomes 23 52 06 00 00 00 00 ...*
eight-byte integer
(or smaller) that will
be encoded in a
binary fashion with
the least significant
byte first.

Binary coded decimal The input data in an *414243 becomes 41 42 43 00 00 00 00 ...*
eight-byte integer
(or smaller) that will
be encoded as BCD
with the most
significant digit first.

ASCII coded decimal The input data in an *414243 -> becomes 34 31 34 32 34 33 00 ...*
eight-byte integer
(or smaller) that will
be encoded as
ASCII text with the
most significant
digit first.

For all representations, the data is padded with **zero bytes** if the size of the data item is
bigger than the amount of data presented. On the other hand, if more data is presented

than what fits in the data item, the data is silently truncated. This will not cause any error message. In general, CardExchange® is very flexible with respect to discrepancies between the presented data and the item type. For example, if you present binary data to a data item, the data will be encoded as such, no matter whether you selected the binary item type or not. On the other hand, if you present text data to one of the integer item types, it will try to convert that text to an integer. Exceptions will only be thrown if CardExchange® does not succeed in doing a silent conversion.

The **size of the data item** is specified by means of the **length in bytes**. Be aware that integers are limited to eight bytes in size, so for any data that exceeds this size, the data representation should be **text**, **binary** or **hexadecimal**. If needed, an [External Plug In](#) can be used to transform database data to a representation that can be handled by the **DESFire wizard**.

The **Processing options** determine whether a **DESFire item** is a **read** or a **write** item. For **write** items, it is possible to perform a **write verify** to ensure that the data is really encoded onto the **DESFire chip**. It is possible that a single item is both a **read** and a **write** item. In that case the item is first read and then written. This makes only sense if a [External Plug In](#) performs some data manipulation in between the **read** and the **write** actions.

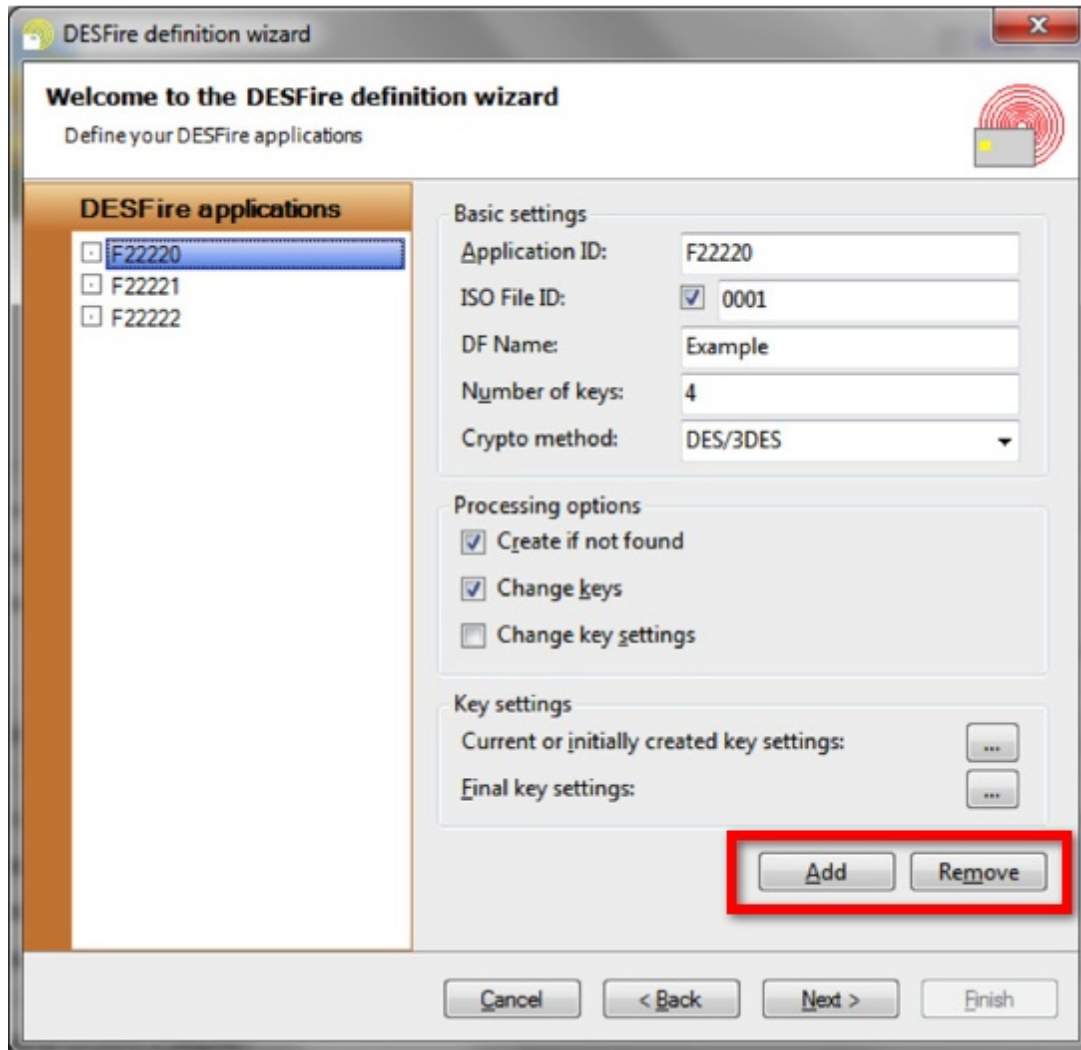
There are a number of **Advanced settings**, whose availability depends on the chosen item type.

- The option **Hexadecimal input strings** is only available for binary integers, binary coded decimals and ASCII coded decimals. If this option is selected, the input data will be considered as hexadecimal data instead of decimal data. So, if the presented data to a binary integer is for example 16, CardExchange® will interpret this as the decimal value 22 and encode it as 16 00 00 00 ...
- **Right align** is available for all item types. When selected items will be preceded with zero bytes, rather than padded, to make the data fit in the item. For example, if the item size is 5, 'ABC' will be converted to 00 00 41 42 43.
- **Reverse bytes** reverses the order of all bytes in a data item. For example, if the item size is 5 and right align is not selected, 'ABC' will be converted to 00 00 43 42 41.

If the selected item type is a **binary** or **ASCII coded decimal**, the option **Trailer digits** specifies what **hexadecimal** digits should be encoded after the actual data. For example, if the number 414243 is presented to a **BCD**-item and the Trailer digits are set to **'FFF'**, CardExchange® will encode **41 42 43 FF F0 00 ...** In practice, **binary** or **ASCII coded decimals** should either have a fixed length, be right aligned or have a non-decimal trailer digit.

Click **Next** to proceed with the creation of the **DESFire Definition** and go to [Step 4](#).

17.2.2.4 Step 4: Define Your Applications



This page allows for defining which applications should be created or already exist on the DESFire card.

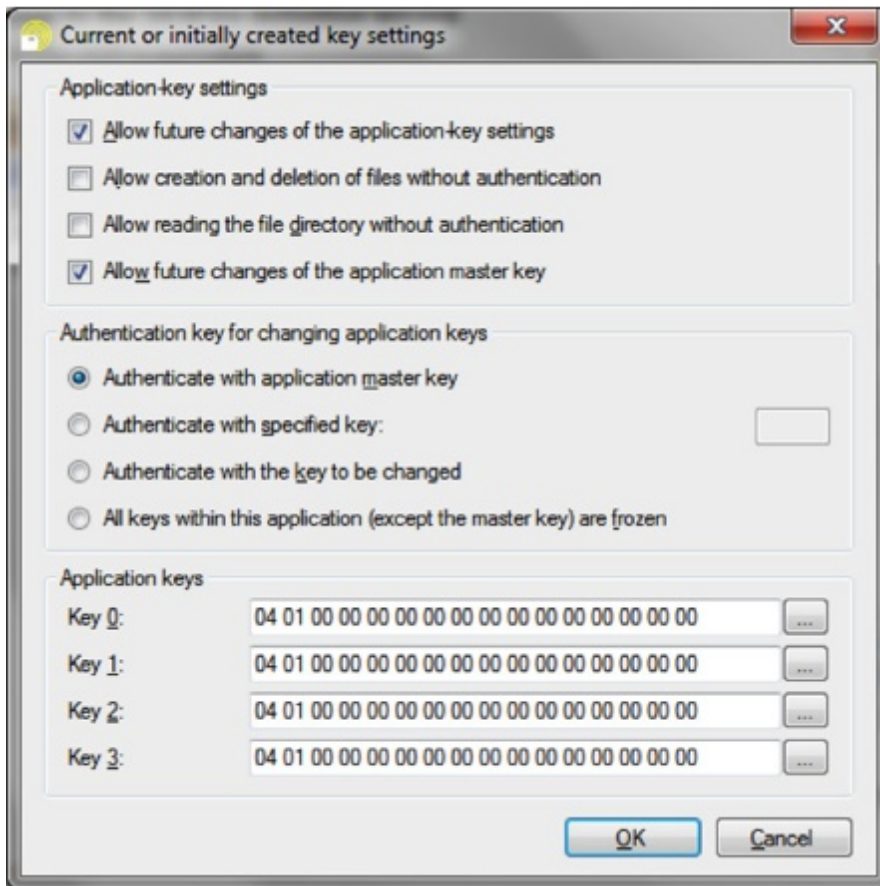
DESFire Applications can be added and removed with the **Add** and **Remove** buttons indicated with the **red rectangle**. They are characterized by their **Application ID**, which is a six-digit (three-byte) hexadecimal string. For DESFire EV1 cards, it is possible to specify an **ISO file ID** (two hexadecimal digits) and a **DF name** (maximum sixteen characters text). The latter two properties are not used by CardExchange when reading applications, but they can be encoded to be compliant with ISO standards. Finally, you need to specify the **Number of keys** to be defined for this application and the **Cryptographic method** (DES-triple DES, three-key triple DES or AES).

With regard to the **DF Name**, there is a hidden option in case you want to use a DF name that does not consist of readable ASCII text. In that case, it is possible to specify the DF name with a hexadecimal string. To indicate that you are using this option, you should

start the DF name with &H or 0x, followed by the hexadecimal string.

The **Processing options** allow for specifying whether an application should be created if it does not exist on the DESFire chip yet, **Create if not found**, which is normally checked for DESFire definitions with write items that operate on blank cards. When an application is created, all its keys are set to zero and it will be necessary to check **Change keys** in order to set the keys to the desired values. Normally, applications can be created with the desired final key settings, but sometimes, these key settings are too restrictive. In practice, you only need to use the option **Change key settings** if the application master key needs to be set to a non-zero value and you do not want to allow future changes of the application master key. In that case, you create the application allowing future changes of the master key, then change the master key, and then change the key settings to not allowing future changes of the master key.

The initial and final keys and key settings can be set by clicking the respective button with three dots. The **Current or initially created key settings** should contain zero keys for new applications and the actual keys for existing applications, as far as these are known and needed. When creating a new application, the initial key settings should be selected such, that the configured actions in the DESFire wizard can be executed. That means that you should not restrict future changes of the master key if you still need to change the master key. For existing applications, CardExchange® will try to read the current key settings from the card and only use the selected ones if that fails or is not allowed.



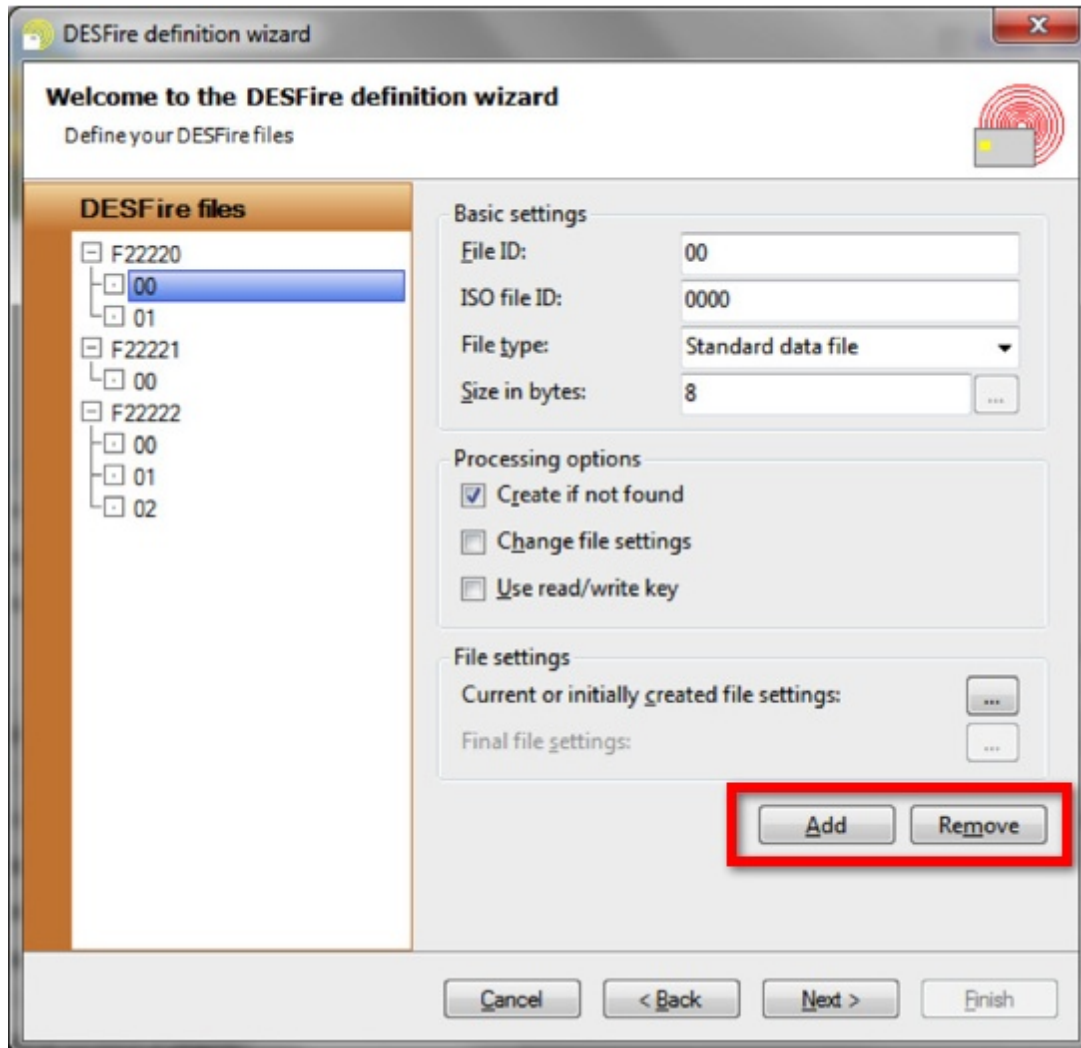
The **Final key settings** window is exactly the same, with the only difference that now you specify the desired keys and key settings after writing the application and changing the keys.

Note: *it is not common to create applications, change keys or change key settings, if a DESFire definition only contains read items.*

Note: *key values can be diversified, randomized or be read from a MIFARE® SAM AV2. This is configured in the same way as already described for the PICC master key, as can be seen the section **Specifying key values** above.*

Click **Next** to proceed with the creation of the **DESFire Definition** and go to [Step 5](#).

17.2.2.5 Step 5: Define Your Files



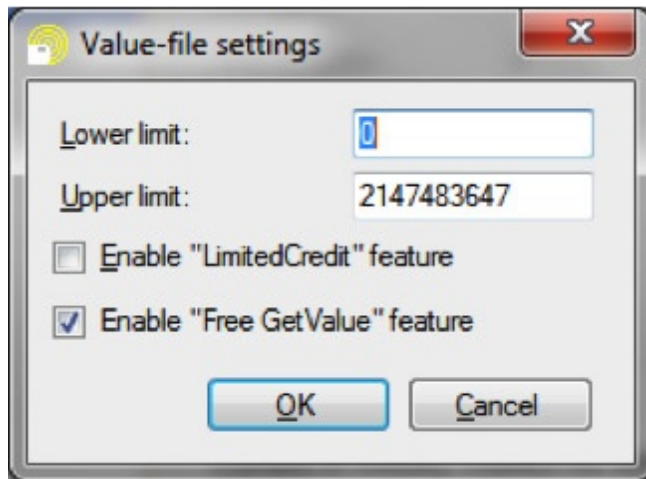
On this page of the wizard you will define for each application which file should be created, read and/or written. They can be added and removed with the **Add** and **Remove** buttons, as indicated with the **red rectangle**, and are characterized by a **File ID** (a one-byte hexadecimal value) and optionally an **ISO File ID** (a two-byte hexadecimal value, EV1 only).

CardExchange supports two file types:

- **Standard data files**, which contain an arbitrary amount of bytes in an arbitrary format, and
- **Value files**, which contain a four-byte integer value.

Currently, **value files** are only supported for **OmniKey** CardMan 5x21 readers, but that might change in the future. The length of a standard data file must be specified (**Size in bytes**). The length of a **value file** is always four, but for a value file, other settings are

configurable by clicking on the  button.



The most common application of a value file is the **MAD-3** standard, which requires that application **FFFFFF** file 01 is a value file that contains the value 3. The above screen shot reflect the settings that the MAD-3 file requires. Especially, the **Free GetValue** feature needs to be enabled for **MAD 3**.

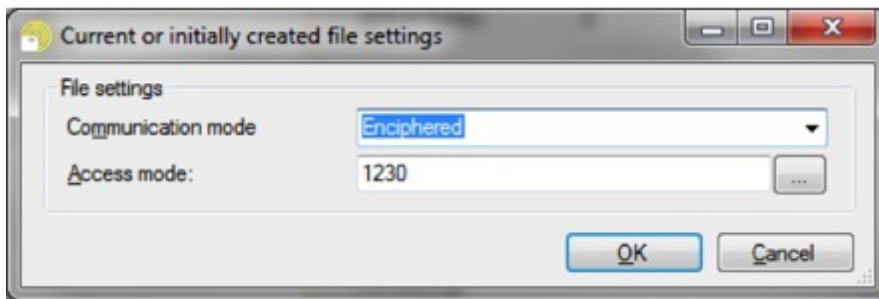
An important difference between standard **data files** and **value files** is that it is possible to write data to existing standard **data files**. Any data you map to a value file will only be written if the file is created, and will be neglected if the file already exists on the **DESFire chip**.

There are three **Processing options**:

- **Create if not found** makes sure that the file is created if it does not exist yet, and is normally checked when writing data to newly created applications.
- **Change file setting** makes it possible to change the file settings after writing the data to it. For **value files**, this option will normally not be needed, as you cannot write data and you can create the file directly with the correct final file settings. For standard data files, it might be necessary to have the initial file settings less restrictive than the final file settings, for example if the final file settings forbid writing data to the file.
- The **DESFire** file settings allow for defining a read key, a write key and a read/write key, which might be the same key, but they can also be different. If the read/write key is different from the read or write key, CardExchange will use the read or write key by default for authentication. In rare cases, it might be possible that you need to write to or read from existing applications while only knowing the read/write key. In that case, select the option **Use read/write key** to ensure that CardExchange® uses the read/write key.

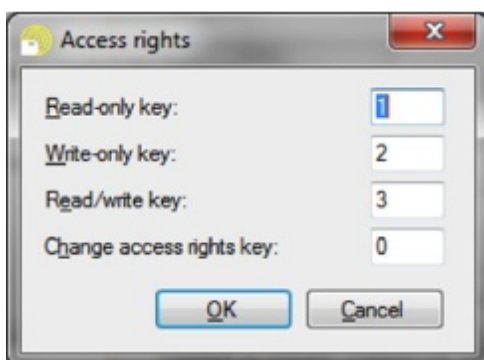
In the **File settings** section, you can specify the **current or initially created file settings**. For new files, CardExchange® will create the file with these settings. For

existing files, CardExchange® will try to read the file settings from the chip, but if that is not possible, it will assume that the specified current file settings apply.



Two file settings need to be defined: the **Communication mode** and the **Access mode**. The **Communication mode** is either **Plain**, **Maced** or **Enciphered** (do not use the option **Plain2**). Please, refer to the **DESFire** documentation for more information about this option. Effectively, Plain means that the data in the file is freely accessible, Maced means that the data is not encrypted, but that it is digitally signed and only accessible after a valid authentication. Enciphered means that the data is fully encrypted and that authentication with the correct key is required to decrypt the data.

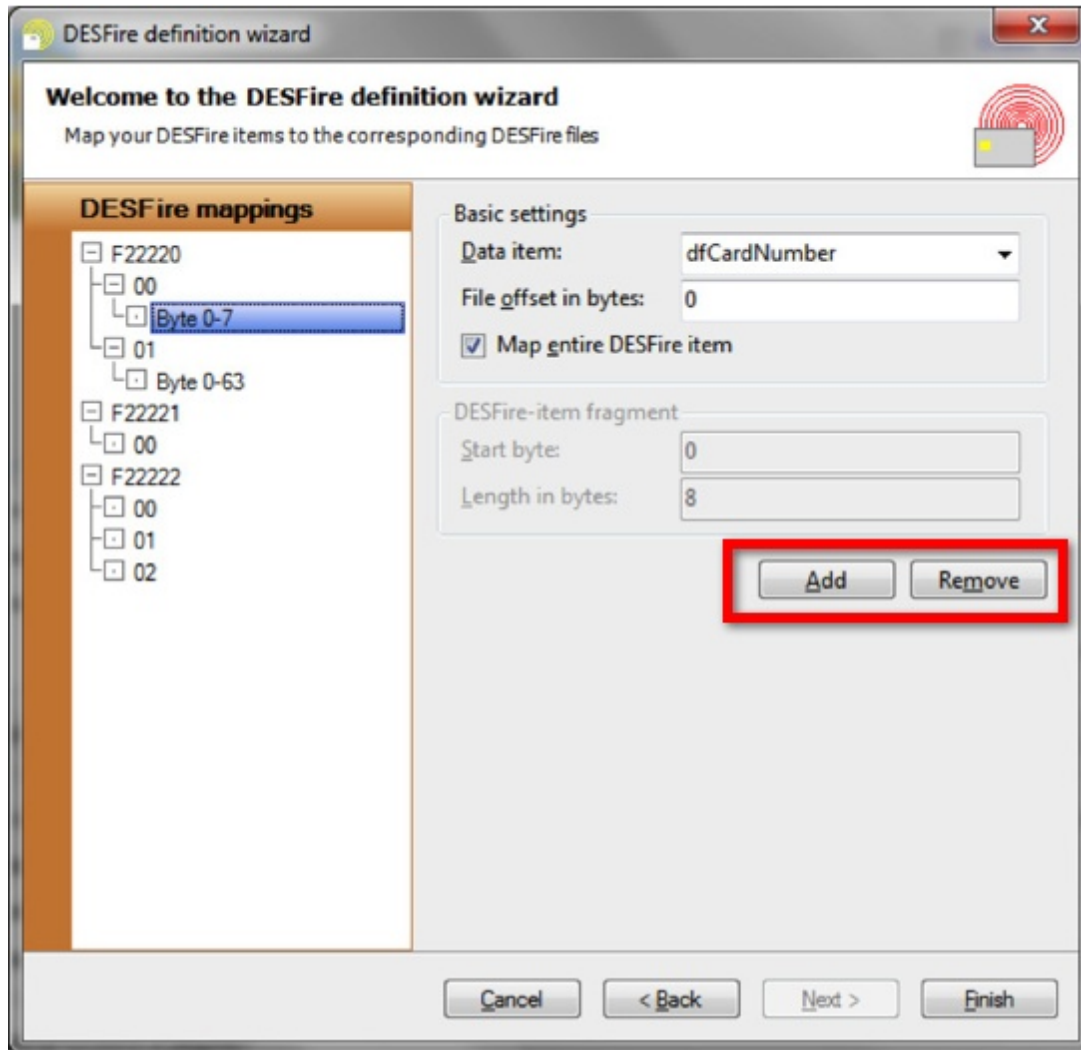
The **Access mode** defines what functions the application keys have for this file. The first digit specifies the read key, the second digit the write key, the third digit the read/write key and the final digit the change-access-rights key. The digits can be either 0 to D to refer to one of the application keys, E to indicate that the action can be done without authentication (free access), and F to indicate that the action is forbidden (deny access). The button with the three dots allows for setting the access mode in a more intuitive way.



If you selected **Change file settings**, you also have to specify the **Final file settings**, which is done in the same way.

Click **Next** to proceed with the creation of the **DESFire Definition** and go to the last step of this wizard, [Step 6](#).

17.2.2.6 Step 6: Map Items to Files



Now, your **DESFire items**, **applications** and **files** have been defined, the only thing that remains to be done is **mapping** the bytes of the **DESFire items** to the bytes of the **DESFire files** which is done at this last wizard page.

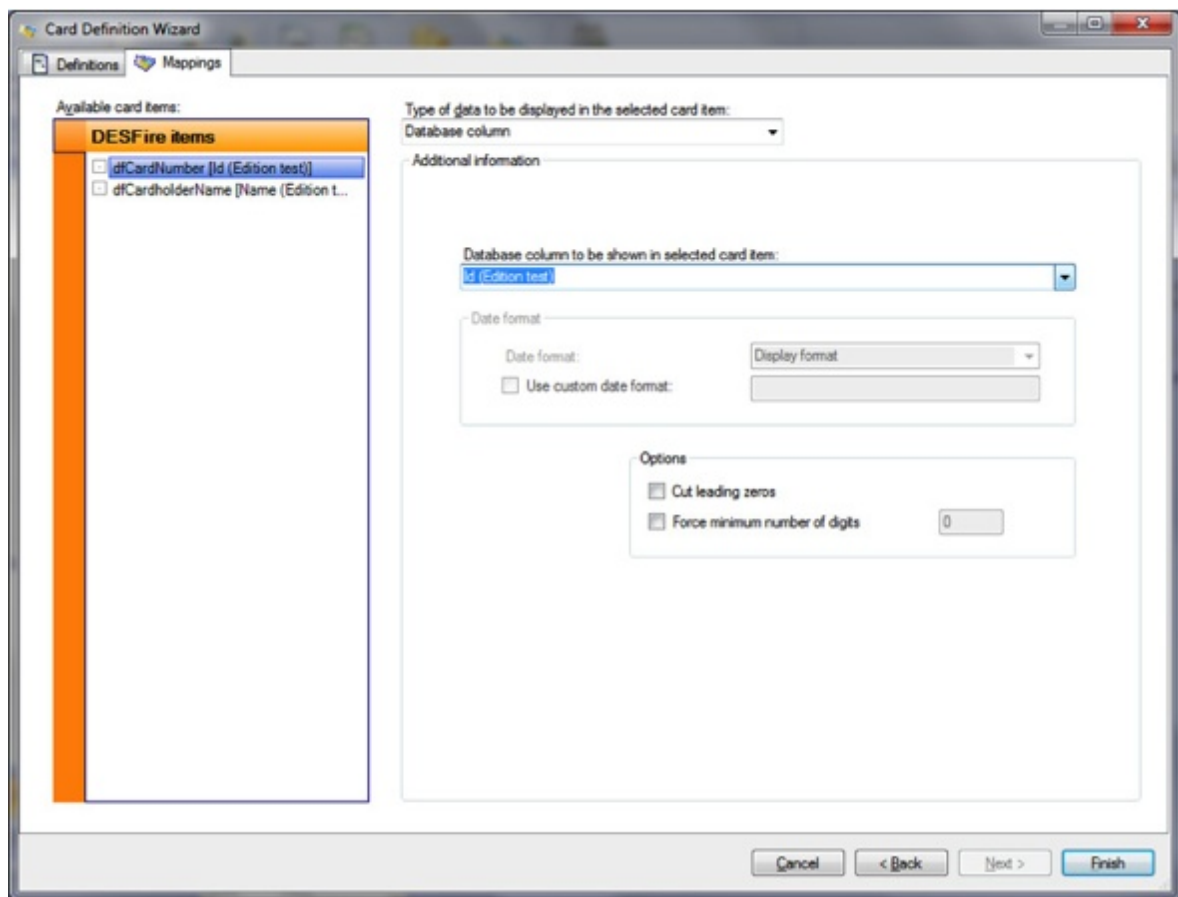
On the left-hand side, all **DESFire** files are listed. By selecting the **DESFire file** and clicking the **Add** or **Remove** button, indicated with the **red rectangle**, you can add file fragments to each file. For each file fragment, you select from which **Data item** it will contain data and with the **File offset in bytes** you indicate where in the file the file fragment starts. If you select **Map entire DESFire item**, the entire DESFire item will be mapped to the file, starting at the indicated offset position. On the contrary, you have to specify which part of the DESFire item needs to be mapped, by setting the **Start byte** and the **Length in bytes**.

In many cases, you will want to map an entire DESFire item to an entire file. In that case, you add a single file fragment to the file, set the **File offset in bytes** to zero and select

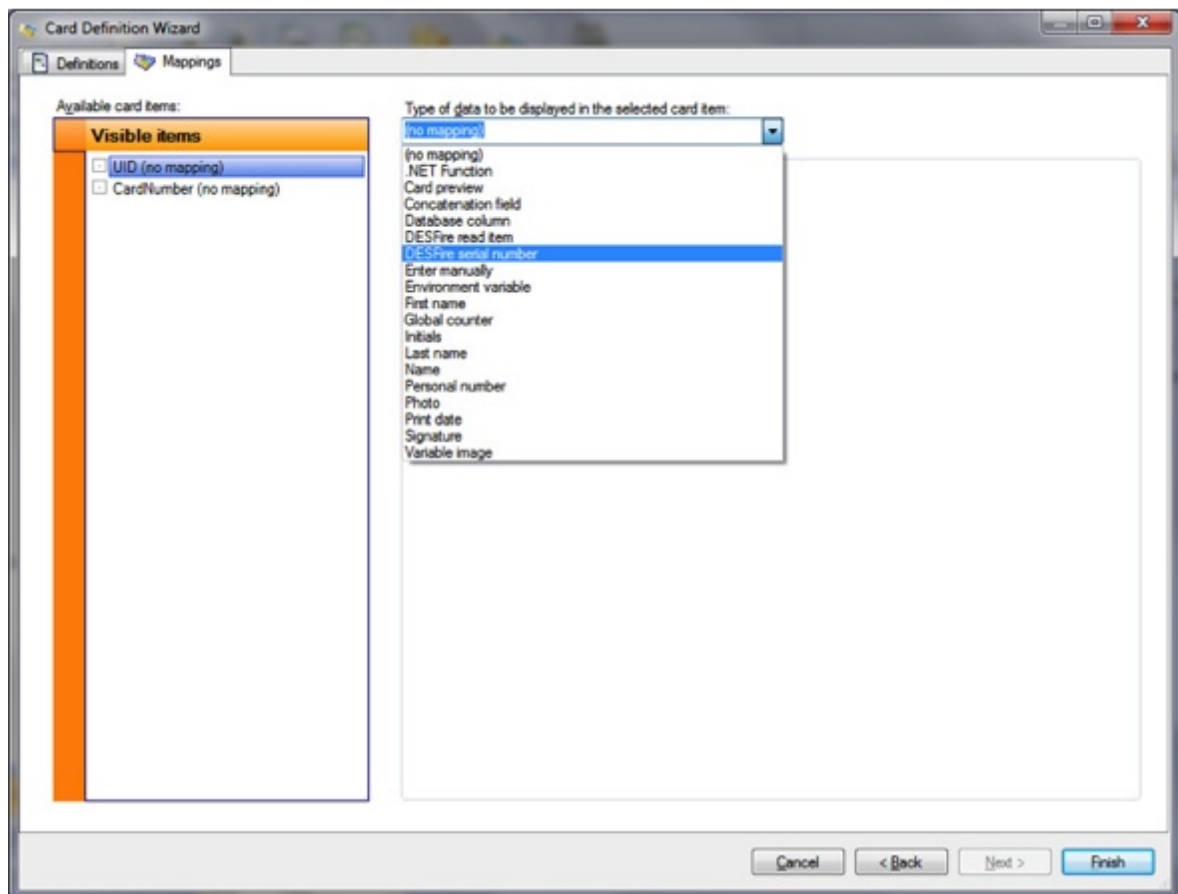
Map entire DESFire item, as in the above screen shot. The length of the DESFire file and item will need to be the same. The **DESFire definition** has now been configured.

When clicking on **Finish**, the wizard will prompt whether you **want to hide the keys**. If you click **yes**, **the keys will not be readable anymore the next time you open the wizard**. We recommend waiting with hiding the keys until after finishing the test phase, when you are sure that all keys are correct. Once the keys are hidden, they **CANNOT** be made visible anymore.

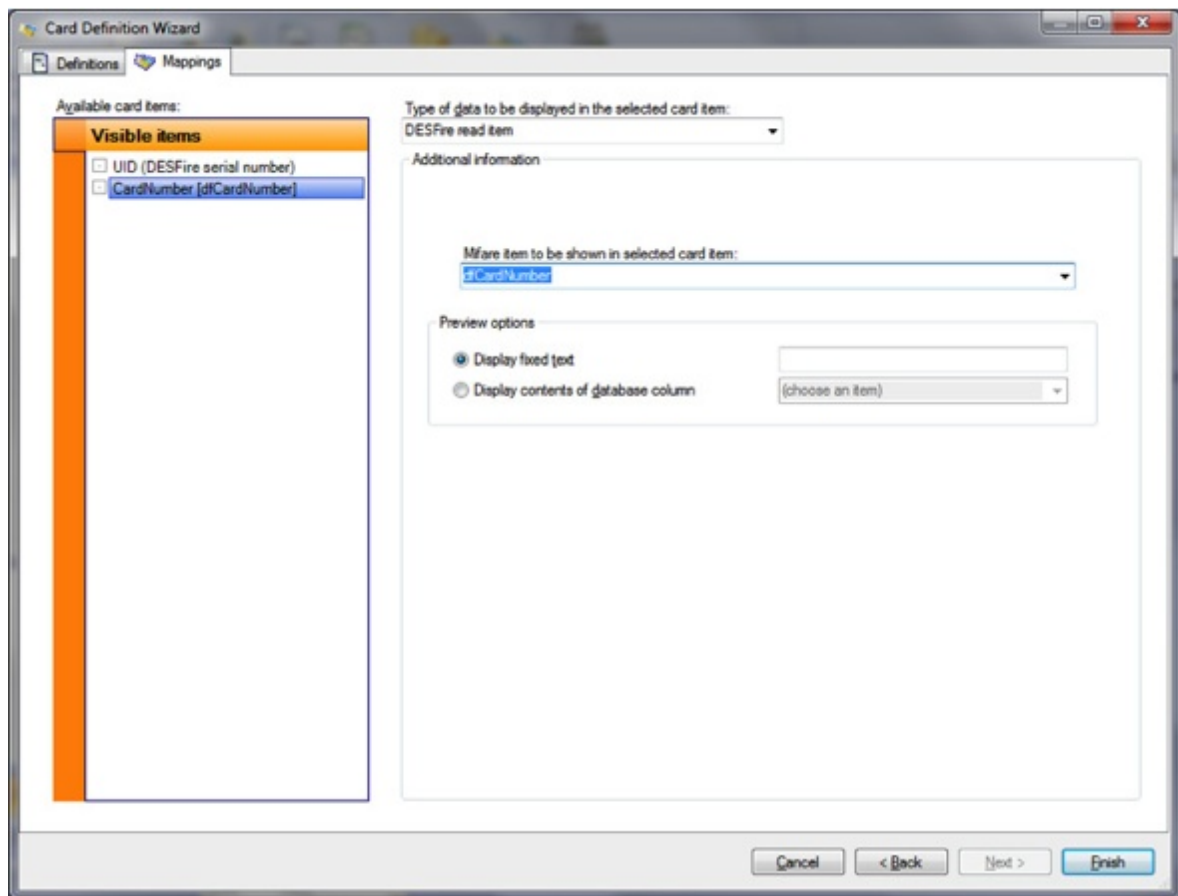
It is still necessary to map the data of the **DESFire items** to **database fields, card objects, storage items**, etc. This can be done in the [Advanced Mappings](#) and we refer you to the corresponding section for more information. Once your **DESFire definition** is configured, the **DESFire write** items will be available in the **card-items navigator** of the mappings window, as shown below:



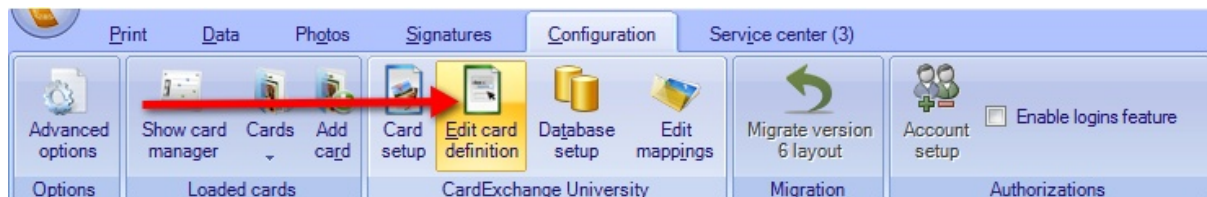
In the drop-down menu **Type of data to be displayed in the selected card item**, you can now choose the **DESFire serial number** as data source.



If the **DESFire definition** contains any read items, it is possible to map those read items to a text object on the card or to a storage item.

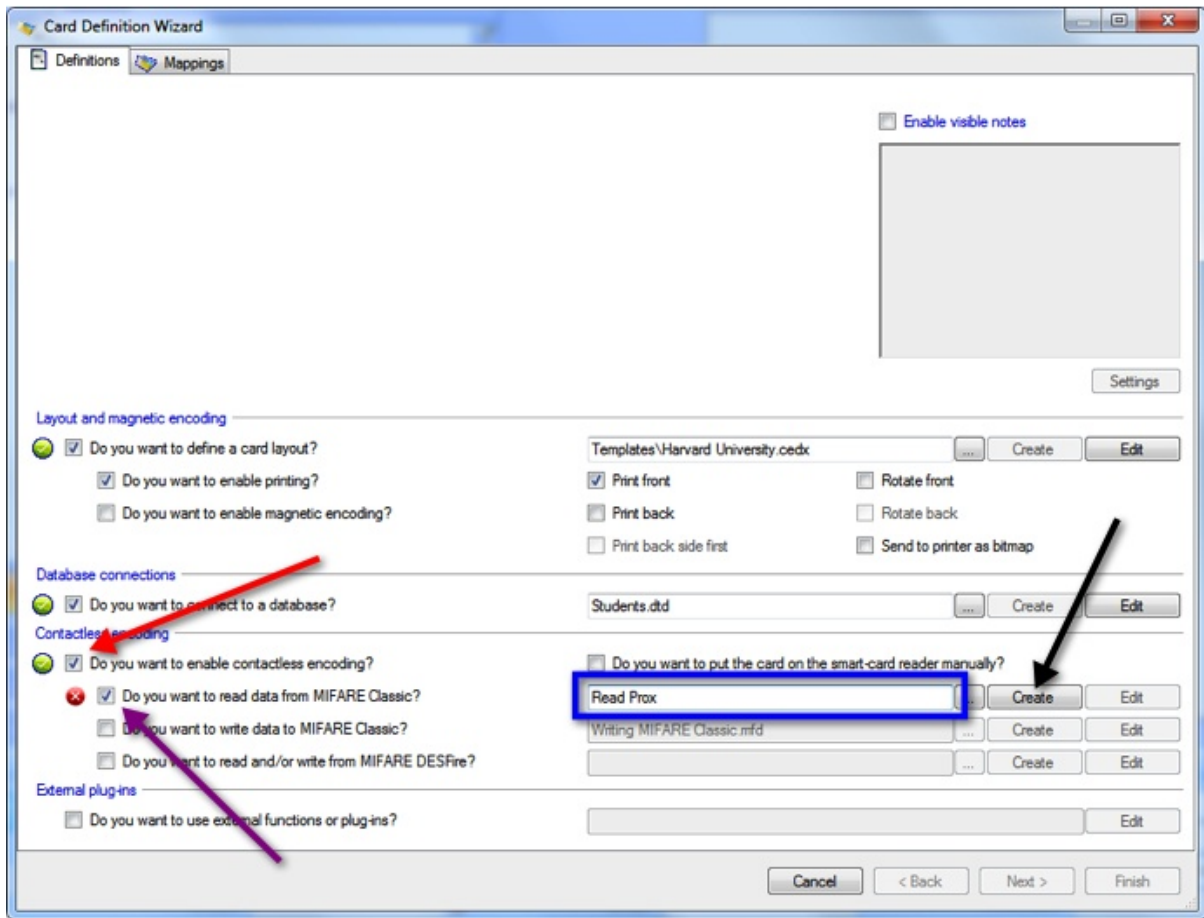


17.3 HID® Proximity




To set-up a new **HID® Proximity** definition, please make sure that the **Show Advanced Mappings** is enabled in the [Advanced Options](#) menu. First click **Edit card definition** as indicated with the **red arrow** to open the [Card Definition Wizard](#).

It is important to know that we use the MIFARE® Classic definitions to create HID definitions files. Therefore the procedure looks similar in the beginning for HID as it is with Classic. The main difference is the fact that we cannot write to HID Proximity cards, only reading!

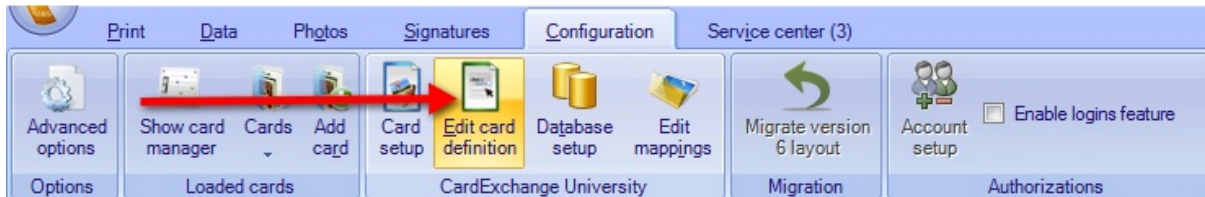


Now proceed as following:

- select **Do you want to enable contactless encoding?** indicated with the **red arrow**,
- select **Do you want to read from MIFARE® Classic?** indicated with the **purple arrow**,
- type a valid file name for your **definition** file in the text box next to the above option indicated with the **blue rectangle**,
- and click on the **Create** button to open the **Classic Definition Wizard**, indicated with the **black arrow**.

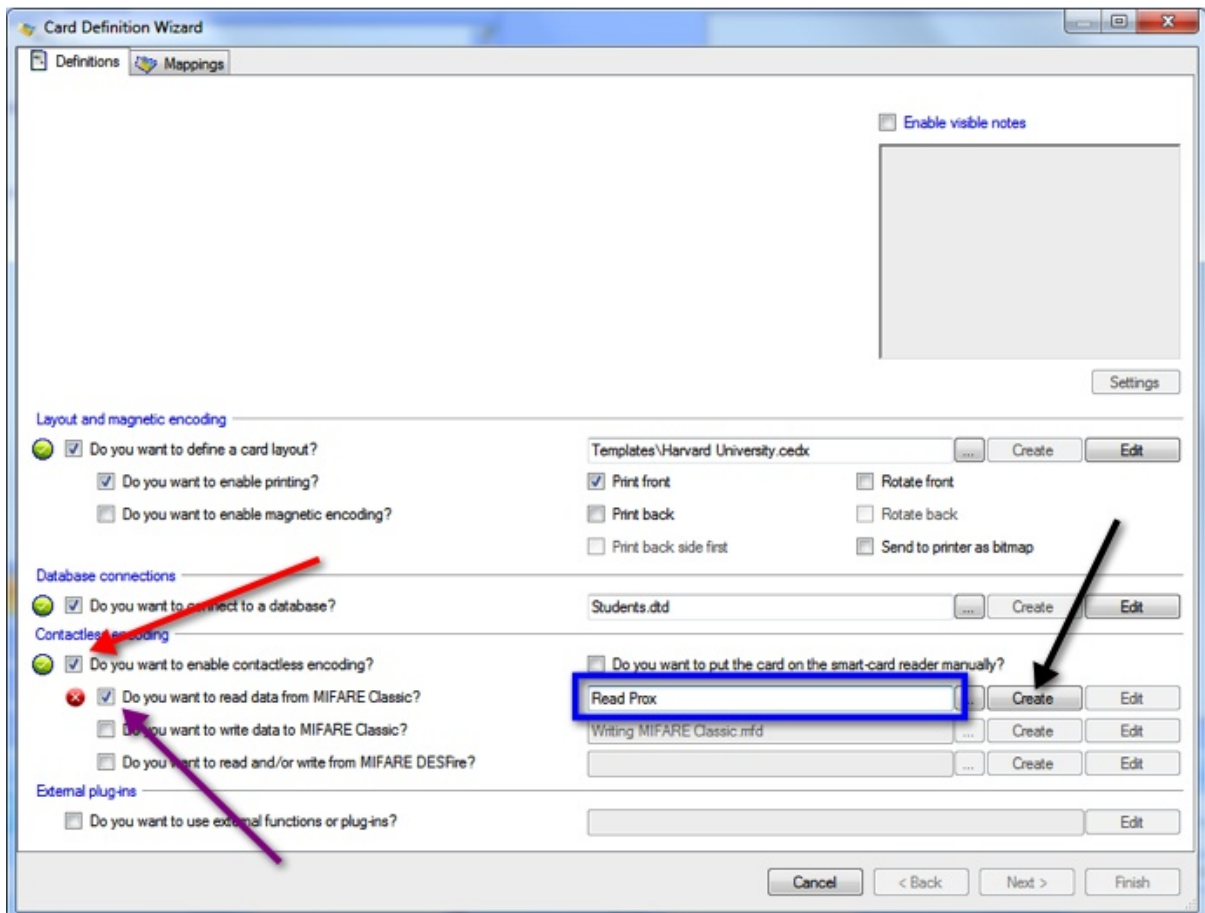
It is possible to select an existing **Classic Definition** with the **Browse** button (), or by typing a file name that already exists on your system. In that case, the **Edit** button will be enabled instead of the **Create** button, and clicking it will open the **Classic Definition Wizard** for the existing definition.

17.3.1 Create HID Encoding



To set-up a new **HID® Proximity** definition, please make sure that the **Show Advanced Mappings** is enabled in the [Advanced Options](#) menu. First click **Edit card definition** as indicated with the **red arrow** to open the [Card Definition Wizard](#).


It is important to know that we use the MIFARE® Classic definitions to create HID definitions files. Therefore the procedure looks similar in the beginning for HID as it is with Classic. The main difference is the fact that we cannot write to HID Proximity cards, only reading!



Now proceed as following:

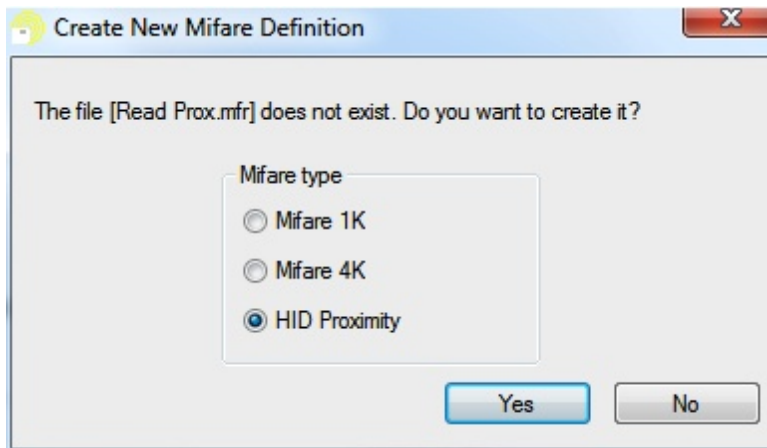
- select **Do you want to enable contactless encoding?** indicated with the **red arrow**,

- select **Do you want to read from MIFARE® Classic?** indicated with the **purple arrow**,
- type a valid file name for your **definition** file in the text box next to the above option indicated with the **blue rectangle**,
- and click on the **Create** button to open the **Classic Definition Wizard**, indicated with the **black arrow**.

It is possible to select an existing **Classic Definition** with the **Browse** button (), or by typing a file name that already exists on your system. In that case, the **Edit** button will be enabled instead of the **Create** button, and clicking it will open the **Classic Definition Wizard** for the existing definition.

17.3.1.1 Step 1: Select Card Type

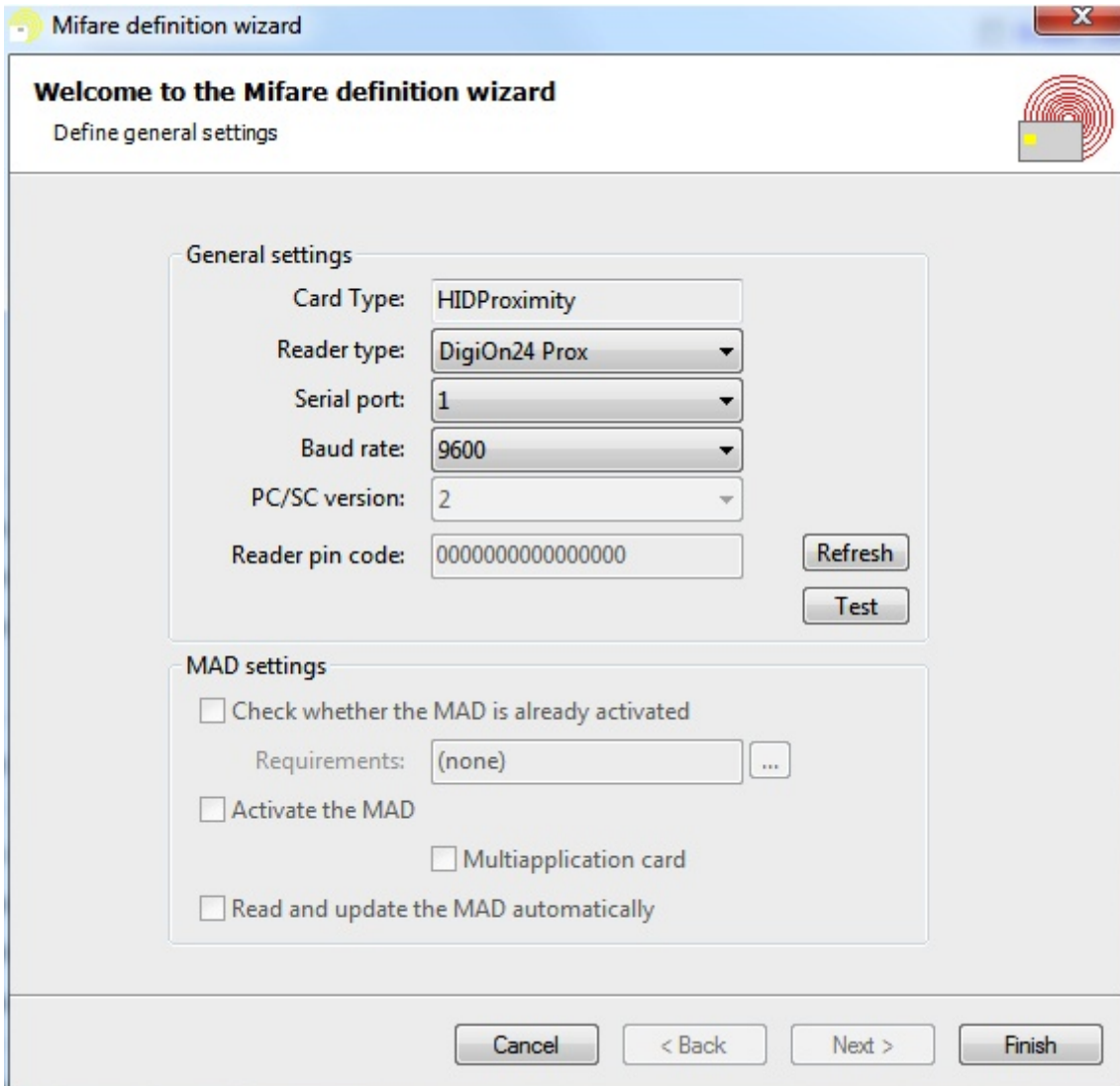
When we have entered a name for the definition into the text box and we click on **Create**, a dialog box '**Create New Mifare Definition**' will be shown asking to make a choice for the type of card to use.



You can select to create a definition for a HID® Proximity encoding. As you can see, you can also select MIFARE® 1K or 4K. This is because we also use the same wizard for defining MIFARE® Classic encoding. See our [MIFARE® Classic](#) section of this Help file for more information.

In this case we select HID® Proximity and click Yes to confirm and proceed with [Step 2](#).

17.3.1.2 Step 2: Define General Settings



The screenshot shows a window titled "Mifare definition wizard" with a close button (X) in the top right corner. The main heading is "Welcome to the Mifare definition wizard" with the subtitle "Define general settings". In the top right corner of the window, there is a small icon of a red fingerprint scanner and a grey card with a yellow chip. The window is divided into two main sections: "General settings" and "MAD settings".

General settings

- Card Type: HIDProximity
- Reader type: DigiOn24 Prox (dropdown menu)
- Serial port: 1 (dropdown menu)
- Baud rate: 9600 (dropdown menu)
- PC/SC version: 2 (dropdown menu)
- Reader pin code: 0000000000000000 (text field)
- Buttons: Refresh, Test

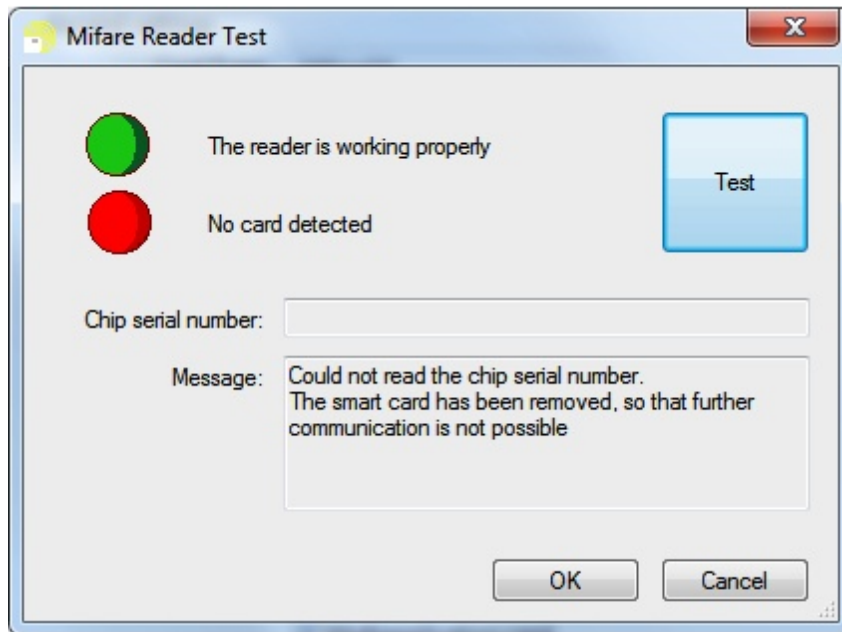
MAD settings

- Check whether the MAD is already activated
- Requirements: (none) (text field) ... (button)
- Activate the MAD
 - Multiapplication card
- Read and update the MAD automatically

At the bottom of the window, there are four buttons: Cancel, < Back, Next >, and Finish.

The **General settings** group box allows choosing the **reader type**, the serial port to which the reader is connected and the baud rate to be used. CardExchange® does not support a lot of readers for encoding HID® Proximity. Currently we support **DigiOn24** and **PC/SC 1 and 2** readers like **OmniKey**.

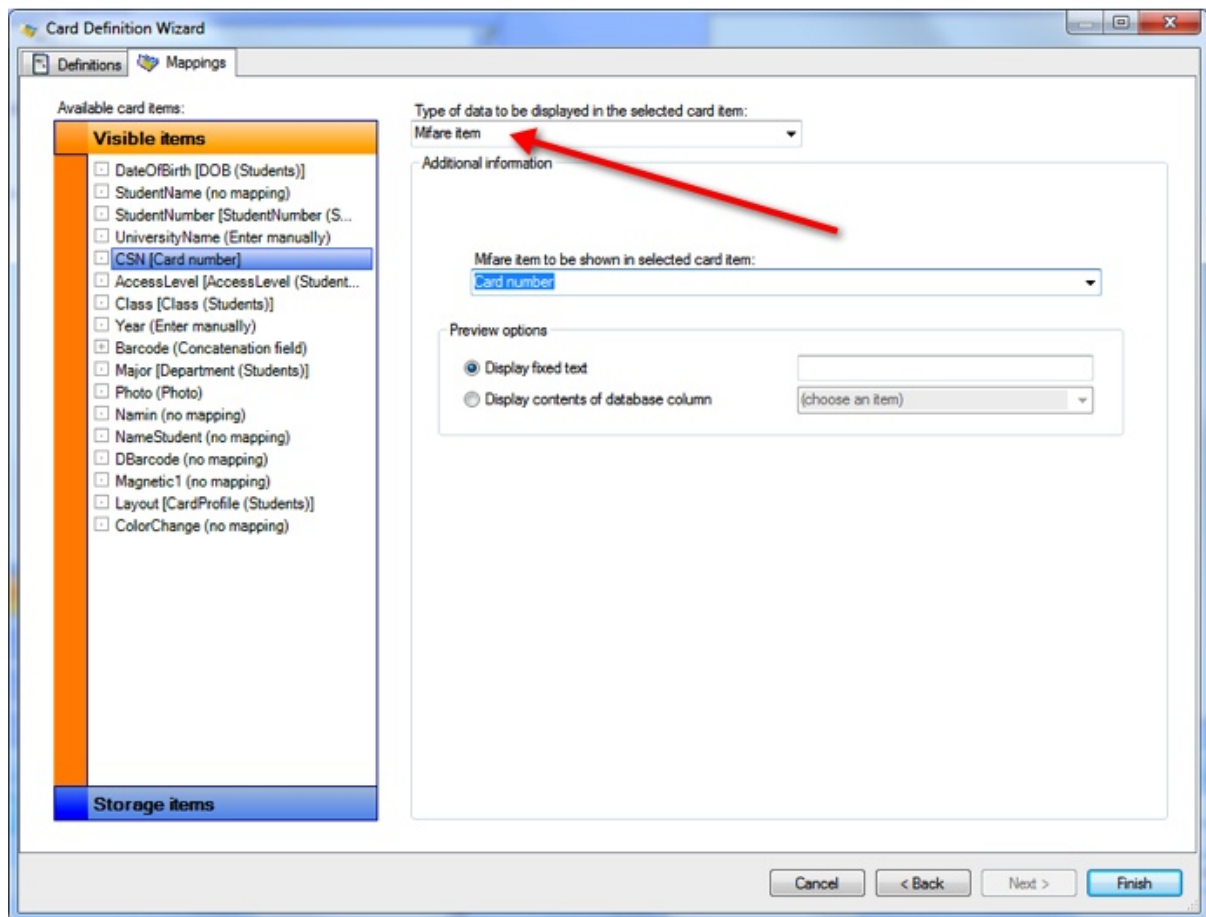
PC/SC readers are only available when installed on your system. If the reader is not available, please make sure it is installed properly. You can click on the **Refresh** button to reload the list with available readers. You are able to test if the connected reader is working and responding correctly. Click on the **Test** button to open the **MIFARE® Reader Test** window.



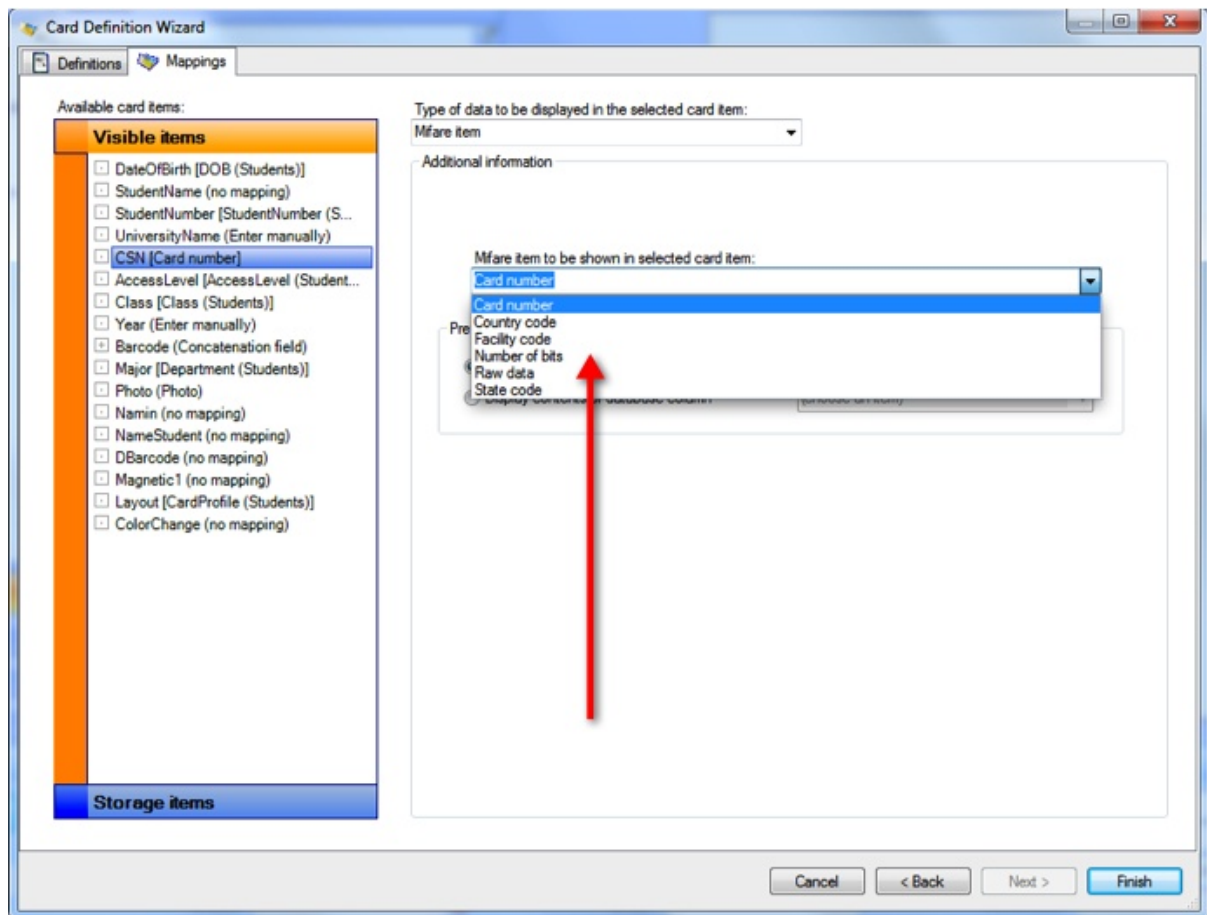
When pressing the **Test** button, CardExchange® will try to connect with the reader and, if a card is present, it will try to read the **CSN**. If the test succeed and the reader is working and a card is present on the reader, you will have two green lights.

When you have selected and tested the reader, you are done with the wizard and you can click Finish.

Compared to DESFire or Classic encoding, the HID definition does not contain any Data Items. The HID definition contains a set of items collected inside a MIFARE® item. This is done in the [Advanced Mappings](#) and we refer you to the corresponding section for more information. Once your **HID definition** is configured, the **MIFARE Item** will be available in the **card-items navigator** of the mappings window, as indicated below with the **red arrow**:



When you have selected the MIFARE Item, you will be able to select a separate Item from the drop down menu as indicated with the **red arrow** below:



The HID definition created offers six different flavors to chose from:

- Card number
- Country code
- Facility code
- Number of bits
- Raw data
- State code

18 Service Center



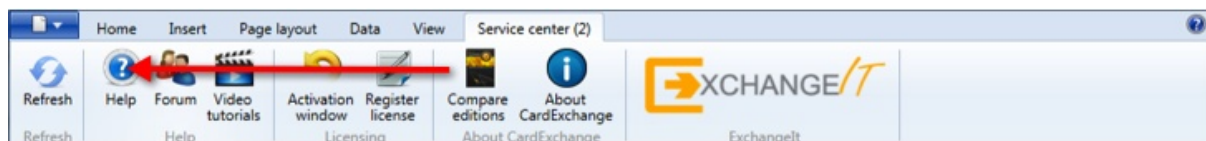
With the release of CardExchange® 8 we brought unique innovation to your desktop by offering everything that you need to produce cards in a fast and secure way at hand in the **CardExchange® Service Center**.

Help, Forum, Videos, etc., it is all available in this section of your CardExchange® product. When you enter the Service Center by selecting the corresponding tab, you will directly see an Outlook style interface showing on the left the available news items and on the right the content of this news item.

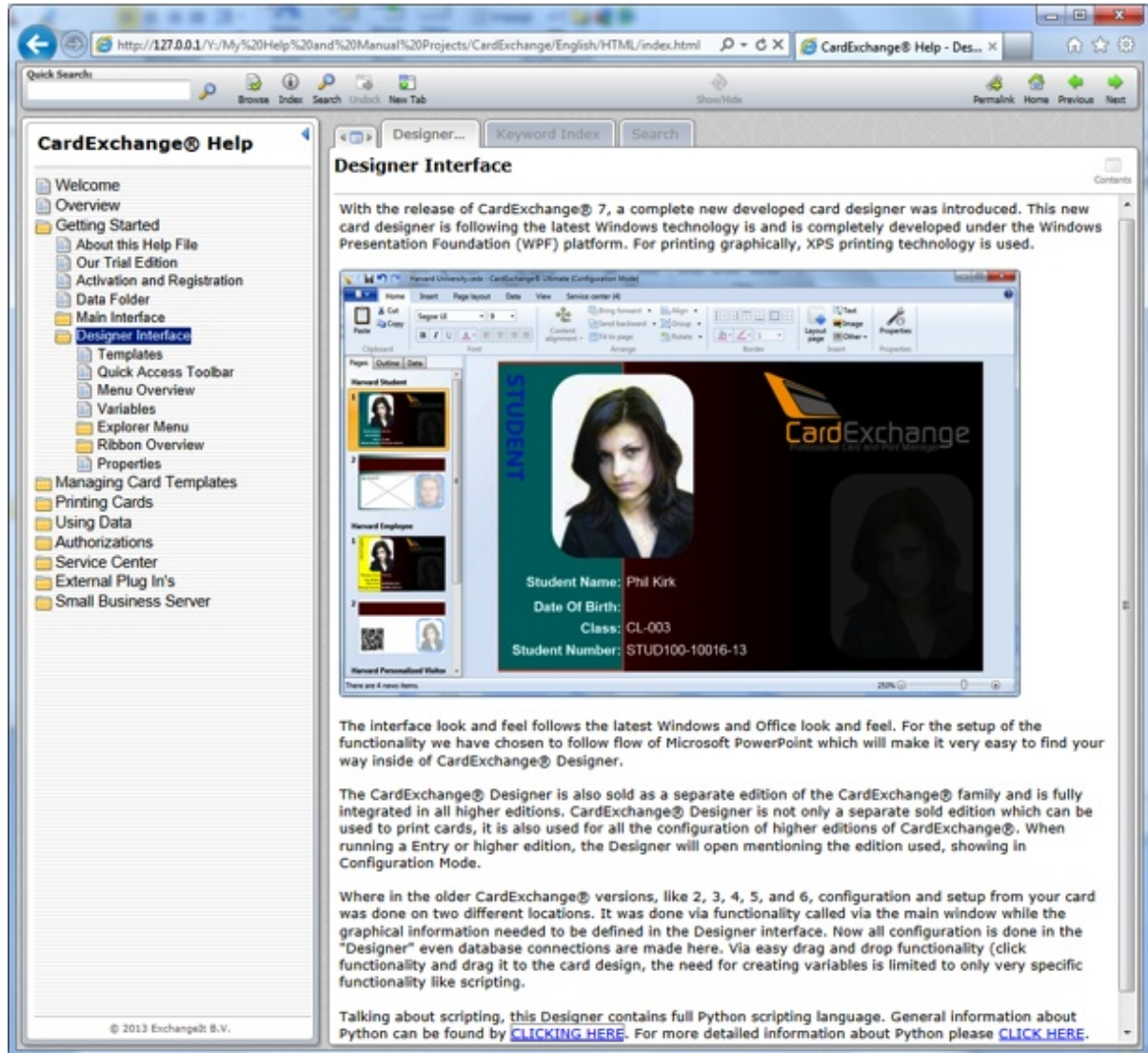
CardExchange® uses this section to keep you informed about new updates and release plans so you will always be able to run the latest version. But also the reseller who has sold the product to you will keep you informed about his latest and greatest.

Take a look at the separate subjects in this section of the Help file and see how this is going to benefit you!

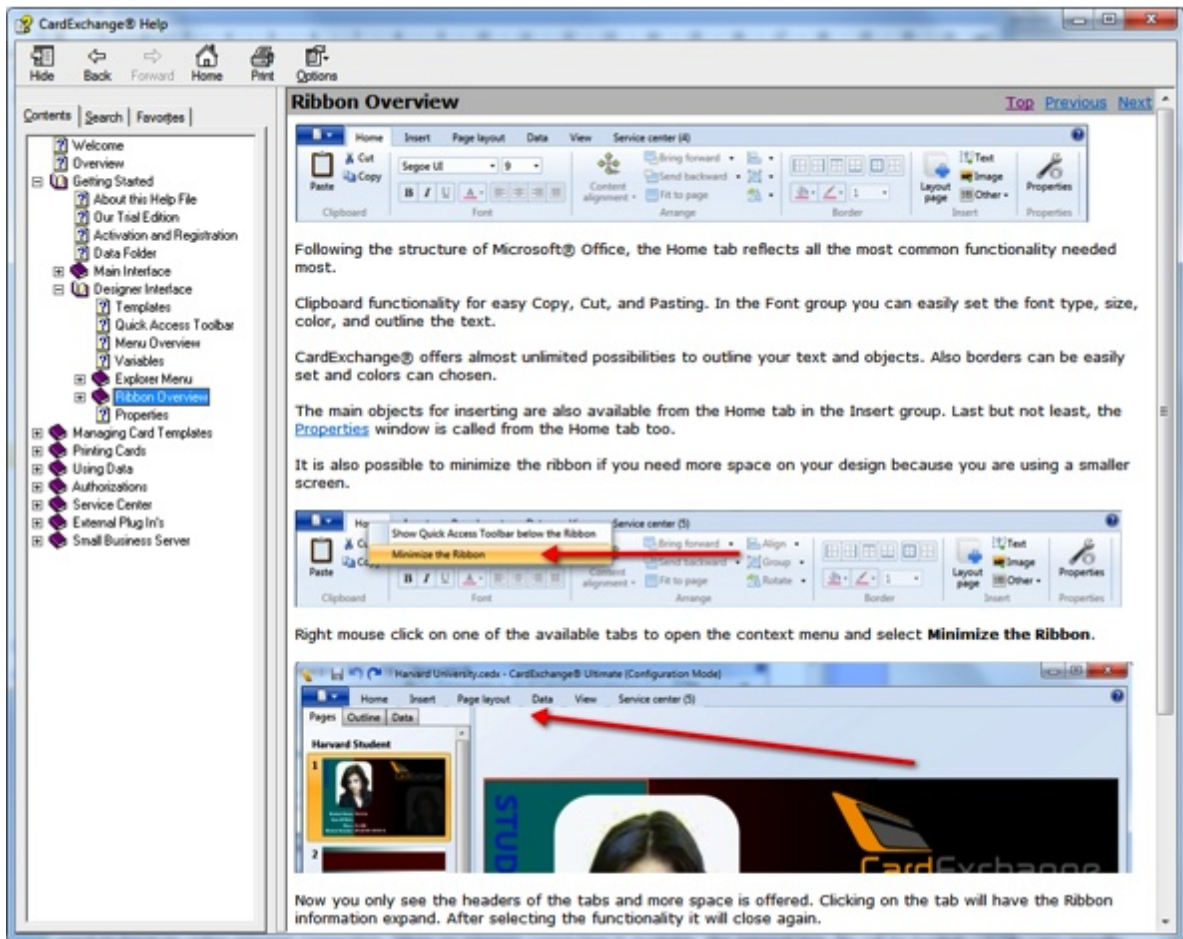
18.1 Help



Have access to online help file directly by clicking on the Help button indicated with the red arrow.

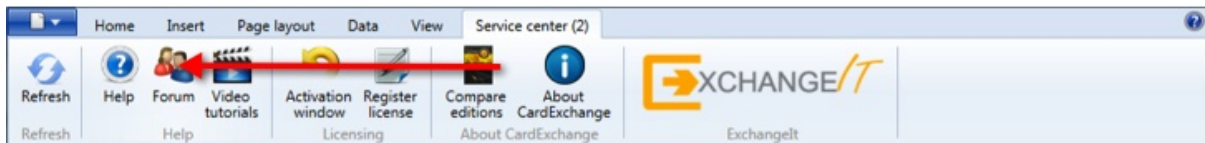


Our online Help files are always up to date and contain always examples with each available functionality. On the left side you see all the available and selectable subjects, and on the right the content of the selected subject. Of course you need to have an online internet connection. When no internet connection is available, the internal Help file will be loaded:

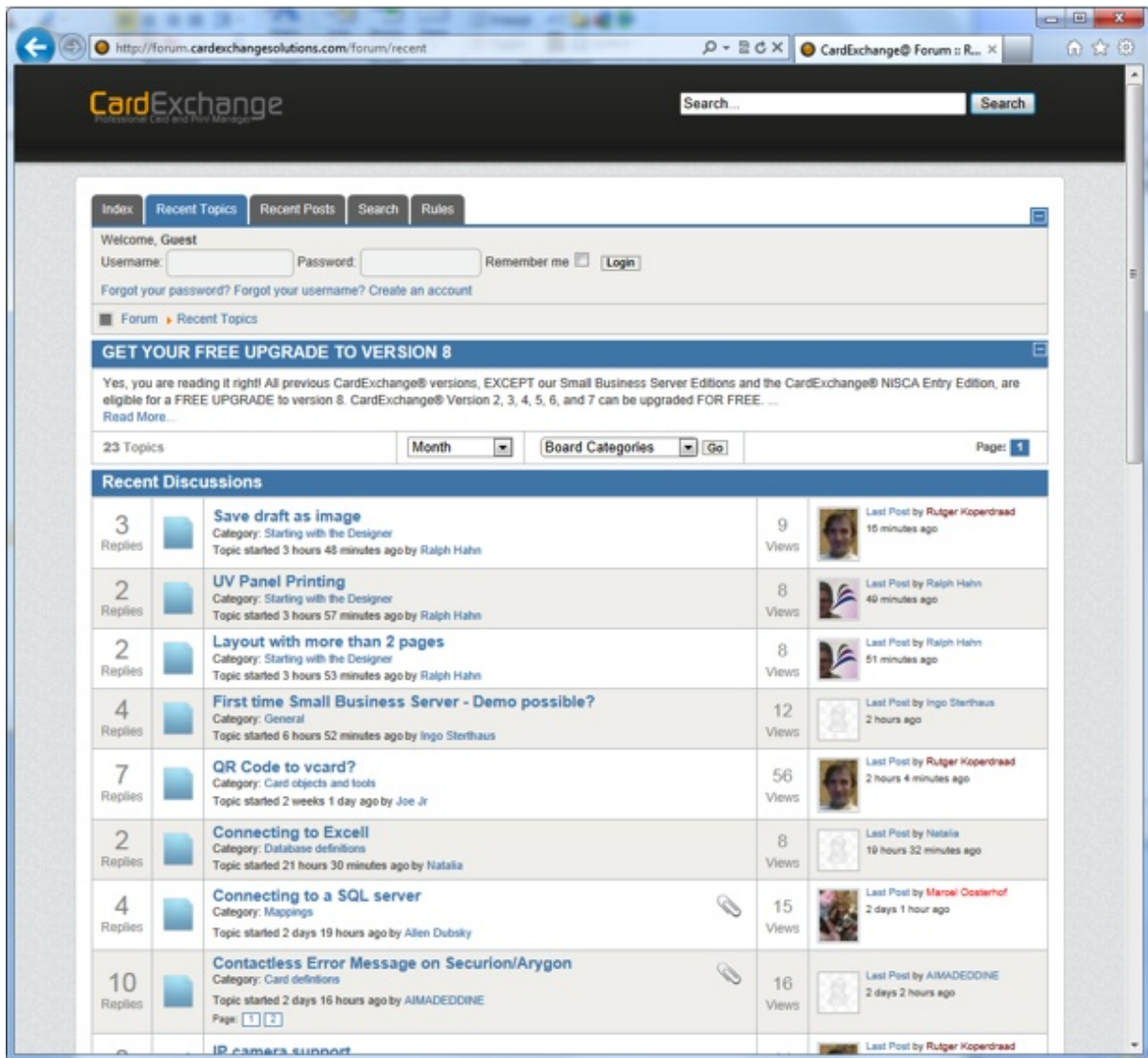


We always strive to have the internal Help file updated to with the latest release but unfortunately we cannot guarantee this.

18.2 Forum



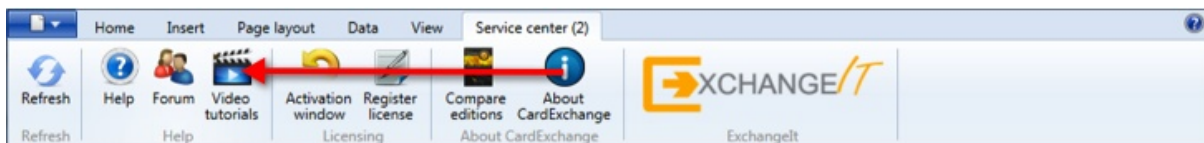
Unique for our industry is our end-user forum. On this forum you can find information from and by other users of CardExchange®.



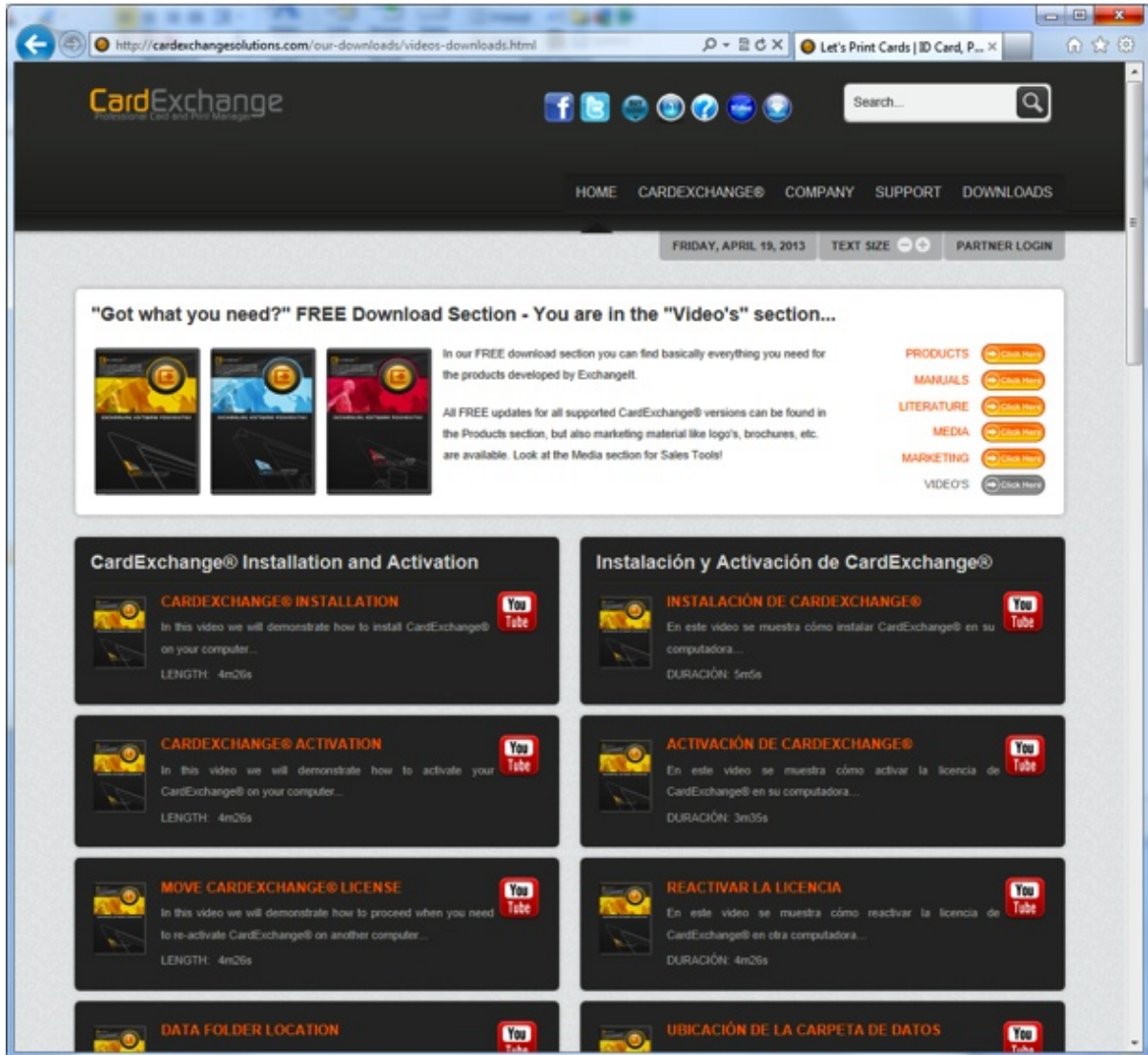
Take a look at all the recent topics and search for solutions you need. Is your solution not available, just register yourself and post it on the forum. Besides other high level users of CardExchange®, all our developers are answering forum questions. We are proud to say that our average response time on this forum is one and a half hour.

Are you looking for answers and solutions? This is the place to be. Don't forget, by posting your questions you are not only helping yourself, you are also helping other users of CardExchange®!

18.3 Video Tutorials



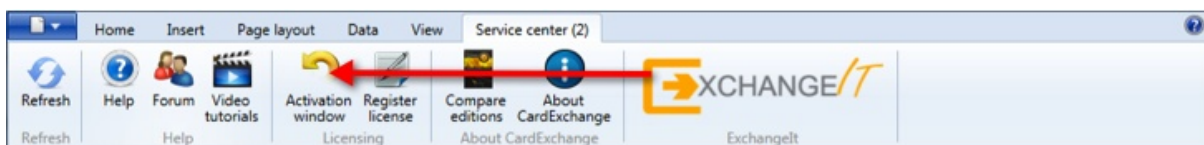
Sometimes it is handy to see how things are done in stead of reading text or other information. Therefore CardExchange® offers a large selection of How-To Videos in our Video Tutorials section.



In this section you can find videos about **installing CardExchange®, activating and moving licenses, MS Excel Connections, How to use Photos, etc.**

All available videos are offered in **English** and **Spanish!**

18.4 Upgrade Your License



In the section [Activation and Registration](#) we have explained how you activate your new CardExchange® license. When you decided that you want to upgrade to a higher edition, and you have ordered the upgrade, you have probably received a new serial number and activation code via email from your reseller.

To get to the higher edition, you will have to activate the new license first. To activate your upgrade, click in the **Activation Window** button indicated with the **red arrow** and the **CardExchange® License Activation Wizard** will start.



The screenshot shows the 'CardExchange® License Activation Wizard' window. The title bar reads 'CardExchange® License Activation Wizard'. The window has a dark left sidebar with the 'CardExchange Professional Card and Print Manager' logo and a globe graphic. The main area contains the following text:

Welcome to the CardExchange® License Activation Wizard. In this wizard you will be able to activate and register your CardExchange® license. By registering your license you make sure that you are being informed about updates and new releases.

Please provide your serial number and activation code in the fields below. If you have received an activation file (*.AUT) or an activated license file (*.LIC), click on the advanced button and select your file.

Serial number:
12345

Activation code:
12234-44552-21233-44556-66677-77787-7888

Machine ID:
10-454CC

Advanced >>

IMPORTANT! Your license can only be activated on a single computer. Do not activate your license on a computer that is only used for testing. The demo version offers all CardExchange® functionality free for 42 days.

At the bottom, there are four buttons: 'Cancel', '< Back', 'Activate', and 'Finish'. The 'Activate' button is highlighted with a blue border.

Enter the **serial number** and **activation code** into the text boxes and click on **Activate** to start the process.

CardExchange® License Activation Wizard

CardExchange
Professional Card and Print Manager

It is recommended that you register your CardExchange® license. By registering your license you make sure that you will be informed about new functionality and upcoming releases.

Yes, I want to register my CardExchange® license

Company name: Exchangelt B.V.

Contact person: CardExchange

E-mail address: CardExchange@Exchangelt24.com

Address: Kalkovenweg 36

ZIP code: 2401LK

City: Alphen aan den Rijn

Country: Netherlands

Phone number: +31 172 520 548

Fax number (optional):

Printer brand: Evolis

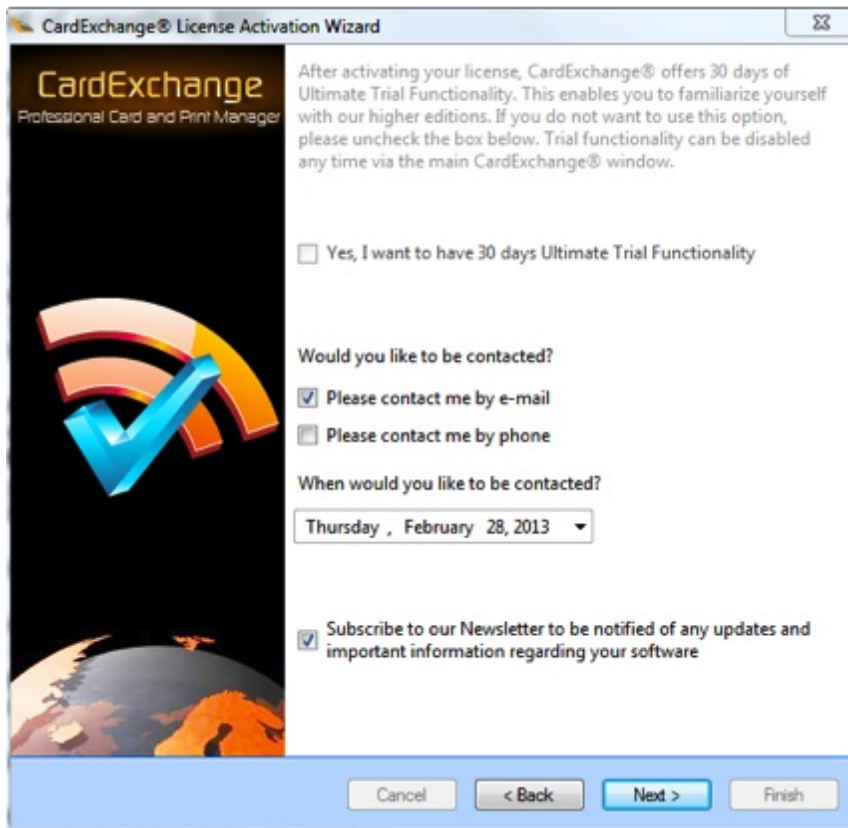
Company type: Printer distributor

Preferred language: English

Alias for forum: CardExchange

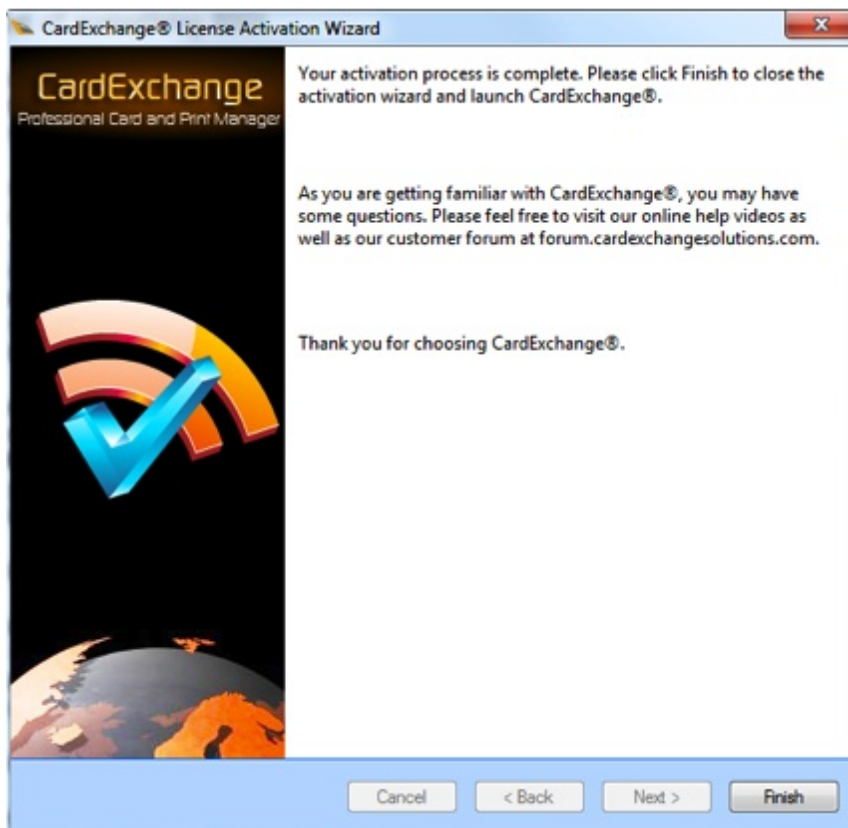
Cancel < Back Next > Finish

If needed you can make changes to your previous registration information, if not, click **Next** to proceed.

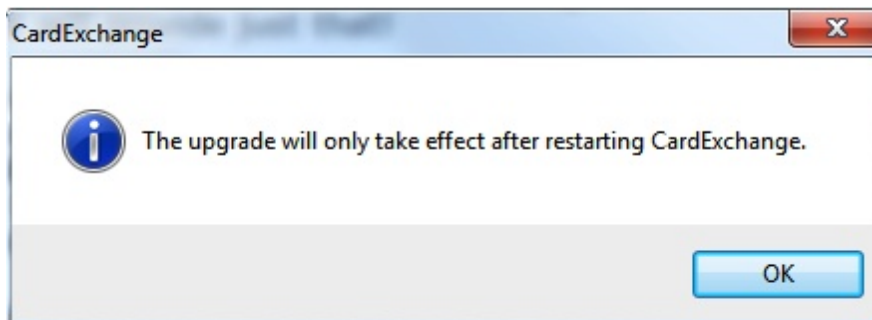


If you would like to be contacted, just select how and when, and your reseller will contact you on the preferred date selected. You can also change your subscription to our newsletter.

Click **Next** to proceed to the Final page of the **activation** process.

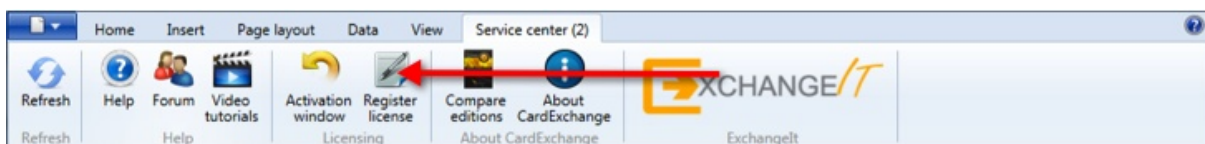


When you click on **Finish**, the dialog below will pop up:



Click on **OK** to confirm and restart CardExchange®.

18.5 Update Your Registration Info



When you have registered your software, you can always update your registration information. Click on the Register License button indicated with the **red arrow** and

CardExchange® License Activation Wizard will start.

CardExchange® License Activation Wizard

CardExchange
Professional Card and Print Manager

It is recommended that you register your CardExchange® license. By registering your license you make sure that you will be informed about new functionality and upcoming releases.

Yes, I want to register my CardExchange® license

Company name: Exchangelt B.V.

Contact person: CardExchange

E-mail address: CardExchange@Exchangelt24.com

Address: Kalkovenweg 36

ZIP code: 2401LK

City: Alphen aan den Rijn

Country: Netherlands

Phone number: +31 172 520 548

Fax number (optional):

Printer brand: Evolis

Company type: Printer distributor

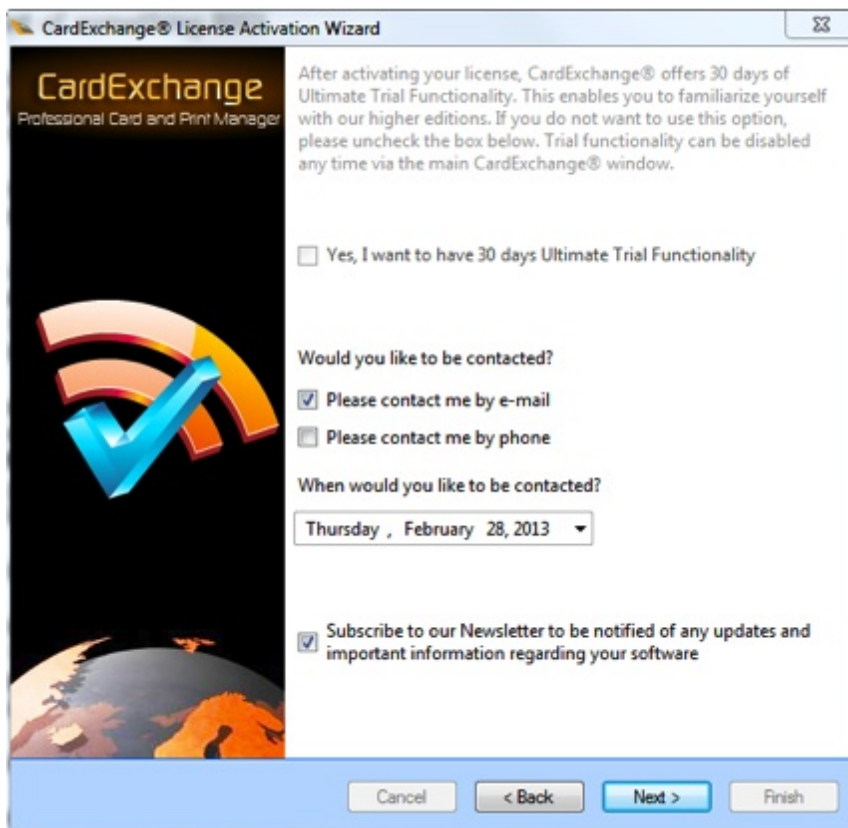
Preferred language: English

Alias for forum: CardExchange

Cancel < Back Next > Finish

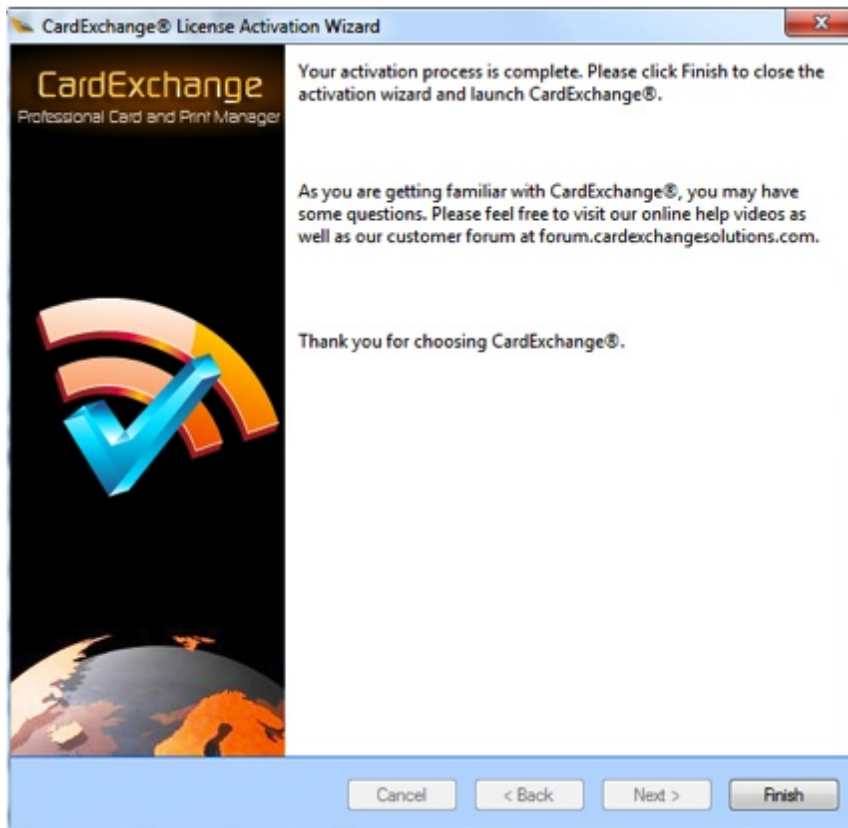
The registration process is a part of the activation process and therefore the same process is used. It does not effect your license information, only your registration information.

Now change the information you want to change and proceed to the Next page when done.

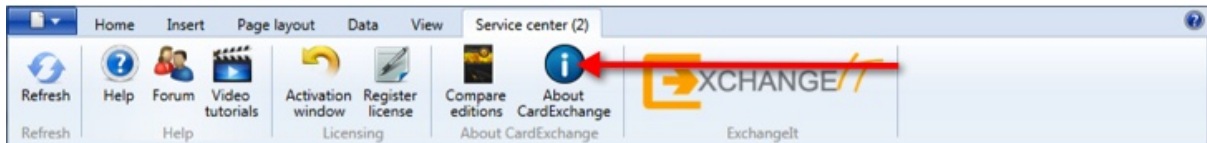


If you would like to be contacted, just select how and when, and your reseller will contact you on the preferred date selected. You can also change your subscription to our newsletter.

Click **Next** to proceed to the Final page of the **Registration** process.



18.6 About CardExchange®

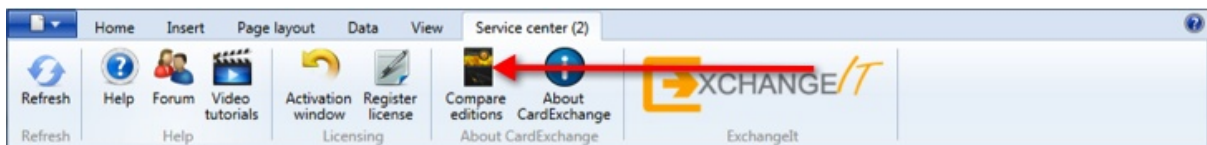


Sometimes when you need support you will be asked which edition and version you are running of CardExchange®. All this type of information can be found in the **About CardExchange®** section. Just click on the button indicated with the **red arrow**, and the window below will be presented:



In this window you can find the **edition** and **version** you are running. This can be important to see if you are running the latest version with regards to solved bugs.

You also can see your **serial number** which enables us or your reseller to request your **activation code**, if needed. It also contains the **Client code** of your license. The **Client code** indicated who has supplied your license. Last but not least, it shows the **Machine ID**, the digital fingerprint of your computer for your CardExchange® license.



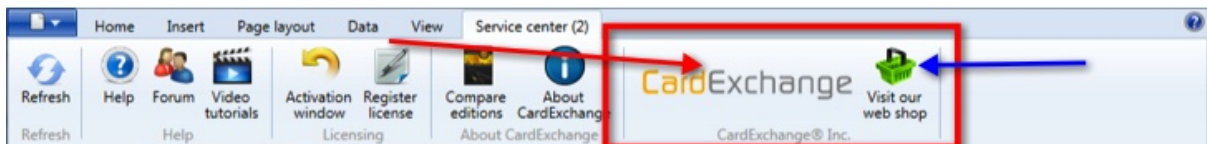
When you are running a Entry edition and you would like to know what type of functionality is offered in other editions of CardExchange®, just click on the **Compare editions** button indicated with the **red arrow** and it will bring you to the **Compare editions** section on our website:

The screenshot shows the CardExchange website's 'Compare Our Editions' page. The page features a navigation bar with links for HOME, CARDEXCHANGE®, COMPANY, SUPPORT, and DOWNLOADS. Below the navigation bar, there is a search bar and a date indicator for FRIDAY, APRIL 15, 2013. The main content area is titled 'CardExchange® "Compare Our Editions"' and contains a table comparing various features across five editions: DESIGNER, ENTRY, PREMIUM, PROFESSIONAL, and ULTIMATE. To the left of the table, there is a sidebar with a 'RETURN EDITION' button, a 'DOWNLOAD SHEET' button, and a 'LEGENDA' section explaining the symbols used in the table: a checkmark for 'AVAILABLE', a dash for 'NOT AVAILABLE', and a circle with a plus sign for 'OPTIONAL VIA ADD ON'.

TOOLS AND FUNCTIONALITY	DESIGNER	ENTRY	PREMIUM	PROFESSIONAL	ULTIMATE
WYSIWYG Card Designer	✓	✓	✓	✓	✓
Conditional Elements and Layers	✓	✓	✓	✓	✓
ID Barcodes	✓	✓	✓	✓	✓
Rich Text Formatting	✓	✓	✓	✓	✓
Text, Image, Database, and Graphical Objects	✓	✓	✓	✓	✓
Multiple Rows and Columns per Layout	✓	✓	✓	✓	✓
Multiple Cards Layout	✓	✓	✓	✓	✓
Ghosting/Opacity Functionality	✓	✓	✓	✓	✓
Automatic Font Resizing	✓	✓	✓	✓	✓
Alignment and Formatting Tools	✓	✓	✓	✓	✓
Formatting of Text, Numbers, and Time/Dates	✓	✓	✓	✓	✓
Automatic Data and Time Objects	✓	✓	✓	✓	✓
Support Windows Fonts	✓	✓	✓	✓	✓
Pre-defined Templates	-	✓	✓	✓	✓
Background Image in Objects	-	✓	✓	✓	✓
Object Rotation Functionality	-	✓	✓	✓	✓
Various Card and Paper Sizes	-	✓	✓	✓	✓
Manual Entries	-	✓	✓	✓	✓
User Guided Step-by-Step Wizard	-	✓	✓	✓	✓
Card Preview Functionality	-	✓	✓	✓	✓
Global Counters	-	✓	✓	✓	✓
Concatenation/Compound Fields	-	✓	✓	✓	✓
ID Barcodes	-	✓	✓	✓	✓
Reporting Number of Printed Cards	-	-	✓	✓	✓
Add Visible Notes to Card Layout	-	✓	✓	✓	✓

Here you can see all the offered functionality available for each separate edition.

18.7 Contact Information



All CardExchange® Resellers and Distributors have a long history in the ID Card Printing market and can advice and help you to make the right choices. But unfortunately it is not always know for the user of our software who supplied the software and were to go to for support.

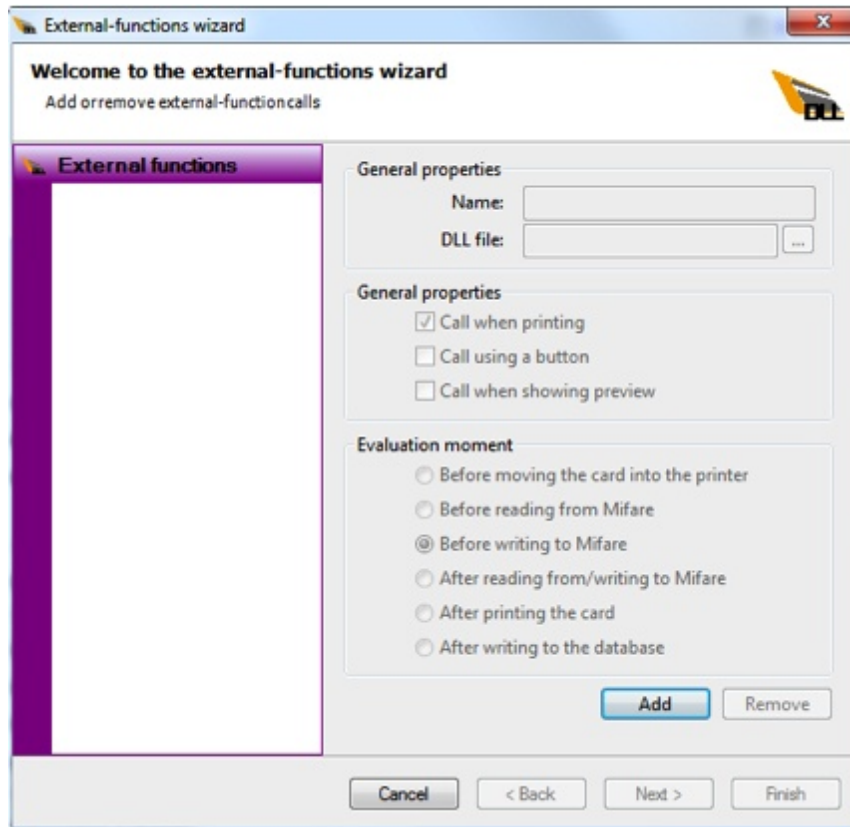
With the release of CardExchange® version 8 we have solved that problem for you. At the section indicated with the **red rectangle** you always find one button indicated with

the **red arrow**. This button contains the Company Logo of the CardExchange® partner that supplied you the software and if you click on the button, it will directly bring you to his home page so you can find all his contact information.

When applicable, in the same section you can find a second button, indicated with the blue arrow, that will bring you directly to the web shop of our partner so you can buy upgrades, supplies, etc.

Together with all the other functionality offered in our Service Center, we strive to offer **high quality** with **high service** without limitations.

19 External Plug In's



External Plug-Ins is CardExchange® most powerful and flexible custom functionality offered! An External Plug-In is basically a wrapper that can contain any possible functionality you can imagine. Most common is the embedding of third party SDK's. For example, want to embed a specific bio-metric fingerprint scanner, or a driver-license scanner, etc., we can simply embed the functionality of the readers into an External Plug-In and make the functionality available inside CardExchange®. External Plug-Ins are developed by ExchangeIt and have quick turnarounds with low cost and offer unlimited possibilities to get into project business without spending thousands and thousands in customization.

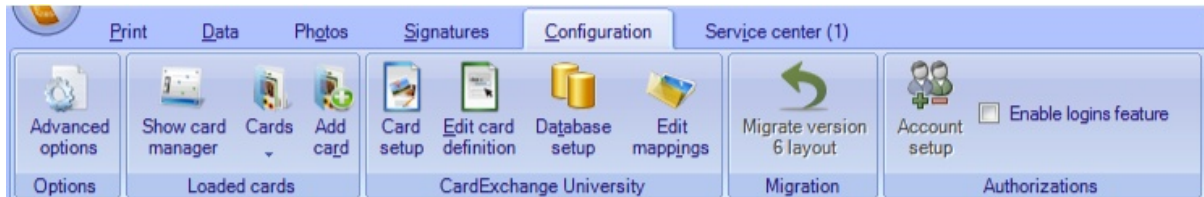
How does it work?

When you have specific need for, for example, a finger print scanner, first contact your CardExchange® Reseller. Inform them about what reader you want to use, if there is an SDK available, what you want to accomplish, for example, do you want to store the finger print image but also the template, etc.

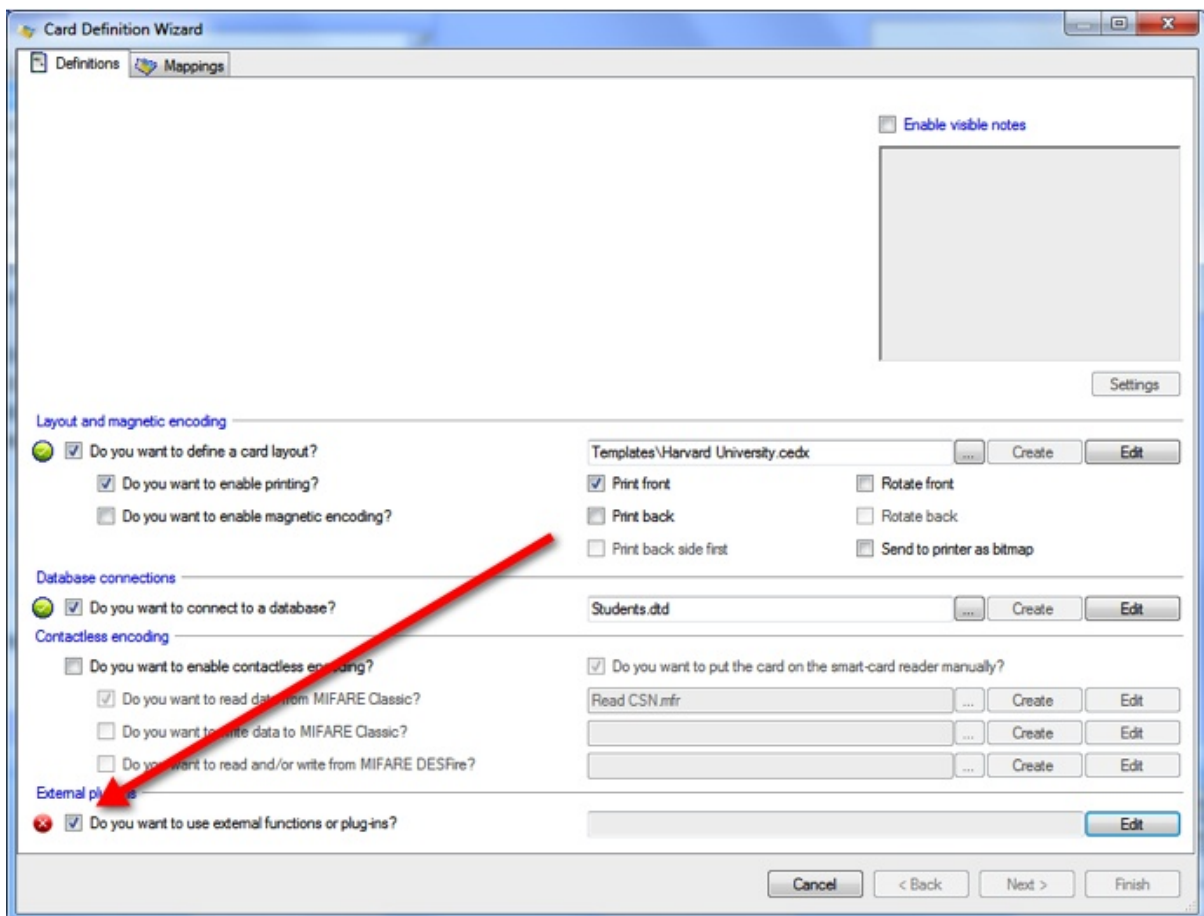
The reseller will contact ExchangeIt for a quote and will get back to you with a price and time frame. When you decide to proceed with the External Plug-In, in most cases you will have to make a reader and the SDK available for ExchangeIt and ship this to us have your reseller ship it to us. Don't know your reseller? Please take a look in the [Service Center](#) and see who your reseller is to contact.

19.1 Configure External Plug Ins

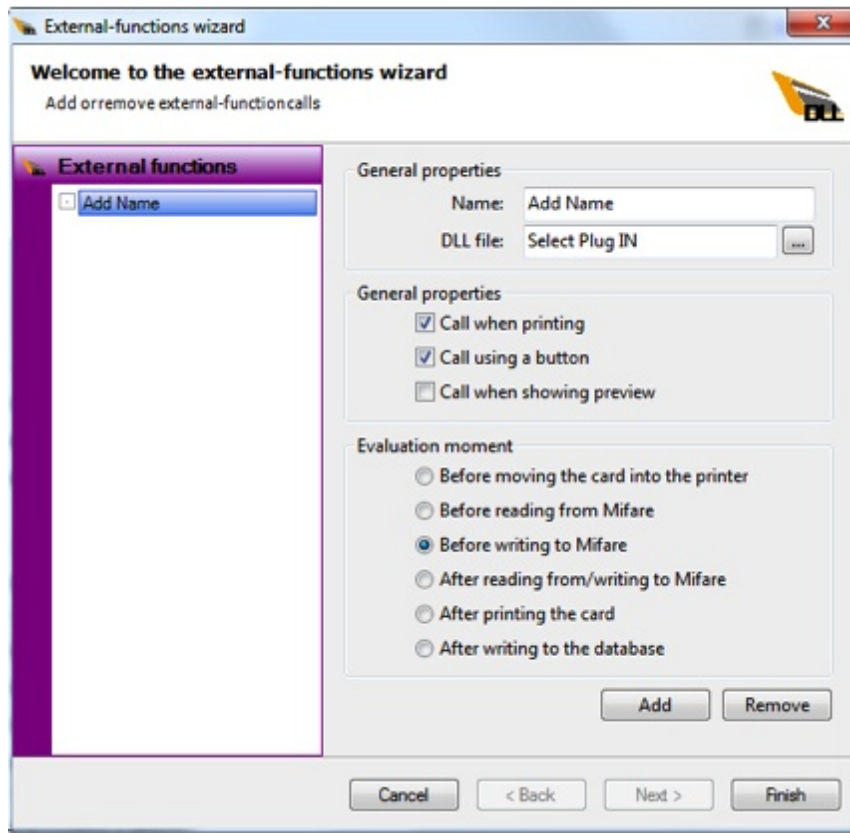
When you have ordered and received a External Plug-In you will have to configure CardExchange® to be able to use this Plug-In. To get access to the Plug-In functionality, you will first have to access the Card Definition Wizard.



To call the Card Definition Wizard you have to click on the Edit card definition button in the [Configuration](#) tab. If you do not see this button, please change the configuration settings as described in the [Advanced Options](#) section of this Help file.



When the Edit card definition button is pressed, the Card definition wizards opens and you need to select "Do you want to use external functions or plug-ins?" and click on Edit to start the wizard.



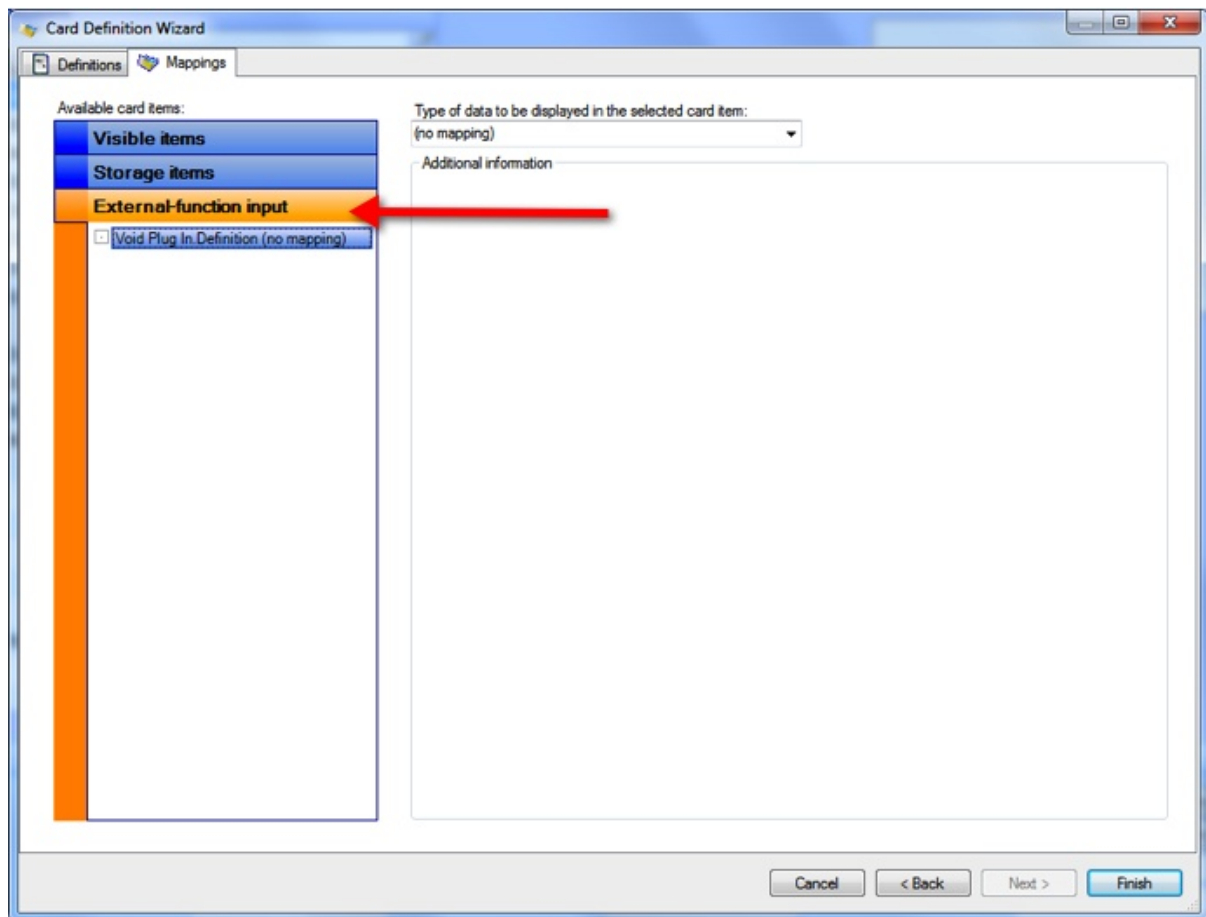
General Properties

- **Name** - Enter a name for the External Plug-In, for example Fingerprint Scan
- **DLL File** - Browse and select the External Plug-In file you received
- **Call when printing** - Select if the plug-in needs to be called during the print process
- **Call using a button** - Select if the plug-in needs to be made available via an button in the Main Interface
- **Call when showing preview** - Select if the plug-in needs to be executed every time the preview is reloaded

Evaluation moment

Check one of the available evaluation moments. For example, if you have an external plug-in that calculates a special value based on the CSN of a MIFARE® Classic 1K card you use before writing to MIFARE® so the calculated value is available for storage or printing in the template.

Click on Finish to store the settings.



Click on Next in the Card Definition Wizard and select the External-function input tab and connect it to the preferred mapping.

IMPORTANT! External Plug-Ins can have input as well output functionality!

19.2 Void Plug Ins

Void plug-ins

The CardExchange® external plug-in framework has a hidden feature, which is the possibility to define a void plug-in. Void plug-ins offer two possibilities that are otherwise not possible: controlling when a .NET Function is executed and using a single manual entry for multiple card items.

Description

A void plug-in is created by defining a plug-in that does not reference a real plug-in DLL. If CardExchange® detects that no real plug-in is selected, it creates an internal plug-in with one input parameter, called "Definition", and one output parameter, called "Result". When executed, the plug-in copies the value of the input parameter to the output

parameter.

By mapping a .NET function to the Definition parameter of a void plug-in, it is possible to combine the advantages of .NET Functions with the advantages of plug-ins, that is, you can develop your own .NET functions and you can still control when the function is executed by using the settings in the plug-in wizard.

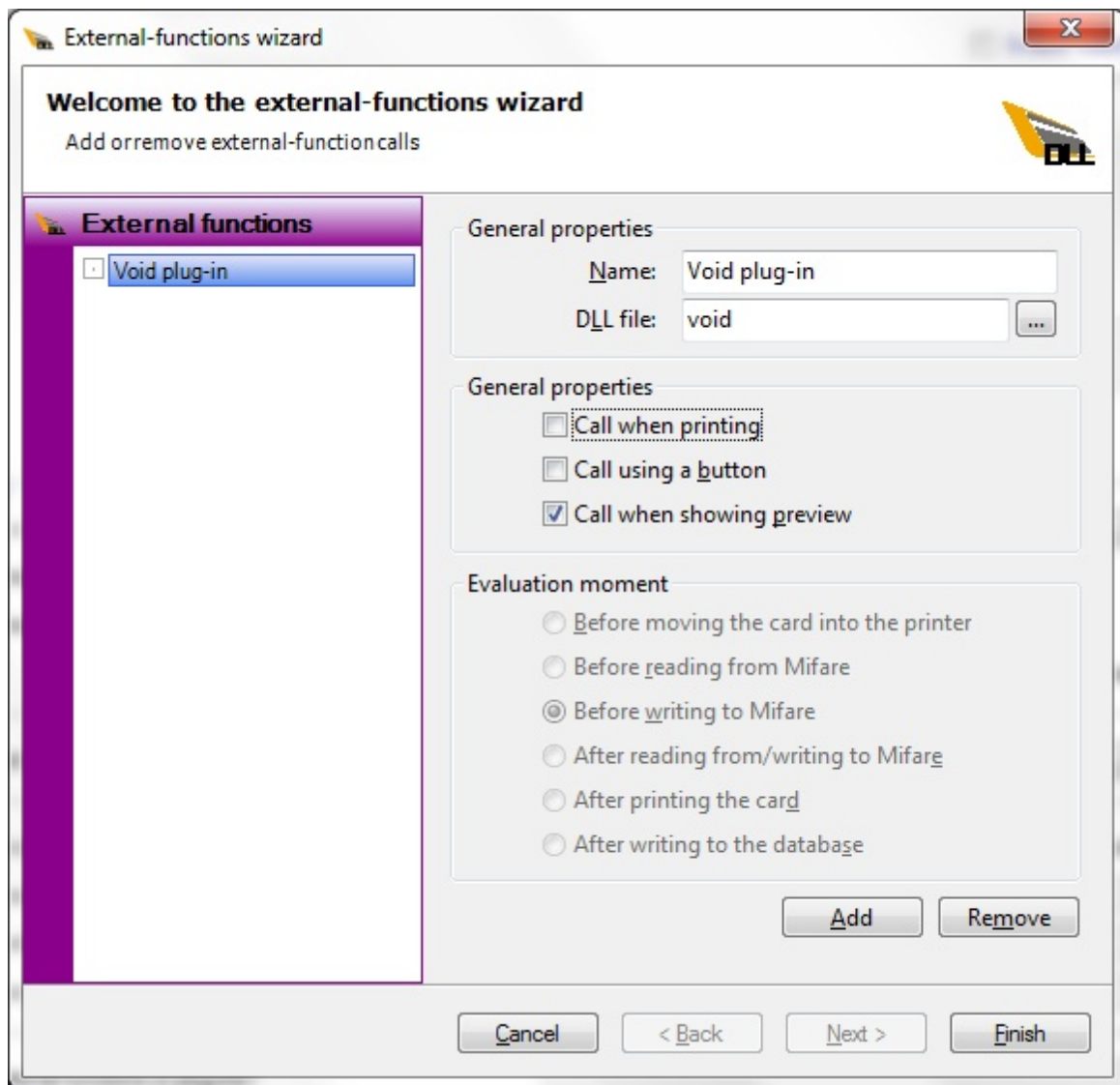
By mapping the Definition parameter to a manual entry, you can use the result of a single manual entry in multiple mappings. That makes it possible to have a single manual entry whose value is both printed on the card and stored in the database.

For manual entries, you will often want the void plug-in to be executed whenever you call a preview. However, when the void plug-in is used in combination with a .NET function, you will often prefer to execute it during the print process only, or when clicking a button.

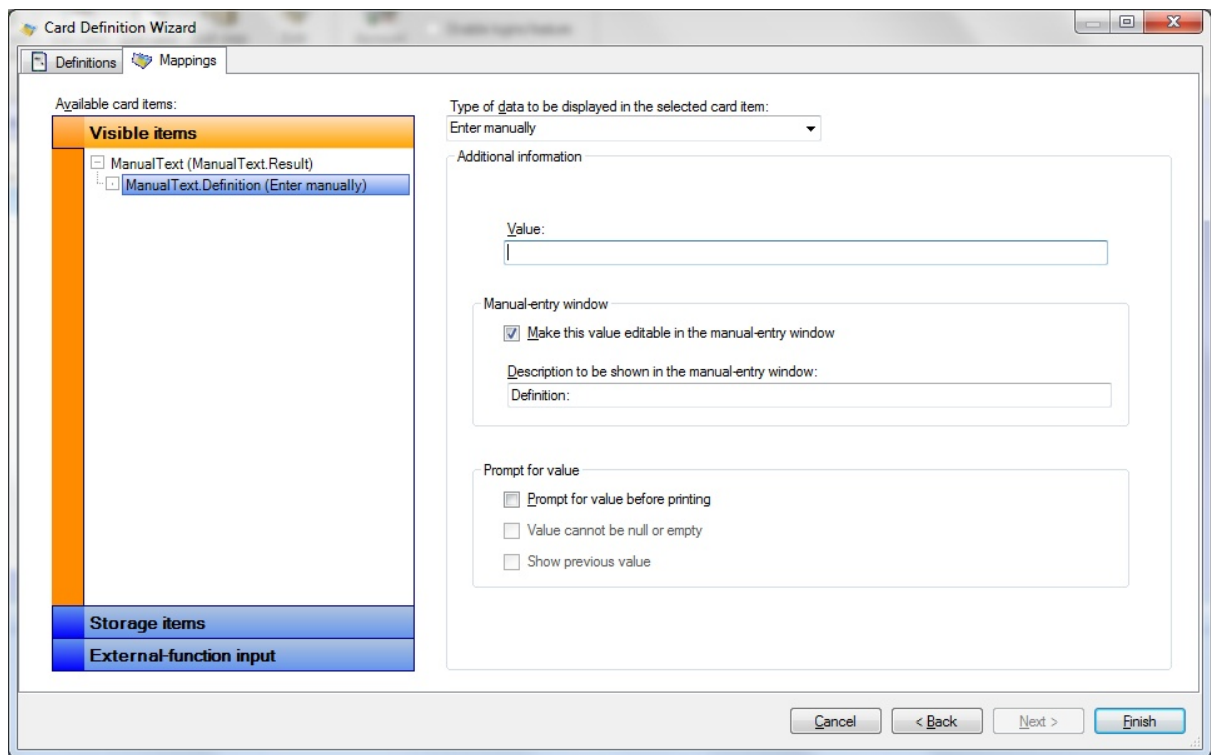
Example

To illustrate how void plug-ins work, we will create a card definition with a single manual entry that is both printed on the card and stored in the database.

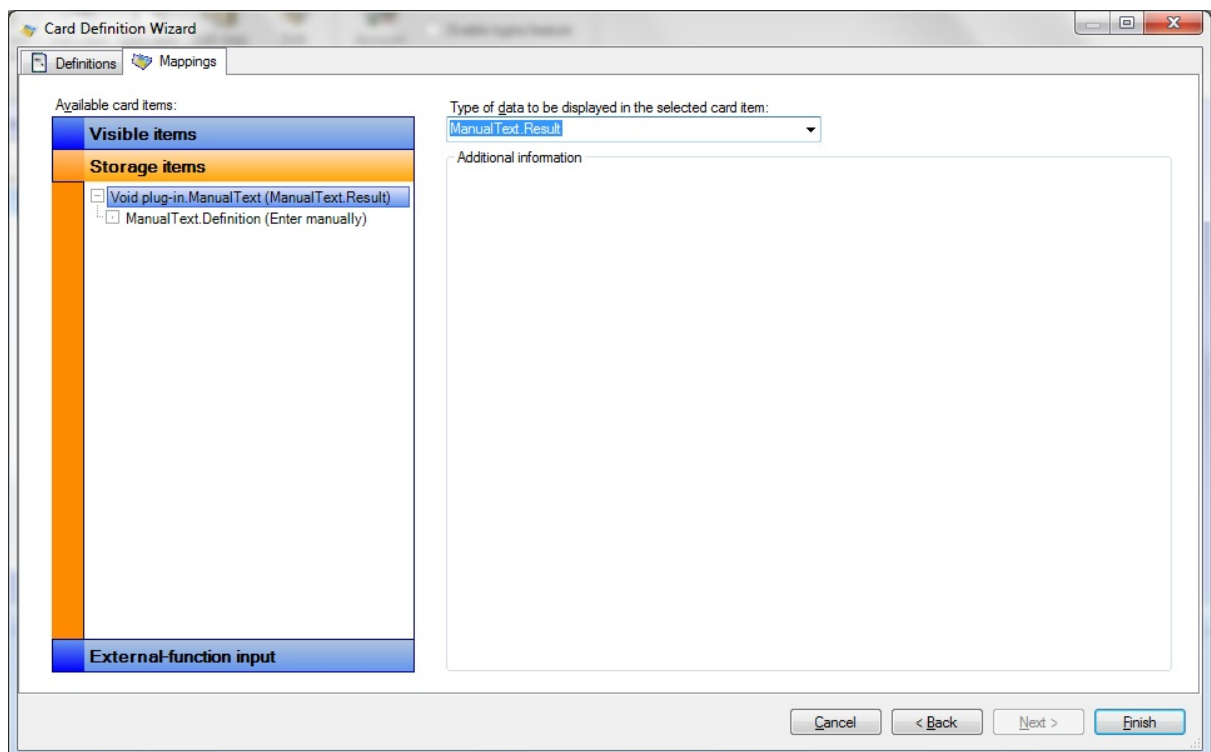
1. To start, add a new card definition that consists of a card layout with a data text object called "ManualText" and a data definition with a storage item called "ManualText".
2. Select "Do you want to use external functions or plug-ins" in the card-definition wizard and click the Edit button to configure the plug-in.
3. Add a plug-in called "ManualText" and type "void" in the DLL-file field. Then click Finish.



4. Click Next to go to the mappings window and map the visible item called "ManualText" to the plug-in output "ManualText.Result". Then map the plug-in input "ManualText.Definition" to "Enter manually".

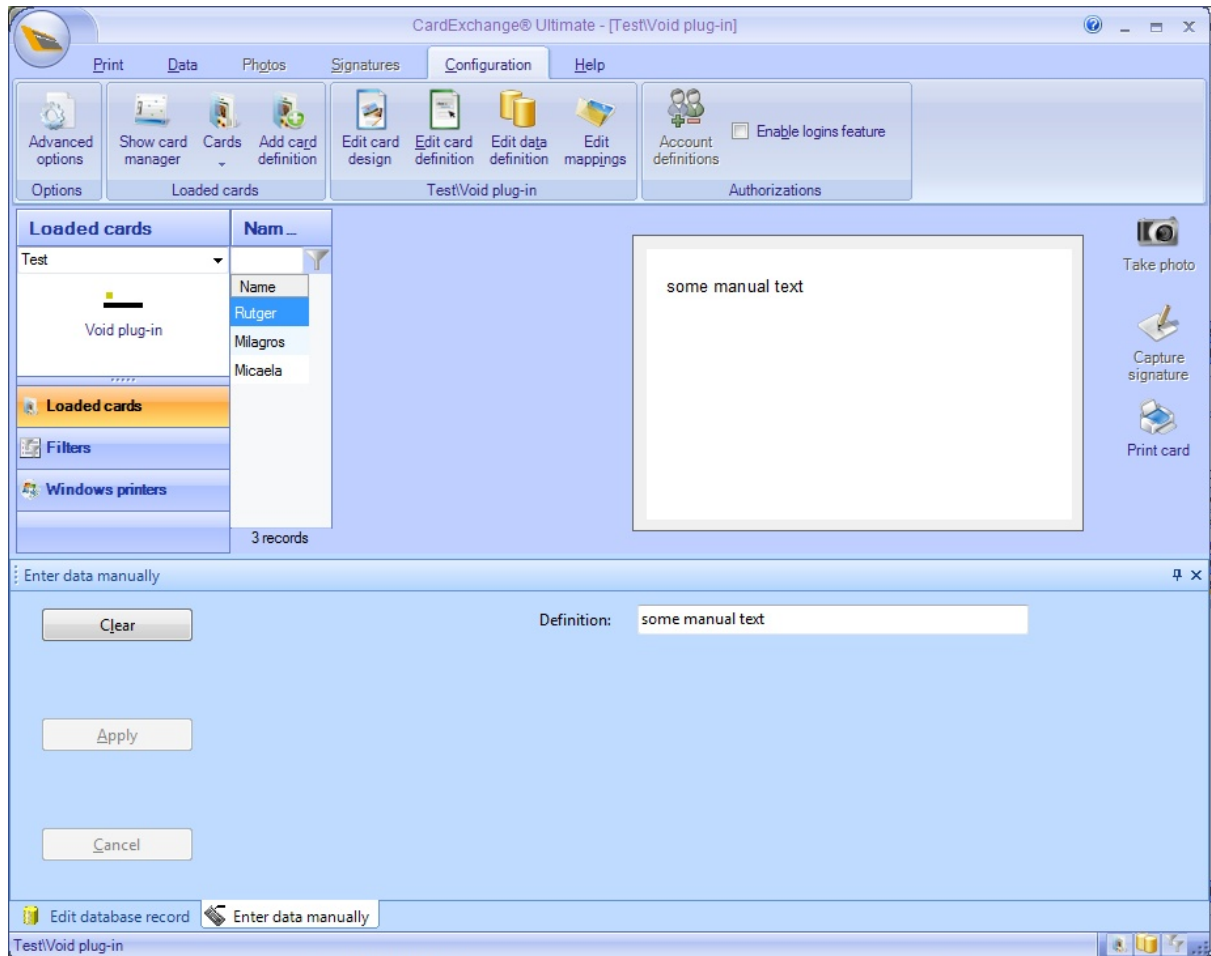


5. Select the Storage items tab and map the storage item "ManualText" to the external function output.



6. Click Finish to close the card-definition wizard and open the manual-entry window. You

will see, that there is a single manual entry.



7. Print the card. You will now see that the manual entry is stored in the database.