

MAGICARD

Prima 2e Re-transfer Printer

Printer Driver Manual



Welcome to the high performance printer driver for the XID5xxi series printer. This manual will help you to install, set-up and configure the driver to get the best results for your prints.

The driver runs on 32-bit Windows platforms and was successfully tested under Windows 2000 and Windows XP Professional.

This driver was designed for the best performance and stability. Additionally, all the necessary features referring to different card materials, color ribbons etc., are included.

All document setting parameters can be controlled from the PC via the new Administration Center.

Technical Support

For technical assistance, please contact the company from which you purchased the printer.

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1. Legal and Copyright Information

This product is provided on an "as is" basis, without any other warranties, or conditions, expressed or implied, including but not limited to warranties of merchantable quality, merchantability or fitness for a particular purpose, or those arising by law, statute, usage of trade or course of dealing. You assume the entire risk as to the results and performance of the Software. Neither we, our dealers nor our suppliers shall have any liability to you or any other person or entity for any indirect, incidental, special or consequential damages whatsoever, including but not limited to loss of revenue or profit, lost or damaged data or other commercial or economic loss, even if we have been advised of the possibility of such damages or they are foreseeable; or for claims by a third party. Our maximum aggregate liability to you, and that of our dealers and suppliers, shall not exceed the amount paid by you for the product. Some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages so the above limitation may not apply to you.

2. Installation

2.1. Printer Driver Installation

Note 1: It is recommended to install the driver before you connect the printer to the PC!

Note 2: System administrator privileges are required for driver installation!

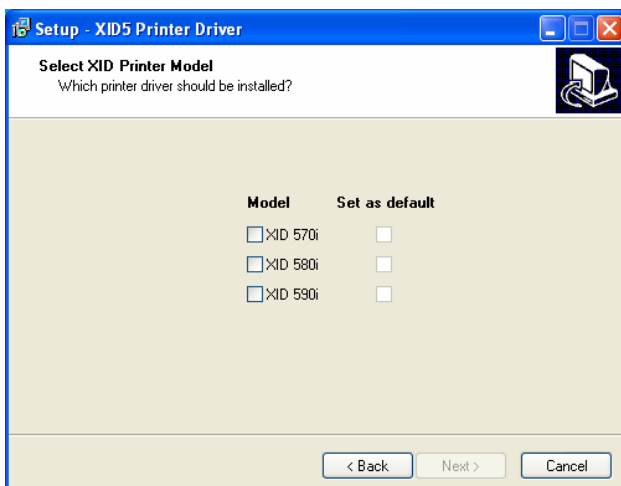
Log on to Windows as system administrator.

Start the installer program "Setup XID5xx 5.3.exe" from your driver CD ROM. Follow the instructions (See the following screen shots).

The installation itself contains two separate steps in one installation procedure: First the printer device driver and second the printer driver itself.

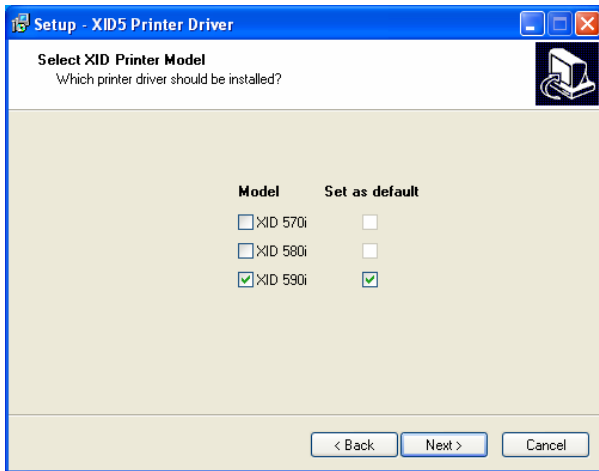


Click "**Next**" to continue.



Please select your "**DIGID XID5xx**" model from the model list. In addition, you can decide to specify the printer as the default printer on your system.

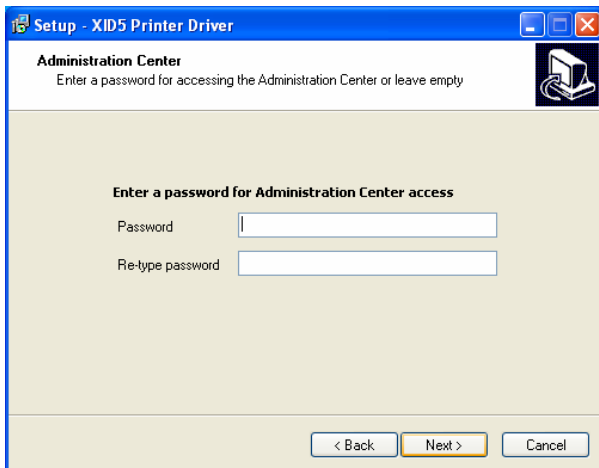
Then click "**Next**" to continue.



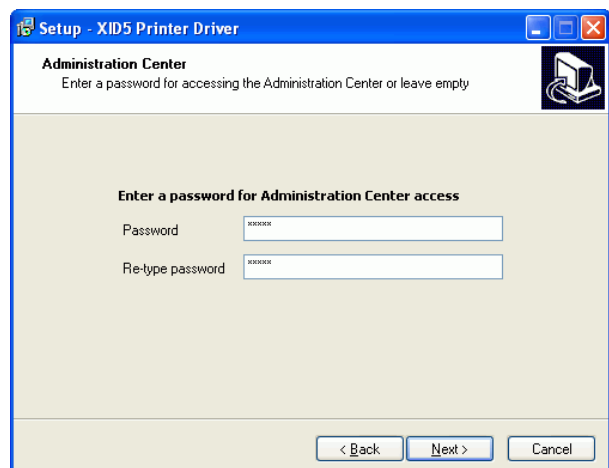
Note: Please note that you have to choose the exact name of the delivered member of our XID Printer Family. The wrong choice will result in a non-working printer!!!

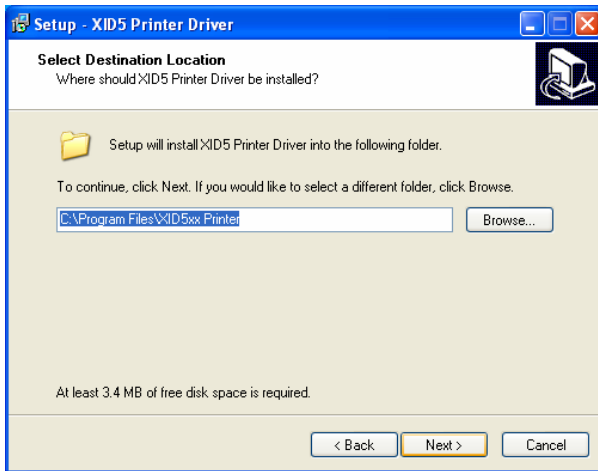
An administrator password can be set during initial installation. This password grants access to the Administration Center.

Note: It is possible to leave this field empty, but it is recommended to enter a password.



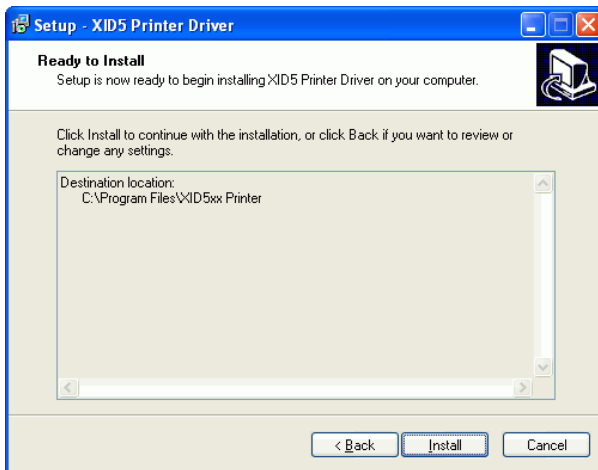
If both entries match, click "**Next**" to continue.





Note: It is recommended to use the proposed default path.

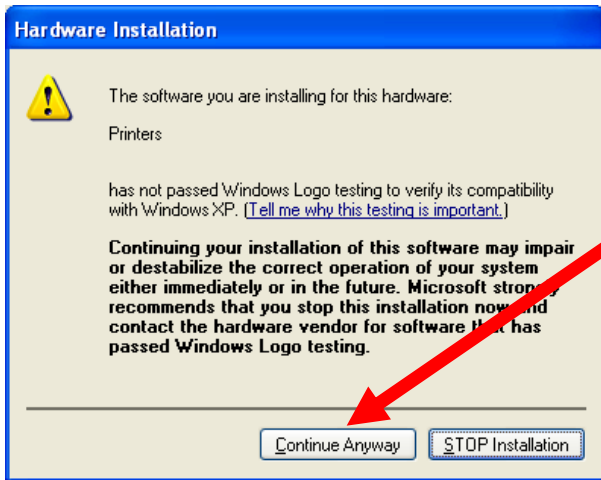
Please verify the path shown and click "**Next**".



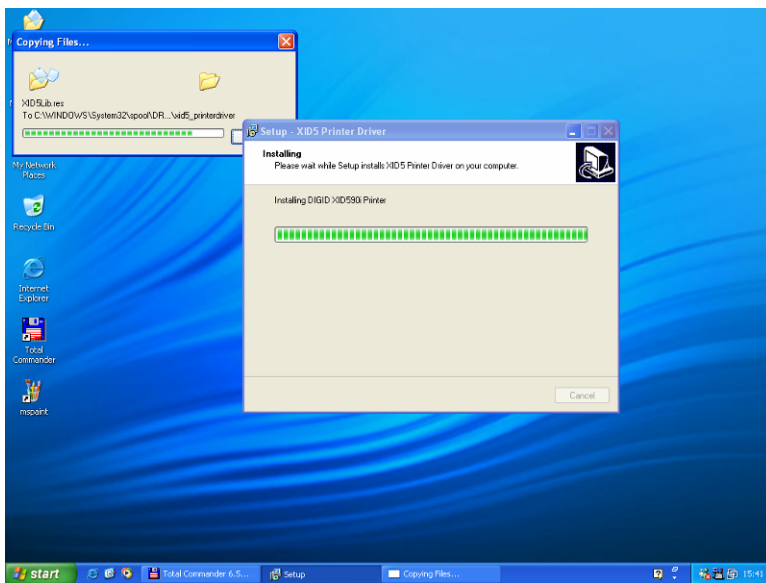
Click "**Install**" to continue.



Click "**Continue Anyway**" to continue the installation.



Click "**Continue Anyway**" to continue the installation.



Now the files will be installed.



Click on "**Finish**" to complete the installation.

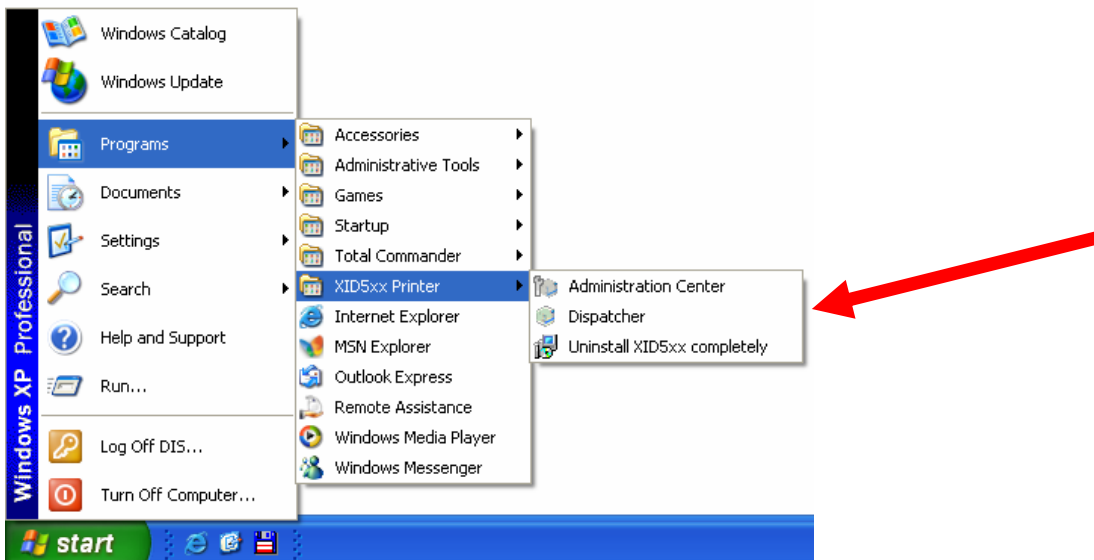
A reboot may be necessary, as shown below.



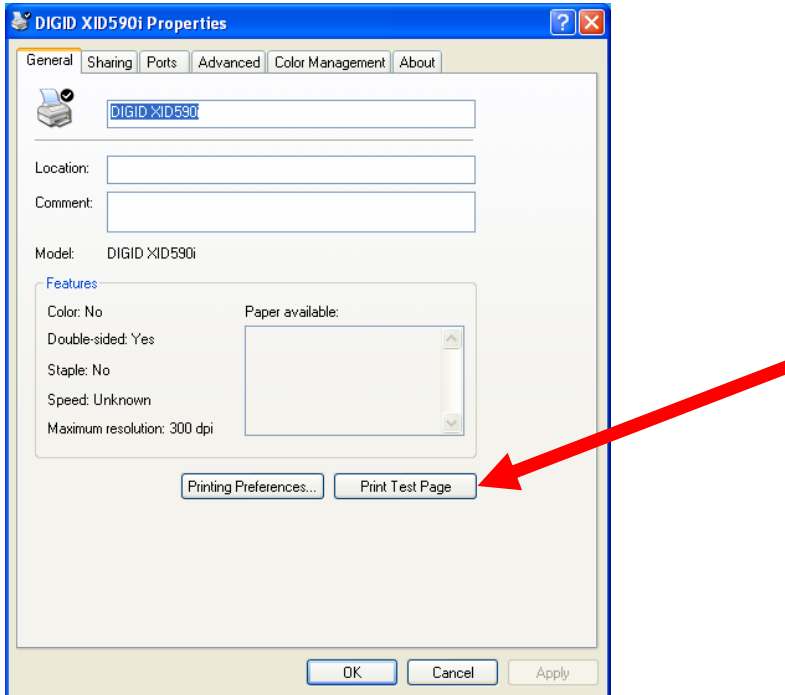
Please wait until the driver installation is completed, then click "**Finish**".

The selected printer should appear here (see arrow):

Under **Start -> Programs -> XID5xx Printer**, you should see the related modules



By calling the printer properties, from the "General" tab, you can print a test page as follows:



After your test page has been printed successfully, click "OK".

After the installation has been completed, connect the printer to the PC and power on. The Hardware Wizard appears and shows a signature warning:



Click "Continue" to proceed.

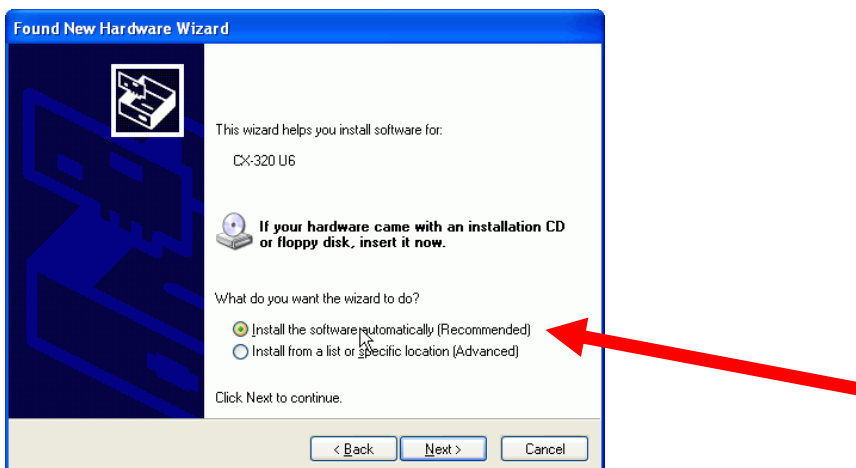
The Wizard will ask you to connect to Windows Update:

Choose **"No, not this time"** and click **"Next"**.



Choose **"Install the software automatically"** and click **"Next"**.

Note: The hardware name ("**CX-320 U6**") may differ depending on the firmware and the ID of the printer.



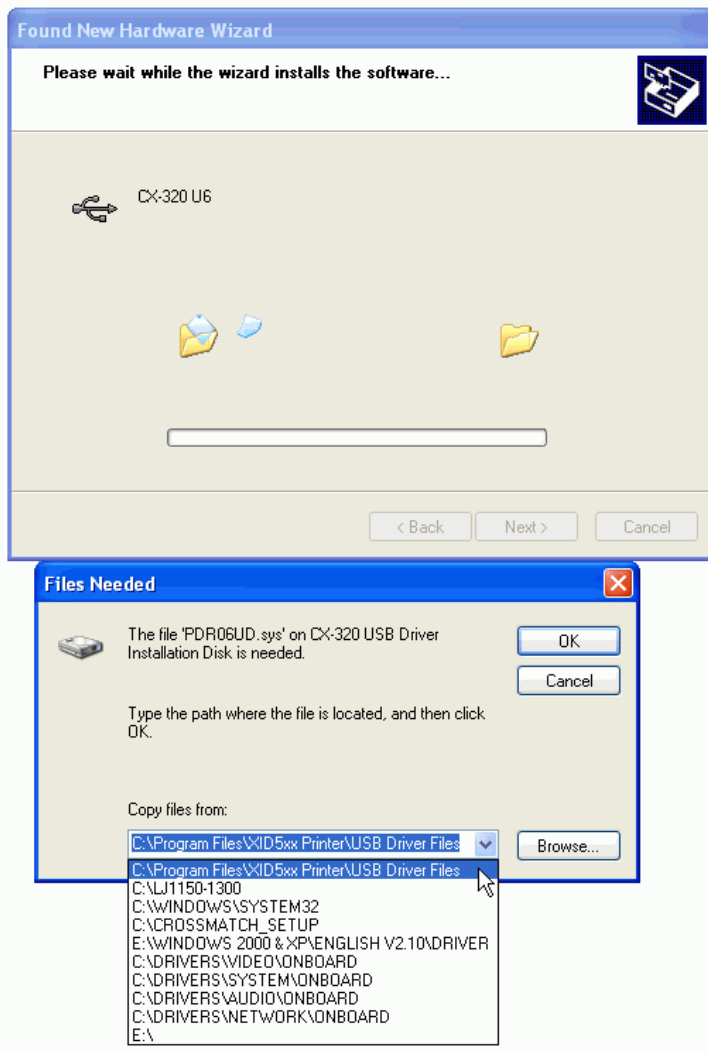
The Hardware Wizard appears and shows a signature warning.

Click **"Continue Anyway"**.

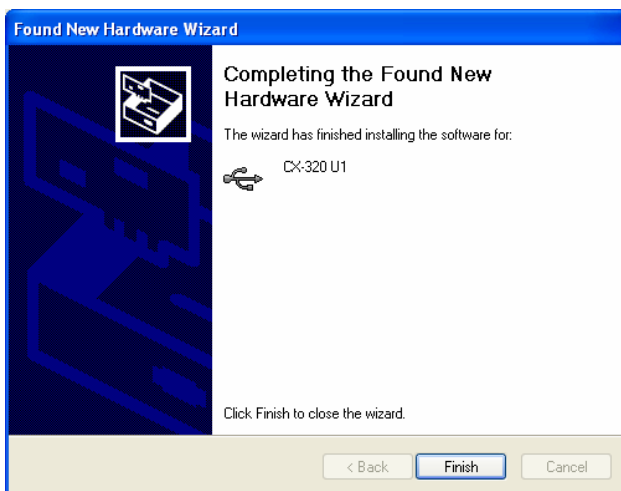


The wizard will ask you for the location of the driver files.

In the **"Files Needed"** window, click on the dropdown list box and choose the first entry. Click **"OK"** to continue.



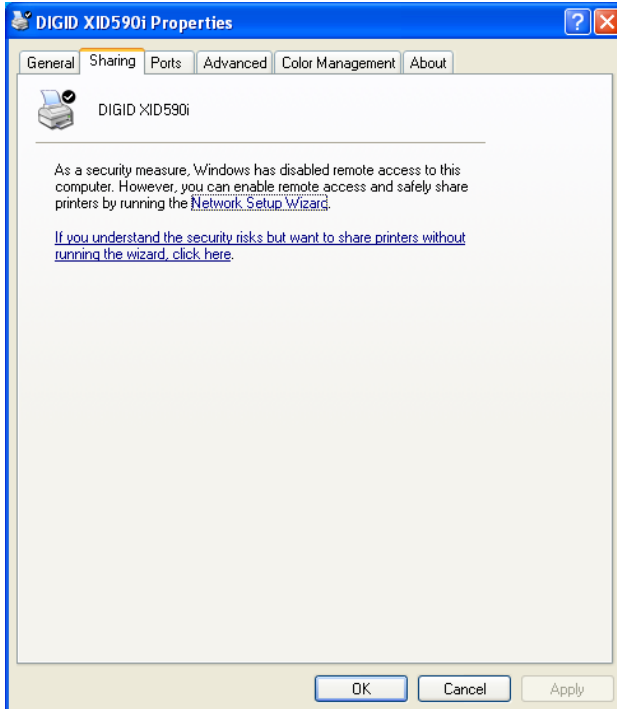
Click **"Finish"** to close the Hardware Wizard.



Congratulations! You have successfully finished the printer driver installation.

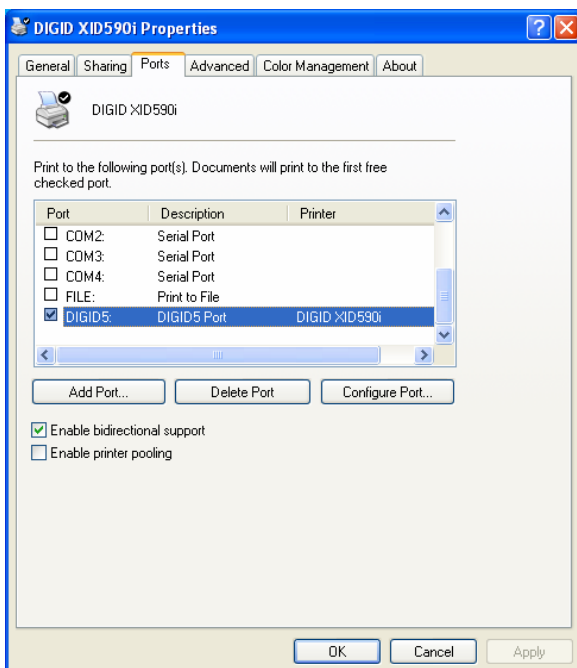
2.2. Advanced Printer Configuration

If the printer is used in a network environment and will be shared with other users, then click **"Shared as:"** and name the printer. Afterwards other users can select this printer within the network environment.

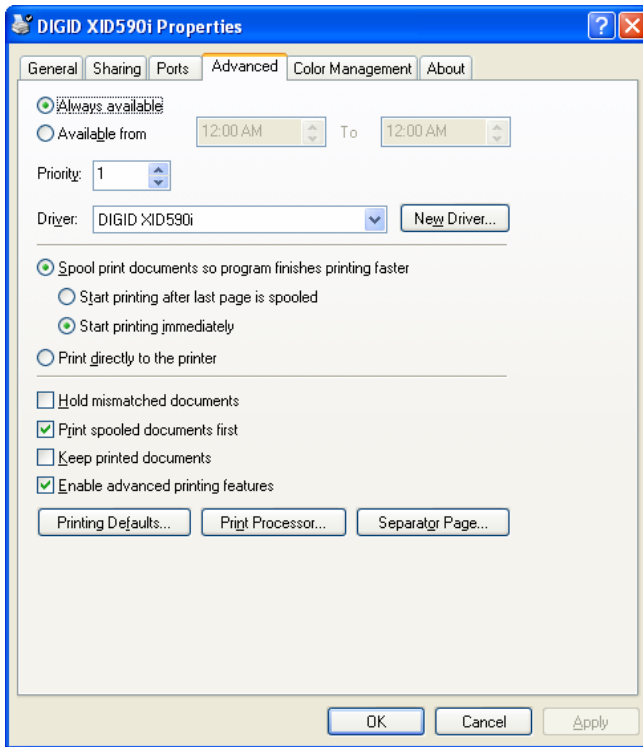


Note: The screenshot may differ depending on system configurations:

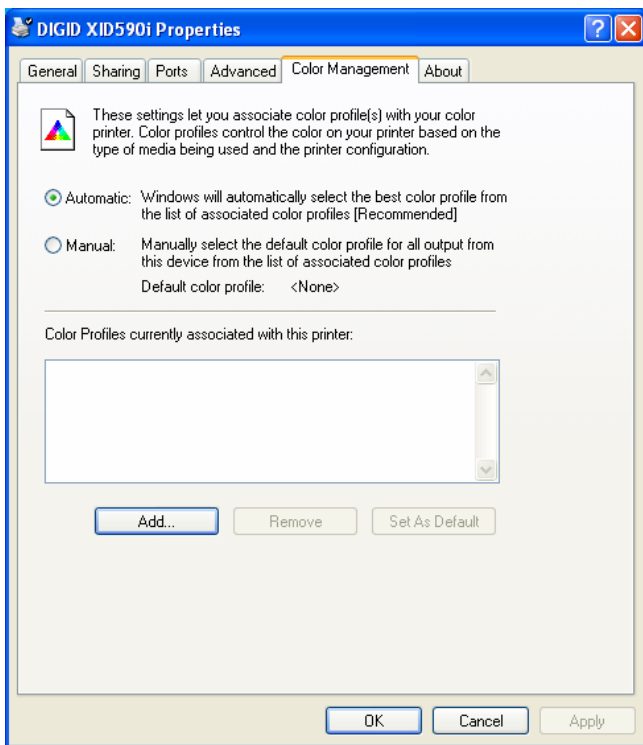
The required printer port will be linked automatically to DIGID5 port.



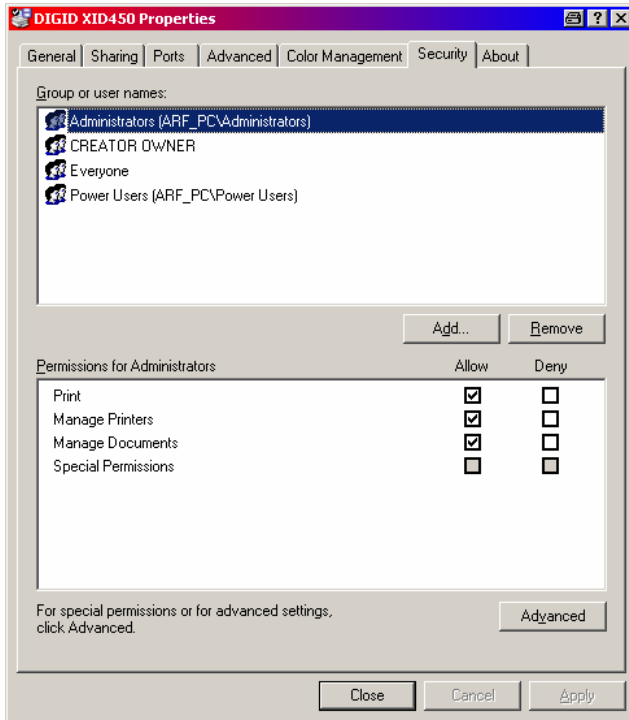
Do not change the following default settings unless you are an advanced user:



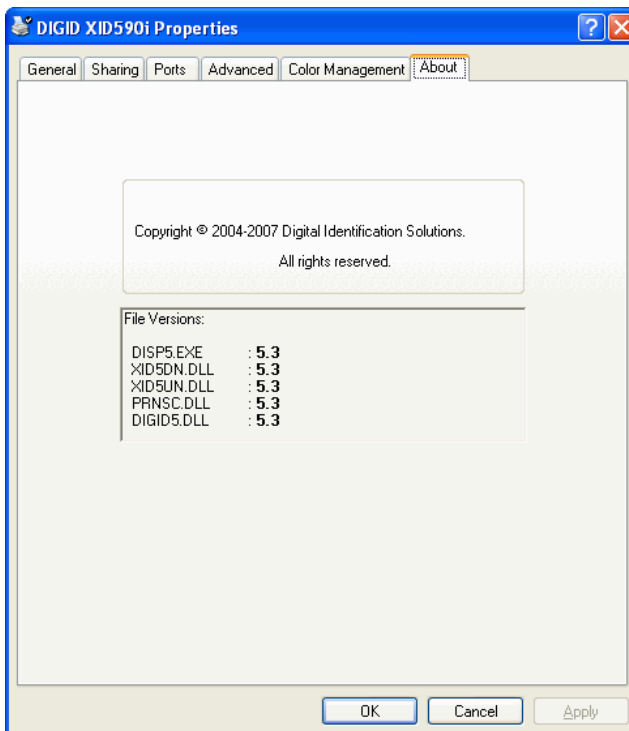
The Color Management settings should only be used by experienced users.



Note: The screenshot may differ depending on system configuration:



On the **"About"** tab you will find the version of the installed printer driver:



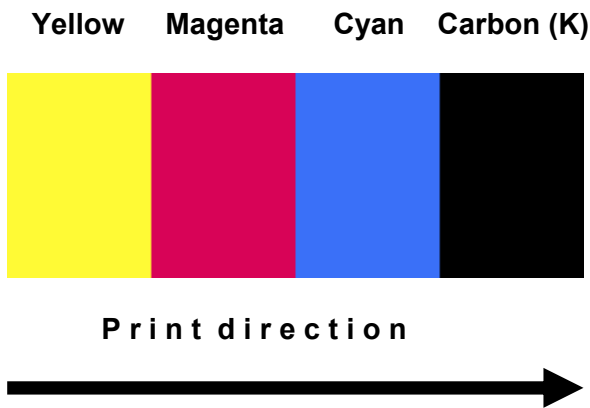
3. Printing Preferences

3.1. Introduction into driver and print technology

In graphic user interfaces all options are shown dynamically as there are card feeding, loading card in magazine, card leaving the printer etc.

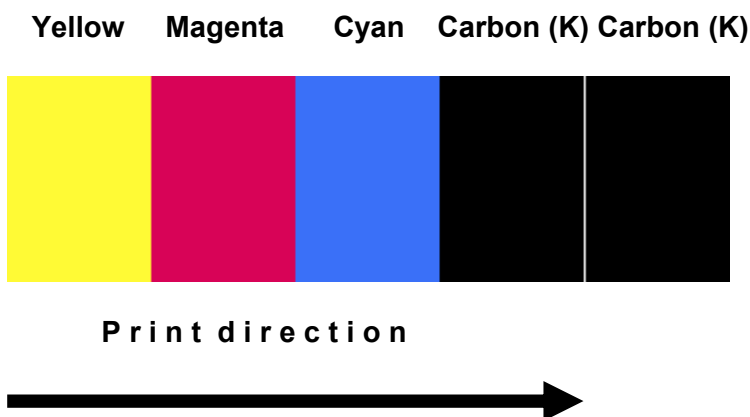
The printing technology contains printing of the colors as a mixture from Yellow, Magenta and Cyan ("Y", "M", "C"). Black ("K"), also known as Carbon black or process black, is often available on color ribbons. The reason for the use of Carbon ("K") black is that a full mixture of Yellow, Magenta and Cyan results in a dark, but not pure black. As a consequence it is common to print strings, barcodes etc. with Carbon ("K") black for achieving a better and sharper impression.

The print order per full color site with an YMCK ribbon appears as following:



For special needs, we are also offering color ribbons with an additional K field. This is a useful option if e.g. a customer needs to print the front of a card in YMCK while on the back of the card has to be printed only some text information in K. The CMYKK ribbon enables this process without the use of a double patch of YMCK and is very cost saving.

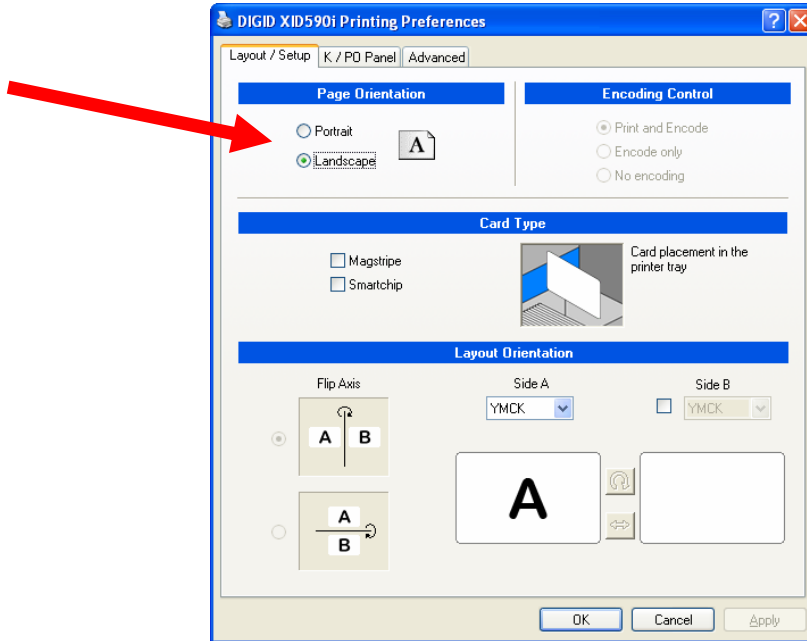
The print order per full color site with an YMCKK ribbon appears as following:



3.2. Layout / Setup

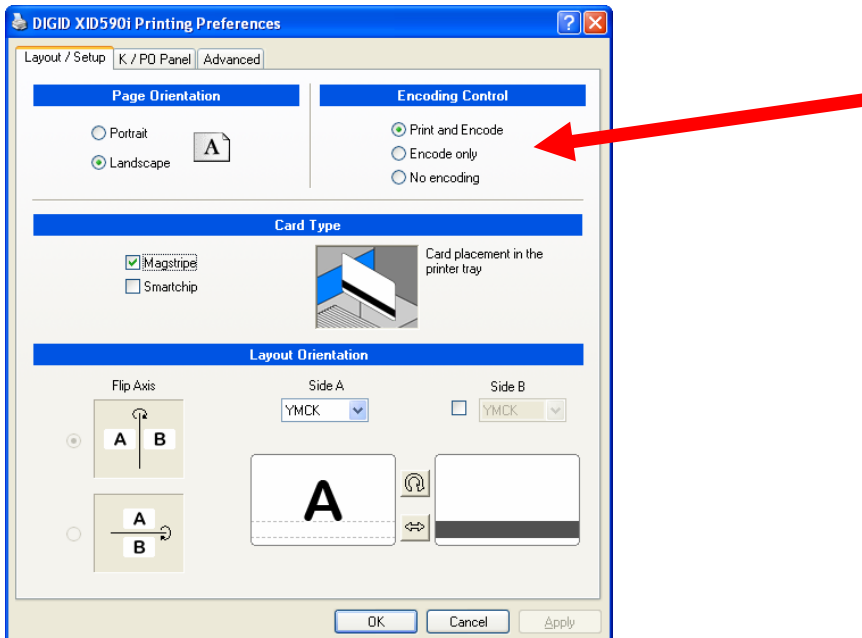
3.2.1. Page Orientation

This option will be used to setup the page orientation between Portrait and Landscape.



3.2.2. Set-up for Control of Printing / Encoding

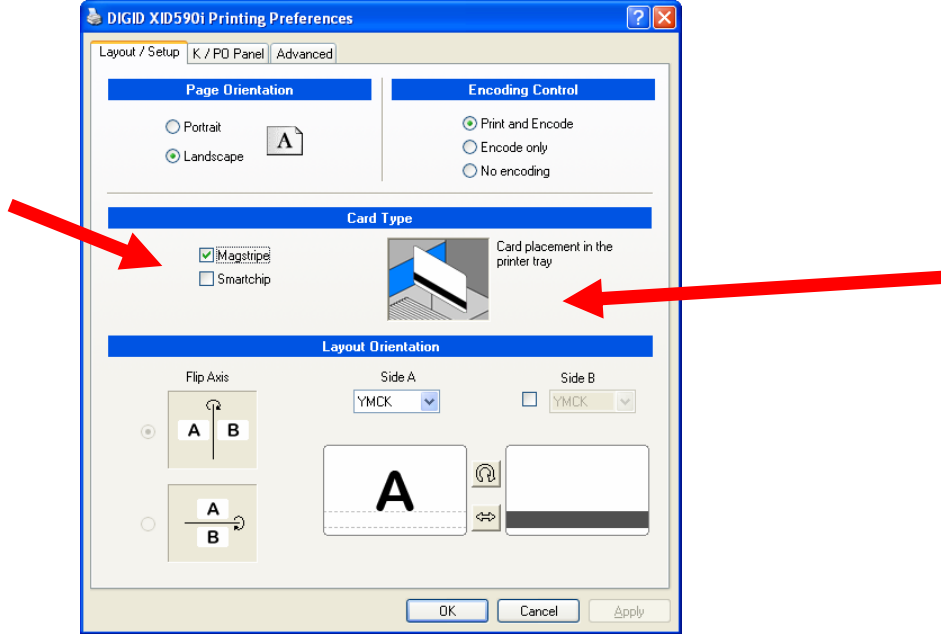
This option sets up the control of "Print and Encode", "Encode only" or "No Encoding".



3.2.3. Set-up for use of cards with magnetic stripe or smartchip (Card Type)

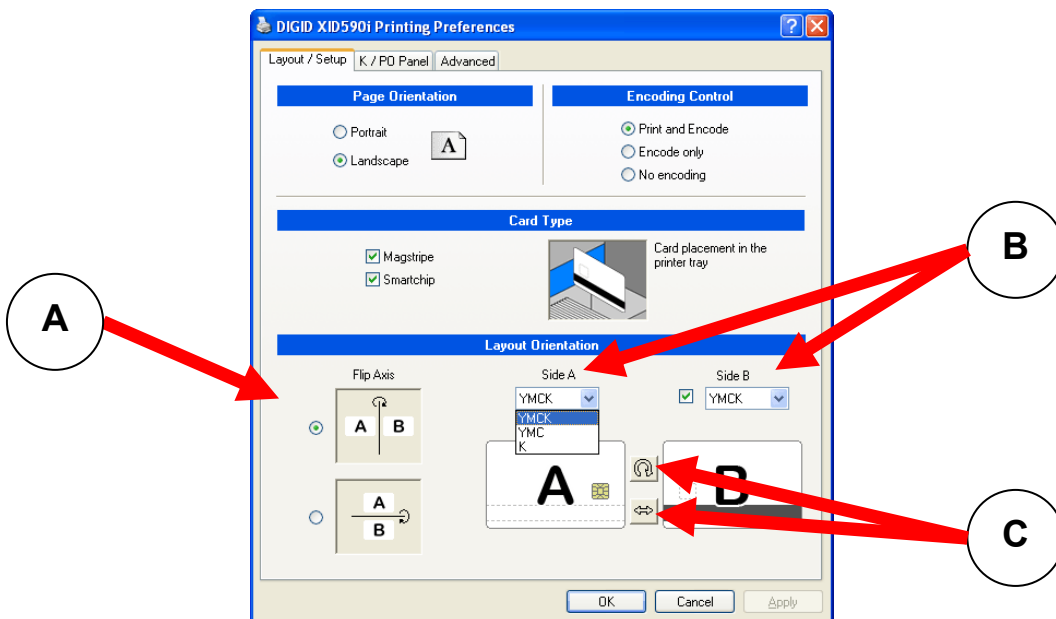
If the "Magstripe" or "Smartchip" checkbox is enabled, all options regarding encoding and positioning of card will be enabled. In addition, the "Card placement in the printer tray" shows dynamically the correct images to the operator.

Please note that the magstripe function is for visualization AND activation.



3.2.4. Set-up for Layout Orientation

The Setup for Layout Orientation is the "central point" of orientation definition of cards and usage of ribbons. With a minimum of mouse clicks you can define every combination you need. By default, the intelligent printer driver's matrix calculates the fastest possible print out speed. However, the operator can always decide between material usage vs. print speed.



- A** Flip Axis: Here you can setup the orientation of the 'card body', which is the same as the function as former 'Image Orientation'. The advantage is that you do not need to imagine how the card will rotate. Just pick up a card and you will understand the idea behind flipping the card horizontally or vertically.
- B** Side A or B: Use the pull down menu to set up the patch usage of the color ribbon for side A (Front side) and side B (Back side).
- C** Rotation / Swap: The rotation button will rotate the full card 180°, while the swap button will exchange the front and back of the layout.

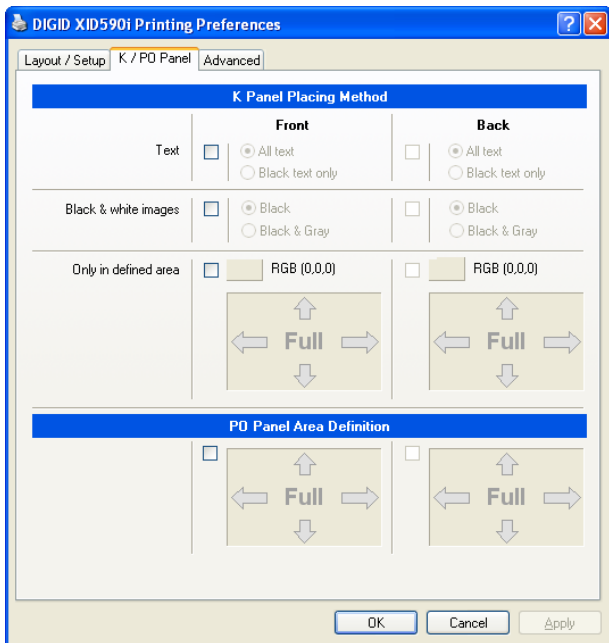
For more details, please refer to **Appendix A** at the end of this document!

3.3. K/PO Panel

3.3.1. Introduction

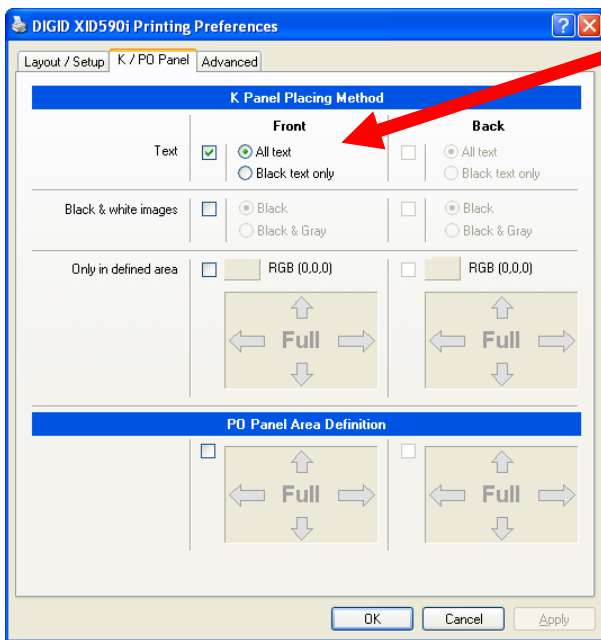
This tab allows you to both define the kind of extraction methods for placing different objects to the K-plane (Carbon black) and to define inclusion areas for PO (peal-off) separately for front and back.

3.3.2. Default Settings

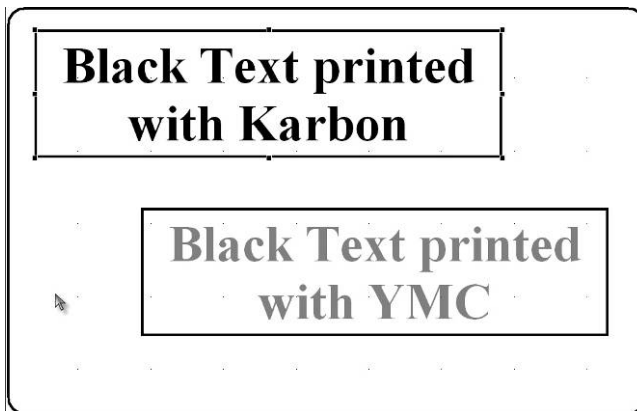


3.3.3. Selection of text objects to be printed on K-plane

By enabling "Text", you are able to specify if all text or only black text should be printed on the K-plane.

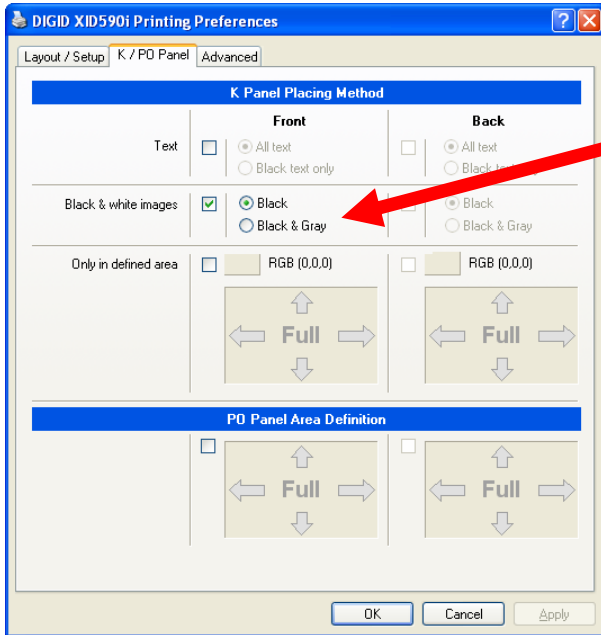


Sample: The upper text box was printed with K and the lower box with YMC:



3.3.4. Selection of black & white images to print on K-plane

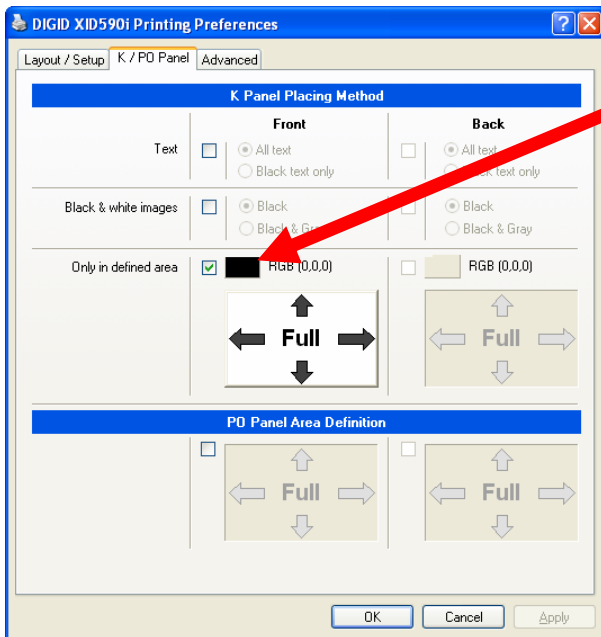
By enabling "Black and White Images" you can specify if black or black & grey images should be printed on the K plane.



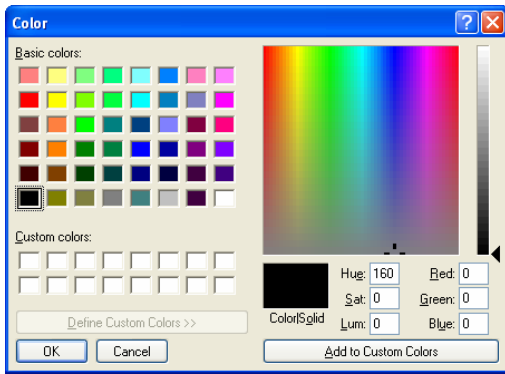
3.3.5. K Plane options

3.3.5.1. Definition of "special colors" for printing on K-plane

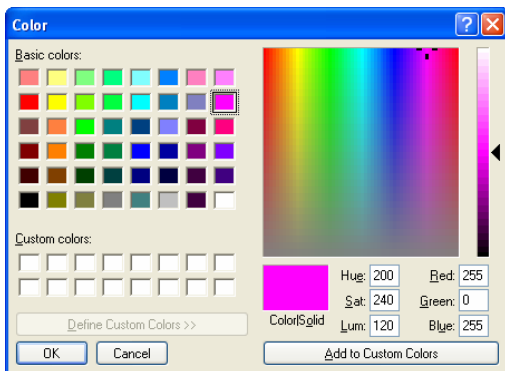
If you use special colors to match existing ones on your layout they will be printed on K-plane.



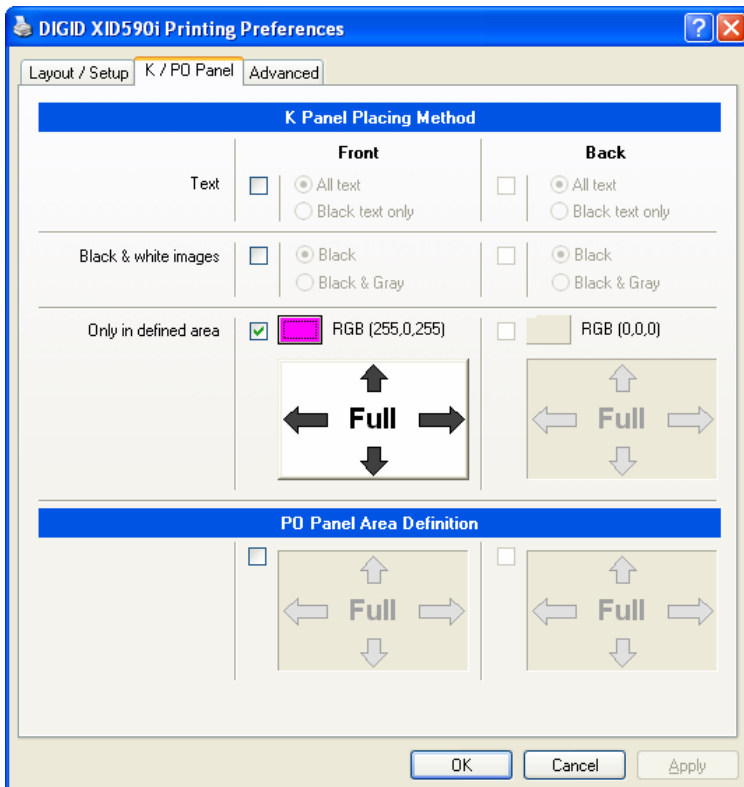
After clicking on the color button, pick up or define a new color as you need. Also, you can add this color to the "Custom colors" as shown:



It is recommended to choose either black or an extreme color, which will not be used in the rest of the layout. Pure colors (like Magenta) will never appear in digital photos, so it is safe to use them without introducing side-effects.

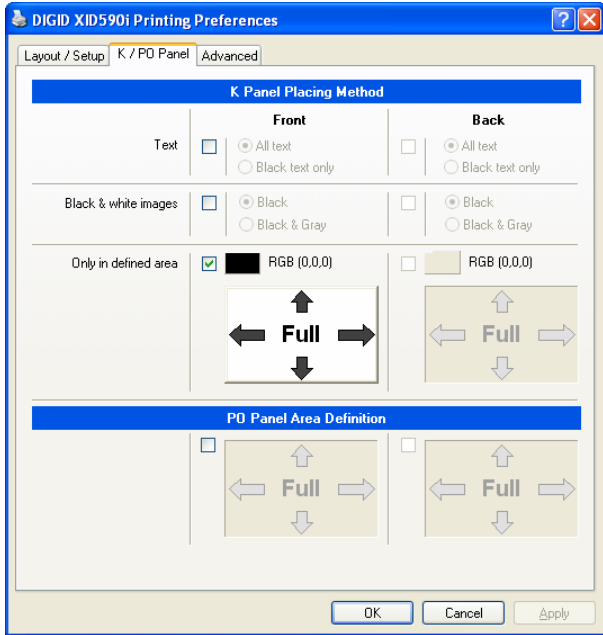


By clicking "OK" the color will be shown on the button.

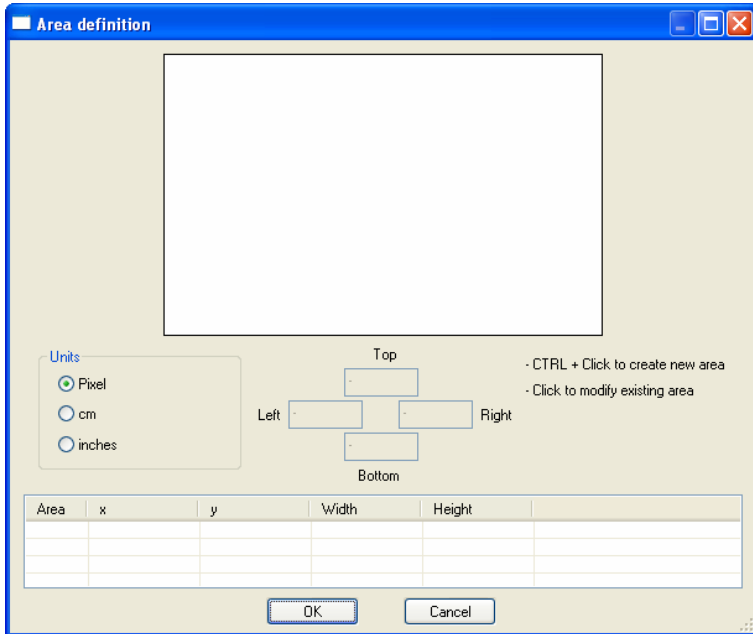


3.3.5.2. Definition of areas for printing on K-plane

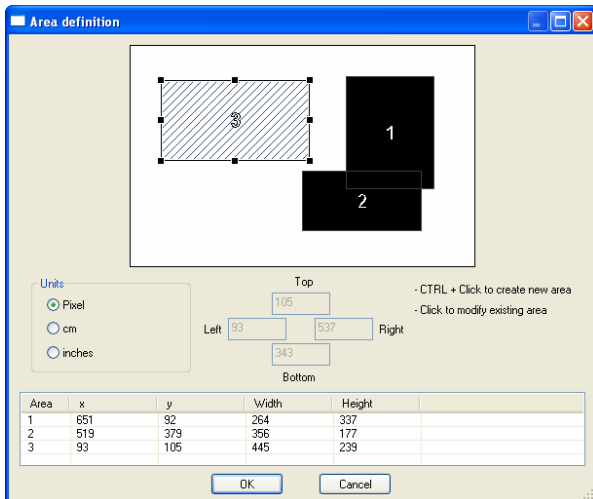
In combination with the special colors (see chapter 3.3.5), you can define inclusion areas:



After clicking on the area button the following dialog window appears:



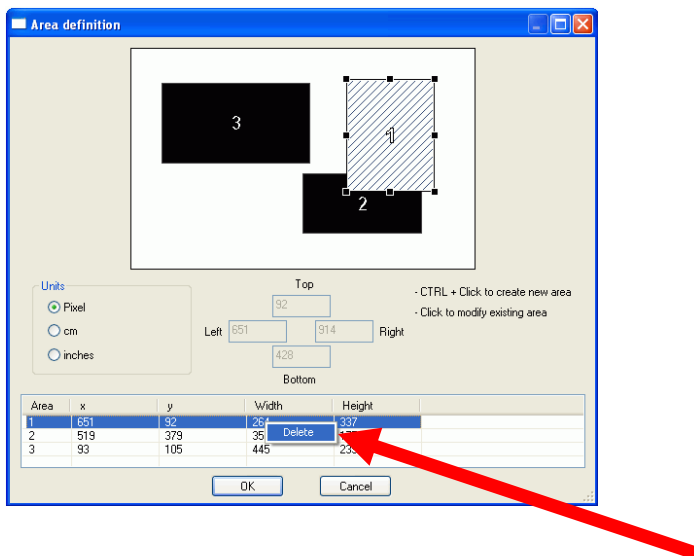
To create a new area: Click and draw a rectangle area while pressing and holding down the **CTRL**-key on the keyboard.



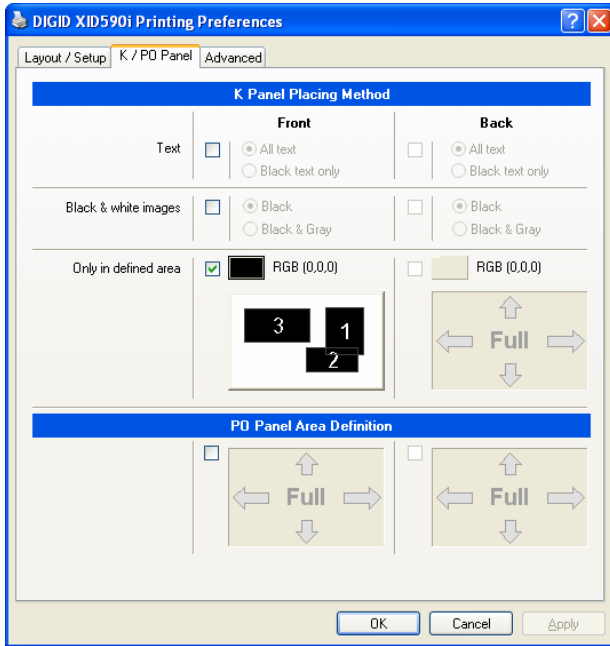
To edit an area: Select an area you want to move or resize by clicking on the area itself or choose it from the list.

You can move the area pixel by pixel using the **cursor**-keys.

To Delete an existing area: Select the area you want to delete or choose the corresponding area from the list, then either right-click on mouse button and click "Delete" or hit del **Del**-key on the keyboard.

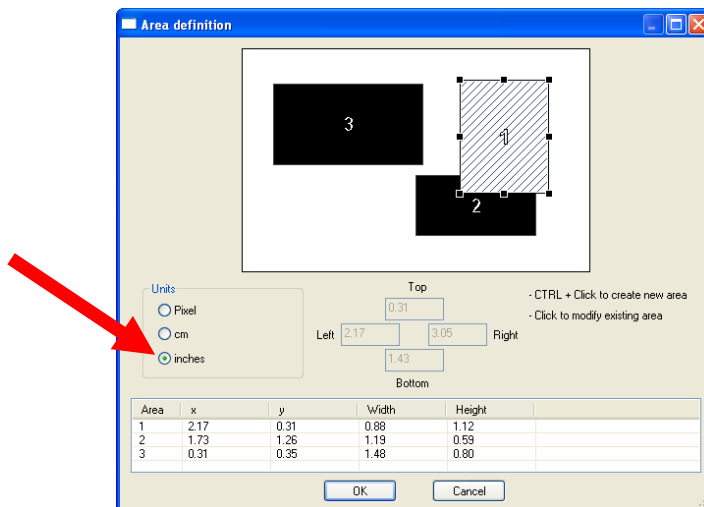


Preview of defined sample K-Panel areas

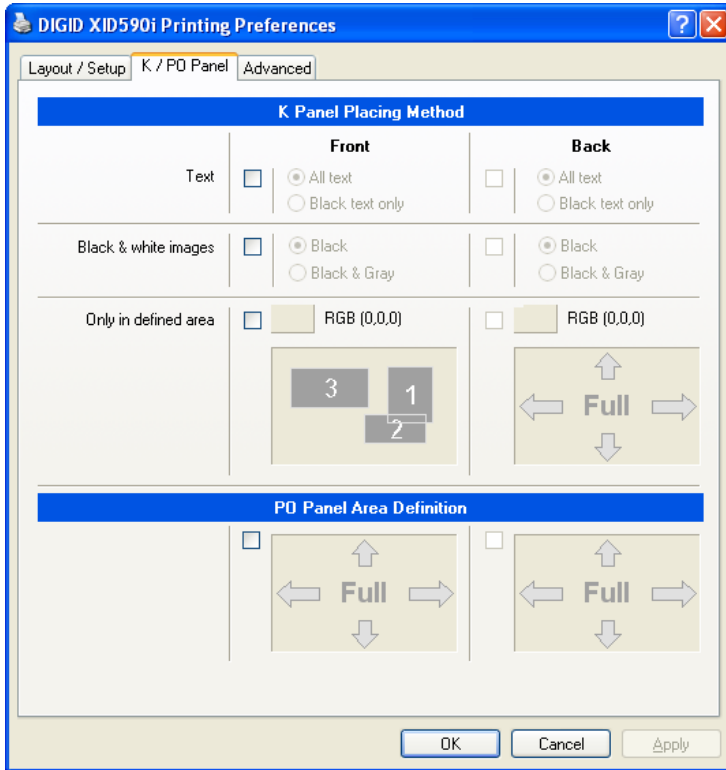


Measurement changes

The following sample shows a change of units e.g. from Pixel to Inch



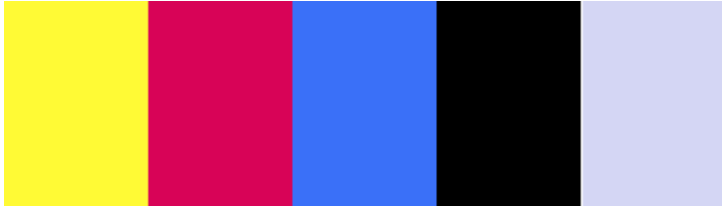
Tip: Keeping values after disabling gives you the flexibility to design the areas before you enable this setting.



3.3.6.PO Panel Area Definition (Peel Off)

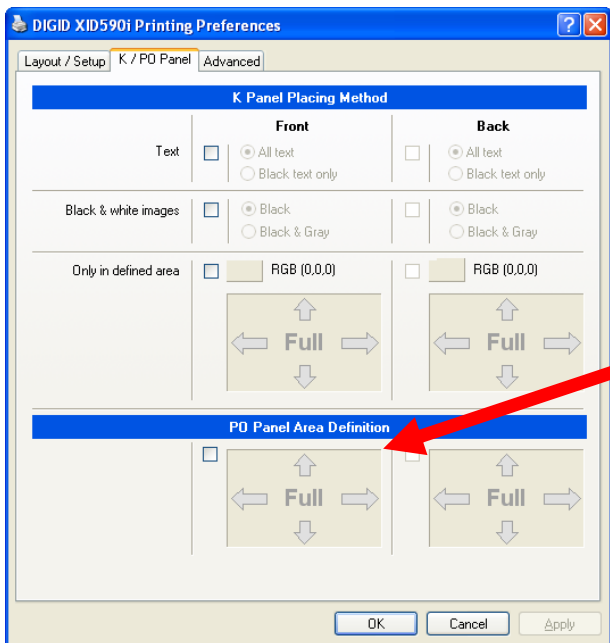
This function is designed to define areas which will be prevented from printing (e.g. signature fields). The YMCK-PO looks like shown:

Yellow Magenta Cyan Carbon (K) Peel Off (PO)

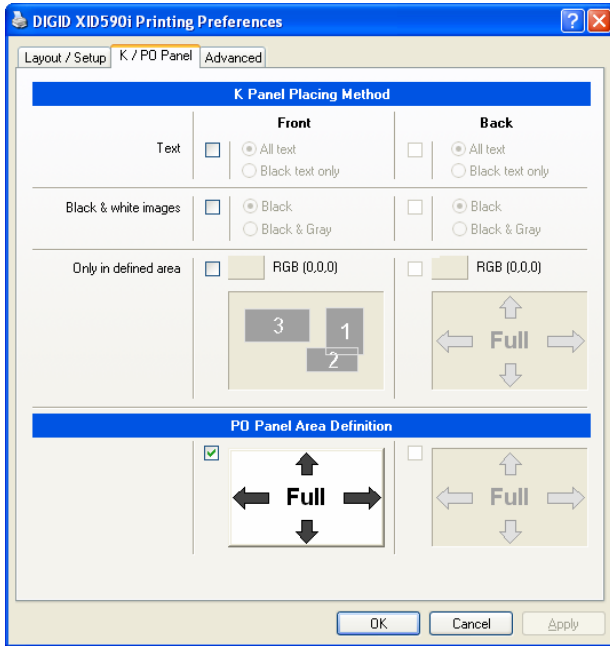


Note: A special ribbon type is required to use this option.

Default Settings

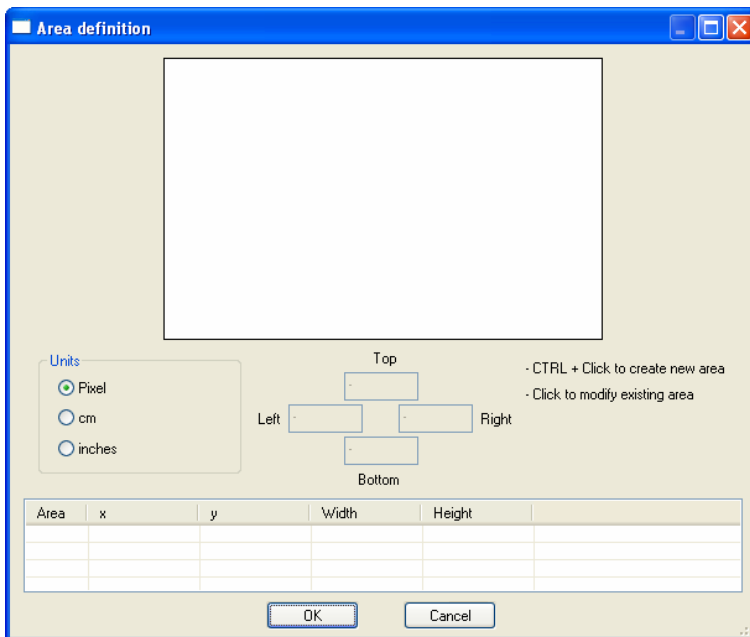


The peel off area is enabled by clicking the checkbox:



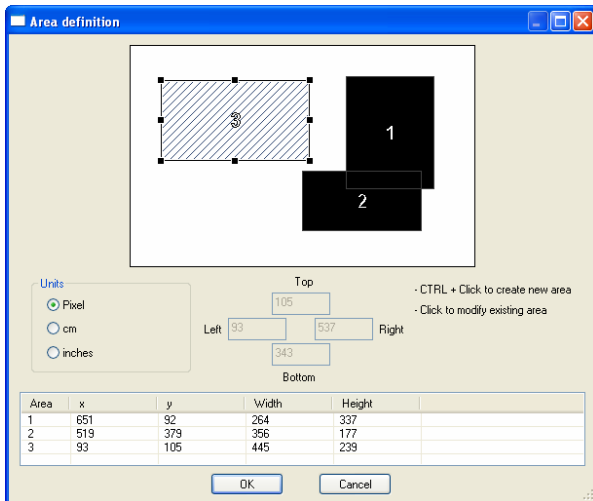
Warning: Use of full PO area results in non-visible printout. In each case you need to define smaller areas (e.g. signature fields).

After clicking on the PO area button the following window appears:



3.3.6.1. Definition of areas Peel Off

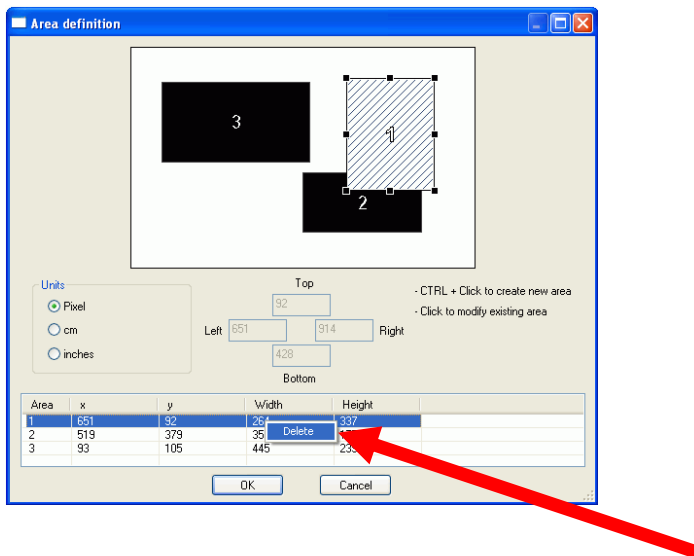
To create a new area: Click and draw a rectangle area while pressing and holding down the **CTRL**-key on the keyboard.



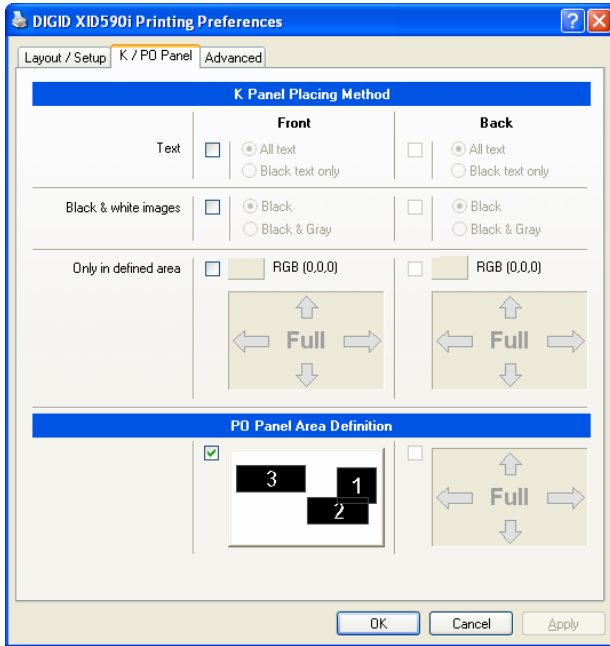
To edit an area: Select an area you want to move or resize by clicking on the area itself or choose it from the list.

You can move the area pixel by pixel using the **cursor**-keys.

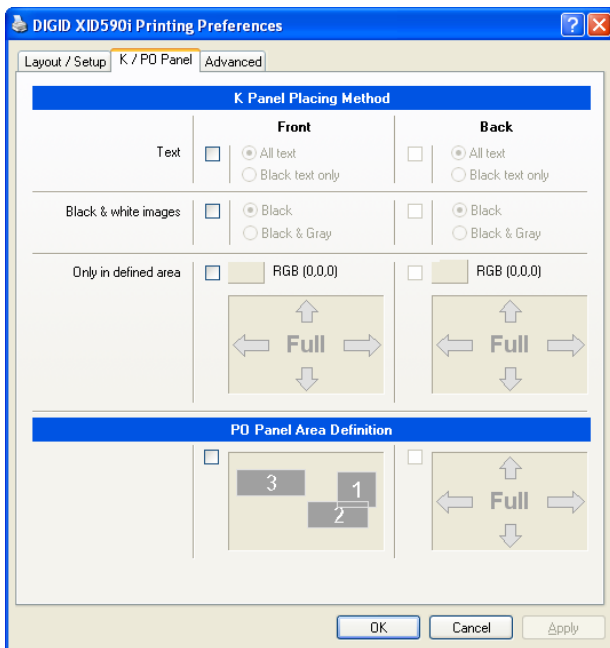
To Delete an existing area: Select the area you want to delete or choose the corresponding area from the list, then either right-click on mouse button and click "Delete" or hit del **Del**-key on the keyboard.



Preview of defined sample K-Panel areas



Tip: Keeping values after disabling gives you the flexibility to design the areas before you enable this setting.



3.4. Advanced

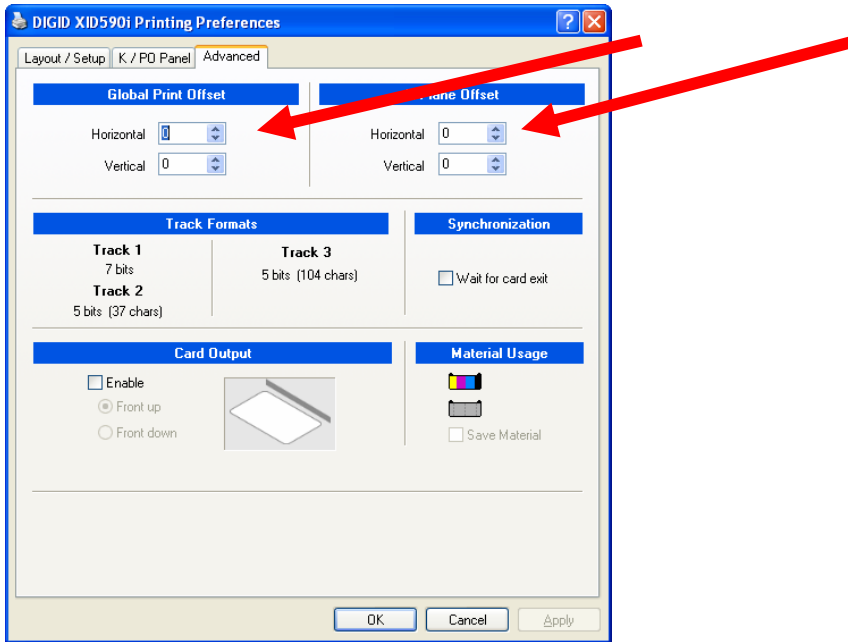
3.4.1. Global Print Offset and K Plane Offset

Global Print Offset:

Here you can shift the offset of the layout in horizontal and vertical direction by changing the values; this influences the complete layout.

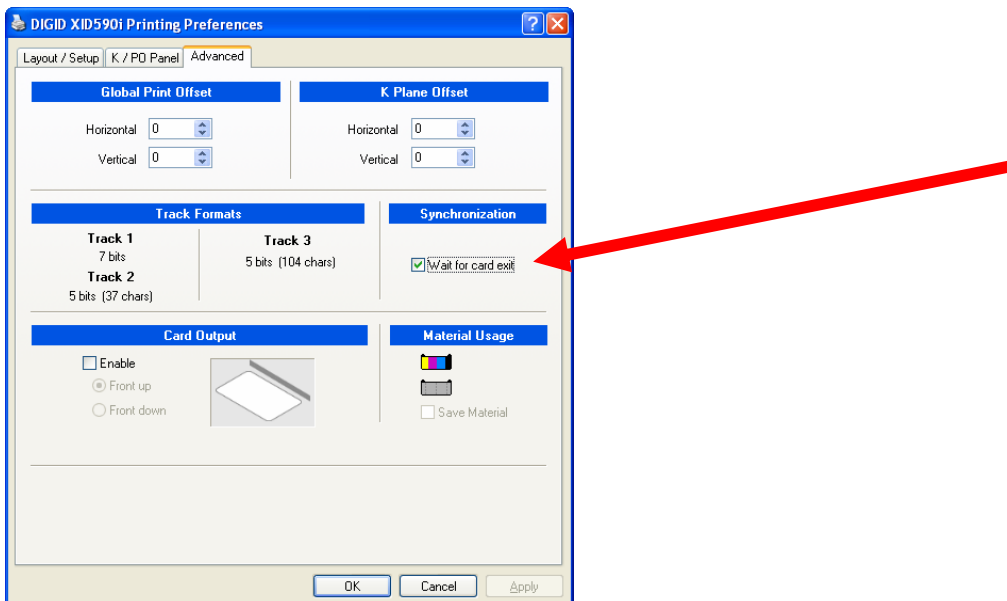
K-plane Offset:

The changing of the values for K-plane only influences the offset of the K-plane.



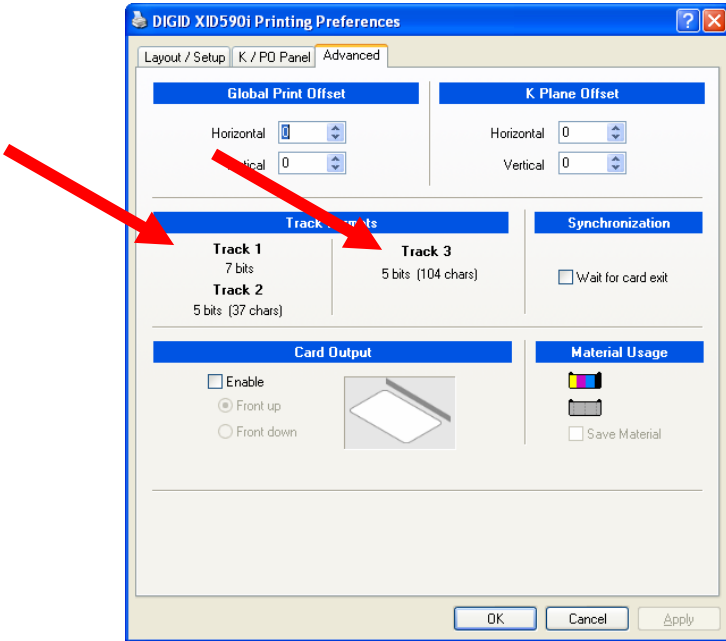
3.4.2. Synchronization

This is only required if the application controls the chip encoding. When encoding and printing batch jobs **without the built-in Advanced Chip Encoding Framework**, the option "Wait for card exit" must be checked:



3.4.3. Track Formats

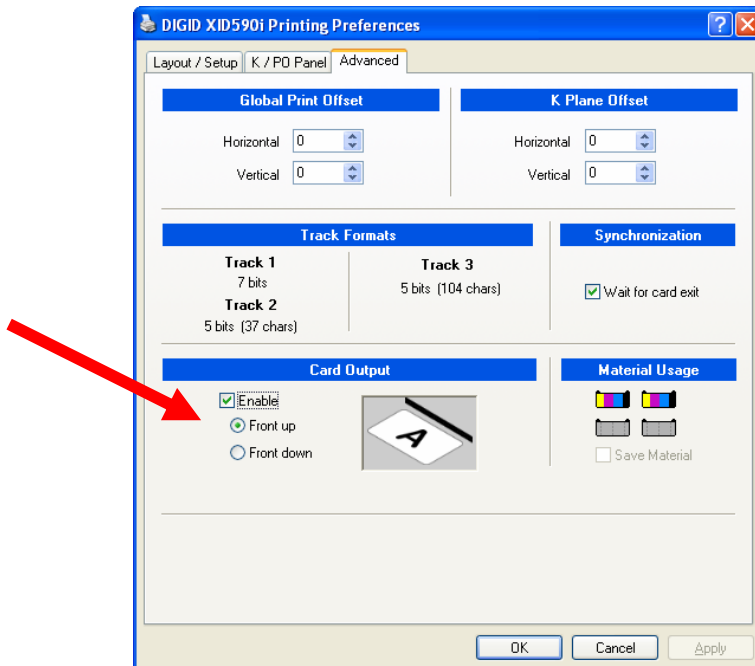
The track formats are shown for informational purpose. Only standard formats are allowed to be encoded.



3.4.4. Card Output

By enabling the "**Card Output**" option, the user can force or override the default setting of the printer driver. Independent from speed or material usage settings, the Card Output options "**Front up**" or "**Front down**" will force the card orientation when leaving the printer.

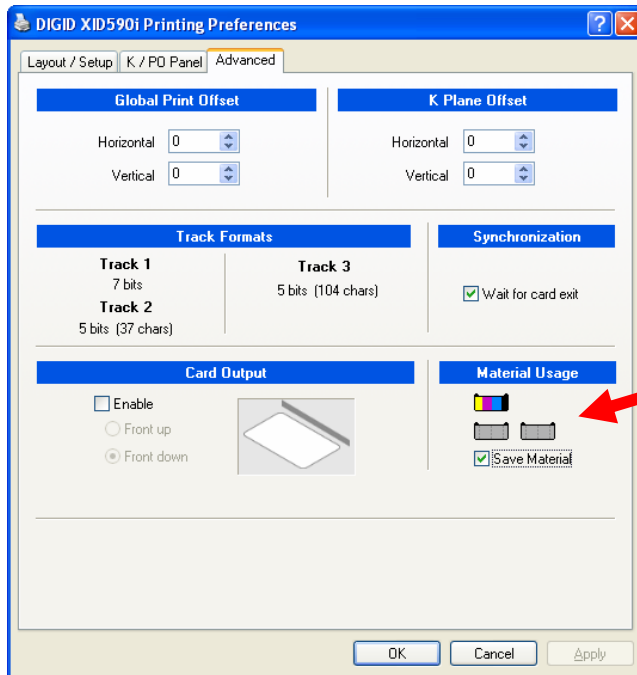
This option should be used only if an external lamination unit is attached to the printer.



3.4.5. Material Usage

The "**Material Usage**" area shows the expected usage of color and retransfer ribbon using the currently selected options.

In some rare combinations, the "**Save Material**" option will become available and lets you enforce material saving over production speed.



3.4.6. Sample of magnetic stripe Encoding

Sending Track Information

Magnetic track data is sent in the form of text strings from the application software to the printer driver, along with all of the other printable objects within your card design. For the printer driver to differentiate between magnetic track data and the rest of the printable objects, the magnetic track data strings must be uniquely "tagged" and formatted by using the "System" font. In other words, specific characters must be added to the magnetic track data for the printer driver to know which data is to be encoded, which tracks to encode, when the track data stops and starts and so on. When using the Generic Printer Driver, you must manually add these characters to the string of magnetic track data. If these characters are not added to the track data, the text intended for the magnetic track will most likely appear as printed text on the card. To avoid this, track information must be entered as described below.

When entering track data, the "~" character is entered first, followed by the track number (1, 2, or 3) on which you intend to encode the data. The data to be encoded should then follow. The first character of this data string must be the track's specific SS (Start Sentinel), and the last character must be the specific ES (End Sentinel). The characters or data in between the SS and the ES can include all of the valid characters specific to each track. The number of these characters, however, is limited by each track's maximum character capacity. When segmenting track data, the appropriate FS (Field Separator) must be used. The following table shows the SS, ES, FS, and valid characters defined for each track. (Track character limits are enforced by the TR-1, TR-2, and TR-3/NNT format options selected in the Magnetic Encoding properties.)

Note: This data must always appear on the first page of your document.

The following example illustrates how track data should be entered for tracks 1, 2, and 3 under following Windows OS:

Windows 2000/XP:

Track	Start Sentinel	End Sentinel	Field Separator	Valid Characters
~1	%	?	^	0-9, A-Z, Dot., ASCII 32-95
~2;	;	?	=	ASCII 48-63
~3;	;	?	=	ASCII 48-63
~3; <i>for XP only</i>	+	?	=	ASCII 48-63

Sample for Windows XP:

Sending Data to Track 1: ~1%JULIE ANDERSON^623-85-1253?

Sending Data to Track 2: ~2;012345...89?

Sending Data to Track 3: ~3+012345...89?

4. Advanced Intelligent Printer Management (AIPM)

4.1. Introduction

The "Advanced Intelligent Printer Management" was developed with a focus on giving the most power and flexibility to the user. All necessary controls and settings are stored centrally in the Dispatcher (DISP) application. The user has direct access to all setting parameters he needs.

The Dispatcher is a part of the printer driver and appears in the program group under the XID5xx Printer folder or starts automatically when launching a print job.

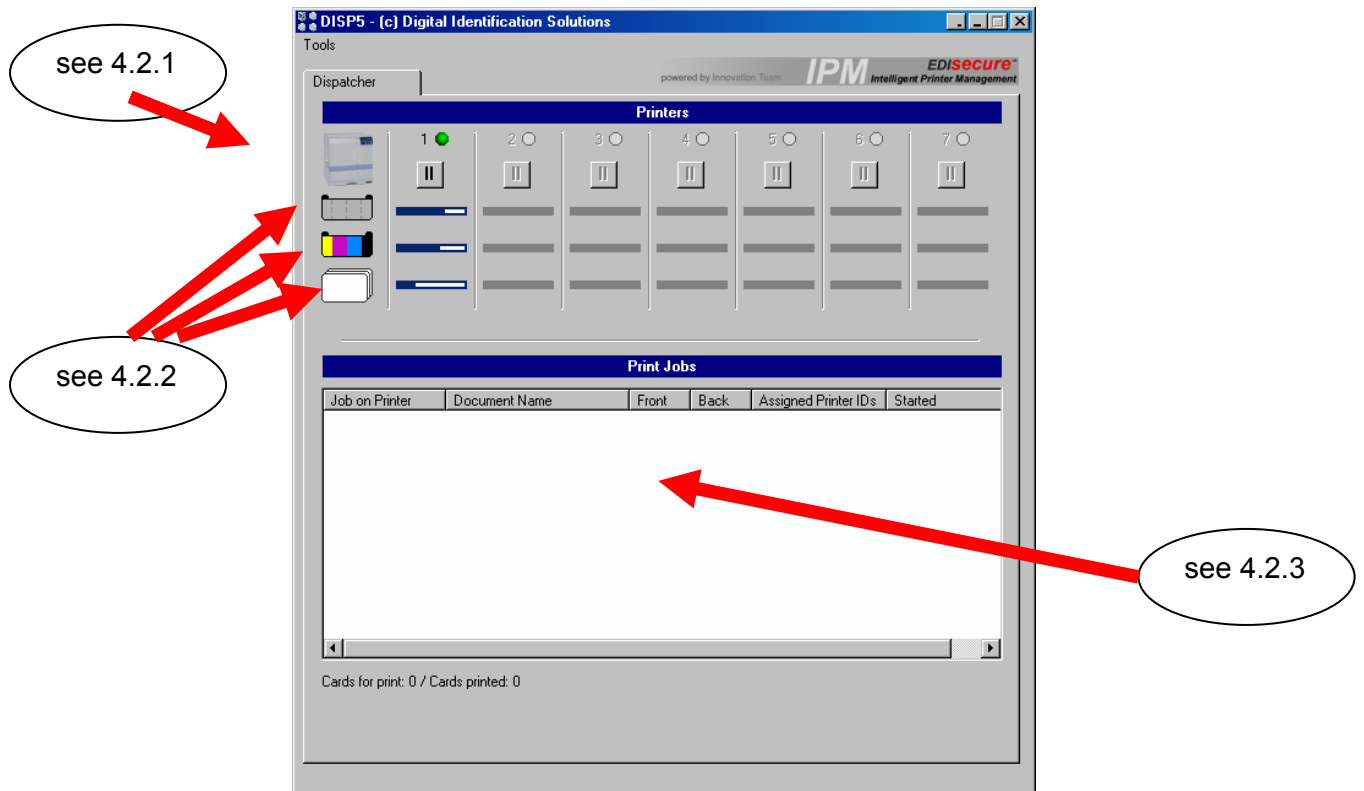
Up to 7 printers (XID590i model only) can be connected to one PC.

The Dispatcher performs the following main tasks:

1. Showing of print job status in real time
2. Pause/Resume control for each printer
3. Showing the Re-Transfer-Film fill status
4. Showing the Color Ribbon fill status
5. Showing the Card Material fill status

4.2. Dispatcher

The Dispatcher is the management center for controlling the operations of the printer and print jobs.



4.2.1. Printers

The printer line shows the printer's status: If the printer is connected and detected by the Dispatcher and has no low level errors (e.g. 'No cards'), the printer's related signs become active.

The 'LED' to the right of the printers ID shows with several colors the related state:

- | | |
|------------------|-------------------|
| - Green | Ready |
| - Green flashing | Printing |
| - Yellow | Initializing mode |
| - Red | Fatal error |

Every printer can be set into Pause Mode or continue individually. This function is very useful e.g. if the user wants to change the ribbon or insert new cards into the tray.

4.2.2. Material Capacity List

For all three printer consumables the remaining capacity will be shown separately: **Retransfer Film, Color Ribbon and Cards in Tray**. All values will be updated dynamically.

Note: The values shown are an approximation.

4.2.3. Print Jobs

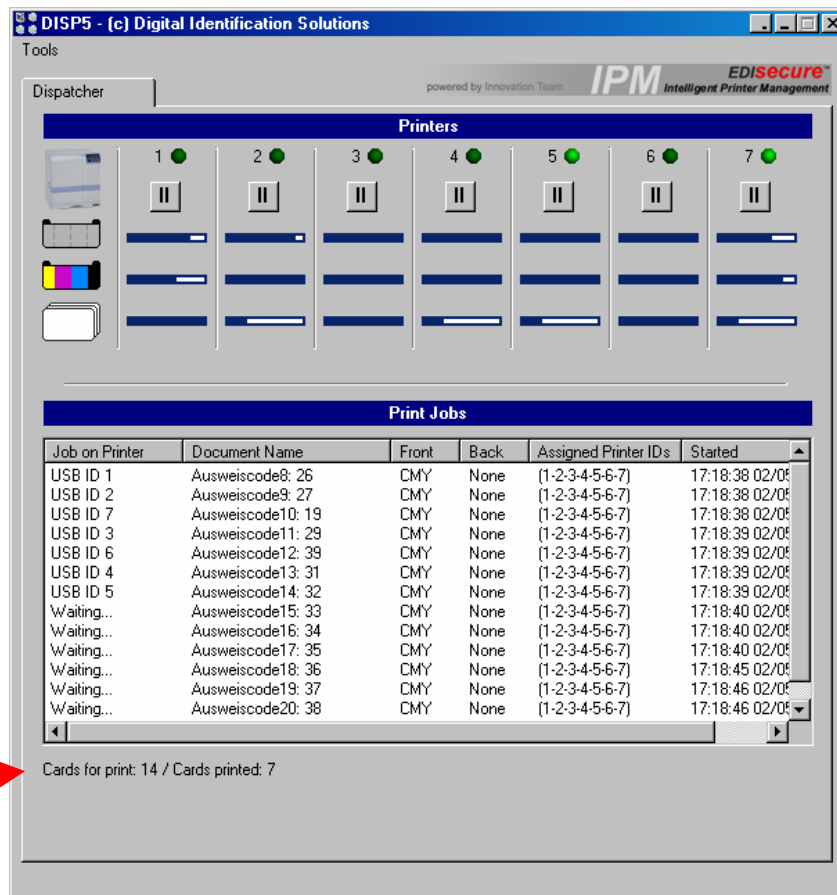
All jobs handled by the dispatcher are shown in the "**File List**" area. Every time an application sends print jobs to the spooler, the dispatcher will take them to its own job list. The problem of hanging print jobs by the Windows spooler is reduced.

When a print job is started, DISP shows the status of every printer including the buffered print jobs in the file list as shown in the sample. The group option will be described later in section 4.4.2.x.

The image sample below shows the action of seven printers connected.

Also listed is the main information regarding the print job:

- Job on printer
- Document Name
- Type of color printed on Front of card
- Type of color printed on Back of card
- Printer ID's assigned
- Timestamp of when the print was started



During the run time of DISP the card counter shows the **Cards for print** and **Cards printed**. **Cards for print** shows all jobs in the file list including copy prints.

In special cases, e.g. if a cleaning procedure is needed, an info line at the bottom shows the related info message.

4.2.4. Tools

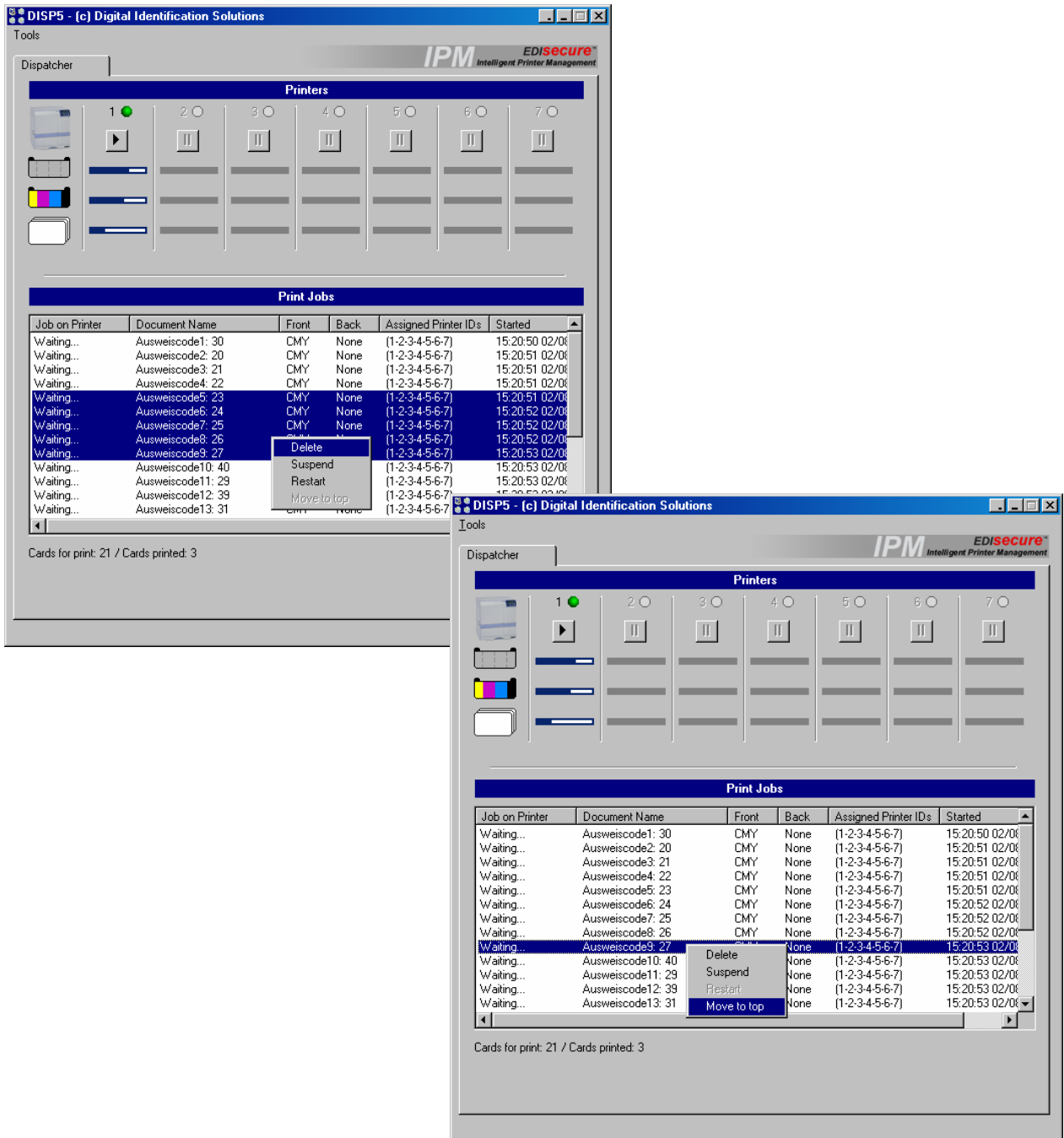
The tools from the pull down menu are designed to control following items

- Clear Spooler: If there is a reason to cancel running prints the clear statement deletes the jobs from the Windows spooler.
- Reset Counter: Here the counter can be reset without closing and restarting DISP.

Inside the Print Jobs list, the user can handle single jobs by right clicking with the mouse button as follows:

- Delete (e.g. if unwanted after error recovery)
- Suspense (e.g. job can wait)
- Restart (e.g. after an error occurred)
- Move to top (prioritization)

Depending on the actual status of the print job, particular functions may not be available. In addition, the user can multi-select several print jobs by hold CTRL or Shift and clicking on the desired print jobs.

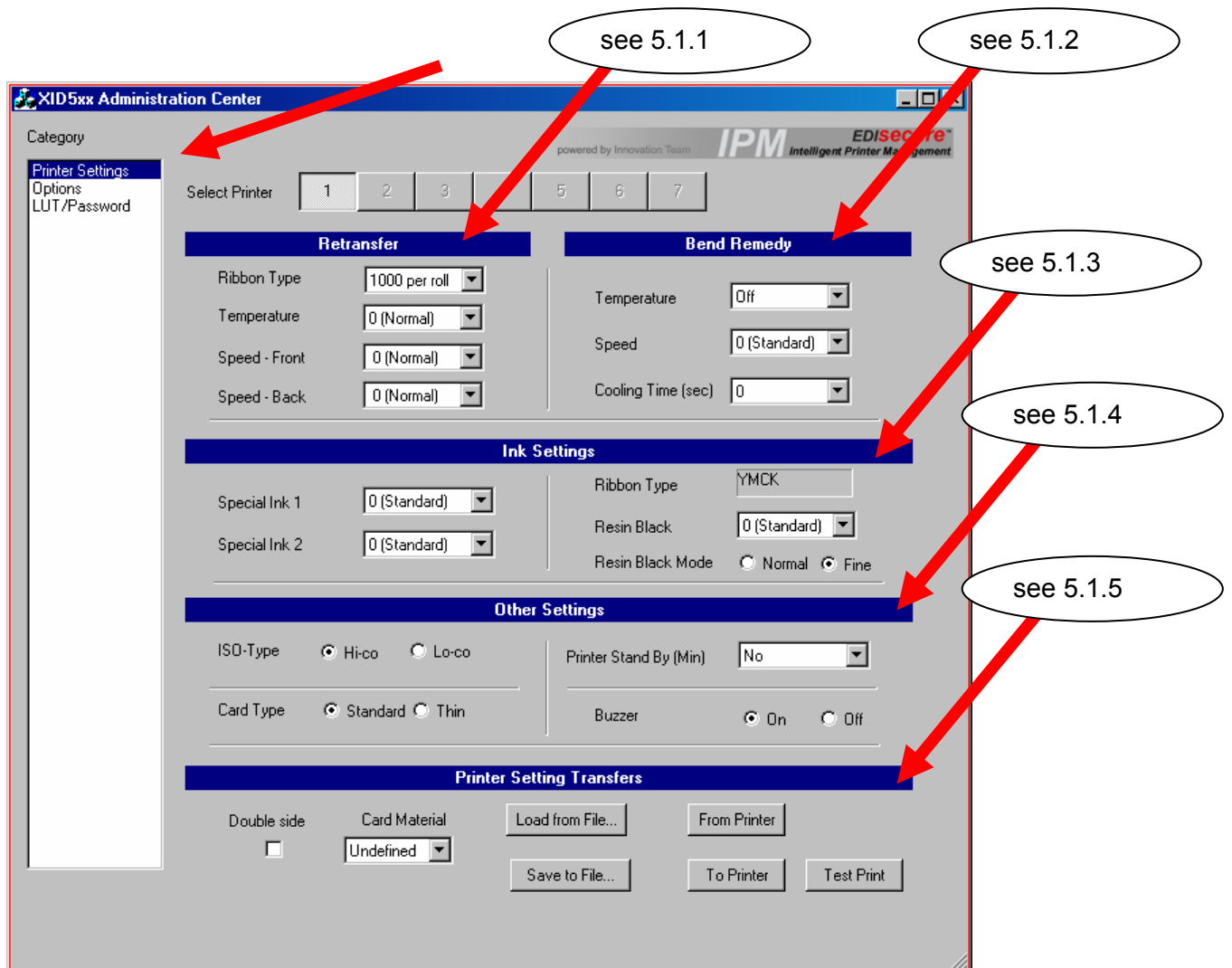


5. Administration Center

The "Administration Center" is the central point for administrative management of hardware related settings, printer driver and LUT/password control. Based on the innovative "Plug-In" architecture, this framework allows you to implement administrative functions by copying new DLL files to the Administration Center directory; no modification of the driver is needed. All administrative functions like "Printer Settings", "Options" and "LUT/Password" are now shifted into the Administration Center. The following Plug-In DLLs are included by default:

5.1. Printer Settings

The "Printer Settings" tab enables the user to set the printing parameters e.g. speed, temperature etc. in a comfortable manner via PC separately for every detected printer. This involves the following main parameters:



5.1.1.Re-transfer settings

Ribbon Type	Counts per roll (1000, 750)
Temperature	-3 (Low) ..Standard + 2 (High)
Speed (Front/Back)	-10 (Slow) .. Standard .. +2 (Fast)

5.1.2.Bend remedy

Temperature	Off .. -5 (Low) .. Standard .. 0 (High)
Speed	-2 (Slow) .. Standard .. +2 (Fast)
Cooling Time	0 sec .. 15 sec

Note: Cooling Time is only available if temperature is not **Off**.

5.1.3.Ink settings

Ribbon Type	YMCK, YMCK + PO, YMCKK
-------------	------------------------

Note: The auto detection function will always show the currently mounted type of color ribbon.

Resin Black	-3 (Thin) .. Standard .. +5 (Thick)
Resin Black Mode	Normal .. Fine
Special Ink: 1/2 (for future use)	-3 (Thin) .. Standard .. +3 (Thick)

5.1.4.Other settings

ISO Type	HiCo or LoCo Magstripe Cards
Card Type	Normal or Cybernetic Size (future use)
Printer Stand By	No .. 60 minutes
Buzzer	On or Off

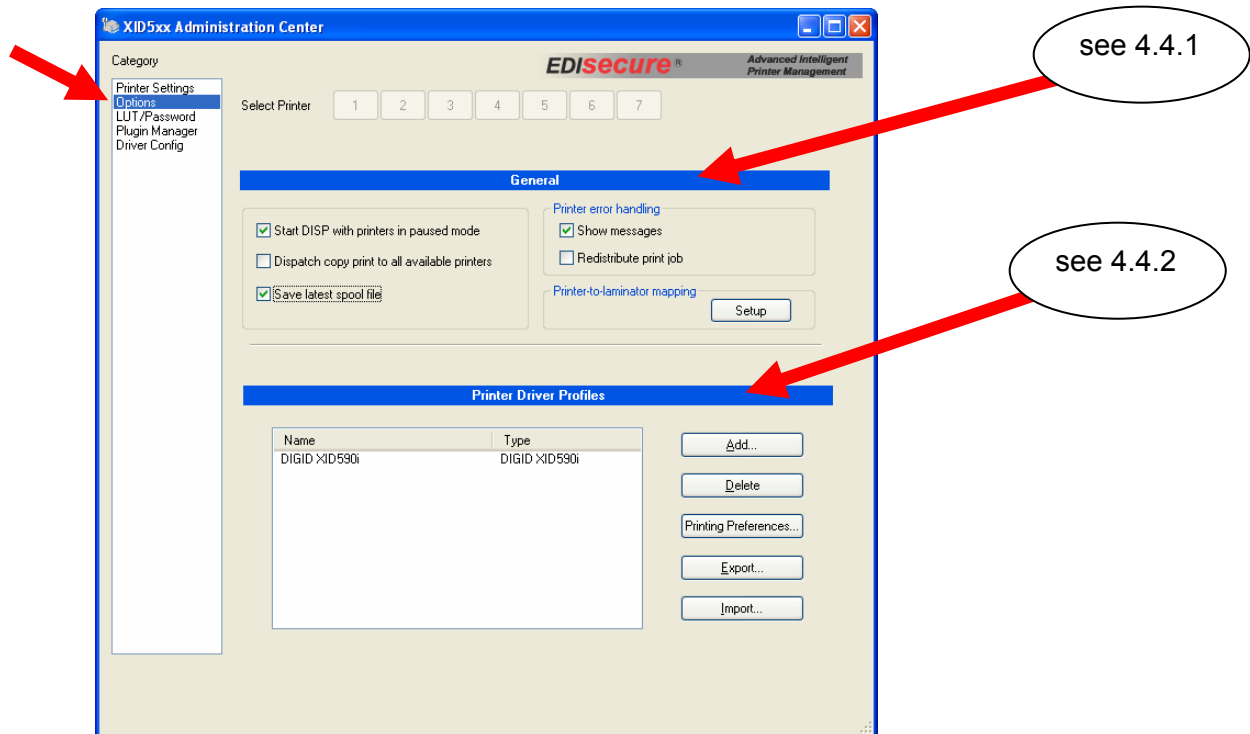
5.1.5. Print setting transfers

Load from File	An already set file can be loaded
Save to File	Actual settings can be saved to file
From Printer	Settings will be read from printer's memory
To Printer	Settings will be downloaded and stored to the printers memory
Test Print	Starts a test print
Card Material	Predefined settings for several cards

Note: These settings are samples only and need to be checked with test material!

5.2. Options

With the "Options" it is possible to enable / disable following items:



5.2.1. General Options

Start DISP with printers in paused mode

If enabled, the next time DISP is started (either by closing or rebooting PC) the printer will stay in paused mode.

Dispatch copy print to all available printers

If enabled, all copy print jobs will be served to all available printers.

Save latest spool file

This new function was built in to enable saving the latest spool file for support purposes in case of problems. This spool file will be stored in the Windows system printer directory by default.

Show messages

Enabled by default. The user can suppress some error messages by deactivating this check box. This makes sense if the customer does not like to confirm error messages on screen in bigger production environments.

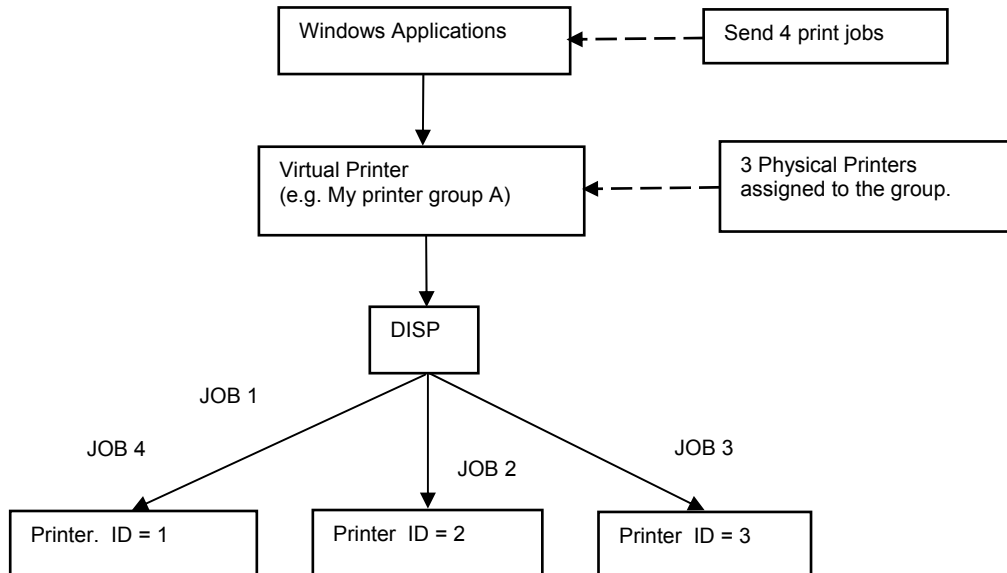
Redistribute print job

If enabled, in case of an error of daisy chained printers this new function will make sure that every print job will be printed on the next available printer in the printer group.

5.2.2. Printer Driver Profiles and Printer Grouping Definition

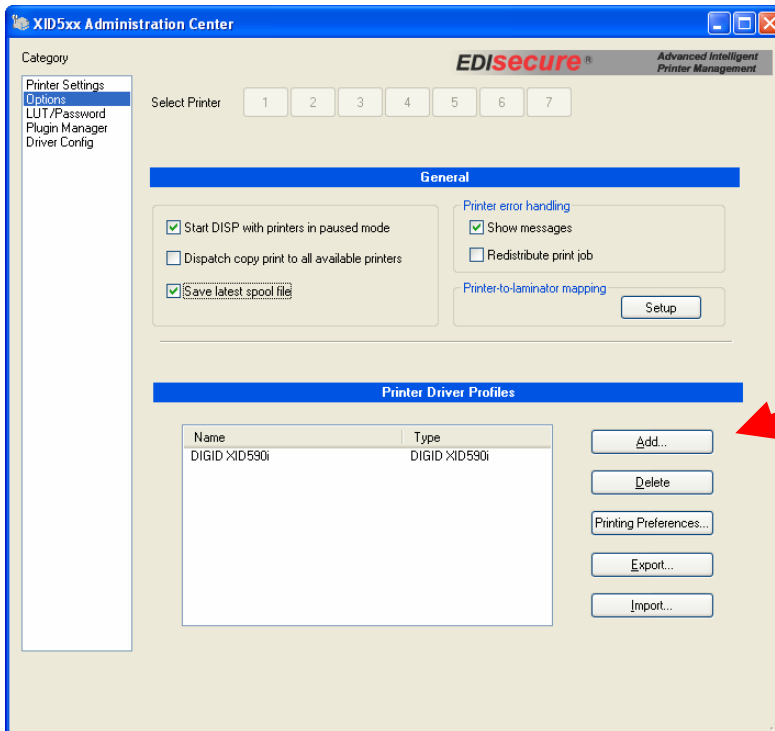
The Printer Group Definition is a unique technique powered by Digital Identification Solutions to define several groups of "virtual" printers. If created, every Windows application can print to one virtual driver shown in the Windows printer folder without sending jobs individually. In addition, a single printer can be defined as a virtual printer for routing the jobs to specific printer.

The following sample shows the technique of serving:

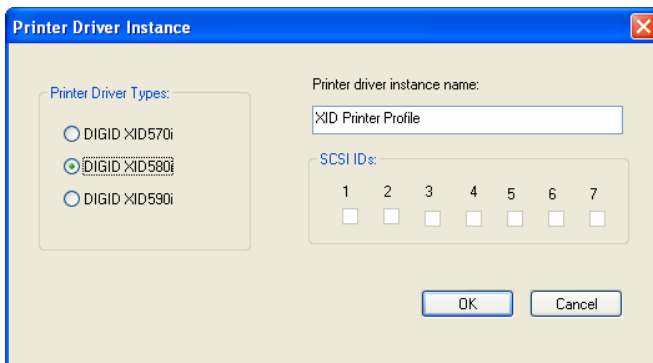


5.2.2.1. Creation of Printer Groups

After clicking on "Add" in **Printer Driver Profiles and Printer Grouping**, the user needs to enter a new group name and the ID of the printer which will belong to this group.



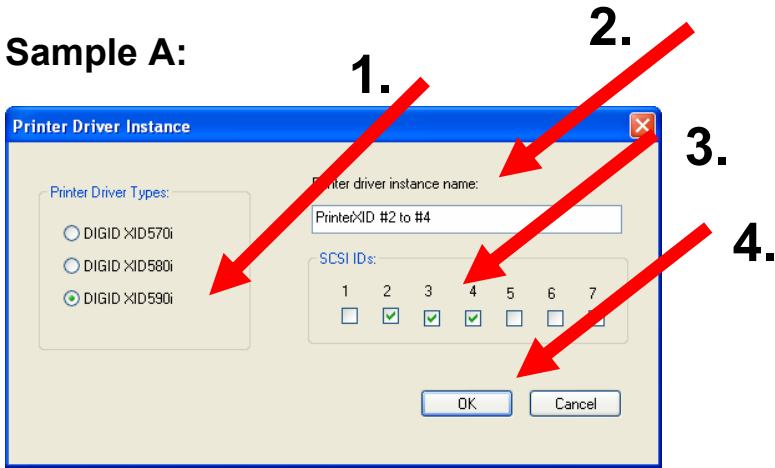
In the following window, the user can enter the following settings.



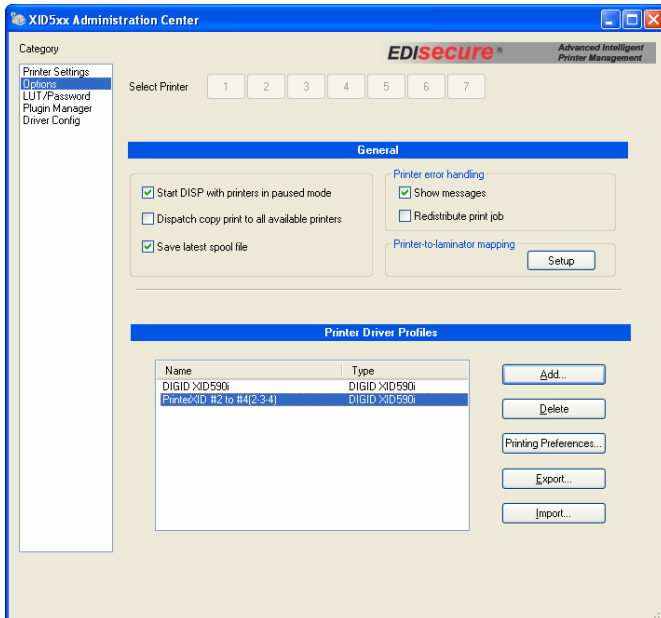
Note: Printer IDs will be enabled only by choosing XID590.

The following two samples show how to enter the information:

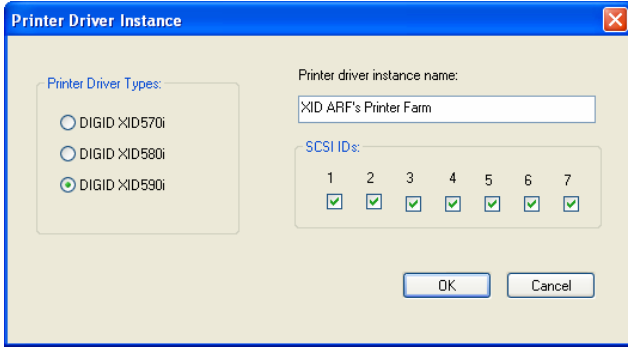
Sample A:



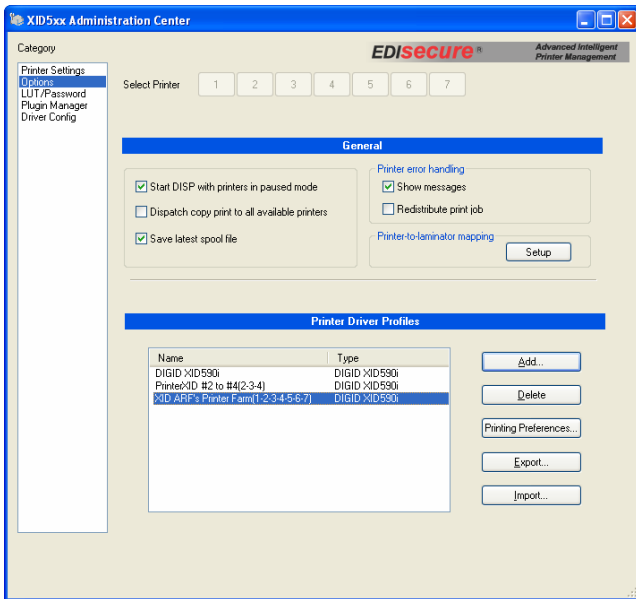
As a result of this definition the printer appears in the list.



Sample B:



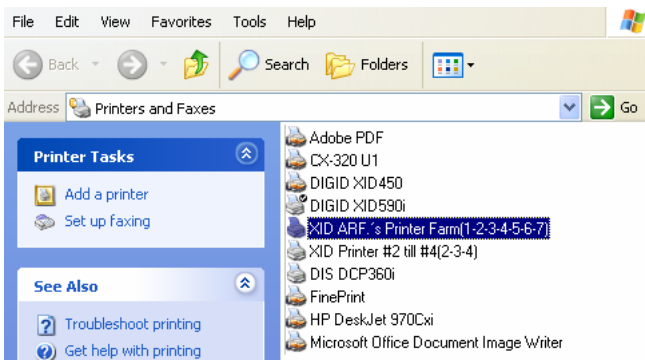
When checking the maximum number of available printers you will get the maximum performance:



It is possible to add several groups including overlapping IDs, as shown in the sample two groups named:

- "PrinterXID #2 to #4" with the IDs 2, 3 and 4 was added.
- "XID ARF's Printer Farm" with the IDs 1 - 7 was added.

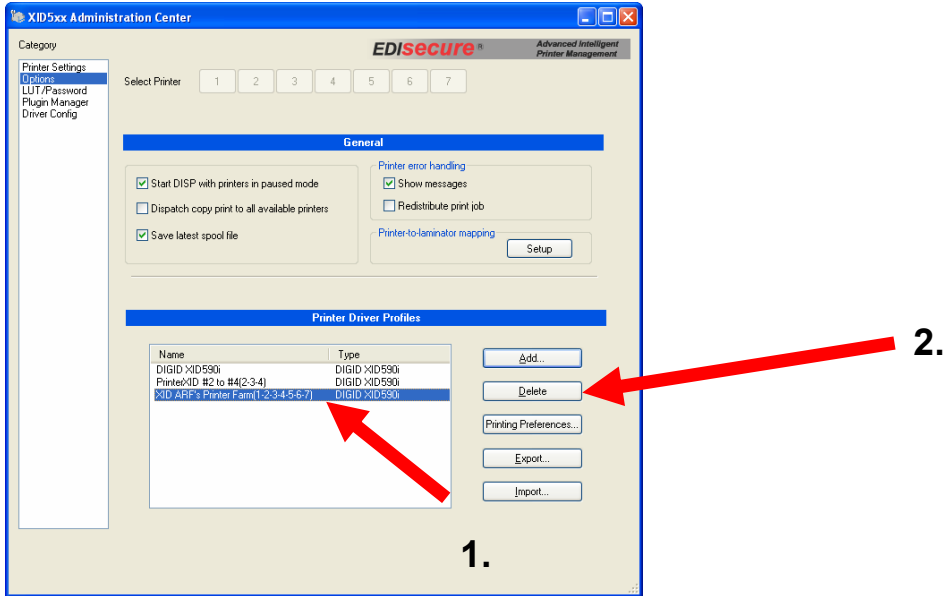
After successfully adding a virtual printer with the same name, additional groups will be generated and displayed automatically in the Windows' printer folder:



5.2.2.2. Deleting of Printer Groups

There are two different ways of deleting Printer Groups: by Dispatcher or by use of the standard procedure in the Windows printer folder. We strongly recommend using Dispatcher. To delete Printer Groups the following steps have to be done:

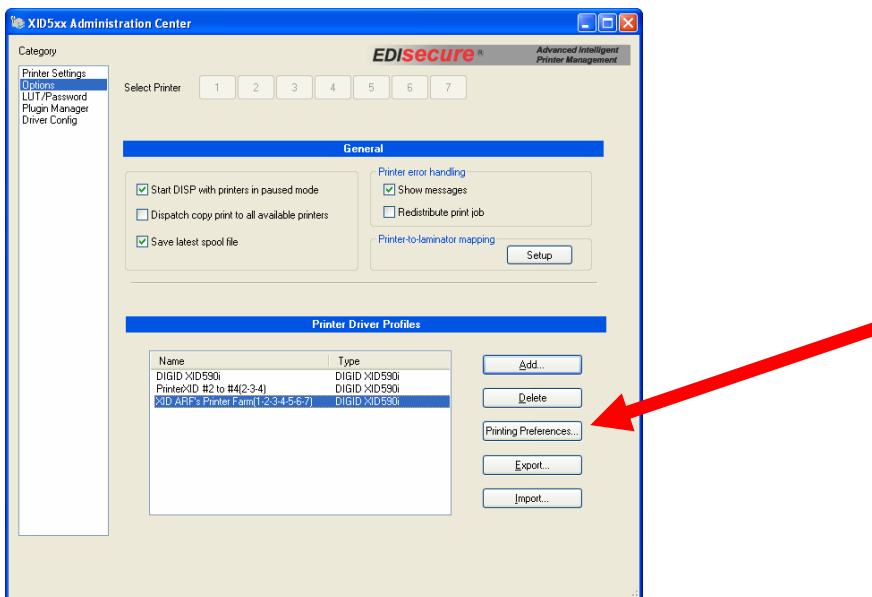
1. Highlight a group by clicking the right mouse button and
2. Click button "Delete Group"



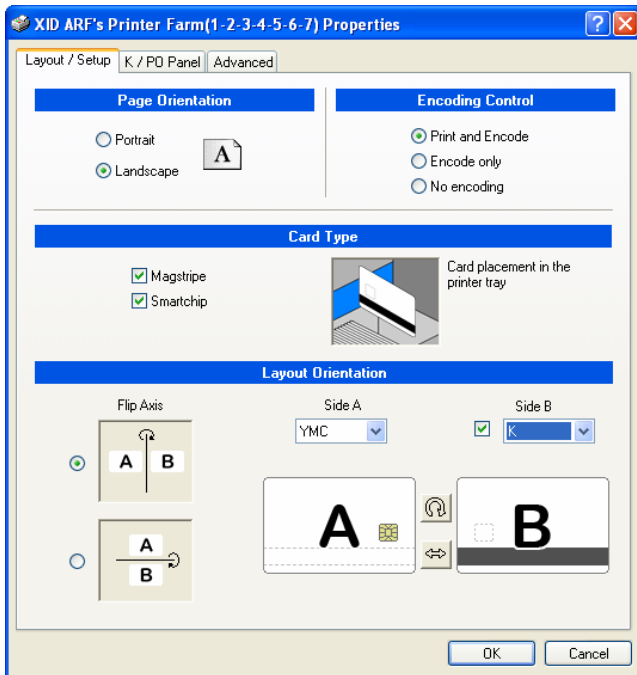
Remember: Deleting a printer group from within the Administration Center will automatically delete the printer in Windows' printer folder.

5.2.3. Setting up Printing Preferences and Managing of Printer Driver Profiles

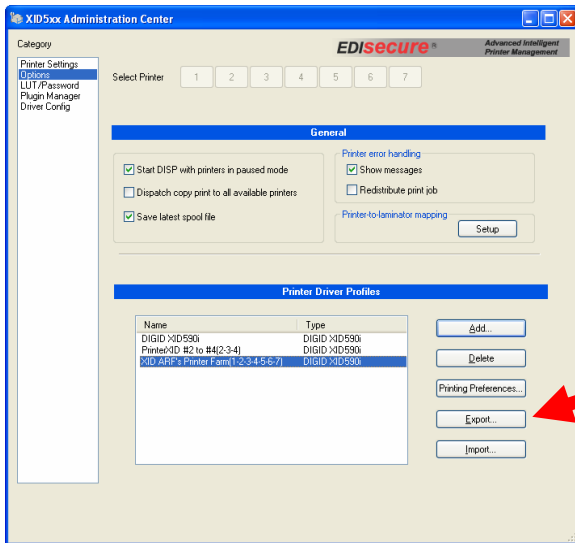
5.2.3.1. Setting up Printing Preferences



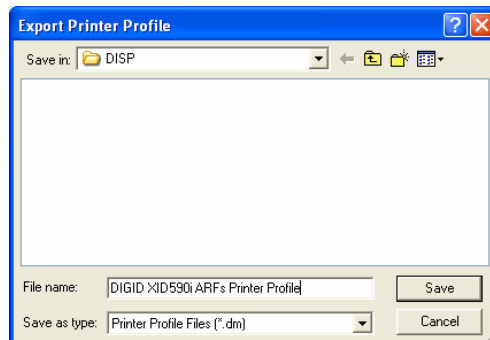
By clicking on the **"Printing Preferences ..."** button the user can view and setup the printer settings out of the Dispatcher for the highlighted printer name as shown below:



5.2.3.2. Exporting of Printer Driver Profiles



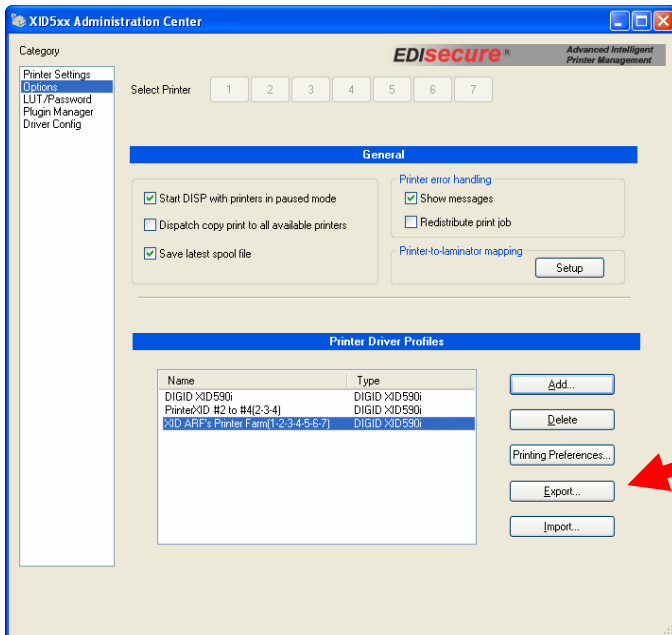
By clicking on the **"Export ..."** button, a save dialog will be opened as shown below:



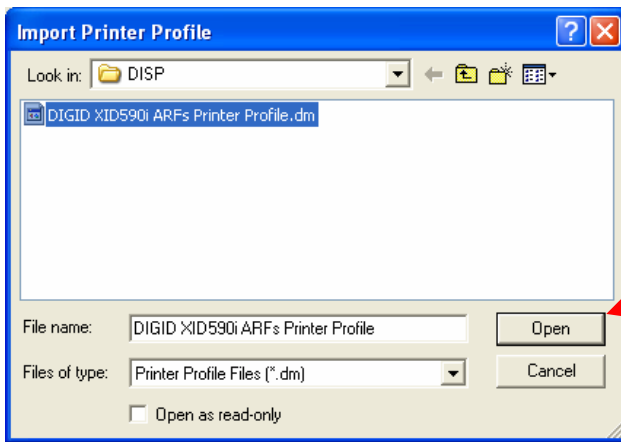
The printer profile will be saved for further use

5.2.3.3. Importing of Printer Driver Profiles

If the customer needs to import the printer profiles he can do this by clicking on the 'Import ...' button.



The Windows open dialog will be opened as shown below:



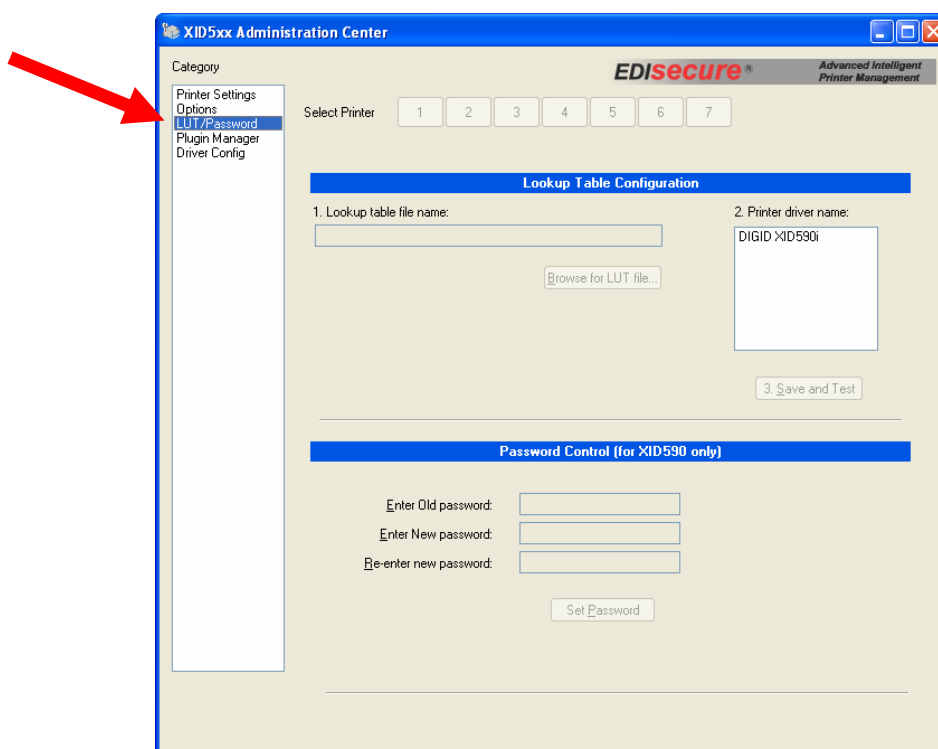
5.3. LUT / Password

5.3.1. Lookup Table Configuration

Inside the Lookup Table Configuration the user has the possibility of using his own LUT tables. LUT tables contain the color control values, which can be used instead of the internal printer LUT.

The Lookup Table contains the values to control the print density for every color separately. It can be useful to get the same color impression if the customer needs to print on several materials with backgrounds in different shades of white.

Remember: Using LUTs other than the printer's internal ones requires deep knowledge in color management and is recommended for special cases only!!



5.3.2. Password

The password option is designed for use in high security environments only. The user can set a password to the printer to make sure only certified operators are able to use this protected printer.

Remember: This function is disabled by default and can only be enabled by contacting Digital Identification Solutions!

5.4. Driver Config

This page allows setting, changing and removing the password of the Administration Center.

When you click on "**Reset**" button, the following dialog appears.

A screenshot of a Windows-style dialog box titled "Change Password". The dialog has a blue title bar with a close button (X) in the top right corner. The main area has a light beige background. It contains three text input fields, each with a label to its left: "Type old password" followed by a field with four black dots; "Type new password" followed by a field with eight black dots; and "Retype new password" followed by a field with eight black dots. At the bottom of the dialog, there are two buttons: "OK" on the left and "Cancel" on the right.

If a password has been set during installation, it can be changed here. To do so, retype the old password and type the new password twice to confirm. Click on OK to store the changes. If the new passwords do not match or the old password is wrong, an error message appears.

To clear the password, the "**new password**" fields must be left empty.

To set a password, and no previous password has been set yet, the "**old password**" field must be left empty.

6. Advanced Chip Encoding Framework (ACEF)

Included in the printer driver is the **Advanced Chip Encoding Framework**, which is capable of handling all card encoding itself. The mechanism is independent from the application, allowing virtually any Windows based application to perform chip encoding.

The main features will be described in detail in the following chapters. These are:

- Plugin architecture
- Single-point and one-time software and hardware setup with the capability to test the setup from within the driver, without the need of an external application
- Multi-printer printing and encoding (in combination with XID590i's Advanced Intelligent Printer Management)
- Printing and encoding over network
- Precoding
- Application independency through the use of an Encoding String

The printer driver handles all of the synchronization and error scheduling of the jobs and initiates the encoding sequence by calling the corresponding plugins.

The encoding itself, i.e. the communication with the encoder hardware and the chip card is done by a small piece of external software that is loaded and executed by the driver. This software is fed with all the necessary information which is needed to perform the encoding on the chip.

Since there is a large combination of different chips and customer requirements, **Digital Identification Solutions** offers several options for the encoding plugins:

1.
Ready-made highly configurable encoding plugins for a diversity of chips on the market are available for sale. The plugins have been developed to provide the most flexibility, while maintaining a high level of security and user friendliness.
2.
Customized plugins can be developed, which meet the exact requirements of the encoding, in case the ready-made plugins do not meet them or the chip or the encoder hardware is not yet supported. This however must be discussed with your local dealer.
3.
Application developers can request a free development package, demonstrating the development of a plugin. This option should be used if the ready-made plugins do not meet the requirements or a yet unsupported chip or encoder hardware is used, or with high security applications where the encoding secret may not be configurable in a user interface or in configuration file.

The configuration is done in the Administration Center's section "**Plugin Manager**".

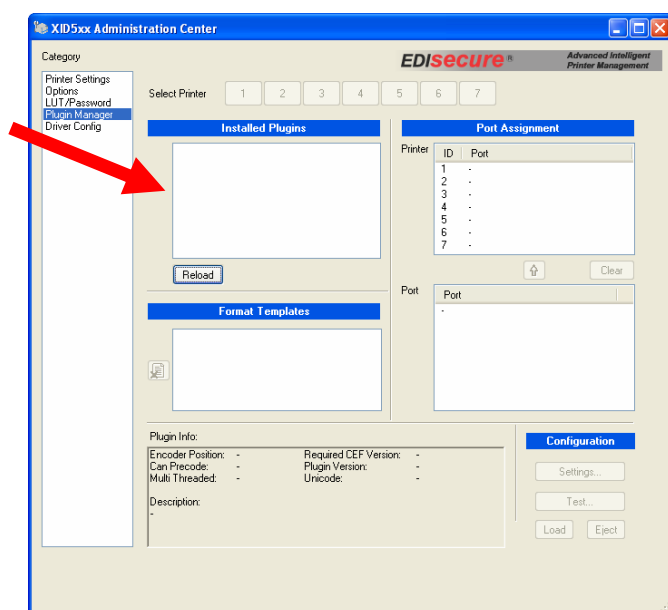
6.1. Plugin architecture

As the printer driver does not do the encoding itself but loads an additional piece of software that know how to "talk" with a certain encoder hardware and chip card, it is not limited to chips and encoders that are currently present on the market.

Such a piece of software is called "Plugin". The driver can handle an almost unlimited number of these plugins.

Important

The base driver will come with **no plugins installed**. Therefore the Plugin Manager will show an empty list in the **Installed Plugins** window, as shown below:



Plugin Manager after clean installation.

As the requirements on the chip type and encoder hardware differ, users can install the plugins they need for their encoding requirements.

Plugin Installation

The installation of a customized plugin depends of the plugin itself. Plugins usually come with a separate setup routine or will be installed by system integrators on customer-side when the printers are setup.

After installation of a plugin, the list can be refreshed by

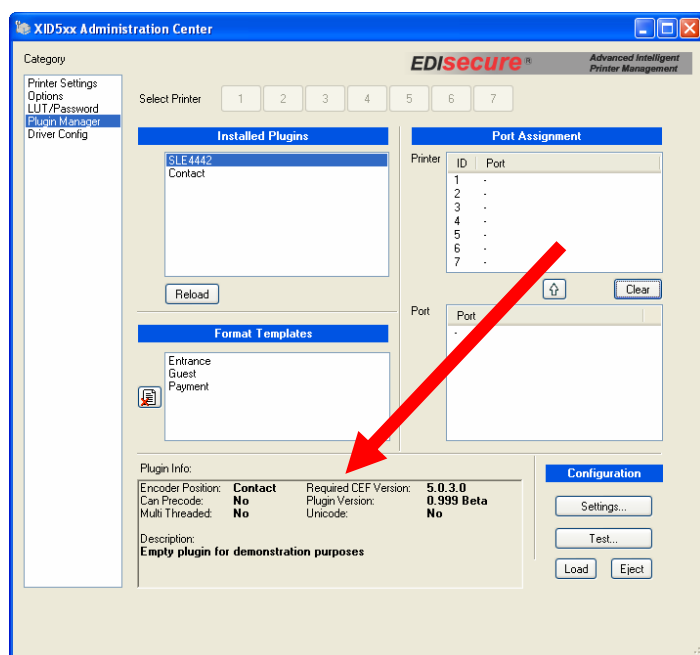
- clicking on the "**Reload**" button below the list of installed plugins
- changing to another **Category** in Administration Center, then going back to Plugin Manager
- restarting the Administration Center

6.2. Software and Hardware Setup

6.2.1. Plugin Info

When a plugin is installed properly and appears in the list of **Installed Plugins**, clicking on it will select and activate it.

The plugin is loaded and additional information of the plugin is displayed in the **Plugin Info** box as shown below:



Encoder Position:

This shows whether a plugin encodes contact or contactless chips (this determines the position where the card is moved in the printer, either to internal encoding position or to the right side of the printer)

Can Precode:

This shows whether a plugin can perform a precode process (see chapter 6.7 for further information about Precoding).

Multi Threaded:

If the plugin and the encoder hardware's driver is able to communicate with several devices **simultaneously**, the encoding process on multiple printers will be faster. However, most encoder manufacturers explicitly restrict the communication to one device at a time only, so the encoding process for further devices must be delayed until the encoding for one device is finished. The plugin must provide the information whether encoding in parallel is possible or not, and the printer driver will delay the encoding on other devices with the same plugin on runtime until the one is completely finished.

Note: This only affects the **encoding process**, which usually takes a fraction of a second. The card positioning and printing are done in parallel, independent of the capability of the plugin.

Required CEF version:

The driver's internal chip encoding framework has its own, driver-independent version number. Since additional functionality may be added in future, the Plugin Manager checks if the installed framework is compatible with the plugin.

If a plugin uses functions of a later framework, the Plugin Manager will show a warning message that a newer driver must be installed containing this framework version.

This prevents plugins from crashing the driver by attempting to use unsupported functions of a later driver release.

Plugin version

The plugin's version number is shown here. This is for support purposes to determine which version of the plugin is installed on the system.

Unicode

Some applications require to encode Unicode characters on the chips. This shows whether the plugin is capable of handling unicode data in the encoding string. If not, Unicode characters will be converted to Ansi by the driver.

Description

The plugin developer can display a short description of what the plugin does here.

6.2.2.Port Assignment

General information

Each encoder hardware must be attached to a printer physically, either inside or outside.

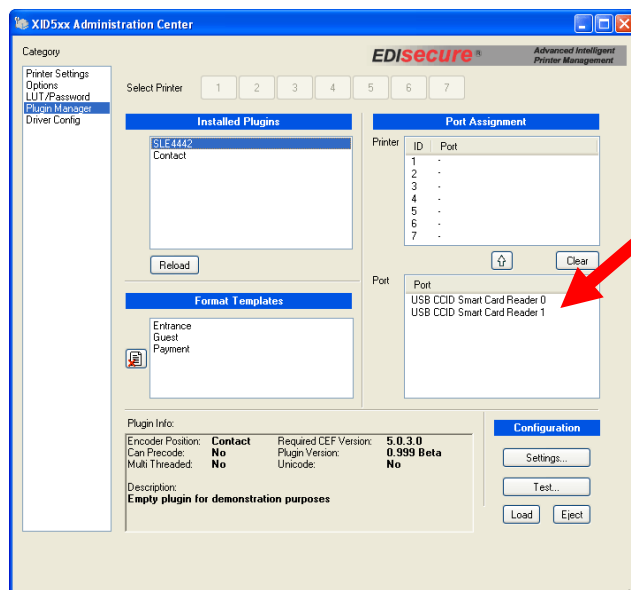
As each printer has its own ID, there is a fixed relation between one specific encoder and one specific printer.

Since each encoder is also attached physically to the computer (USB, COM or any other possible port), a link of a "printer ID" and the "port" where the encoder hardware is attached on the PC must be created. This link is called "**Port Assignment**".

In the Plugin Manager, the **Port Assignment** section shows two lists, one with all possible printer IDs and one with the available ports. Initially, both lists are empty. Depending on the encoder hardware and the ID of the printer to which the encoder is attached, the port names and IDs differ.

Encoder ports

The list is dynamically filled in real-time. That means as soon as a plugin is selected and an encoder, which is supported by the plugin, is attached, the port list shows the port name as a new entry immediately after Windows has recognized the device. For some encoders, it may be necessary to install the manufacturer's device drivers first.



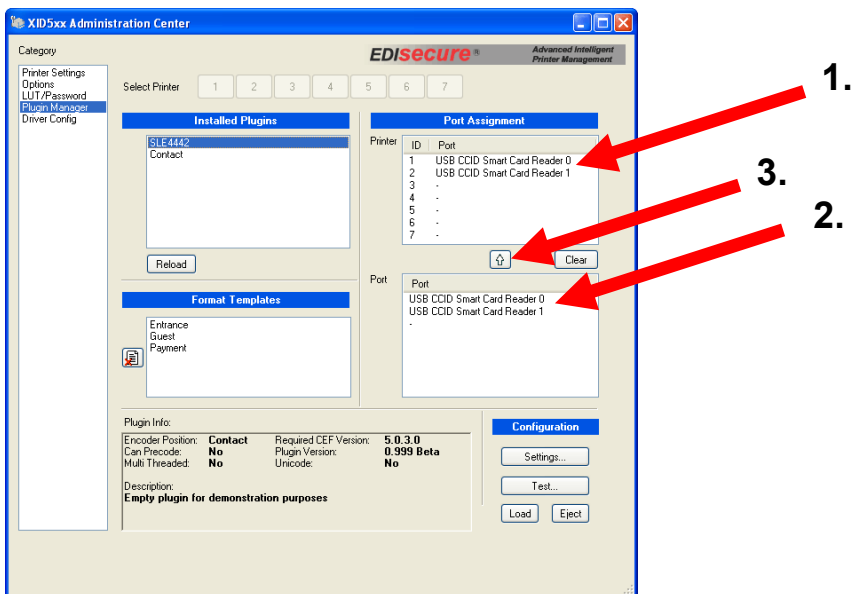
The same is true when a device is unplugged, i.e. the port disappears from the list.

This mechanism allows easy recognition of the port name of each single encoder device in a multiple printer (and encoder) environment by plugging them in one-by-one.

Creating the link between encoder and printer ID

When having identified the port name of an encoder that is connected to a specific printer, the link between both must be created so the driver knows on which port the encoding must be performed when printing on a certain printer ID.

This link is created by selecting the printer ID in the printer list, the encoder's port name in the port list and then pressing the "**arrow-up**" button to create the link. This procedure must be repeated for each encoder connected to a printer.



To reset all assignments for the current plugin, click on the "**Clear**" button.

To reset the assignment of a single printer, either select the dash "-" from the port list and assign it to a printer ID by clicking on the "**arrow-up**" button, or assign an already assigned port to another printer ID.

Note: Ports cannot be assigned to two printers at once!

The names of the ports differ from plugin to plugin, especially with USB encoders, as USB ports do not have common names.

6.2.3.Format Templates

Some applications require different encodings, depending on the layout of the card, but use one chip type.

Plugins can be developed to support multiple encoding styles, definitions, formats, and all in combination.

In order to understand what "**Format Templates**" do, let's have a look at the following example.

Important

Keep in mind that there are several ways to achieve this, depending on the plugin and the requirement specification!!!

This is only an example demonstrating how a sophisticated plugin *could* handle the case. This does not work with all plugins and it requires the plugin to contain support for Format Templates!

Assume we have two cards with different layouts:

The first one is a guest card that should contain only a sequential serial number, which must be written to sector 0 using the key "1234", has 10 digits and should be filled with leading zeroes. We call it the "**SeqSerNumber**".

The second card is an employee card that should contain the employee number, which must be written to sector 0 using the same key as the guest card, and the first and last name of the employee, along with his birth date, which must be written to sector 1 using a highly secure key. The field names (and lengths) are "**EmployeeNo**" (10) and "**Firstname**" (20), "**Lastname**" (20), "**BDate**" (YY-MM-DD).

Using the same chip cards for both layouts allows using the same plugin, just with different "definitions" on what and how to encode.

For the two different encoding requirements, we would create two "Format Templates". Each of them contains the description of each request, so Format Template 1 would contain the following definition:

Format Template "**Guest**"

Fieldname	Sector	Key	Len	Filler	Format
SeqSerNum	0	1234	10	0	Num

and Format Template 2 would contain the definition:

Format Template "**Employee**"

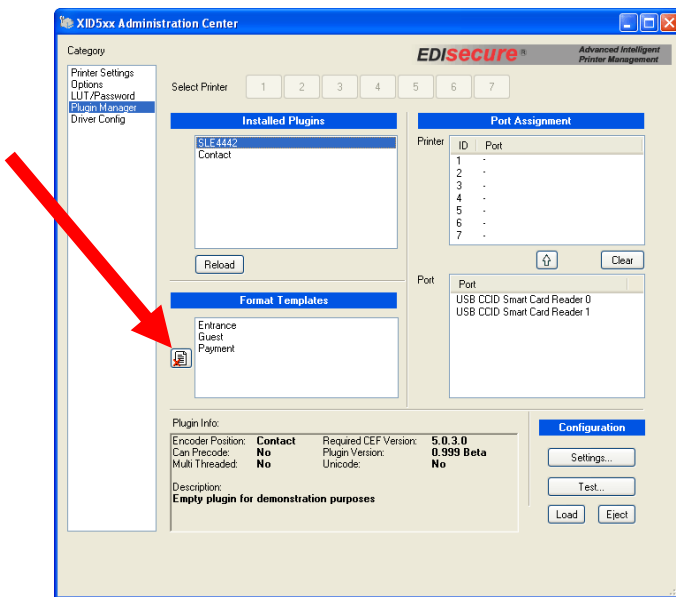
Fieldname	Sector	Key	Len	Filler	Format
EmployeeNo	0	1234	10	leading 0	Num
Firstname	1	<i>scrambled-high-secure-key</i>	20	trailing spaces	Text
Lastname	1	<i>scrambled-high-secure-key</i>	20	trailing spaces	Text
BDate	1	<i>scrambled-high-secure-key</i>	-	-	Date (yy-mm-dd)

Each layout must then contain a "reference" to each format template, along with the encoding data, and the plugin would be able to understand what, where and how needs to be encoded. For an example how this reference looks like, please refer to section 6.8, keyword "ft".

Note that neither the contents nor the usage of "**Format Templates**" is defined or restricted by the driver. It is purely handled by the plugin, so the format definitions, field names, storage of the keys (unencrypted or encrypted, or none at all), format options and anything else depends only on the plugin itself. A minimalist plugin does not need to provide support for format templates at all. The lack of support may also be desired by the security requirements of the application.

According to the example, another plugin could also have an attribute "**Position**" so the position inside the block could be specified, and another plugin could have all of the attributes hard-coded so nobody could temper with the format templates and change them.

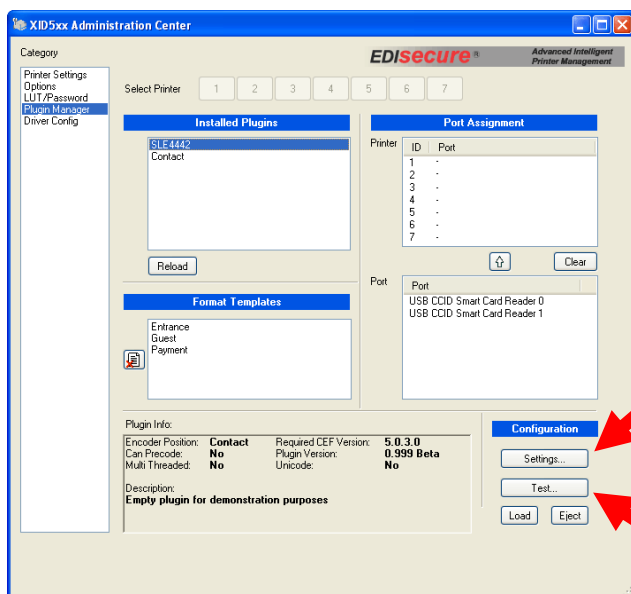
Format templates can be deleted using the "Delete" button next to the **Format Templates** list. A confirmation dialog is shown to proceed with deletion.



6.2.4. Configuration (Global Settings and Test)

The most important part in the chip encoding setup is to test the communication with the encoding device and to test if the encoder can access, write to and read from the chip. Some encoders require even global settings like authentication keys or the transfer speed, which is common for COM ports.

Each plugin can **optionally** provide a user interface for both, the global settings and the encoding test. If one of these or both are supported, the corresponding buttons "**Settings...**" and "**Test...**" will be enabled.



If these options are provided by the plugin, clicking on either button will open a configuration or a test dialog and show the corresponding functions that are necessary to configure the encoder hardware and to test the encoding of the card.

The extent of the user interface depends on each plugin, i.e. there are no generic options from the driver.

A sophisticated plugin should provide an easy-to-use user interface for both options and a way to do encoding tests with real data in the test dialog, preferably with the same format templates that have been set-up for the real encoding, as it is mandatory for the production that the hardware is working correctly with the encoder software and the data is encoded properly on the chip.

Since both options are optional, a minimalist plugin does not need to provide these functions. The absence of these options may also be desired by the security requirements of the application.

6.3. Application Setup

The chip encoding features of the driver are application independent, i.e. the application does not need to be set-up for the specific encoder hardware of the encoding plugins.

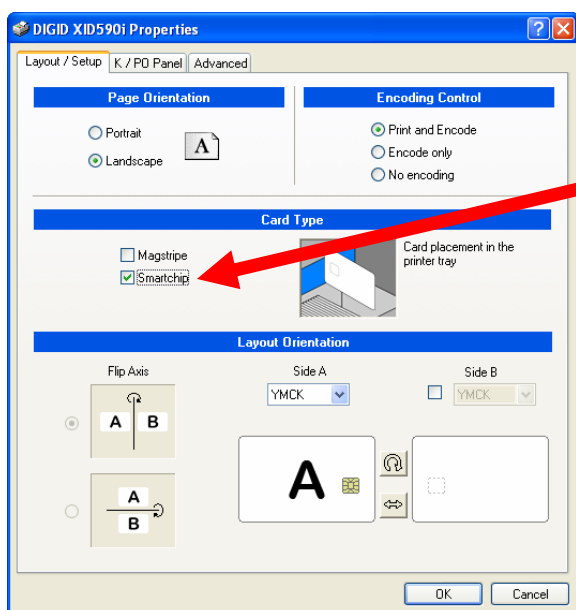
The entire encoder-specific configuration is done in the Plugin Manager, stored and handled outside the printing application, as well as the encoding process itself.

However, there are application requirements that need to be fulfilled in order to process the encoding data in the driver.

All of the encoding data is transported in a so called "encoding string" to the driver and later to the plugin. The card layout must contain this string somewhere on the **front page**. This is especially important to remember when using two-sided layouts.

If the driver recognizes the encoding string on the layout, it will not print it on the card but use it for encoding. Therefore, the encoding string must be sent **"as text"** by the application.

The "switch" for the driver to find the encoding string is in the **Card Type** section of the document's printer properties. If **"Smartchip"** is selected here, the encoding string will be captured and processed.



Unfortunately, it cannot be determined in advance whether an application sends the string in the correct format or not. The simplest way to check this is to print a layout containing a valid encoding string. If the string is printed, the application does not support the way how the driver intercepts the encoding string.

However, this has been tested thoroughly with many different applications and there are two rules-of-thumb that you have to know:

Pixel graphic drawing applications usually render text "as pixels" and are therefore not capable of sending the encoding string "as text" to the driver.

Special transformations for shading, blending, winding, squeezing, skewing, twisting, outlining and anything else do process the text "as graphic" and are therefore not suggested for the encoding string.

The font, however, is not relevant for parsing, as long as it is a standard Windows font.

So to summarize all of the above:

Important

- The encoding string must be on front page of the layout!
 - The encoding string must be in plain standard format with no special effects in the layout!
-

6.4. Multi-printer encoding

By using multiple XID 590i printers in a printer group (see 5.2.2.1, Creation of Printer Groups), the throughput of produced cards per hour can significantly increased.

The printer driver offers full support for printing and encoding on multiple printers simultaneously.

Note that the correct port assignment for each printer using an encoder is required before printing and encoding in a printer group.

6.5. Printing and encoding over network

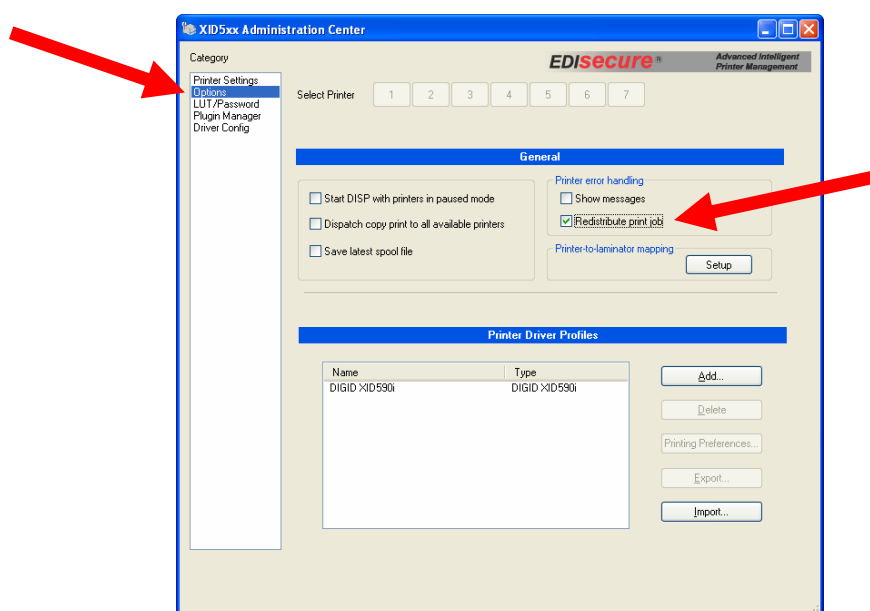
Multiple workstations on the network can print on a PC that has one or more printers attached locally and has shared the printers in Windows. Such a PC is called **print server**.

On the print server, it is mandatory that a user is logged on, otherwise the dispatcher will not be able to process the jobs.

As the encoding string is embedded in the layout, the encoding string is transported inside the print job (or *spool job*) over the network from the printing workstation to the print server.

The print server will properly process the job including the encoding, and distribute it to the corresponding printers.

In an operator-less mode, it is even possible to re-encode and print failed jobs on other free printers with the option "**Redistribute print job**" on the **Options** page of Administration Center. This guarantees that all cards in the batch will be produced without user interaction - assuming that enough printers are in the group for high availability.



6.6. Multiple encodings on one card

The driver is capable of handling multiple encoding strings in one layout, which might be

- different encoding format templates with one encoder
- contact encoding and contactless encoding
- combination with magstripe

Usually, the driver processes the strings in the order how they are sent from the printing application. Since it is impossible to determine this, and since this differs for each application, a special keyword allows specifying the processing sequence of multiple encoding strings. Using the so-called "**sequence order**", the encoding and printing process can be tweaked to be performed in the fastest possible way.

6.7. Precoding

Introduction

A special preprocessing might be required by the application before encoding or printing the card, or both.

In some cases, a serial number from a card needs to be processed and the card which has to be produced is selected by this serial number, i.e. the card holder record is determined by the number that is pre-encoded on the card.

Another example of the need to preprocess the card is when the card's pre-encoded serial number must be printed on the card.

In both cases, a pre-processing needs to be done before the real print job is created:

- the card must be loaded to the encoder and some data from the chip is processed
- the layout is selected or adjusted and send to the print job queue

What is precoding?

In the time between the first and the second step, this printer must be locked for the second step, which contains the data that needs to be encoded on the card or the layout that needs to be printed, or both. (This is especially important in a multi-printer environment)

This first step is called "**Precoding**". In this step, the card will only be loaded to the encoder and the printer will be locked for the second step and data from the chip is processed. No printing is done at this step

What is done in the precode step?

In order to give the most flexibility, the plugin is completely free to decide what to do in the first step. Examples of possible processings are:

- reading a serial number
- writing it to a database or log-file and
- report it to the application (to let it select the record for the printing layout and the encoding string)

Precoding however does require the plugin to interact with the printing application so it can prepare the second processing step when the precode step is finished.

Therefore, the plugin and the application must be customized to work together. As this requires the adaptation of the printing application to the plugin, precoding will not work with most standard applications, unless a special feedback interface is provided by the application out-of-the-box.

This should always be done in collaboration with your system integrator!

Important

Precoding always requires customization of the plugin together with the printing application!

6.8. Encoding String

In an encoding environment, there are many parameters that must be configured in order to the encoding to be performed correctly.

We have seen above how to set-up the hardware, a way to configure the formatting and positioning of the data with sophisticated plugins, and now there's one thing left: The user data that actually needs to be encoded on the card.

Since this data is different for each printed card, it is placed directly on the layout.

The encoding string has a special format that can be recognized by the printer driver. There are several keywords that are reserved and required by the driver to determine what needs to be done.

The basic syntax of an encoding string is:

```
{pi=<pluginname> [ft=<formattemplatename>] [so=<n>] [pre] [pid=<n>]  
[[field1="abcd"] [field2="732894732984"...] }
```

Attributes in square brackets [...] are optional.

Attributes in pointy brackets <...> are mandatory.

Double quotes "" must be present in the string

Double-quotes inside encoding data must be escaped with a backslash before the character, e.g. when encoding the string

John "Doe" Wood

the attribute must look like:

```
{ pi=... field1="John \"Doe\" Wood" ... }
```

The encoding string always starts and ends with the curly brackets {...}, containing the encoding information for one encoding. There may be multiple encoding strings on the layout, as described in 6.6.

User Data

The "field1" and "field2" attributes contain the **user data** that will be encoded and must be named according to the plugin and the used format template. There is no fixed naming convention, so **field1** may be **Firstname** or **EmployeeNo** or anything else except the reserved keywords (see table below for a description).

The number of user data attributes depends on the plugin and the template format that is used for the encoding string.

Since the encoding string is fixed in the layout, it is the responsibility of the application to replace the variable user data on runtime, when printing the layout.

Many card managements and even other standard applications allow the replacement of placeholders when a job is sent to the printer.

Since almost every application handles variable data in a different way, it is far beyond the scope of this document to give instructions on how to do this. It is recommended to look up the

corresponding section of the application's handbook on how to set up a text field with a string that can hold both, fixed and variable data.

There are three types of applications that:

- recognize placeholders and replace them inside the fixed text encoding string
- require a temporary field and a script to build the full encoding string
- cannot replace user data at all

Usually applications belonging to the latter category will not be used at all for card production with variable data per record because they cannot even print variable data.

Important

- Sophisticated plugins can provide a user interface to visually build and test a syntactically correct encoding string that reflects the fields from the selected format template!
 - Applications should provide a way to replace data inside a text field per-record.
-

The following keywords in an encoding string are *reserved* by the driver and processed in a special way.

Keyword	Option	Format	Description
pi	mandatory	Text	<p>plugin name</p> <p>This name must match with the one shown in the Installed Plugins list in Plugin Manager.</p>
ft	optional	Text	<p>format template name</p> <p>This name must match with one of the format templates shown in the Format Templates list in Plugin Manager for the plugin selected above (keyword "pi").</p>
so	optional	Number	<p>sequence order</p> <p>This specifies the sequence order and should only be used when using multiple encoding strings on one card. The numbers can be chosen freely.</p> <p>The encodings will be processed in ascending order.</p> <p>If two so-numbers are equal, the processing order of the two is undefined and dependent on the application!</p>
pre	optional	-	<p>precode step</p> <p>This indicates that this is a precode step in which the card will only be loaded but not yet printed.</p> <p>This attribute must be present in the precode step and must be omitted in the second (encode) step. It has no value!</p> <p>In addition, the printer will be locked for the precode-id (see below).</p>
pid	optional	Number	<p>precode id</p> <p>The number must uniquely identify the precode step and must be the same on the second (encode) step.</p> <p>This attribute is mandatory in an environment where precoding is done and must be present in both steps.</p> <p>The application needs to take care that each card to be printed and encoded gets a unique precode ID that is used for both steps.</p> <p>The printer is locked in the first step for this precode ID and only a second job with the same ID can unlock the printer. Therefore it is required that other cards have different IDs.</p>

6.8.1. Encoding string examples

1. Simple encoding string

```
{pi="Contact" ft="Guest" ...encoding data... }
```

Uses the plugin "**Contact**" and the format template "**Guest**" to encode the encoding data, then prints the card.

2. Multiple encoding strings

```
{pi="Mifare" ft="All Access" so="2" ...encoding data... }
```

```
{pi="Contact" ft="Payment" so="1" ...encoding data... }
```

First encodes with the plugin "**Contact**" and the format template "**Payment**", then encodes with the plugin "**Mifare**" and the format template "**All Access**", then prints.

3. Precoding

```
Job 1: {pi="Contact" ft="Guest" pre pid="16457" ...encoding data... }
```

```
Job 2: {pi="Contact" ft="Guest" pid="16457" ...encoding data... }
```

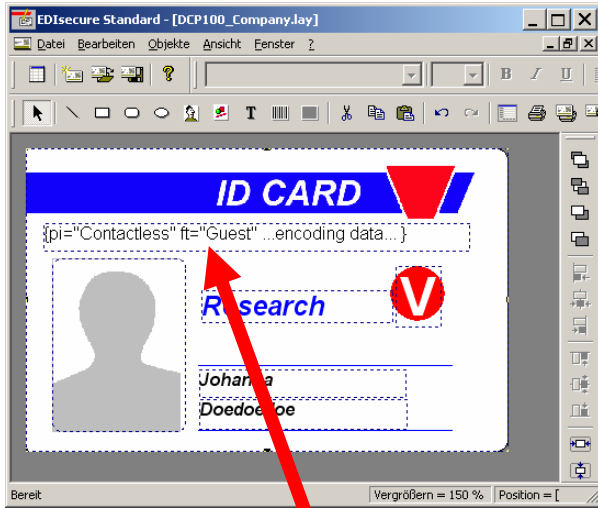
Job 1 runs the plugin "Contact" using the format template "Guest" to read something from the card and locks the printer for the second job with the precode id "16457".

Job 2 runs the same plugin and format template on the previously locked printer to encode the data, then prints.

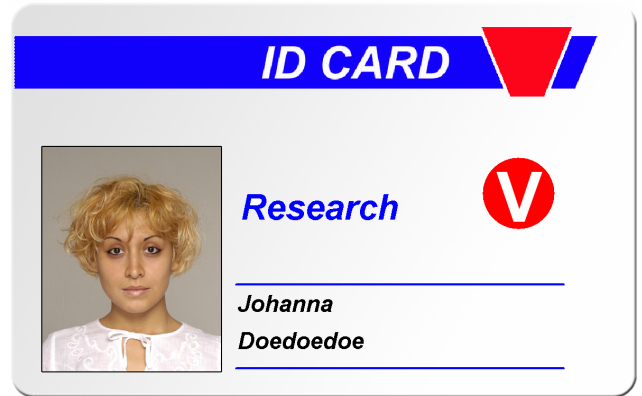
4. Visual appearance of encoding strings

This example shows how an encoding string does appear in the application window and does not appear on the printed card

Encoding string in the layout



Printed card



7. Troubleshooting and known limitations

Print Errors

As a result of the enhanced error recovery capability of the AIPM driver, the user can decide in case of an error to cancel, delete, recover, pause or re-print jobs.

In case the error persists, mostly due to a hardware error, please write down the error message and contact the company from which you purchased the printer.

Known limitations

- Copy printouts depend on the applications used. In this case, use the "**Collate**" or "**Sort**" option for printing copies.
- In some cases underlines will be printed in CMY instead in K.

8. Appendix A

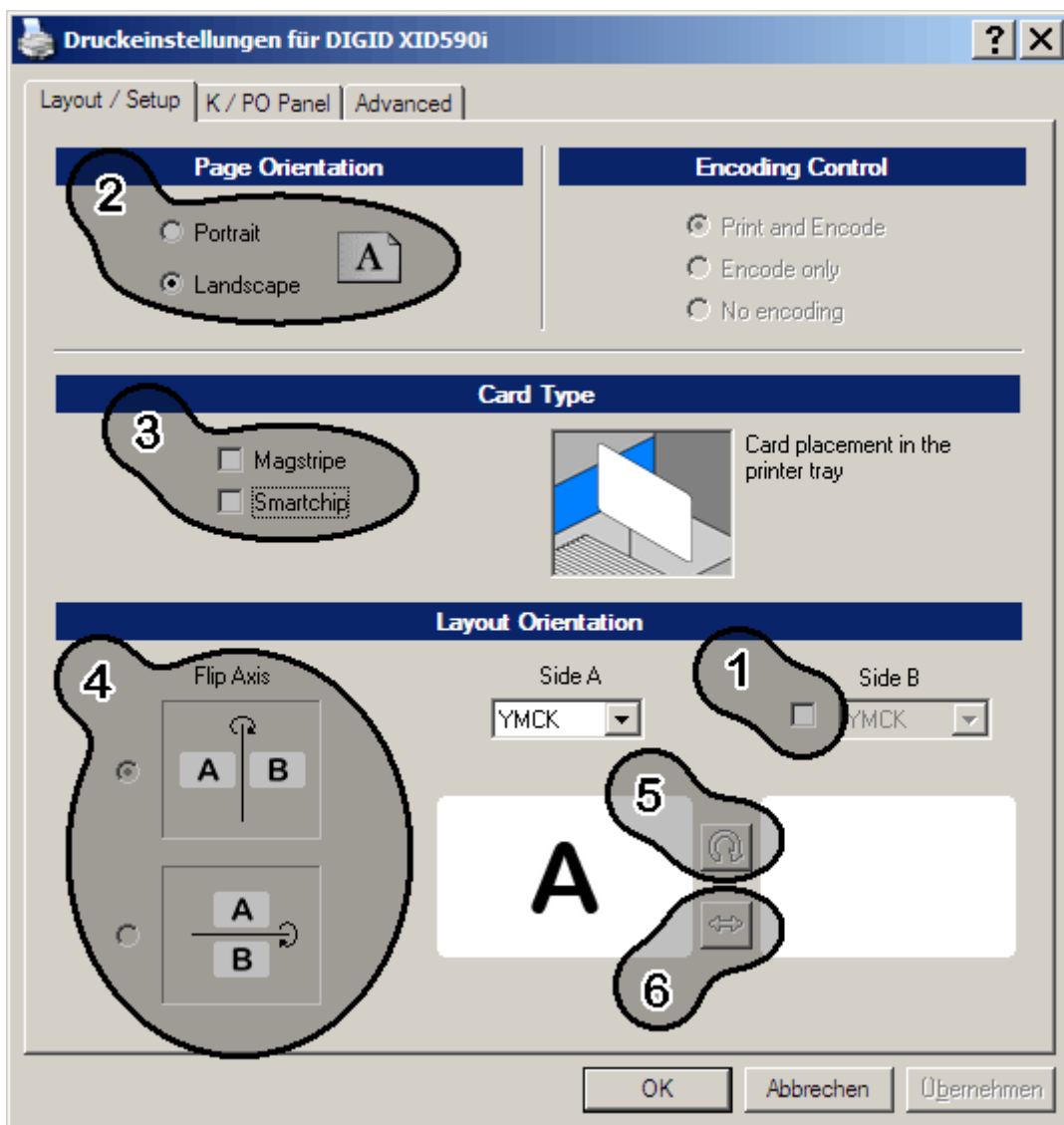
Layout placement on card

The printer driver uses a technology that allows you to quickly setup and adjust the document properties for correct layout placement on the printed card.

This section describes the idea behind it and how to find the correct settings in six intuitive steps.

For first time users, take the card template that was used for designing the layout. Place it in front of you to be able to **look** at it and to turn the card.

Open the printing preferences in the application you want to print (usually in menu **File** -> **Print...** -> select printer -> click on **Preferences...**)



The numbers show the steps which are explained on the following pages.

Step 1: One- or two-sided layout

Check if the design is a one or two-sided layout, i.e. if the layout has **only a front side** or a **front and back** side.

One sided layout:



Front side of card

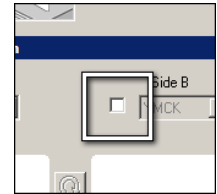
+



Back side of card

=

Select



or

Two sided layout:



Front side of card

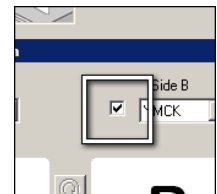
+



Back side of card

=

Select



Step 2: Landscape or portrait

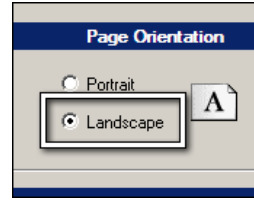
Check if the design is a landscape or a portrait design.

Landscape



=

Select



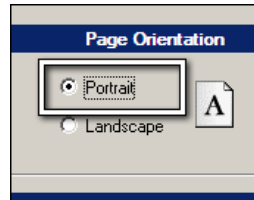
or

Portrait



=

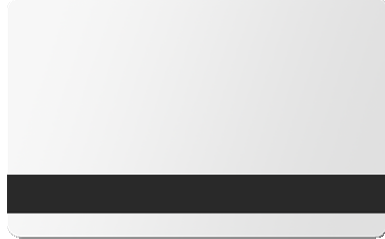
Select



Step 3: Visible encoding features, Magnetic Stripe or Contact Chip

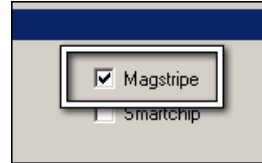
If the card is not blank, it is important to select the features so the driver knows in which order and the sides must be printed.

Magnetic stripe card



Select

=



or

Contact chip card



Select

=



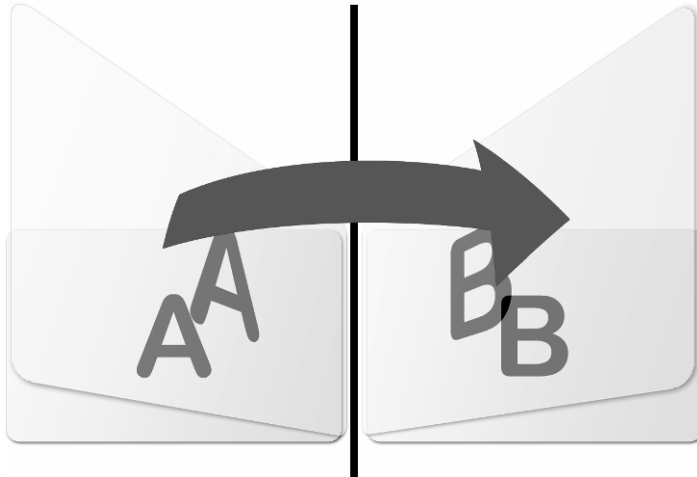
Note: If the card has **both encoding features**, you need to select **both types**, Magstripe **and** Smartchip.

Step 4: Flip axis

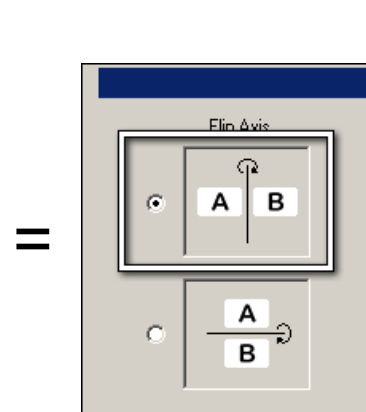
The driver determines the rotation of the layout sides from the flip axis of the card, which is the axis around which the card can be flipped and the layout stays in the correct orientation, not upside-down.

The following illustration shows a vertical flip axis, i.e. the card is flipped along its **short side edge**:

Vertical flip axis

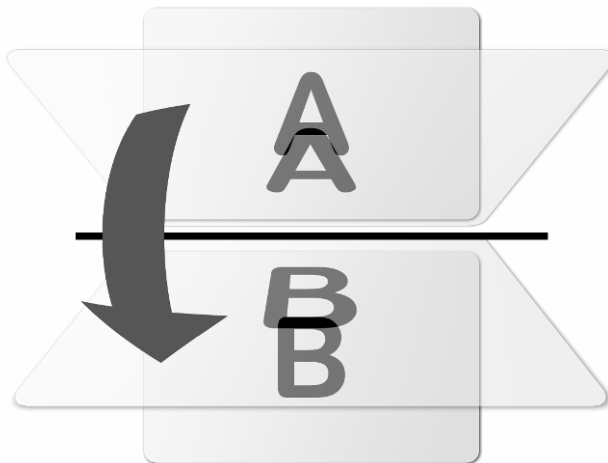


Select

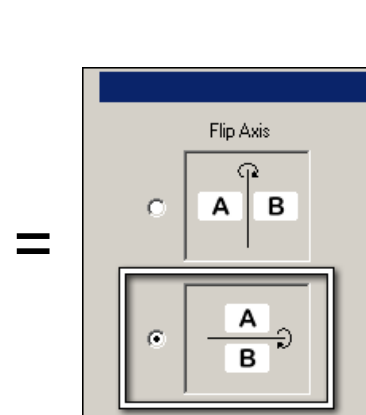


or

Horizontal flip axis



Select



Rule of thumb:

If you turn the card around the short edge (**vertical flip axis**) and the **back-side** is **upside-down**, select the **horizontal flip axis**.

Note: For **one-sided layouts**, the flip axes are **not selectable**.

Step 5: Rotation of the card

For non-blank cards, the layout design must cope with either the contact chip or the magnetic stripe or both on each side of the card. In the layout, these areas are usually left blank and the **Rotation-button** allows the print to match the layout, i.e. to **place the elements** in the correct positions as they were intended during layout creation.

Magnetic stripe:

The stripe can either be on the **top** or the **bottom** of the **layout**.

Contact chip:

The chip can either be on the **left** or the **right** side of the **layout**.

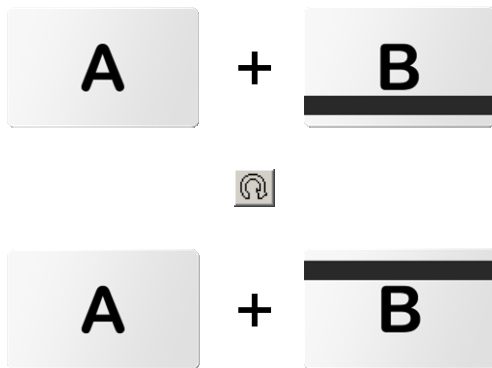
Important:

The **rotation button** will **rotate the card**, so both, the position of either chip or magnetic stripe will rotate on **both sides of the layout**.

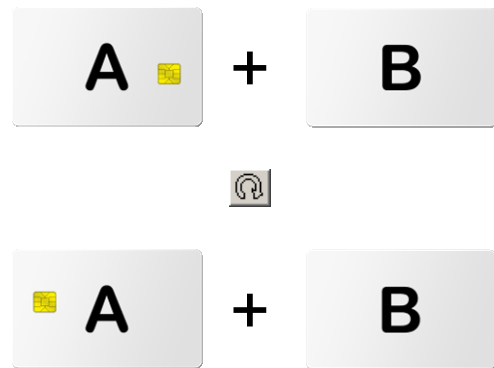
The following illustrations show some examples of magnetic stripe and chip cards and a combination of both types and the effect of the rotate-button.

Note: The same applies for one-sided cards.

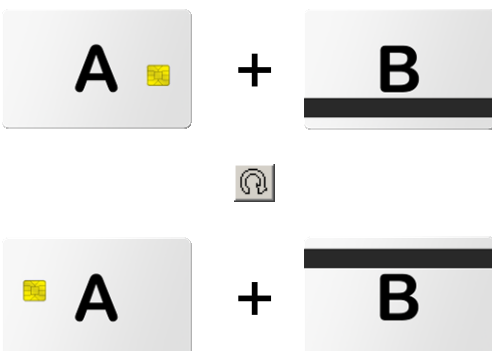
Magnetic stripe



Contact chip



Magnetic stripe + contact chip



Step 6: Exchange the card sides

As seen in the last step, for non-blank cards, the position of the magnetic stripe or contact chip or both must be adjusted to fit the layout. While the Rotation-button rotated the card on both sides, the **Exchange-button** allows to swap the front and back sides if the magnetic stripe or the chip are shown at the wrong side of the layout.

Magnetic stripe:

The stripe can either be on the **front** or the **back** side of the **layout**.

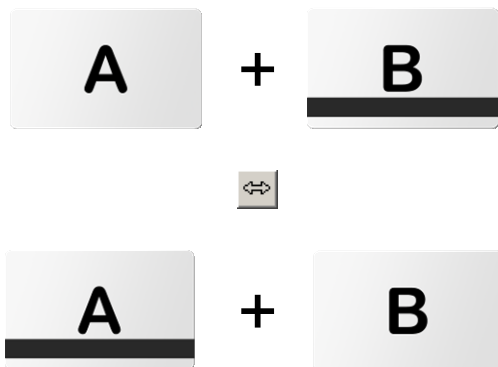
Contact chip:

The chip can either be on the **front** or the **back** side of the **layout**.

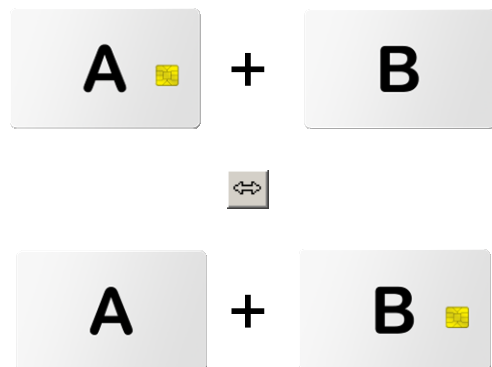
The following illustrations show some examples of magnetic stripe and chip cards and a combination of both types and the effect of the rotate-button.

Note: The same applies for one-sided cards.

Magnetic stripe



Contact chip



Magnetic stripe + contact chip

