ZC100/300 Series

Card Printer

Linux Driver User Guide

ZEBRA

P1102717-001

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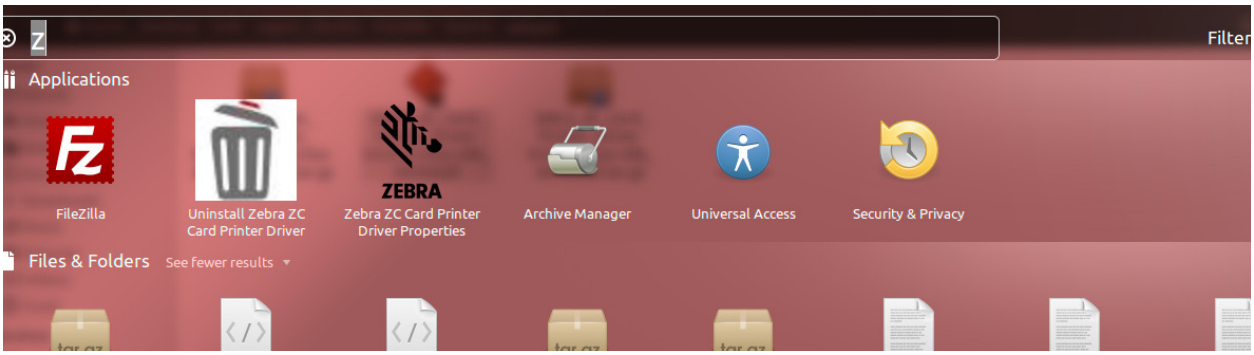
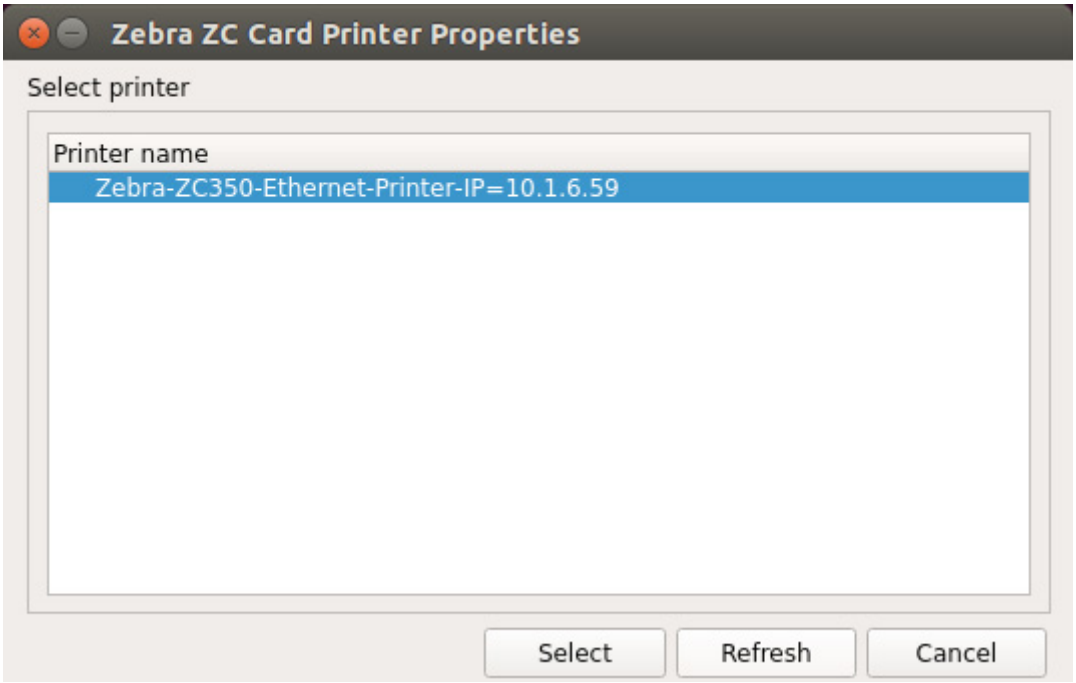
Printer Properties

Type “Zebra” in the Unity Launcher (available in the top left corner of the screen by default or else use Window Key).



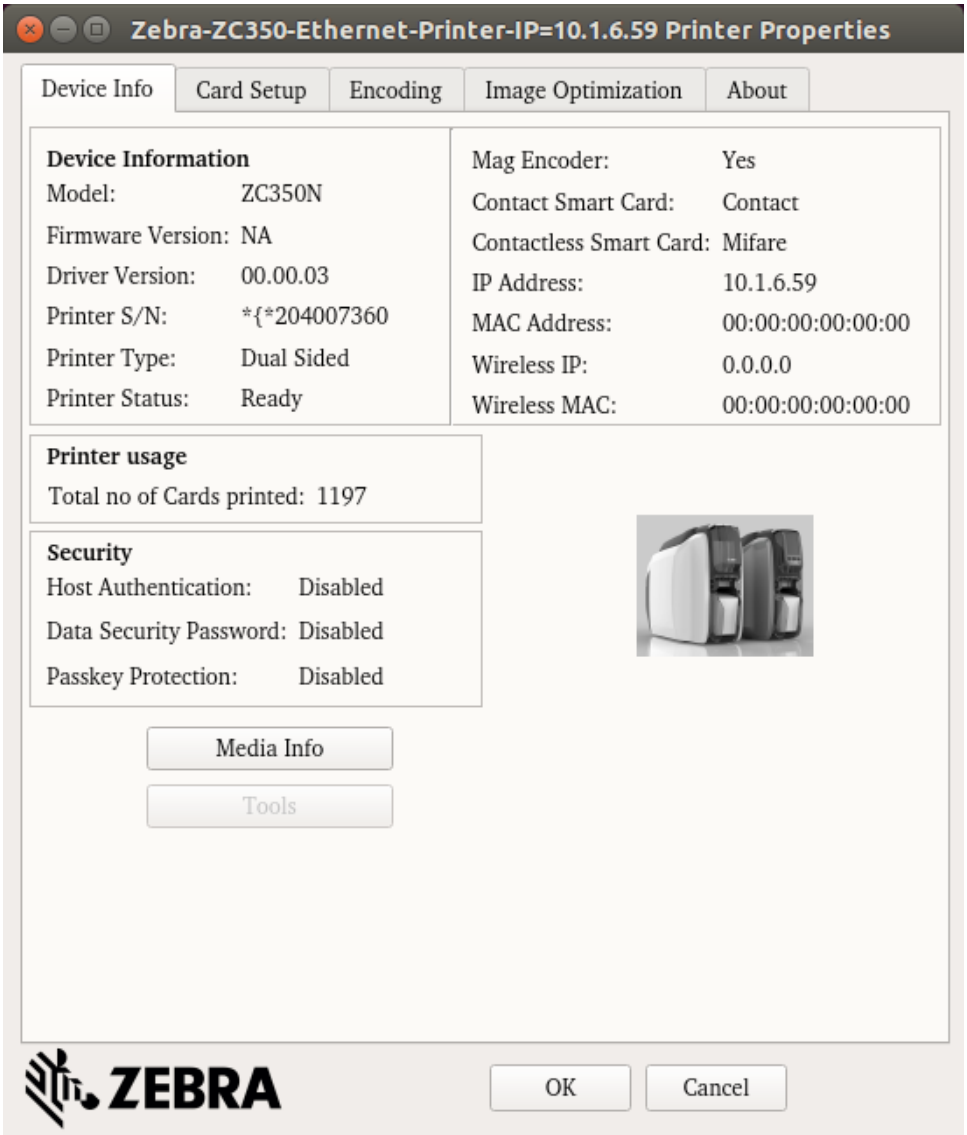
An authentication dialog will appear to confirm launching the printer properties, click **Yes** to continue.

At the Select printer window, highlight the desired printer and click **Select**. Otherwise, click **Cancel** to exit.



Device Info Tab

The Device Information tab provides device information, security status, and printer usage.



Device Information

Model – Shows the model name of the printer.

Firmware Version – Shows the version of firmware.

Driver Version – Shows the version of the installed driver.

Printer S/N – Shows the printer serial number.

Printer Type – Shows single-sided, or dual-sided.

Printer Status – Shows the status of the selected printer.

Mag Encoder – Shows if a Mag Encoder is installed or not.

Contact Smart Card – Shows if the contact smart card encoder is installed or not.

Contactless Smart Card – Shows the type of contactless smart card option installed.

IP Address – Shows the IP address.

MAC Address – Shows the MAC address.

Wireless IP – Displays the wireless IP address

Wireless MAC – Shows the wireless MAC address.

Printer usage

Total no of Cards Printed – Shows the total number of cards printed for the lifetime of the printer.

Security

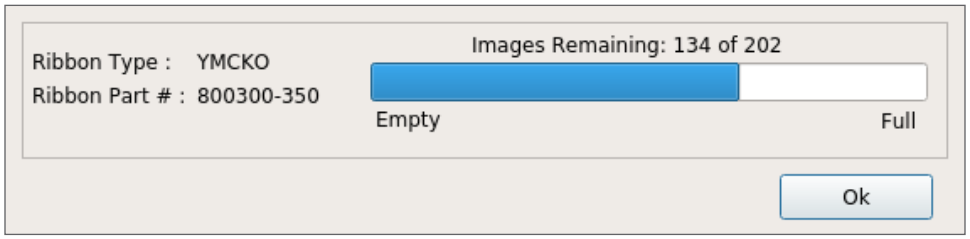
Host Authentication – Shows the status of the host authentication.

Data Security Password – Shows the status of the data security password.

Passkey Protection – Shows the status of the passkey protection.

Media Info

The **Media Info** button takes you to the Media Info screen.



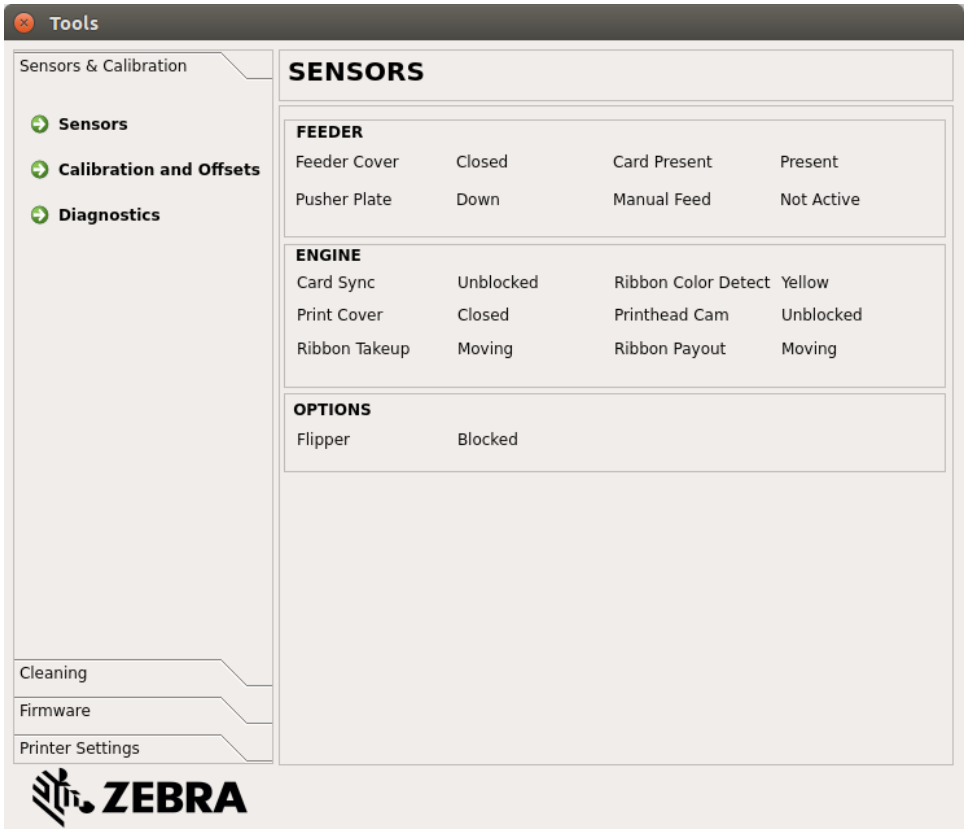
Tools

The **Tools** application includes functions that are used for printer operation and / or maintenance. The Tools application is divided into four tabs:

- Sensors & Calibration
- Cleaning
- Firmware
- Printer Settings

Sensors & Calibration

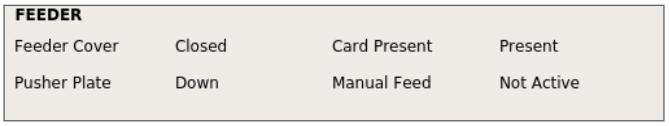
The **Sensors & Calibration** tab is divided into three sub-tabs:



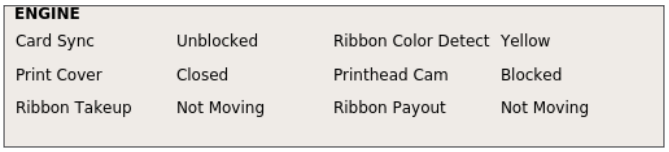
- Sensors
- Calibration and Offsets
- Diagnostics

The **Sensors** sub-tab is divided into three sections:

The **Feeder** section tracks the sensors in the feeder section of the printer and notifies the user of the current status.

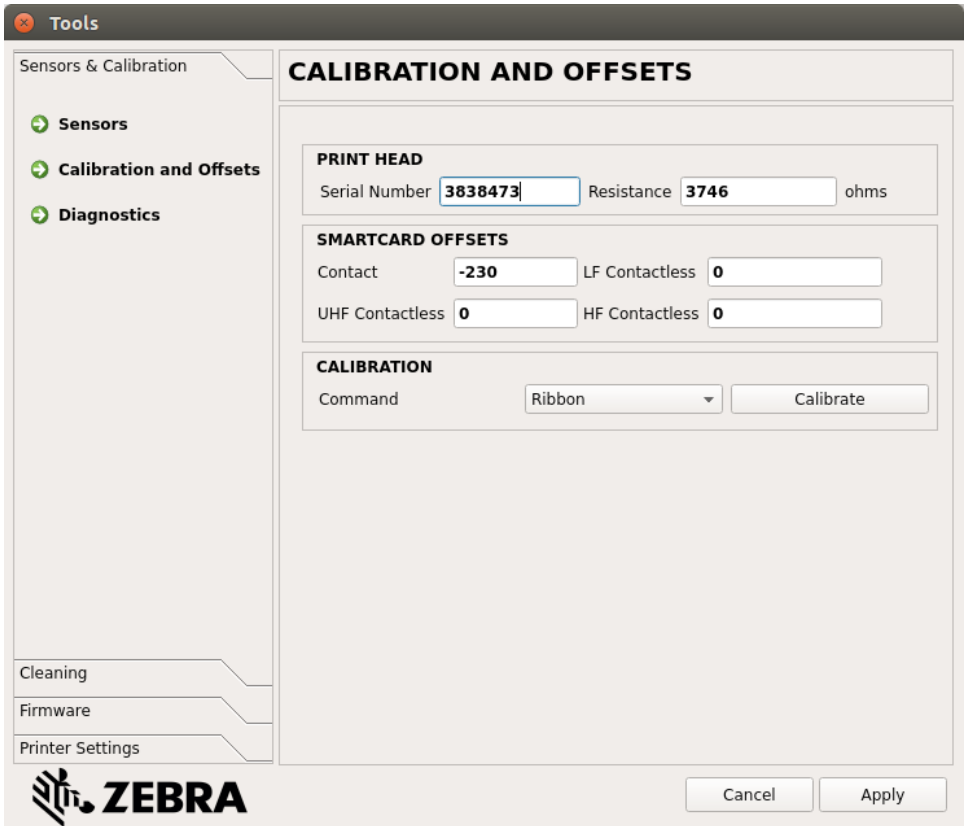


The **Engine** section tracks the sensors in the main section of the printer and notifies the user of the current status.



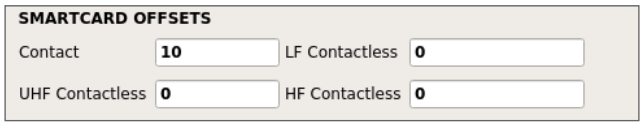
The **Options** section tracks the sensors in the installed options of the printer and notifies the user of the current status.

The **Calibration and Offsets** sub-tab is divided into three sections:



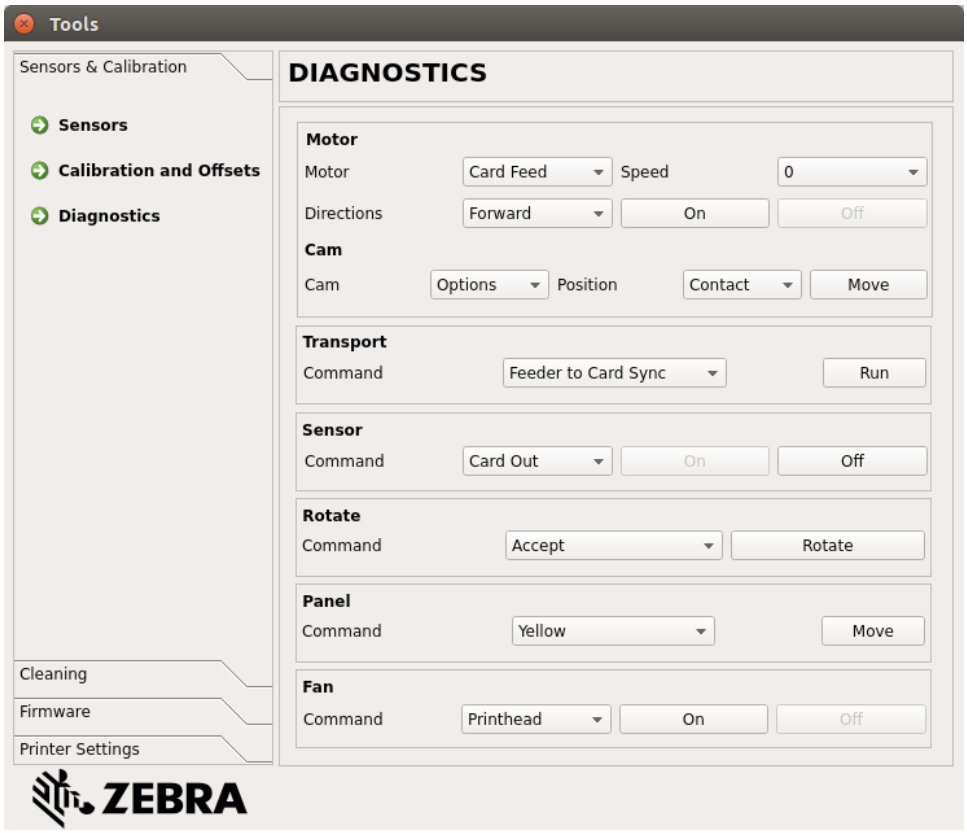
The **Printhead** section tracks the serial number and resistance value of the currently installed printhead. Use this section when installing a new printhead to enter new values.

The **Smartcard Offsets** sections identifies values for different smartcard types, and enables the user to change the values.

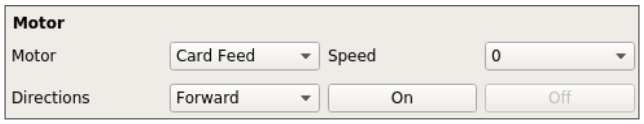


The **Calibration** section enables the user to calibrate certain sensors in the printer. This option can be used if a particular sensor is suspected to not be working properly. Currently, the only sensor available to calibrate is the Ribbon Detect Sensor.

The **Diagnostics** sub-tab is divided into seven sections:



The **Motor** section enables the user to activate the motors individually. Select the motor, the motor speed (if applicable), and direction from the drop-down lists and click **On**. The motor will engage at the selected settings, click **Off** to disengage the motor.



WARNING • Do not engage the card feed motor with cards present in the input hopper or serious damage may result.

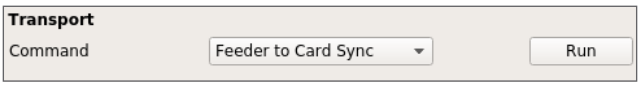
Note • Each motor can be engaged in forward or reverse.

- The Card Feed motor can be engaged at speeds ranging from 0–2000 in increments of 100.
- The Card X motor can be engaged at speeds of 1–20 in increments of 1.
- The Ribbon motor can be engaged at a single speed only.
- The Head Lift motor can be engaged at speeds of 0–2000 in increments of 100.
- The Options motor can be engaged at speeds of 0–2000 in increments of 100.

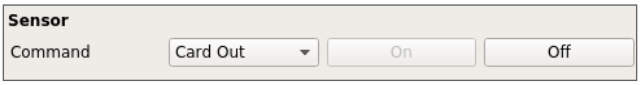
- The Flipper motor can be engaged at speeds of 0–2000 in increments of 100.

The **Cam** section is used to drive the lift cam for either the options module (if installed), or the printhead to be put into preset positions.

The **Transport** section sends cards to different locations in the printer.



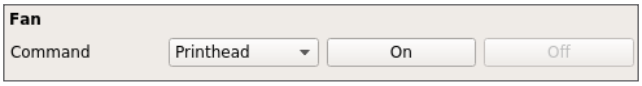
The **Sensor** section enables the user to turn different sensors on or off.



The **Rotate** section is used to move the flipper (if installed) to different positions.

The **Panel** section is used to move the specified ribbon panel into the ready position. The drop-down menu contents will vary depending on the ribbon installed.

The **Fan** section turns the cooling fan(s) on or off. Currently, only the printhead fan is supported.



Cleaning

The **Cleaning** sub-tab shows the user how many cards can be printed before the next cleaning is required.

Caution • **PROTECT YOUR FACTORY WARRANTY!**

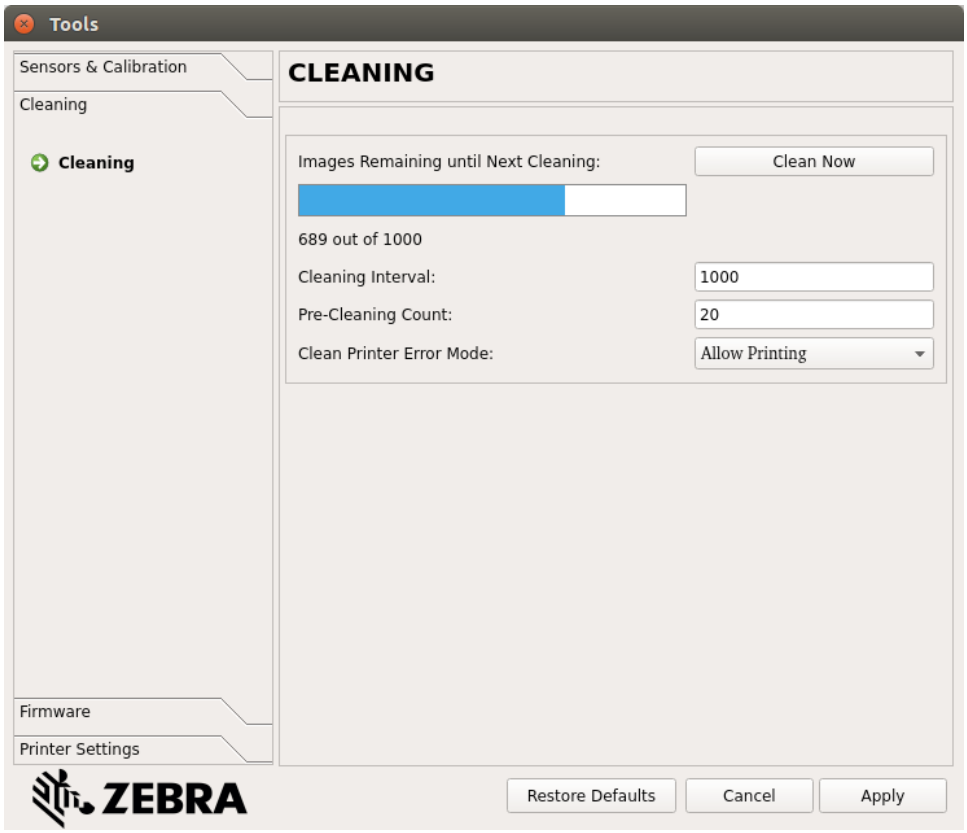
The recommended cleaning procedures must be performed to maintain your factory warranty.

NEVER loosen, tighten, adjust, bend, etc., any part or cable inside the printer.

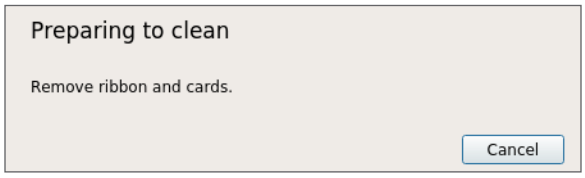
NEVER use a high pressure air compressor to remove particles in the printer.

The regular use of cleaning cards will clean and maintain important parts of your printer that cannot be reached: including the printhead, the transport rollers, and the magnetic encoder station (optional).

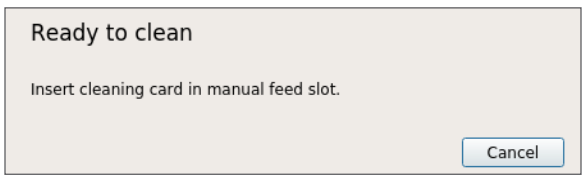
Click **Clean Now** to initiate the cleaning process.



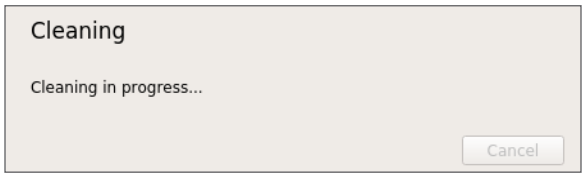
Step 1. At the prompt, remove the ribbon and cards from the printer.



Step 2. At the prompt, insert the cleaning card into the manual feed slot on the printer.



Step 3. The cleaning process will begin.



Step 4. When the cleaning process has finished, remove the used cleaning card after it has been ejected.

Step 5. Replace the ribbon and cards.

The **Cleaning Interval** determines how many cards can be printed before cleaning is required; the recommended (and default) value is 1,000 cards, and the maximum cleaning interval is 5,000 cards.

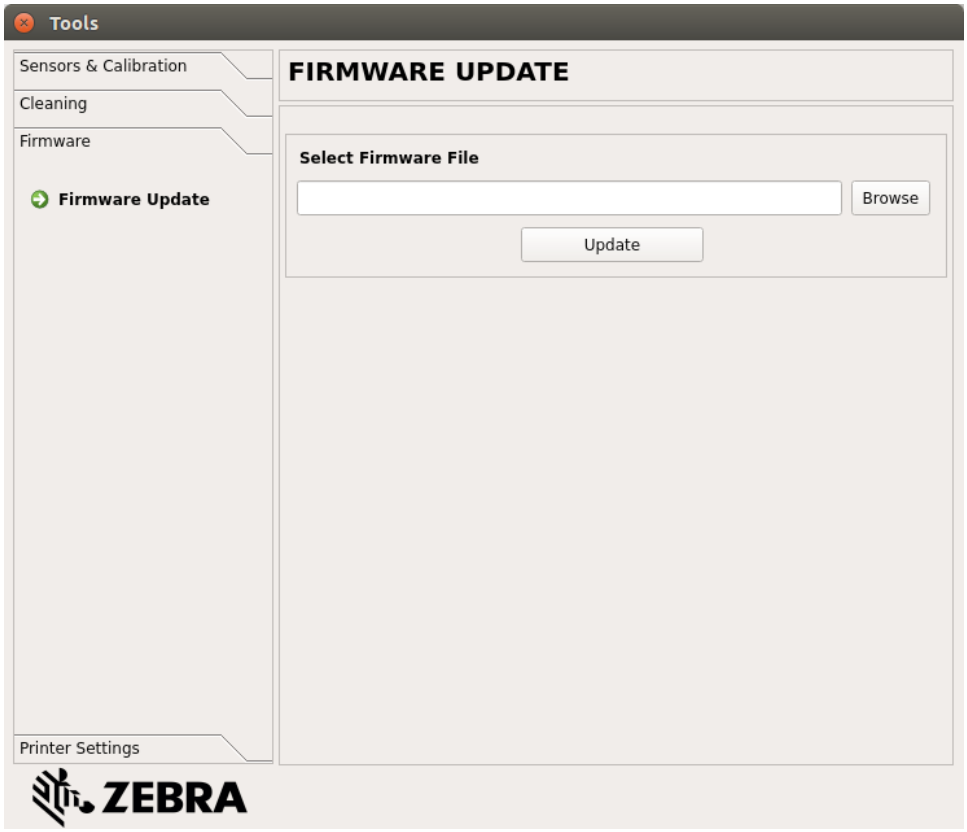
Important • Zebra does not recommend continued printing past the default cleaning interval as dust and debris will collect on the print surfaces and result in poor print quality.

The **Pre-Cleaning Count** displays a warning in the driver control panel and the printer display (ZC100 not applicable) showing the number of cards remaining before cleaning is due. The default value is twenty (20).

The **Clean Printer Error Mode** setting tells the printer to either Stop Printing when the cleaning notification occurs, or to Allow Printing (default). If the user sets the error mode to Stop Printing, cleaning must be done before any printing can continue. If the user sets the error mode to Allow Printing, printing can continue and cleaning can be done at a later time.

Firmware

In the **Firmware** sub-tab, the user is shown the current firmware version, and can update to the latest firmware.



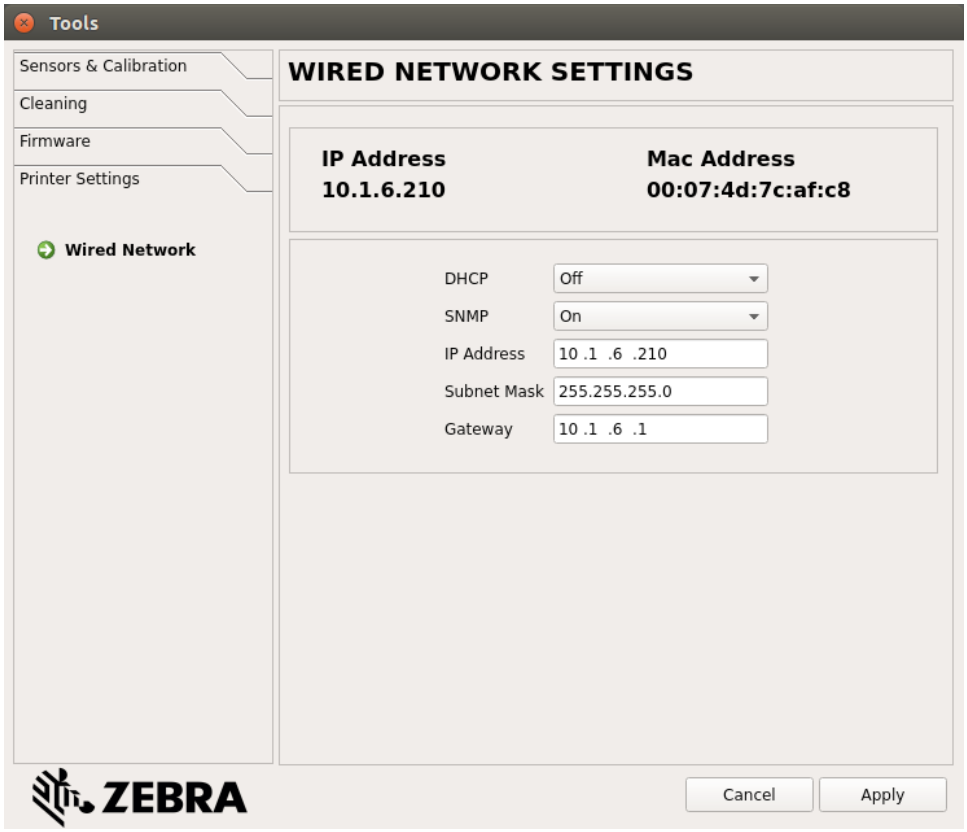
Printer Settings

The Printer Settings allows you to change the various network configuration parameters (DHCP, SNMP, IP address, Gateway, and Subnet mask). Note that the MAC address cannot be changed.

Turn DHCP off to set a static IP address.

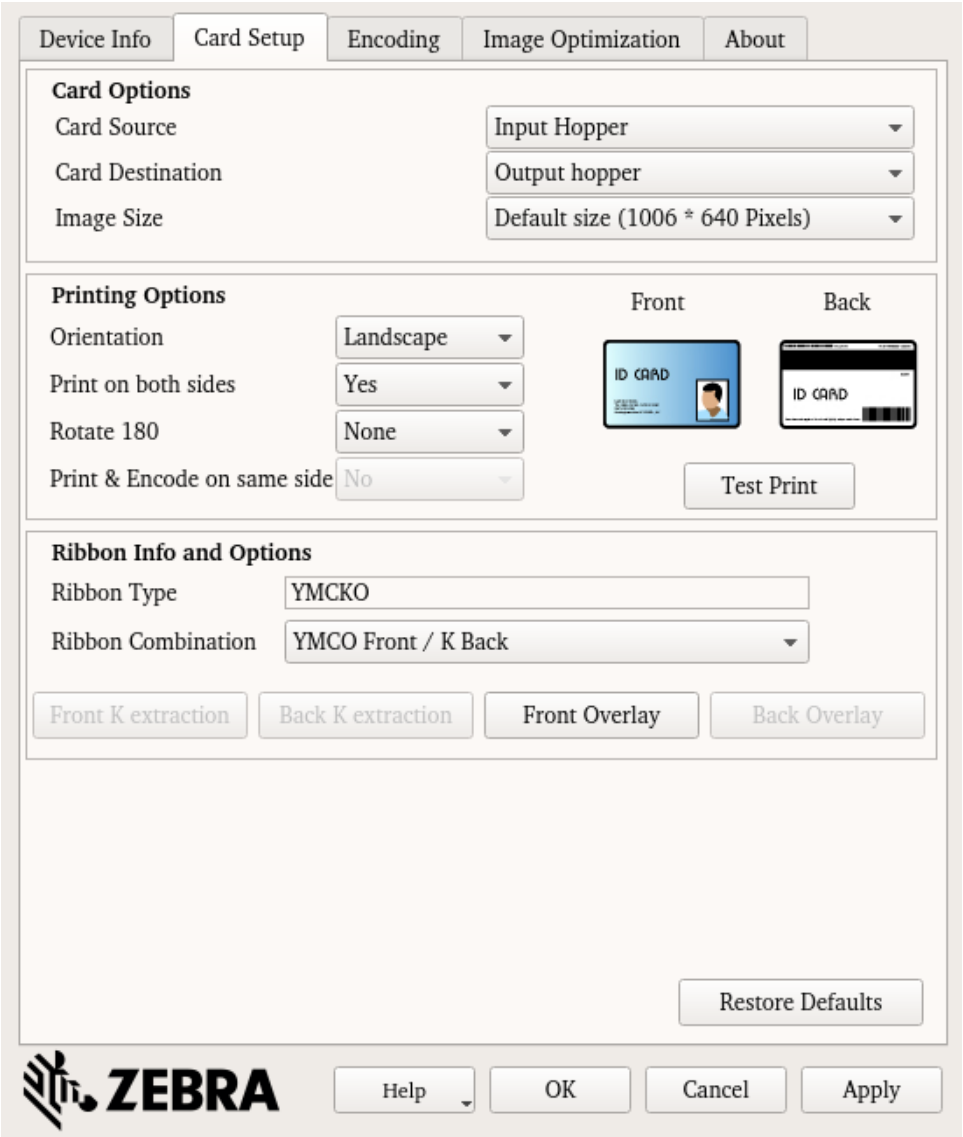
Turn SNMP off if you do not want the printer to be discoverable on the network.

You cannot configure the settings for Wired Ethernet while you are connected via Ethernet; Ethernet settings are configured while the printer is connected via USB. This is to prevent loss of communication.



Card Setup Tab

The Card Setup tab enables the user to adjust selected card, print job parameters and print test cards.



Card Options

Card Source – Enables the user tell the printer where to take the card from.

Card Destination – Enables the user tell the printer where to send the finished cards.

Image Size – Enables the user to specify how much of the card to be printed on.

Printing Options

The **Orientation** drop-down list tells the printer to print in either Landscape (horizontal) or in Portrait (vertical) depending on the design or the desired use of the card. Note that the printing orientation cannot be mixed; in other words, you cannot print portrait on the front and landscape on the back.

The **Print on both sides** switch enables double-sided printing (applicable to dual-sided printers; ZC100 not compatible).

The **Rotate 180°** drop-down list tells the printer to rotate the image on the card 180° (degrees). Use this option if you want the images to be oriented the same way depending on how the card is flipped over.

The following selections are available from the Rotate 180° drop-down list:

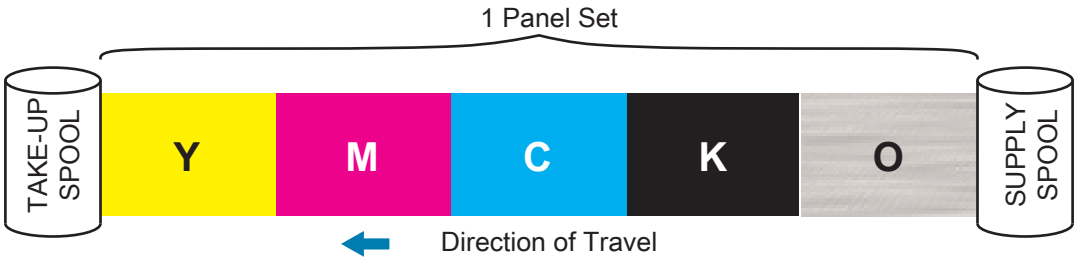
- **None** – does not rotate the image(s).
- **Front** – only rotates the image on the front of the card.
- **Back** – only rotates the image on the back of the card.
- **Both** – rotates the image on both the front and the back of the card.

Print and Encode Same Side enables the user to encode a card and print an image on the mag stripe side. This option is disabled when **Print on Both Sides** is enabled. To Print and Encode Same Side the printer must be dual sided, Print on Both Sides must be set to No, and the printer must have a mag encoder.

Print Test Card enables the user to print a test card.

Ribbon Info and Options

Zebra card printers use ribbons (media) that come in two types: monochrome and color panels. Monochrome ribbons are one continuous ribbon of a single color—typically black, but may be white, gold, or other single color ribbons. With color panels, such as YMCKO (used for full color printing), each individual primary color (yellow, magenta, cyan or YMC) along with black (K) and overlay or varnish (O) are laid out in sequence for one complete card print process.



The printer will recognize the type of print ribbon installed and display it in the **Type** field. The available ribbon combinations will be shown in the **Combinations** drop-down menu. Additionally, the **Print on both sides** and the **Print and Encode on Same Side** settings will affect the available ribbon combinations. The **Images Remaining** status bar indicates how many images can still be printed on the installed ribbon. This feature applies to ribbons with panels and refers to the panel set (YMCK); monochrome ribbons do not apply. When a ribbon cartridge has 10 panel sets remaining, a Ribbon Low warning will be displayed.

The following table shows the supported ribbons and their respective combinations:

Ribbon	Print on Both Sides	Print and Encode Same Side	Ribbon Combination
YMCKO	Off	Off	YMCKO front
		On	YMCKO back
	On	Off	YMCO front / K back (default)
			YMCKO front / YMCKO back
YMCKOK	Off	Off	YMCKO front
		On	YMCKO back
	On	Off	YMCKO front / K back (default)
			YMCKO front / YMCKO back
1/2YMCKO	Off	Off	YMCKO front
		On	YMCKO back
	On	Off	YMCKO front / YMCKO back
1/2YMCKOKO	Off	Off	YMCKO front
		On	YMCKO back
	On	Off	YMCKO front / KO back (default)
			YMCKO front / YMCKO back
KrO	Off	Off	KrO front
		On	KrO back
	On	Off	KrO front / KrO back
KdO	Off	Off	KdO front
		On	KdO back
	On	Off	KdO front / KdO back
K (Monochrome) Includes all single color ribbons	Off	Off	K front
		On	K back
	On	Off	K front / K back
YMCPKO	Off	Off	YMCPKO front
		On	YMCPKO back
	On	Off	YMCPO front / K back (default)
			YMCPKO front / YMCPKO back
YMCKLL	Off	Off	YMCKLL front
		On	YMCKLL back
	On	Off	YMCLL front / K back (default)
			YMCL front / KL back
			YMCKLL front / YMCKLL back
SDYMCKO	Off	Off	SDYMCKO front
		On	SDYMCKO back
	On	Off	SDYMCO front / K back (default)
			SDYMCKO front / SDYMCKO back

The **YMC** panels in a color ribbon are used to create the color image. The ZC100 and ZC300 Series printers use 24 bit color data, color algorithms, and printhead management formulas to achieve 256 shades of color when printing a full color image.

The printer uses the **K** panel to print black elements on a color image (see “Black/Mono Panel” on page 23), or barcodes and text. This is a resin panel, which means it cannot be used to print continuous tones of color. The K panel can only print binary (pure on or off) images.

K is also used to denote monochrome ribbons, which are available in black, white, gold, silver, red, and blue. Monochrome ribbons are also made of resin materials, which means they cannot be used to print continuous tones of color, and can only print binary (pure on or off) images.

Kd denotes a black dye panel, which allows continuous shades of gray to be printed, and is ideally suited for photos and graphics.

The **O** panel is an overlay which protects the dye panels against fading due to the effects of UV light and abrasion. Overlay can also be applied to K resin to further protect text and barcodes against abrasion. This makes the KrO ribbon useful in applications where card is swiped against a magnetic stripe reader and text or barcodes are printed on the opposite side of the magnetic stripe.

The **L** panels in the YMCKLL ribbon enable long lasting color personalization of cards without the use of lamination. The combination of two extra thick overlay panels adds four times more abrasion resistance to a color card, compared to a standard YMCKO ribbon. The panels can also be used to print security features, which will appear as a watermark on the card, and fluoresce under UV light. Refer to “YMCKLL” on page 17 for more information.

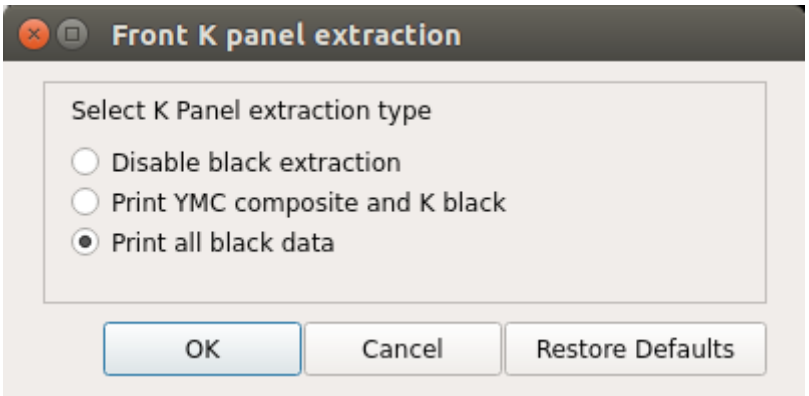
The **S** (silver) panel in the SDYMCKO ribbon enables 3D-like visual effects to be created on the card. The silver is a resin panel and it can be printed on the entire card for a metallic effect, or underneath a specific graphic element, like a logo or text and then printer over with YMC to create a unique visual effect. Refer to “SDYMCKO” on page 18 for printing options.

The **P** (pearlescent) panel is a color shifting panel in the YMCPKO ribbon, enabling covert security elements to the printed on the card, on demand. Images printed using the K and the P panels should ideally not overlap in the design of the card. Refer to “YMCPKO” on page 20 for more printing options.

The **Half-Panel** (1/2) ribbons are used for printing full color images on a smaller area of a card (i.e., an ID photo). The color panels are half the size of a normal color panel so waste is reduced and cards printed per ribbon is greater; the K (black) and Overlay panels remain full size.

Front K Extraction

The Front K extraction button will become active when the ribbon type and ribbon combination has both YMC and K on the same side (e.g., a YMCKO ribbon type and a YMCKO front ribbon combination).



Disable black extraction – does not use the K panel for any part of the image. This selection will have the effect of rendering all black images as YMC composite.

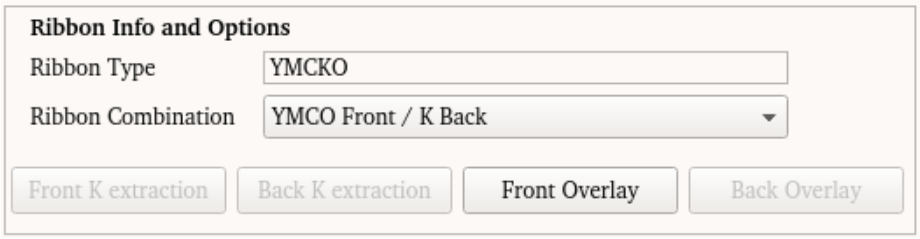
Print YMC composite and K black – uses both the K panel and the Y, M, and C panels to print the portions of the image that are identified as black. This selection will result in a dark, black image; but the edges will be smooth (due to YMC printed under the K), not the sharp edges typically desired for a barcode.

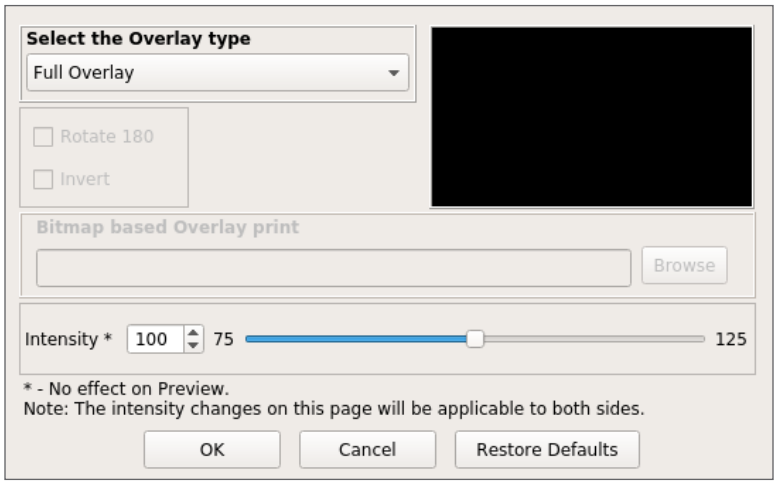
Print all black data – uses only the K panel to print the portions of the image that are identified as being black.

Back K Extraction

The Black Panel Options for the front and back are the same.

Front Overlay





Disable overlay – Overlay panel is not printed.

Full overlay – Overlay panel is printed over entire card.

Bitmap based Overlay – Tells the printer to print a solid image using the overlay, such as a logo, a shape, or text that has been converted to a 1-bit per pixel bitmap. Click **Browse**, locate the file you wish to upload, and click **Open**. Only 1-bit BMP and JPG files are supported.

- **Rotate 180°** is enabled when Bitmap based Overlay is selected.
- **Invert** is enabled when Bitmap based Overlay is selected, and reverses the dark and light colors--creating a negative image.

Smartcard ISO – This option leaves a small area open over a smart card chip.

Magnetic Stripe – This option leaves an area open over the magnetic stripe.

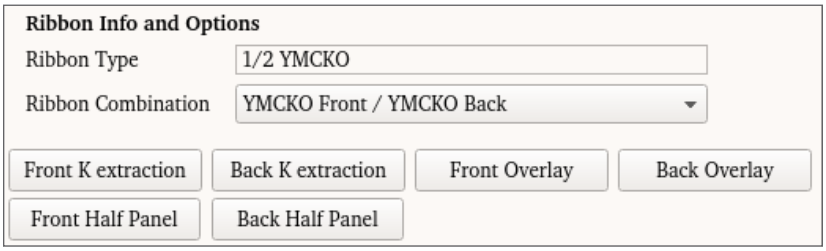
The **Intensity** adjustment gives the user control over how dark or light the overlay panel is printed.

Back Overlay

The Overlay Panel Options for the front and back are the same.

Half Panel

For single-sided printers and dual-sided printers with Print on Both Sides set to No the only ribbon combination for Half Panel is YMCKO Front. For dual-sided printers with Print on Both Sides set to Yes the only ribbon combination for Half Panel is YMCKO Front / YMCKO Back.



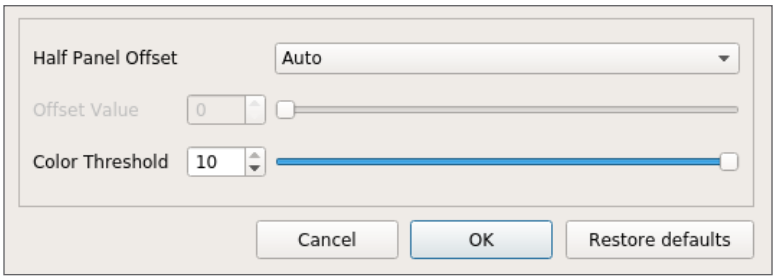
Note • The printable area for the color portion of the half-panel ribbon is 34 millimeters wide.

Typical YMCKO Ribbon

Half Panel YMCKO Ribbon

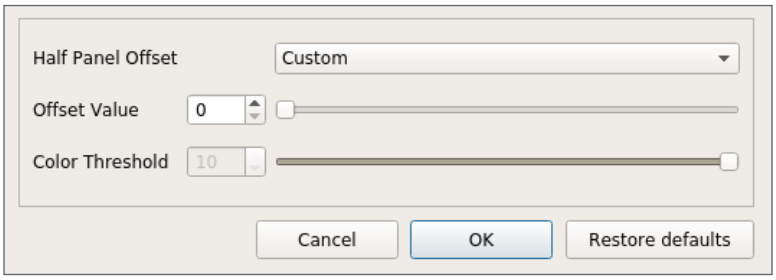
Auto (default) – detects the location of the color portion of the image and starts color printing at that location. In some cases, Auto detect may not be suitable for your image (one of the other three options may work better).

The **Color Threshold** slider is used to adjust the sensitivity of the algorithm that determines the starting location of the color panels. It is only available with the Auto offset.



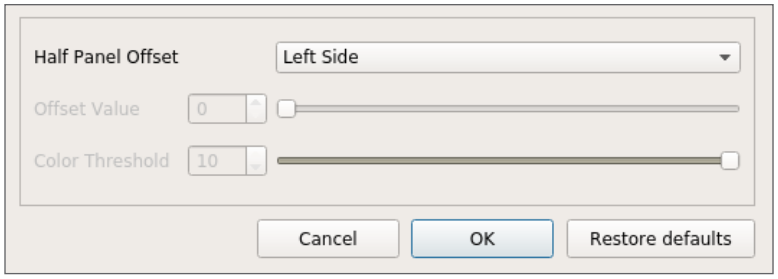
Custom – enables a manual offset setting.

The **Offset Value** slider is only available with the Custom offset.

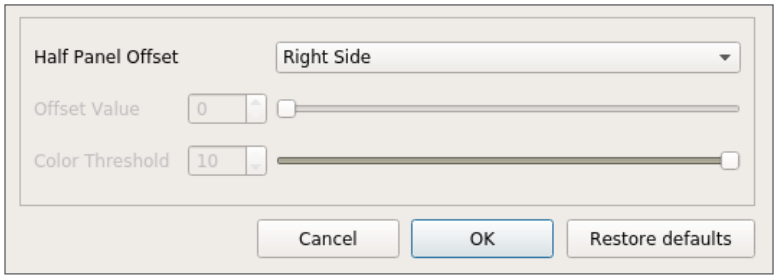


Note • Measurements are in pixels and start at the left, 1 pixel = 0.085 mm.

Left Side – sets the print area to the left side of the card.

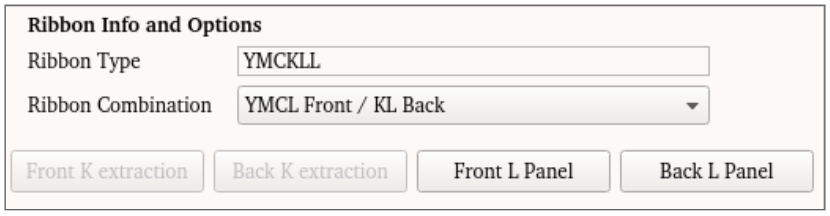


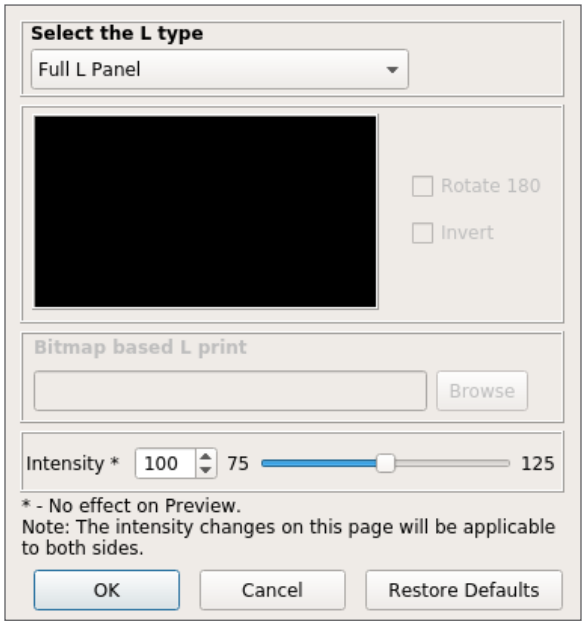
Right Side – sets the print area to the right side of the card.



YMCKLL

For single-sided printers and dual-sided printers with Print on Both Sides set to No the only ribbon combination for the L Panel is YMCKLL front. For dual-sided printers with Print on Both Sides set to Yes there are three (3) ribbon combination for the L Panel.





Disable L Panel – L panel is not printed.

Full L Panel – L panel is printed over entire card.

Bitmap based L Panel – Tells the printer to print a solid image using the first L panel, such as a logo, a shape, or text that has been converted to a 1-bit per pixel bitmap. Click **Browse**, locate the file you wish to upload, and click **Open**. Only 1-bit BMP and JPG files are supported.

When both L panels are printed on the same side of the card, and the bitmap option is enabled, the bitmap is only printed using one of the L panels. This allows security features to be printed while maintaining a protective overlay.

- **Rotate 180°** is enabled when Bitmap based Overlay is selected.
- **Invert** is enabled when Bitmap based Overlay is selected, and reverses the dark and light colors--creating a negative image.

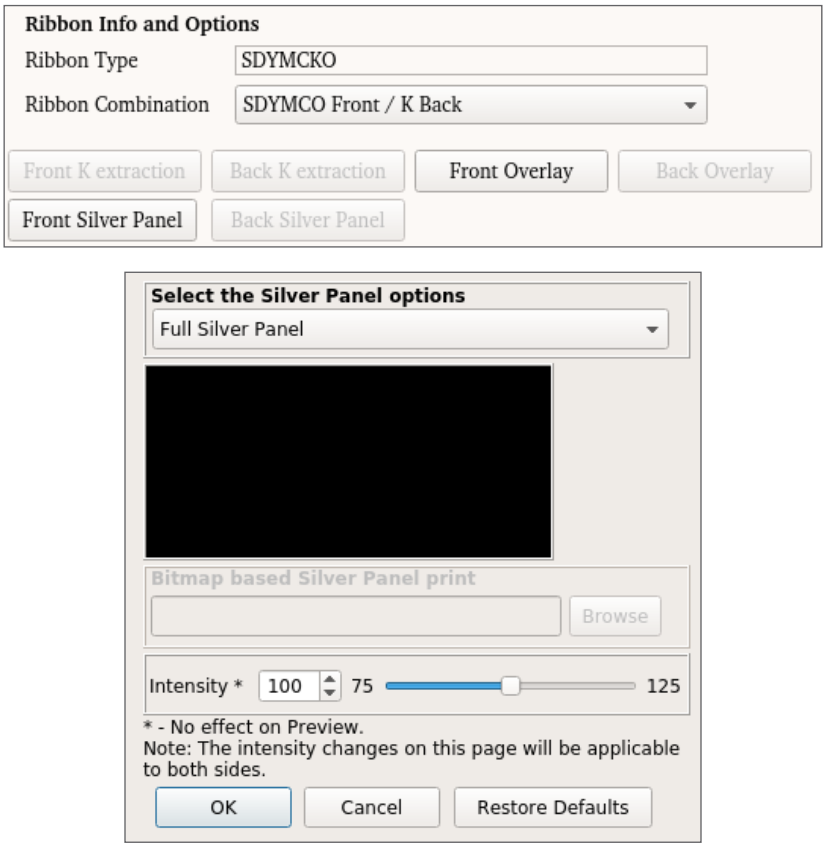
Smart Card ISO – This option leaves a small area open over a smart card chip.

Magnetic Stripe – This option leaves an area open over the magnetic stripe.

Lastly, the **Intensity** slider can be used to increase or decrease the intensity of the L panel. In most cases this should not be necessary; however, some card types may require more or less energy to print successfully with the L panel.

SDYMCKO

For single-sided printers and dual -sided printers with Print on Both Sides set to No the only ribbon combination for the Silver Panel is SDYMCKO Front. For dual-sided printers with Print on Both Sides set to Yes there are two (2) ribbon combinations for the Silver Panel.



Disable Silver Panel – Silver panel is not printed.

Full Silver Panel – Silver panel is printed over entire card.

This enables the user to give the entire card a shiny look. Note that non-printed areas will appear silver, so this combination is best suited for color images that completely cover the entire card.

The user only needs to send one color image to the printer for single sided cards (i.e., SDYMCKO front), or two images to the printer for dual-sided jobs (i.e., SDYMCO front / K back (first image color, second image mono) or SDYMCKO front / SDYMCKO back (both images color)).

Bitmap based Silver Panel – This enables the user to print the same image with the silver panel for every card, such as for a logo or graphic.

This combination uses the same user-supplied bitmap for the silver panel for every card. Once the bitmap has been selected, the user only needs to send one color image to the printer for single sided cards (i.e., SDYMCKO front), or two images to the printer for dual sided jobs (i.e., SDYMCO front / K back (first image color, second image mono) or SDYMCKO front / SDYMCKO back (both images color)).

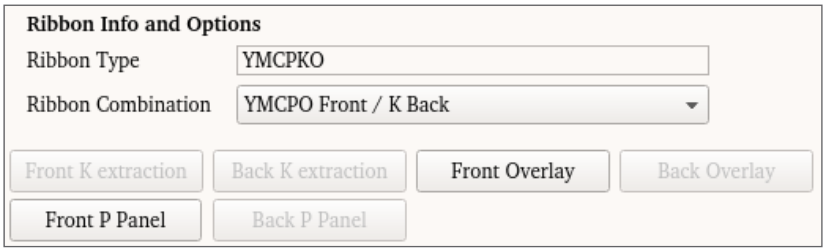
If the bitmap option is chosen, but no image is selected, the user must send the silver panel as part of the job. This combination requires the user to send two images to the printer in order to print with the silver panel. The first image is for the silver panel, while the second image is for the color panels. If K is also on the same side (i.e., SDYMCKO front), then K will be extracted from the second image if this feature is enabled. If K is on the back side of the card (i.e., SDYMCO front / K back), then a third image is needed for the K panel—the first image is still for the silver panel and the second image is still for the color panels. When printing SDYMCKO front / SDYMCKO back, four images need to be sent to the printer. The first image is for the silver panel on the front, the second image is for the color and K panels on the front, the third image is for the silver panel on the back, and the fourth image is for the color and K panels on the back.

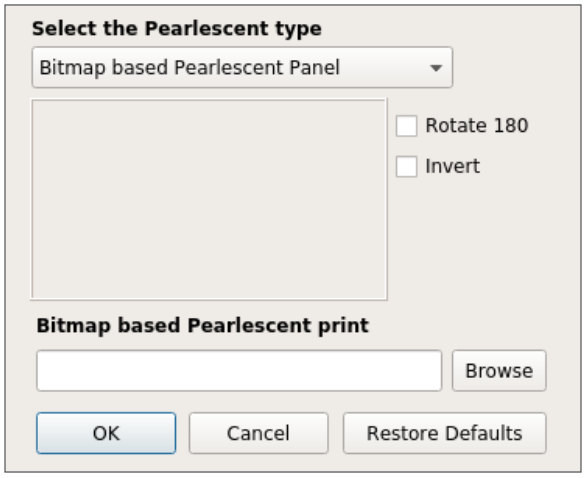
The front and back silver panel options can be set independently; however, this only applies to the SDYMCKO front / SDYMCKO back ribbon combination.

Lastly, the **Intensity** slider can be used to increase or decrease the intensity of the silver panel. In most cases this should not be necessary; however, some card types may require more or less energy to print successfully with the silver panel.

YMCPKO

For single-sided printers and dual-sided printers with Print on Both Sides set to No, the only ribbon combination for the Pearlescent Panel is YMCKPO Front. For dual-sided printers with Print on Both Sides set to Yes, there are two (2) ribbon combinations.





Disable Pearlescent – Pearlescent panel is not printed.

Bitmap based Pearlescent Panel – This enables the user to print the same image with the pearlescent panel for every card, such as a logo or graphic.

This combination uses the same user-supplied bitmap for the pearlescent panel for every card. Once the bitmap has been selected, the user only needs to send one color image to the printer for single sided cards (i.e., YMCPKO front), or two images to the printer for dual sided jobs (i.e., YMCPO front / K back (first image color, second image mono) or YMCPKO front / YMCPKO back (both images color)).

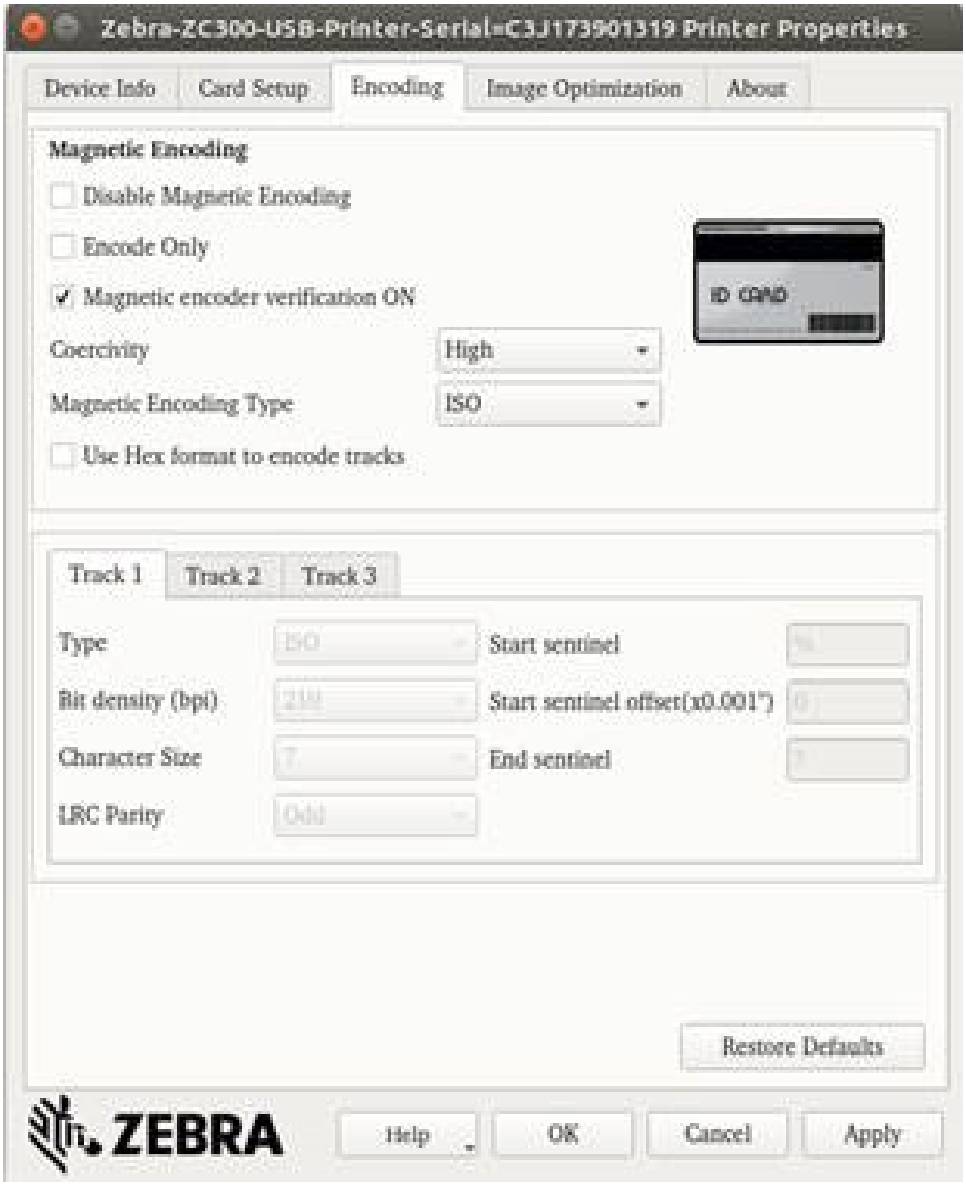
If the bitmap option is chosen, but no image is selected, the user must send the pearlescent panel as part of the job. This combination requires the user to send two images to the printer in order to print with the pearlescent panel. The first image is for the color panels, and the second image is for the pearlescent panel. If K is also on the same side (i.e., YMCPKO front), then K will be extracted from the first image if this feature is enabled. If K is on the back side of the card (i.e., YMCPO front / K back), then a third image needs to be sent to the printer for the K panel. The first image is still for the color panels and the second image is still for the pearlescent panel. When printing YMCPKO front / YMCPKO back, four images need to be sent to the printer. The first image is for the color and K panels on the front, the second image is for the pearlescent on the front, the third image is for the color and K panels on the back, and the fourth image is for the pearlescent panel on the back.

- **Rotate 180°** is enabled when Bitmap based Overlay is selected.
- **Invert** is enabled when Bitmap based Overlay is selected, and reverses the dark and light colors--creating a negative image.

Note • The front and back pearlescent panel options can be set independently; however, this only applies to the YMCPKO front / YMCPKO back ribbon combination.

Encoding Tab

The Encoding options enable the user to set various magnetic encoding options.



Disable Magnetic Encoding – Prevents the printer from encoding a card, whether the job has magnetic encoding data in it or not.

Encode Only – Disables printing, whether the job has an image to be printed or not.

Magnetic encoder verification ON – Verifies the data that is written to the card before declaring the encoding action to be successful.

Coercivity – Selections are High and Low to match the card type.

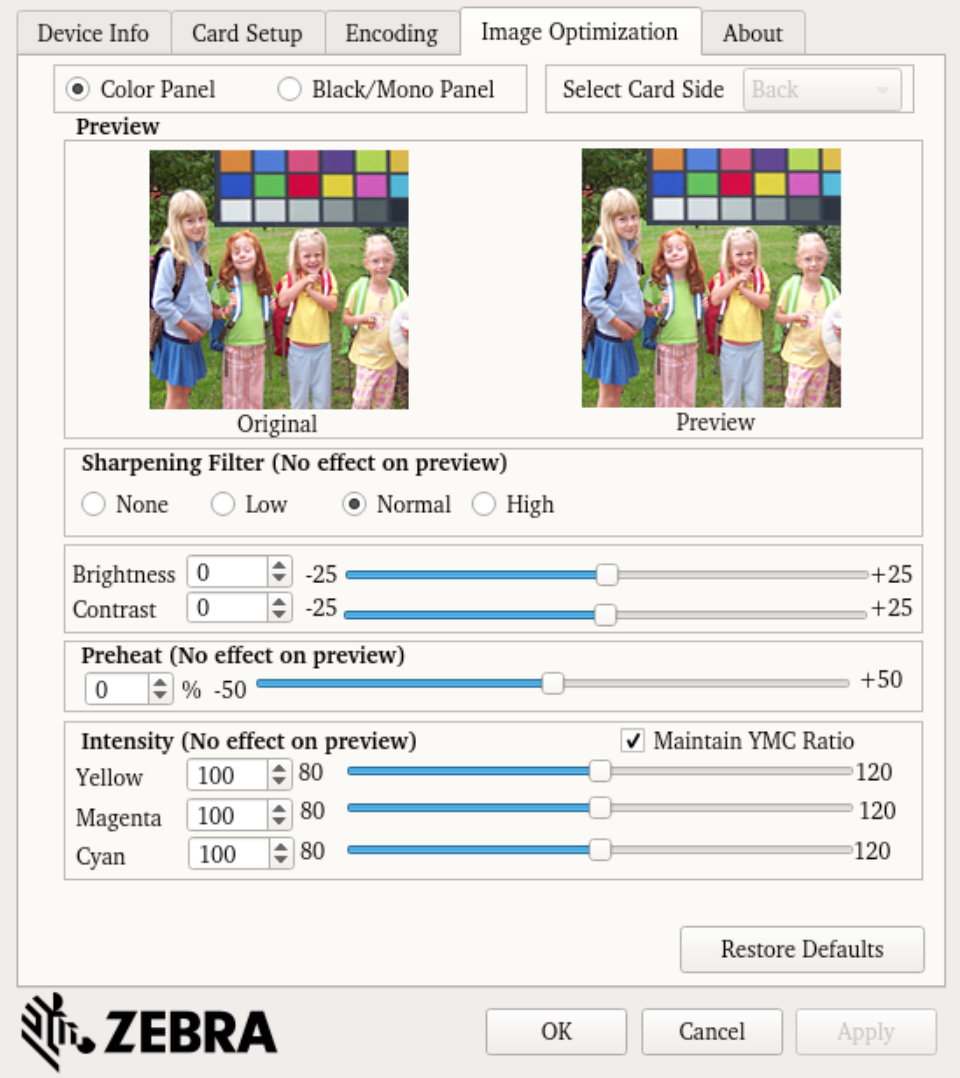
Magnetic encoding type – Selections are ISO (default), AAMVA, CUSTOM, and BINARY.

Use Hex format to encode tracks – Select this option to encode the tracks using hexadecimal format.

Image Optimizations Tab

Color Panel

The Color Panel selection enables the user to adjust how the color images print—it does not affect the color images.



Sharpening Filter – Options are None, Low, Normal (default), and High. Adjustments are not reflected in the preview image.

Brightness and **Contrast** – Adjustments range from -25 to +25, default = 0. Changes are reflected in the preview image.

By default, the image file is automatically sharpened; i.e., edges are enhanced within the image. If sharpening has already been done, this function can be turned off (None). The Low and High options are available if additional sharpening adjustment is required.

Preheat – Adjustment ranges from -50 to 50, default = 0. Increasing the preheat value will darken up edges of fonts, fine lines, and color edges that are against a white or very near white background.

In some cases, increasing the preheat value too much can cause the white or near white images to print with a light color cast. Increasing the preheat might also improve color-to-color mis-registration that may occur.

Intensity – Adjustments for Yellow, Magenta, and Cyan range from 80 to 120.

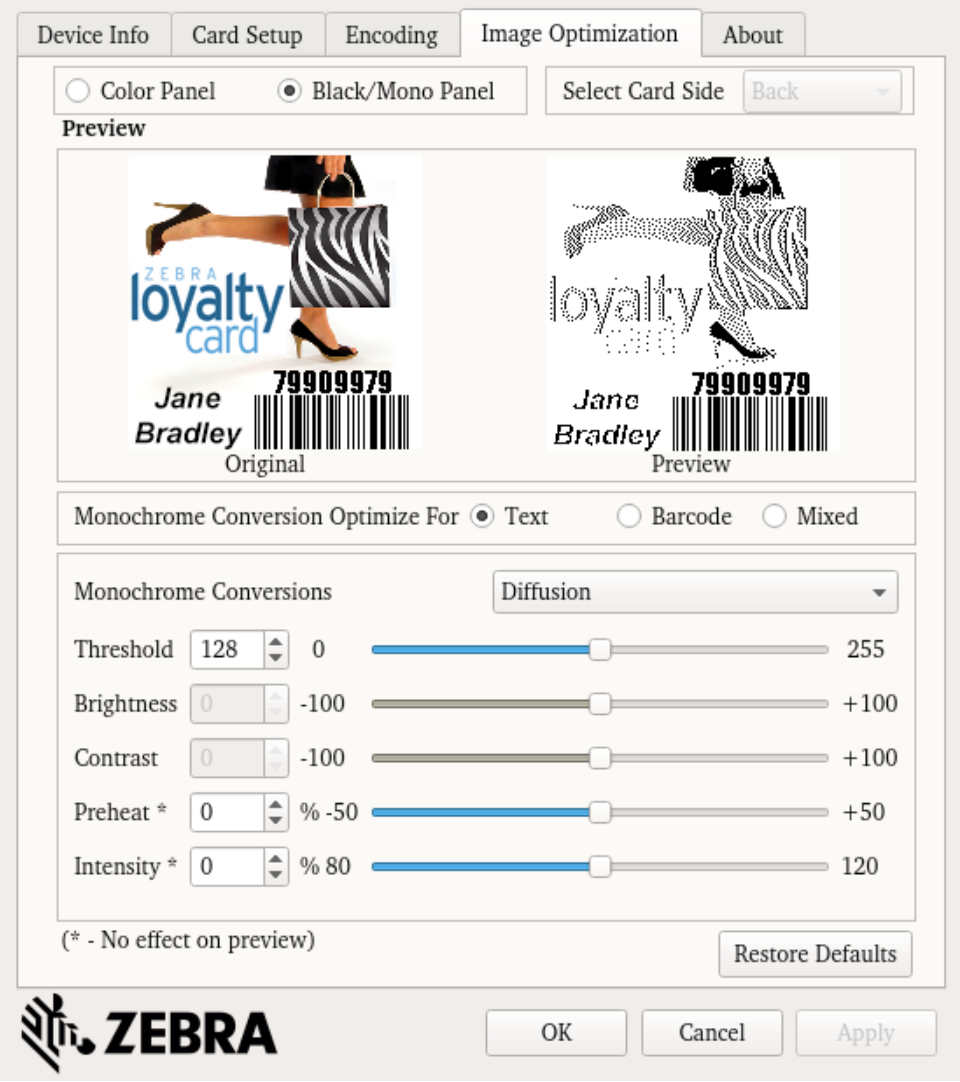
By default, the Maintain YMC ratio checkbox is selected; so all three sliders move at the same time. With the checkbox unselected, the sliders move independently. Note that by moving the sliders independently the tones of the image will shift.

Intensity can be used to lighten or darken the entire printed color image. It can be used to eliminate ribbon wrinkling or ribbon sticking/ripping in hot or humid environmental conditions.

Note • Note that the Intensity setting has no effect on the preview image but is applied to the image during the printing process. These adjustments remain set until changed.

Black/Mono Panel

The Black/Mono Panel tab displays two identical adjustment sections (Front and Back) to optimize black panel printing for the type of image being printed. The front side and back side options are enabled based on the availability of K panel in the ribbon combination or the presence of a monochrome ribbon.



Optimization – Enables presets for optimal printing:

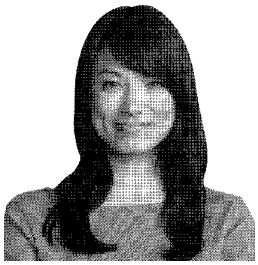
Text – Optimizes black panel printing to produce crisp, clear text.

Mixed – Optimizes black panel printing for both text and barcodes, or text and pictures, or other combinations.

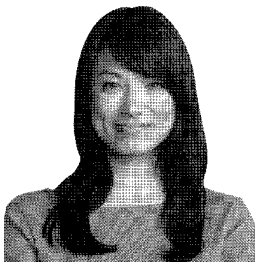
Barcode optimizes black panel printing for sharp barcodes that are easily read by scanners.

Monochrome Conversion – Used to convert continuous tone 8-bit-per-pixel RGB or gray image content into binary1-bit-per-pixel content, as monochrome panels can only print binary (pure on or off) images.

Threshold – This is the simplest method for converting from 8 bits per pixel to 1 bit per pixel. For example, the input pixel can be a value from 0 to 255. If the threshold is 128, any pixel from 0 to 128 becomes full on (1); and any pixel that is higher than 128 becomes full off (0). This mode works best for text, barcodes, line art, logos -- everything except continuous-tone pictures. Use the Threshold slider to set the desired value.



Diffusion – Dither diffusion is used primarily where you have a full color (RGB image with 8 bits per pixel) or full gray (single color but still 8 bits per pixel) that you need to print with binary printing (can only print full-on or full-off; i.e., 1 bit per pixel). Typically preferred over halftoning for most images. Use the brightness and contrast sliders to adjust the levels to the desired output.



Halftone – prints the bitmap image as a 6 x 6 halftone image, which simulates continuous tone imagery through the use of dots, varying either in size or in spacing.

The conversion option selected determines which of the controls is enabled; i.e., selecting Threshold enables the Threshold, Preheat, and Intensity controls.

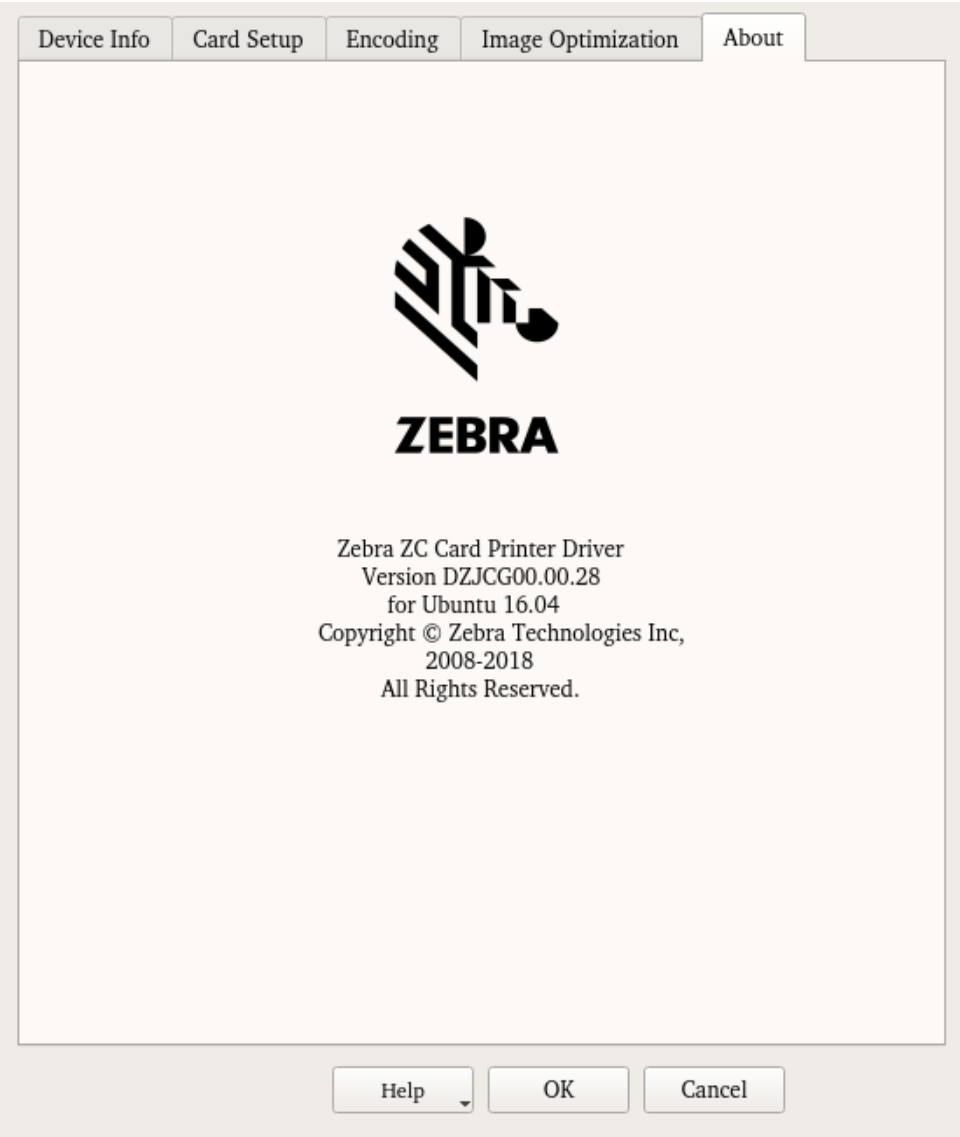
Threshold – Sets the transition point between black (0) and white (255); i.e., pixel values less than the threshold value would be black, and pixel values greater than the threshold value would be white. Default is 128.

Brightness – Controls overall the brightness of the image. Move the slider to the right to lighten the image or to the left to darken the image.

Contrast – Controls the difference between the light and dark areas of the image. Move the slider to the right to increase the contrast and vice versa.

Preheat – Affects the edges of the printed image. Adjustments range from -50 to +50, default = 0.

Intensity – Adjusts the lightness or darkness of the image. Adjustments range from 80 to 120.

About Tab

The **About** tab shows the driver version, the supported operating systems, and the copyright