

ENTRUST

User's Guide

LXM Card Printer Driver for Linux

Software Version 1.8

Notice

Please do not attempt to operate or repair this equipment without adequate training. Any use, operation or repair you perform that is not in accordance with the information contained in this documentation is at your own risk.

Trademark Acknowledgments

Entrust, Sigma and the hexagon design are trademarks, registered trademarks and/or service marks of the Entrust Corporation in the United States and other countries.

Datacard is a registered trademark and service mark of Entrust Corporation in the United States and other countries.

MasterCard is a registered trademark of MasterCard International Incorporated.

Visa is a registered trademark of Visa International Service Association.

All other product names are the property of their respective owners.

Proprietary Notice

The design and information contained in these materials are protected by US and international copyright laws.

All drawings and information herein are the property of Entrust Corporation. All unauthorized use and reproduction is prohibited.

Entrust Corporation

1187 Park Place
Minneapolis, MN 55379
Phone: 952-933-1223
Fax: 952-933-7971
www.entrust.com

Revision Log

Revision	Version	Date	Description of Changes
A	1.0	November, 2019	First release of this document.
B	1.1	December, 2019	Updated for driver version 1.1
C	1.2	October, 2020	Updated for driver version 1.2
D	1.3	February, 2021	Updated for driver version 1.3
E	1.4	October, 2021	Updated for driver version 1.4
F	1.5	August, 2022	Updated for driver version 1.5
G	1.6	December, 2022	Updated for driver version 1.6
H	1.7	January 2024	Updated for driver version 1.7
J	1.8	April 2025	Modified the driver uninstall and install steps. Added RIM information to the Kiosk and Embossing Sample topics.

Contents

Notices	2
Notice	2
Trademark Acknowledgments	2
Proprietary Notice	2
Revision Log	3
Contents	5
Chapter 1: About the Linux Driver	7
Linux Driver Support	7
Supported Printers	8
Chapter 2: Install and Setup the Driver	9
Before Installing the Linux Driver	9
Prerequisites	9
Install the Driver	10
Run Wrapper Scripts	10
Run the Install Script	10
Install Multiple Network Printers	13
Remove Multiple Network Printers	13
Printer Properties	14
View the Printer IP Address	14
Specify Printer Driver Options	14
Rewritable Card Printing	21
K Panel Printing	25
Use the Default K Panel Masks	26
K Panel Mask Examples	33
Creating K Panel Masks	41
LXM Driver Setup Tool	43
Linux Driver Logging	44
Update the Linux Driver	44
Uninstall the Driver	44
Printer Error Messages	45
Chapter 3: Linux Driver SDK	47
Install the SDK	47
Manually Installing the SDK	47
Developer Environment	48
Interactive Operations	48
StartJob	48
Resume, Cancel, or Restart	50
Print	51

EndJob	51
Linux SDK Sample Code	51
Magstripe Sample	52
Magstripe Features	52
Magstripe Sample Program	54
Printing Sample	56
Printing Features	56
Printing Sample Program	56
Status Sample	60
Status Features	60
Status Sample Program	70
Kiosk and Embossing Sample	71
Kiosk Emboss Features	71
Card Eject Side	76
Get the Status of an Interactive Job	76
Kiosk Emboss Sample Program	78
Read and Write Data to Loosely Coupled Smartcard	81
Smart Card Features	81
Smartcard Sample Program	82
Read and Write Data to a DUALi Reader Over Single-Wire	84
Application Responsibilities with Single-Wire Smart Card	84
DUALi Sample Program	84
Read and Write Data to an OMNIKEY Reader over Single-Wire	86
Application Responsibilities with Single-Wire Smart Card	86
OMNIKEY Features	86
OMNIKEY Sample Program	86
Chapter 4: Printer Configuration	89
USB Printers	89
Host CDC Module	89
USB Network Device PCI Enumeration	89
Rename the USB Network Device Host	90
Unmanage the USB Network Interface	90
Host Firewall Configurations	91
Chapter 5: Troubleshooting	93
Install and Uninstall Troubleshooting	93
Other Troubleshooting	94
Appendix A: Retrieve the Printer IP Address	95
Retrieve the Printer's IP Address	95

Chapter 1: About the Linux Driver

1

This chapter describes installing and using the Entrust LXM Card Printer Driver for Linux.

Linux Driver Support

The LXM Card Printer Driver for Linux supports the following:

- The Linux 1.8 driver supports the following operating systems
 - Ubuntu 20.04 LTS
 - Kylin 10
 - Fedora 40
- Files created with LibreOffice
- Ethernet and USB communications
- Duplex printing using CMYKP ribbon with the CR805™ printer
- Duplex printing using YMCKT and KT ribbon on the SD260™ and SD460™ and Sigma printers
- Rewritable card printing (not supported by the CR805™)
- Rear indent module (RIM) on Sigma printers
- Manual feed printers
- Ability to print at 300 DPI on SD260, SD460, and Sigma™ Card Printers
- Ability to print at 600 DPI on CR805™
- Ability to laminate cards and debow cards
- Driver has 64 bit OS support only
- IAT Magstripe read and Magstripe encode using the driver SDK
- Loosely coupled smart card encoding using the driver SDK
- Support for DUALi and OMNIKEY Single-Wire smartcard
- Support for non graphical interface
- Multiple network printer destinations can be installed on the same PC

The LXM Card Printer Driver for Linux has the following limitations:

- Multiple-copy printing is not supported
- When the driver is set to Simplex and a multi-page job is sent, all pages other than page 1 are discarded.
- Multiple USB printer destinations cannot be installed on the same PC.

Supported Printers

The Card Printer Driver supports the following printers:

- Entrust® SD Series: SD260™, SD460™ Card Printers
- Entrust Artista® CR805
- Entrust® Sigma DS1, DS2
- Entrust® Sigma DS3

Refer to each printer's *Installation and Administrator's Guide* and *User's Guide* for complete information about setting up and using the printers.

The information in this Guide applies to all supported printers. Printer-specific differences or exceptions are noted, where necessary.



Other Entrust printers may be supported through the use of a RFID upgrade kit.

Chapter 2: Install and Setup the Driver

2


This chapter provides install instructions for the printer driver.

Before Installing the Linux Driver

Use the following instructions to install the driver using either a USB or a network connection. The installation procedure is similar for either method; differences are noted.

Prerequisites

For network installation, ensure that the printer is powered on (the LCD panel displays "Ready"), and the printer is connected to the network. Also ensure that the IP address of the printer is known (refer to [Retrieve the Printer IP Address on page 95](#) for details).

 For static IPs, set the printer's static IP before installing the driver. Ensure the printer and host are on the same subnet. By default, the printer uses DHCP for IP addressing.

For USB installation, ensure that the printer is powered on (the LCD panel displays "Ready") The printer should not be connected to the PC. The installation process will prompt to connect at the appropriate time. Also ensure that the IP address of the printer is known (refer to [Retrieve the Printer IP Address on page 95](#) for details).

Install the Driver

Run Wrapper Scripts

1. Log in to the system and open a terminal session.

i Installing the Linux driver requires Linux root permission.

i For installing the Linux driver for a USB printer, power up the Entrust printer, then restart the host.

2. Enter `sudo chmod +x entrust_driver_*.sh` on the command line to make the install and uninstall wrapper scripts executable.

i The wrapper scripts are used to install or uninstall the Linux driver:

- `entrust_driver_install.sh` - Installs the Linux driver
- `entrust_driver_uninstall.sh` - Uninstalls the Linux driver

These scripts detect the host operating system and use the self-extractor installer for either Fedora (RPM), Ubuntu or Kylin distributions.

Run the Install Script

i If you are updating an existing driver, refer to [Update the Linux Driver on page 44](#).

Install the driver with the install script.

i The install script takes two arguments:

- The zip file provided for the Linux driver
- The temporary directory for installing

i Unzipping a new Linux driver version zip file will remove previous files existing in the directory.

1. Enter `./entrust_driver_install.sh LXM_Driver_x.y.zz.zip tmp_extract` in the terminal (where x is the major version, y is the minor version, and zz is the build version number).
2. The install displays LXM license agreement. Enter **q** to continue.
3. The install displays "I have read and accept the terms". Enter **y** to continue.
4. Verify that the following printer installation notification appears:



5. The LXM Driver Setup Tool should run automatically. Continue with the [Driver Setup Tool Procedure](#) below.

Driver Setup Tool Procedure

When the LXM Driver Setup Tool (LDST) starts, a prompt asks for the type of connection wanted to establish with the printer.

The program can be quit immediately. Quitting leaves driver unconfigured and will require that to be performed later on for proper printer functionality.

1. Respond to the first prompt.
 - What type of connection would you like to use?
 - Quit without doing anything.
 - Network Printer (Using manually specified printer IP address)
 - USB Printer (Single printer only)
2. Respond to the second prompt. The prompt will either show the Network Printer or the USB Printer options, depending on the selection made at the first prompt.
 - Network Printer: Enter the IP address of the printer.
 - Enter a valid IP address in the form ###.###.###.### where "###" is a number between 0-255.
 - Leaving out any preceding zeros will not affect the entry. For example entering "10.11.12.13" instead of "010.011.012.13".

i The LXM Driver Setup Tool will now check for communication with the printer at the IP address supplied. The printer should respond within a few seconds depending on network configurations. If a long time has elapsed, ensure the connection is good and that the printer is fully powered on and ready.

- USB Printer: Follow the prompt to unplug any Entrust printers that are currently connected before continuing.
 - Follow the prompts on the terminal to complete the USB printer setup.

i The printer will be issued an IP address automatically by the setup tool. This IP address can be used to open the printer's onboard printer manager web page later on.

3. Follow the prompt to select a printer type. This prompt looks like this:

a. Select Printer and Ribbon Type

What kind of printer do you have?

- Direct-to-Card (e.g. SD260, SD460)
- Retransfer (e.g. CR805)
- Sigma
- Skip this step

i Choosing to skip this step leaves the driver in an unconfigured state with default options set. It is necessary to configure the driver later either through Printer Properties or by running the LDST again.

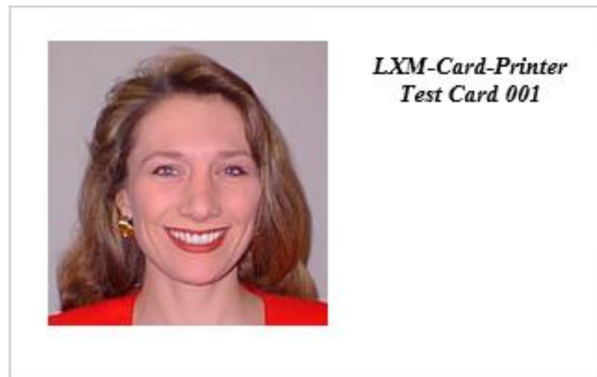
i The default setting is a Sigma printer and YMCKT ribbon.

4. If a SD260/460 printer is selected, select from the list of supported ribbon types for that type of printer.

- Select the type of ribbon installed in the printer in order to enable full printer functionality.
- Skipping this step and using the default values may result in printer errors.

5. Follow the prompt for printing a test card. The prompt will look like this:

- a. Print Test Card. Prepare the printer, and then choose from these options:
- Print a Color Test Card



- Do not print a test card

b. Follow the on-screen instructions following test card printing.

i Color test cards can include monochrome (black and white) cards for users with KT ribbon installed.

If the configuration cannot be restored, run the LXM Driver Setup Tool again to clean up the changes it made.

The driver completes the last installation steps.

The LXM Driver Setup Tool produces a series of log files and saves them to the /tmp/lxm-card-printer-diagnostics.zip file when it completes. Send the .zip file to technical support for troubleshooting assistance, if needed.

i While the LXM Driver Setup Tool is running, press **Ctrl+C** to end the program. However, some system configuration parameters are altered during diagnostics, and they may be left in debug states. Pressing **Ctrl+C** when a prompt message displays restores the settings for normal printing.

i Do not send any jobs to the printer while the LXM Driver Setup Tool is running. The LXM Driver Setup Tool cancels all queued print requests.

i After updating the LXM Driver Setup Tool, confirm the settings are correct in the printer properties and printer options tab.

Install Multiple Network Printers

The user may have multiple Entrust desktop printers that can be used from a Linux based machine.

To install the first printer, refer to [Run the Install Script on page 10](#).

To install the second, third or more printers follow these steps:

1. Open a terminal session.
2. Enter the command:

```
sudo lpadmin -p <Unique-Printer-Name> -v lxm-card-printer-backend://<your-printer-IP-address> -i /usr/share/cups/model/lxm-card-printer.ppd -E
```

User need to manually configure printer driver after install. Refer to [Specify Printer Driver Options on the next page](#).

Remove Multiple Network Printers

From a terminal session, enter the following command to remove the named printer:

```
sudo lpadmin -x <Unique-Printer-Name>
```

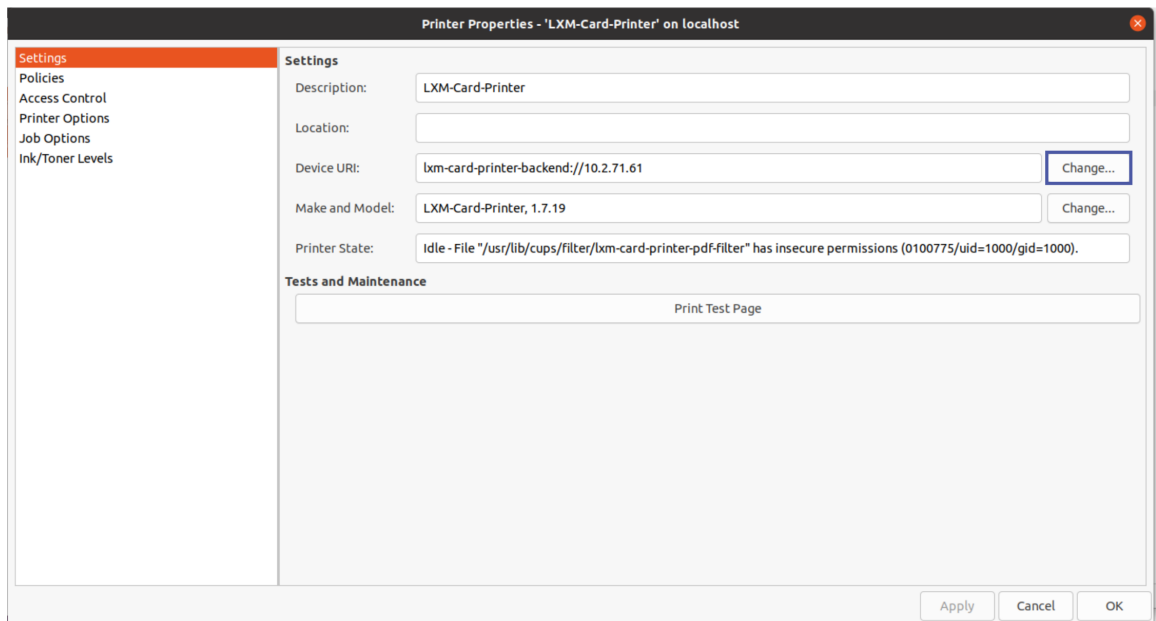
Printer Properties

Use the Printer Properties window to specify printer information and the options to use.

View the Printer IP Address

Use the Printer Properties window to view the IP address of the printer.

1. Double-click the printer icon and select **Properties** to open the Printer Properties window.
2. Select **Settings** in the left pane and locate the "Device URI" field.



i The **Print Test Page** button sends a Linux test card to the printer to verify communication between the computer and printer.

Specify Printer Driver Options

Specify Printer Driver Options Using the Command Line

lpadmin

User can use lpadmin to configure driver options for the printer.

lpadmin syntax

- p <printer name> configures the named printer
- o name=value Sets a driver option for the printer.

Example

Configure LXM-Card-Printer for duplex printing

```
lpadmin -p LXM-Card-Printer -o DualSidePrinting=Duplex
```

i User is required to be part of lpadmin group on Ubuntu OS. This is varying from one distribution to another distribution.

lptions

Driver options can be listed using the -l option with the lptions command.

Example

List the printer specific options and their current settings for LXM-Card-Printer

```
lptions -p LXM-Card-Printer -l
```

For More information on printer driver options, refer to Step 2 of [Specify Printer Driver Options Using User Interface on page 17](#).


Driver Feature	Name	Supported Options
Printer type	PrinterType	DTC RET SIG
Resolution	Resolution	300dpi 600dpi
Ribbon name	RibbonName	YMCKT KT CMYKP
Page size	MediaSize	ISOID1 ISOID1Retransfer
Rotate	Rotation	RotateNone RotateFront RotateBack RotateBoth

Driver Feature	Name	Supported Options
Print on both sides	DualSidePrinting	Simplex Duplex
Rewrite	RewriteBlock	No Yes RewriteFrontUseMaskFile
Print using K panel on front of the card	FrontKPrint	FrontKPrintNone FrontKPrintApply
Print using K panel on back of the card	BackKPrint	BackKPrintNone BackKPrintApply
Top Coat Front	FrontTopcoat	FrontNoTopcoat FrontFull FrontBlockSC
Top Coat Back	BackTopcoat	BackNoTopcoat BackFull BackBlockMS3T
Retransfer twice	RetransferActionPasses	RetransferActionPassesNo RetransferActionPassesFront RetransferActionPassesBoth
Retransfer Front Side Print Area	PrimerApplication	PrimerFullCard PrimerSCBlock
Retransfer Back Side Print Area	PrimerApplicationOnBack	PrimerFullCard PrimerMSBlock

Driver Feature	Name	Supported Options
K Panel Obscuration	RibbonObscuration	RibbonObscurationOff RibbonObscurationOn
Lamination L1	L1	L1None L1Front L1Side1Twice L1Back L1Both
Lamination L2	L2	L2None L2Front L2Side1Twice L2Back L2Both
Debow Card	Debow	DebowNone DebowYes
Impress	LaminatorImpress	LaminatorImpressNone LaminatorImpressFront

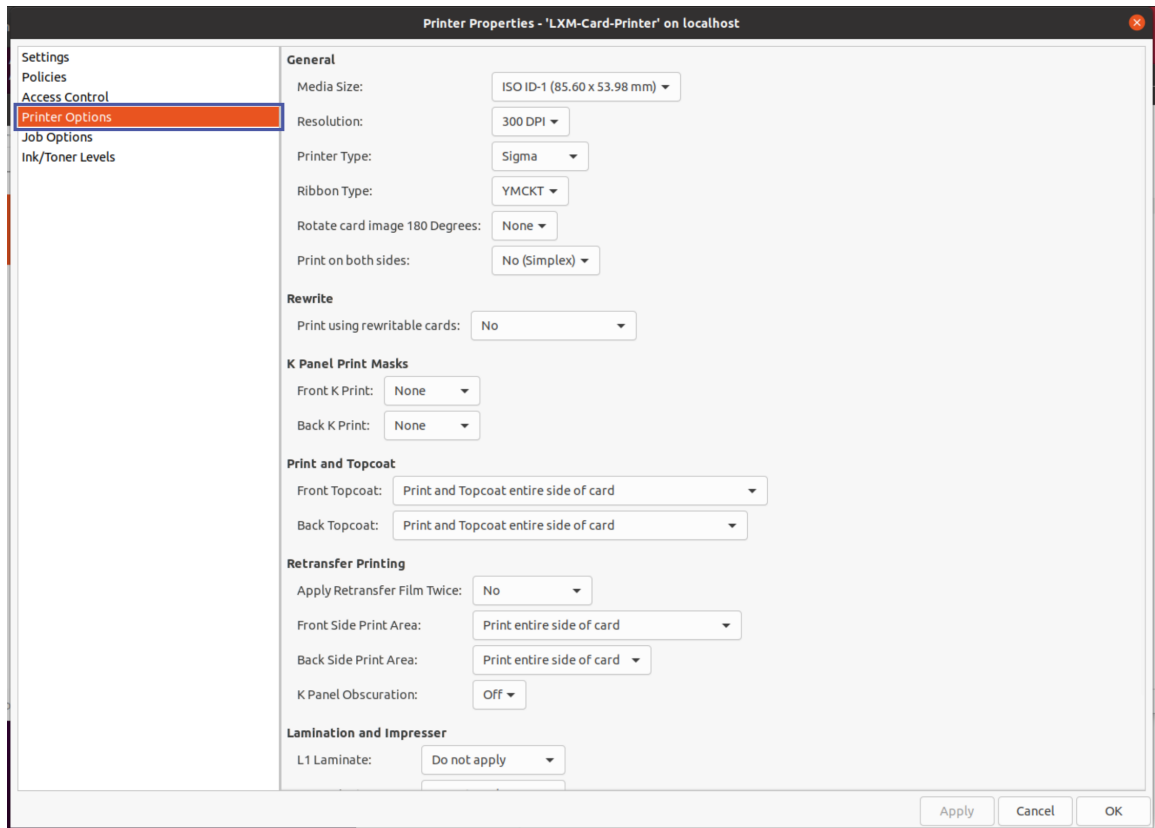
Specify Printer Driver Options Using User Interface

Use the Printer Options tab to specify the printer options to use.

 The Printer Options window may show a “Conflicts” message. In this case, the Apply button is grayed-out and inaccessible. This occurs when two or more printer settings are in conflict. A Conflicts button also appears in this case. Click **Conflicts** to view and change any settings causing the conflict(s) before proceeding. If the conflict cannot be resolved, it will not prevent you from printing.


1. Select **Printer Options** in the left pane.


i The initial default settings (shown below) following installation of the driver are appropriate for a Sigma (Direct to card) printer. The settings can be changed for other printer types.



2. Select the required options for the type of printer in use. Options that are required for use with a specific printer type are noted below; all other choices are optional.
 - Media size:
 - ISO ID-1 Retransfer - for use with the CR805 printer
 - ISO ID-1 (85.60 x 53.98 mm) - select this option when using an SD/CD and Sigma printer
 - Resolution
 - 600 DPI - for use with the CR805 printer
 - 300 DPI - select this option when using an SD/CD and Sigma printer
 - Printer Type:
 - DTC - select this option when using an SD260™ Card Printer, or SD460™ Card Printer.
 - Retransfer - for use with the CR805 printer
 - Sigma Card Printer

- Ribbon Type
 - YMCKT (select this option when using an SD/CD and Sigma printer)
 - KT (select this option when using an SD/CD and Sigma printer)
 - CMYKP (select this option when using an CR805 printer)
- Rotate card image 180 Degrees:
 - None - no rotation of the card image occurs
 - Front - the front of the card is rotated 180 degrees
 - Back - the back of the card is rotated 180 degrees
 - Both - both sides of the card are rotated 180 degrees
- Print on Both Sides:
 - No (simplex printing)
 - Yes (duplex printing)
- Rewrite:

 This option cannot be used with a CR805 printer.

 Refer to [Rewritable Card Printing on page 21](#) for details

 - No
 - Yes (Erase Entire Card)
 - Use Mask Image File
- K Panel Print Masks:
 - Refer to [K Panel Printing on page 25](#) for details.
 - To select the mask, refer to [Select a K Panel Option on page 31](#).
- Print and Topcoat: (cannot be applied with CR805)
 - Front Topcoat
 - Print and Topcoat entire side of card
 - Do not apply Topcoat to entire side of card
 - Block Print and Topcoat on ISO 7816 Contacted Smart Card
 - Back Topcoat
 - Print and Topcoat entire side of card
 - Do not apply Topcoat entire side of card
 - Block Print and Topcoat on ISO 3-Track Magnetic Stripe
- Retransfer Printing (cannot be applied with SD/CD and Sigma printers)
 - Apply Retransfer Film Twice
 - No
 - Front Side Only
 - Both Sides
 - Front Side Print Area
 - Print entire side of card
 - Block on ISO 7816 Contacted Smart Card

- Back Side Print Area
 - Print entire side of card
 - Block on ISO 3-Track Magnetic Stripe

i You cannot apply retransfer film over the magnetic stripe or signature panel on the back side of the card. A second layer of film applied over those features would make them unusable.

i If selecting Block on ISO 3-Track Magnetic Strip, you must select either No or Front Side Only for “Apply Retransfer Film Twice”.

- K Panel Obscuration
 - Off
 - On

i K Panel Obscuration prints a randomized pattern that make the ribbon negative unreadable.

- Lamination and Impresser

i Select the lamination options for each laminator installed on the printer.

i When applying an overlay to a card, the card may become bowed slightly due to heat from the laminator. Specify a Debow Card option to return the card to its proper shape.

Select from the following options:

- L1 Laminate and L2 Laminate. Specify an option for each laminator.

i The L2 laminator is optional in the SD460 system. If the L2 laminator is not installed, do not select an L2 Laminate option.

- Do not apply - no overlay material is applied to the card
- Front side only - applies the overlay to the front of the card
- Twice on front side - applies two layers of the overlay material to the front of the card; use this option only with a topcoat overlay
- Back side only - applies the overlay to the back side of the card
- Both sides - applies the overlay to both sides of the card
- Debow Card:

- Do not apply - select this option when using a CR805 printer (since SD/CD printers do not support debowing)
- Apply
- Laminator Impress:

i If the laminator impresser is installed and to be used, select from the impress options:

 - Do Not Apply
 - Front

Click **Apply** to save the selections, or click **OK** to save the selections and close the Printer Properties window. Click **Cancel** to exit without saving.

i If the laminator system is equipped with the optional impresser, select to add an impression to the front of the card. The impresser uses an installed die to stamp an impression on the card. The impresser uses heat to fuse the laminator overlay material to the card, adding an extra measure of security.

i Use the LXM Printer Driver to specify if impressing the card is needed. The impresser can stamp up to three impressions on either the left, center, or right part of the card front.

i Impresser settings are specified using Printer Manager or the Printer Dashboard. Refer to the "Laminator" section of the printer's *Installation and Administrator's Guide* for information about using Printer Manager, or the Printer Dashboard Help.

i Some Sigma and retransfer card printers support the optional Tactile Impression Module (TIM) that is installed at the back of the printer. The LXM Card Printer Driver does not support TIM.


Rewritable Card Printing

Rewritable cards are used with applications that contain variable information, allowing erase and reprint multiple times on the same card. The options for erase patterns include "entire card," which erases the whole card, or a user-defined erase pattern, which specifies the portion of the card to erase.

i Rewritable cards are erased and printed only on the front side of the card.

A user-defined erase pattern uses .png files that are installed as part of the Linux driver installation. View the table below for file name details. The sample files are installed in the following folder:

`/usr/local/lxm-card-printer/masks/originals/`

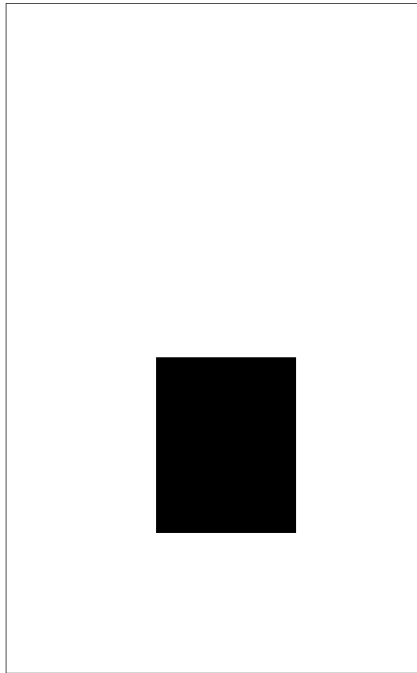
 The sample files installed in the `/usr/local/lxm-card-printer/masks/originals/` folder are replaced each time the Linux driver is installed.

The .png files are black-and-white images that can be modified to specify the portion of the card to erase, based on the card design. The white area of the image (RGB=255,255,255) represents the part of the card that is not erased, and the black area (RGB=0,0,0) represents the area to erase. Use an image editing program, such as GIMP, to modify the driver-provided files.

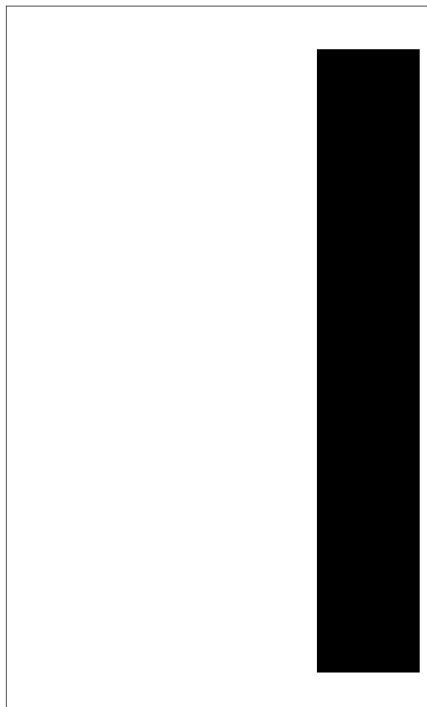
Orientation	.png File
Portrait	RewritableEraseFront.png

Modify an Erase Pattern

1. Open the driver-provided .png file that describes the orientation of the card design. The example below shows RewritableEraseFront.png.



2. Create a new erase pattern by drawing a shape that corresponds to the area of the card to be erased. The example shows a custom erase area that erases and rewrites the right side of a portrait-oriented card.



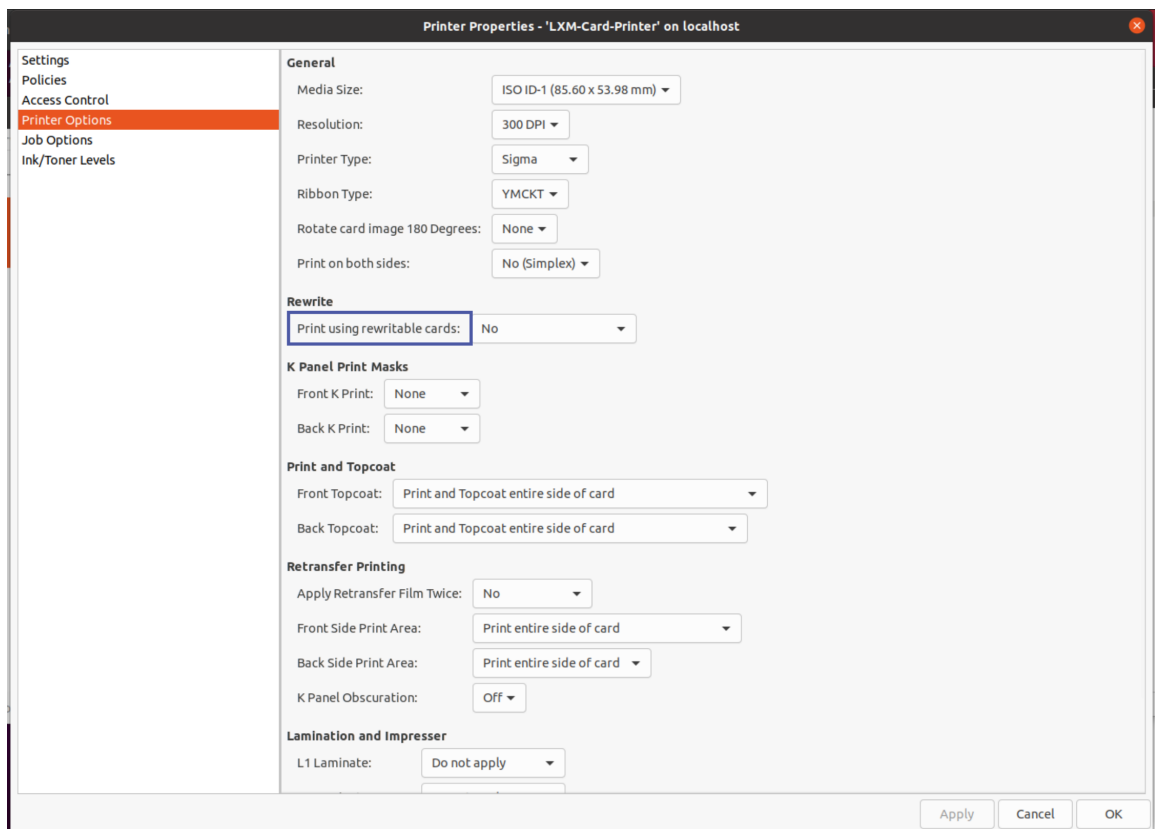
3. Save the file in the **/usr/local/lxm-card-printer/masks** folder. Use the same name as the original file. The Linux driver checks the folder for the .png file when **Rewrite** is selected in the Printer Properties window.

i The user-defined mask files saved in the **/usr/local/lxm-card-printer/masks** folder are not replaced when installing a new version of the Linux driver.

Select a Rewrite Option


Use the Printer Properties window to specify the erase pattern to use. The options for erase patterns include entire card, which erases the whole card, or a user-defined area, which erases a portion of the card based on the .png file saved in the **/usr/local/lxm-card-printer/masks** folder.

1. Open the **Printer Properties** window.
2. Select **Printer Options** in the left pane.
3. Locate the **Print Using Rewritable Cards** options.




4. Select one of the following Printer Using Rewritable Cards options:

No	Do not use the rewrite option.
Yes (Erase Entire Card)	Erase and rewrite the entire front side of the card.
Use Mask Image File	Use the custom, user-defined .png file to erase and rewrite the card. The .png file used is based on the card orientation specified (refer to Printer Properties on page 14).

 The Print and Topcoat settings are ignored when a Rewrite option is selected.

- Click **Apply** to save the selections, or click **OK** to save the selections and close the Printer Properties window. Click **Cancel** to exit without saving.

Refer to the printer's *User's Guide* or *Installation and Administrator's Guide* for complete information about how to prepare the printer to use rewritable cards.

 If the front of the card has both printing and a rewrite area, it requires two passes through the printer to complete the card.

K Panel Printing

The Linux Card Printer Driver allows the areas of the card where the K panel of the color print ribbon should be specified. This can include areas such as the following:

- Black text on a white background
- Black monochrome images (such as a bar code) on a white background
- Color images that should be printed using the K panel
- Black text or images on a color background

The driver uses mask files that indicate the areas to print using the K panel. The driver checks the area identified by the K panel mask and places the five black-most shades (from a palette of 256 shades) on the K panel image.

Several default files are installed with the driver. These mask files can be modified and applied to a single card design, or used to create multiple masks that are applied to different card designs. Refer to the following for more information:

- [Use the Default K Panel Masks on the next page](#)
- [K Panel Mask Examples on page 33](#)

i K panel printing is supported for both the front and back of cards. The mask file names are the same for each, but with “front” or “back” specified for the appropriate type.

Examples of how to print cards for three different K panel scenarios are also provided. Refer to the following for details:

- [K Panel Mask Examples on page 33](#)

i For those interested in viewing an example of the advantages of K panel printing, printing a card without K panel selections first, and then printing the same card again, with K panel options selected, for comparison is recommended.

Use the Default K Panel Masks

The default mask files are added as part of the driver installation. The mask files that should be selected vary depending on the type of printer in use. View the information below for file name details.

The files are installed in the following folder: `/usr/local/lxm-card-printer/masks/originals`.

- The files are black-and-white.png files that specify the area for the K panel printing. The black areas of the images (RGB=0,0,0) represent the parts of the card that are printed using the K panel, and the white areas (RGB=255,255,255) represent the color print areas.
- The *Black.png mask files specify the monochrome text and graphics that should be printed using the K panel. The *Graphics.png mask files specify the color graphics that should be printed using the K panel.
- To use a K panel mask file, use an image editing program, such as GIMP, to modify the driver-provided files based on the card design.
- Card sized (2.125"x3.375" for DTC printers and 2.24"x3.5" for retransfer printers) PNG image files which contain black colored areas denoting where the driver should attempt to print exclusively with the K panel of the print ribbon.

Black mask and graphics mask behave differently. Below is a description of their differences.

- Black Mask
 - Tells the driver to analyze the specified area for black or near-black pixels.
 - RGB values of (0) to (5) are all printed as K panel. The masking threshold can be changed, refer to [Changing the Black Masking Threshold on page 28](#).
 - Tells the printer to print those pixels with the K panel of the print ribbon in addition to the color printing.
 - To print bar code users should select black mask.

- Using Black Mask driver removes the black or near-black pixels before YMC panel and adds it to K panel.
- Graphics Mask
 - Tells the driver to convert the specified area to grayscale.
 - Based on printer type, the driver may apply a dithering algorithm to the specified pixels to achieve a grayscale effect.
 - Removes the specified area from the color portion of the image.

If both a Black and Graphics mask are specified on the same card design and the masks have overlapping regions, the Black mask takes priority in those regions. When applicable, this ensures that color printing happens as much as possible and is intended to provide the highest quality output.

KT Ribbon

- If user selects **None** then entire card is dithered and printed using K panel.
- Graphics mask is not used when user selects **Use Masks**.
- If user selects **Use Masks** and black mask file is present, then the black portion of mask is analyzed for black or near-black pixels and printed with K panel. The white portion of the mask is dithered and printed with K panel. For example, user might not want barcodes to be dithered for KT ribbon. In this case, they would use black mask.
- If user selects **Use Masks** and black mask file is not present then driver applies black mask to full card. The entire card is analyzed for black or near-black pixels and only black enough pixels are printed on the card.

300 DPI (1012px x 640px) DTC and Sigma Printers

Orientation	.png File
Portrait	MaskBlackBackDTC.png
	MaskBlackFrontDTC.png
	MaskGraphicsBackDTC.png
	MaskGraphicsFrontDTC.png

600 DPI (2100px x 1343px) Retransfer Printer

Orientation	.png File
Portrait	MaskBlackBackRET.png
	MaskBlackFrontRET.png
	MaskGraphicsBackRET.png
	MaskGraphicsFrontRET.png

Changing the Black Masking Threshold

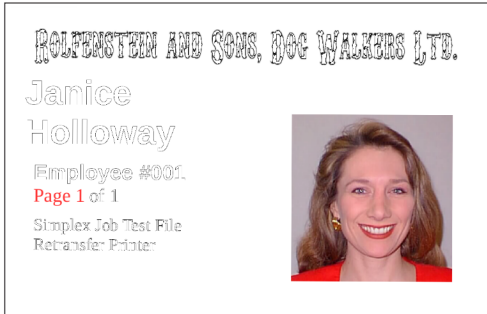
The user has the option of making the printer print using the black ribbon instead of YMC if the pixels are dark enough. This is done by adjusting the threshold of Black. To adjust the threshold, navigate to the configuration file **/etc/lxm-card-printer.conf**, and change the value by modifying `diagnostics.maskthreshold`.

The K panel mask must still be modified to set what part of the card the black mask is printing on. Refer to [Select a K Panel Option on page 31](#).

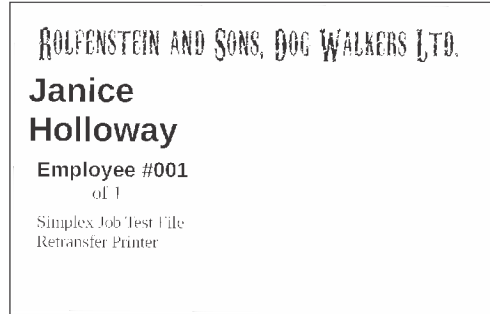
The default threshold is (5). By adjusting it to (128) most dark pixels will be printed with the black mask. For the most pixels to be considered and printed as black, adjust the threshold to (160).

Below are examples of what will happen to the card at different threshold adjustments.

This is what YMC will print when the black masking threshold is set to 5,5,5 (default)



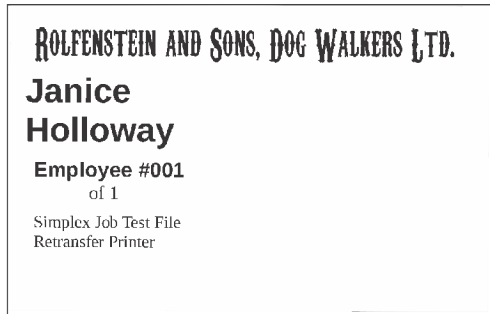
This is what K will print when the black masking threshold is set to 5,5,5 (default)



This is what YMC will print when the black masking threshold is set to 128,128,128



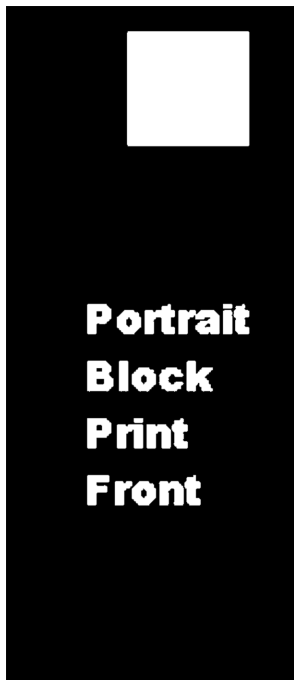
This is what K will print when the black masking threshold is set to 128,128,128



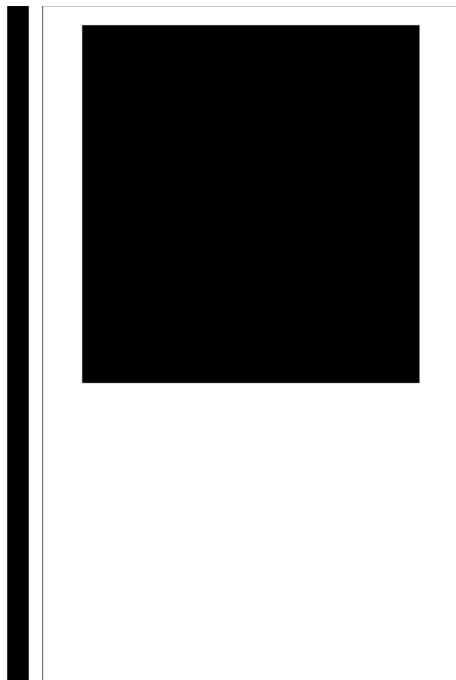
Modify a K Panel Mask File

i Only the 300 DPI DTC printer front panel mask files are shown below, as examples. 600 DPI retransfer printer mask files, as well as back panel files for each type, are also available. View the tables above for details.

1. Copy the .png files to the /usr/local/lxm-card-printer/masks folder.
2. Open the driver-provided .png file that matches the printer type and the side the mask is being applied to.

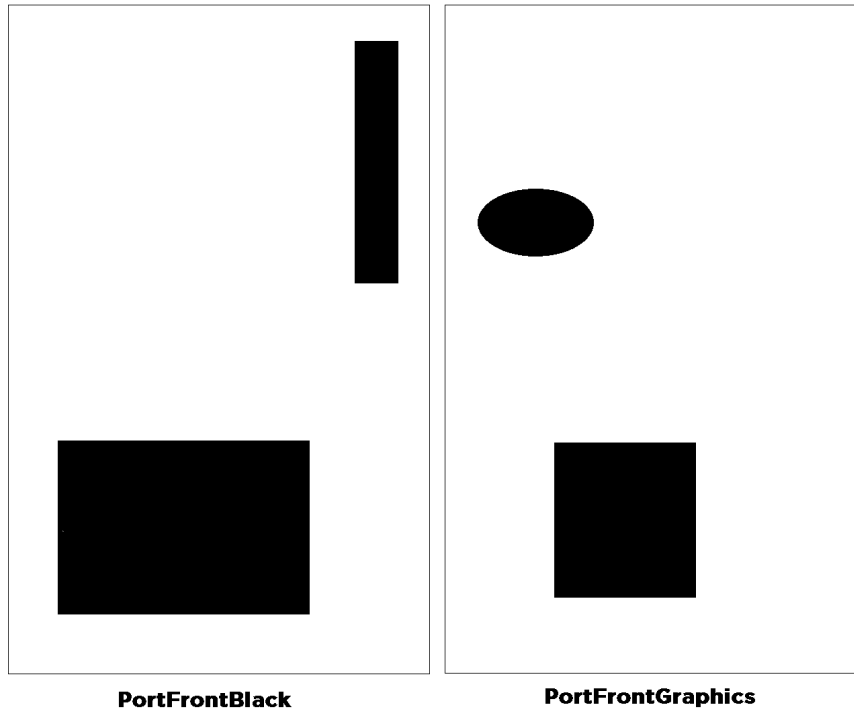


MaskBlackFrontDTC.png



MaskGraphicsFrontDTC.png

3. Draw one or more shapes that correspond to the K panel print areas of the card. The example shows custom K panel print areas for a portrait-oriented card.



MaskBlackFrontDTC.png specifies the monochrome text and graphics to print using the K panel and MaskGraphicsFrontDTC.png specifies the color graphics to print using the K panel.

i If areas of the card are in both the Black and Graphics masks, the Black mask takes precedence.

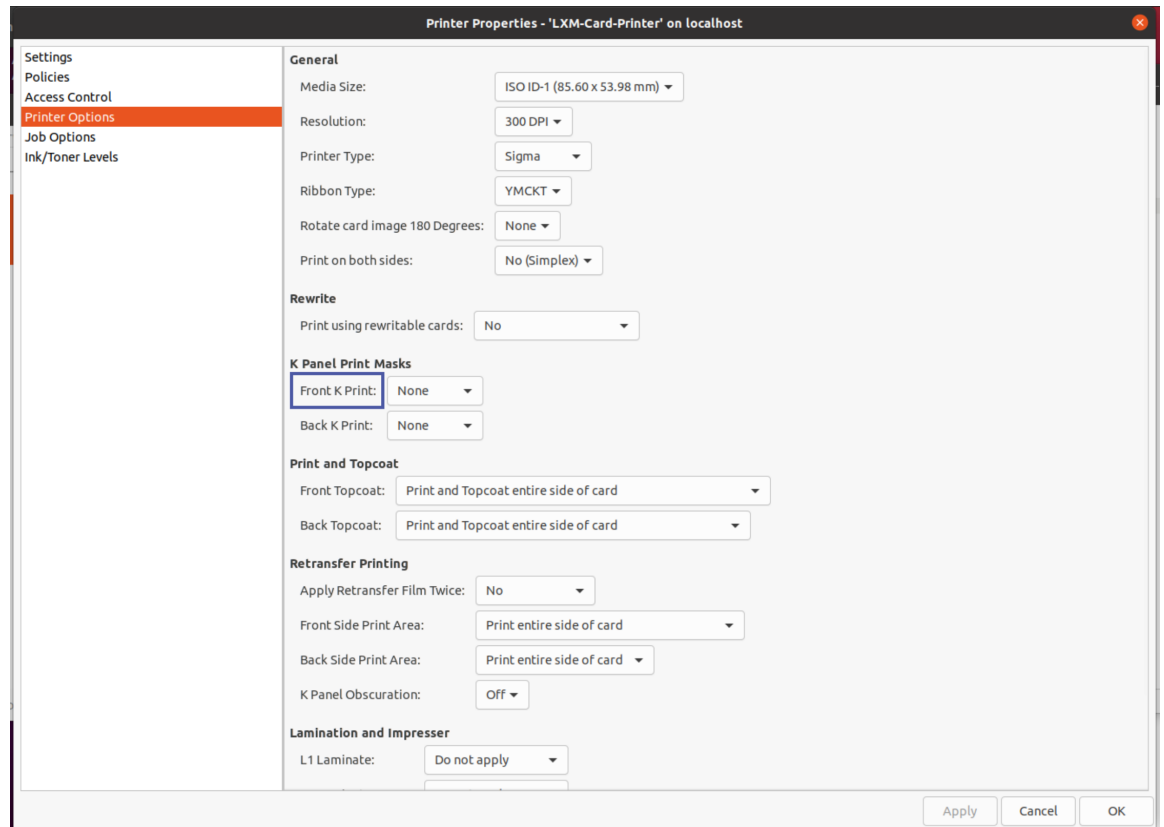
4. Save the files using the same name in the /usr/local/lxm-card-printer/masks folder.

Select a K Panel Option

Do the following to enable K panel printing on the card.

1. Open the **Printer Properties** window.
2. Select **Printer Options** in the left pane.
3. To select a front panel mask:

- a. Locate the **Front K Print** options.

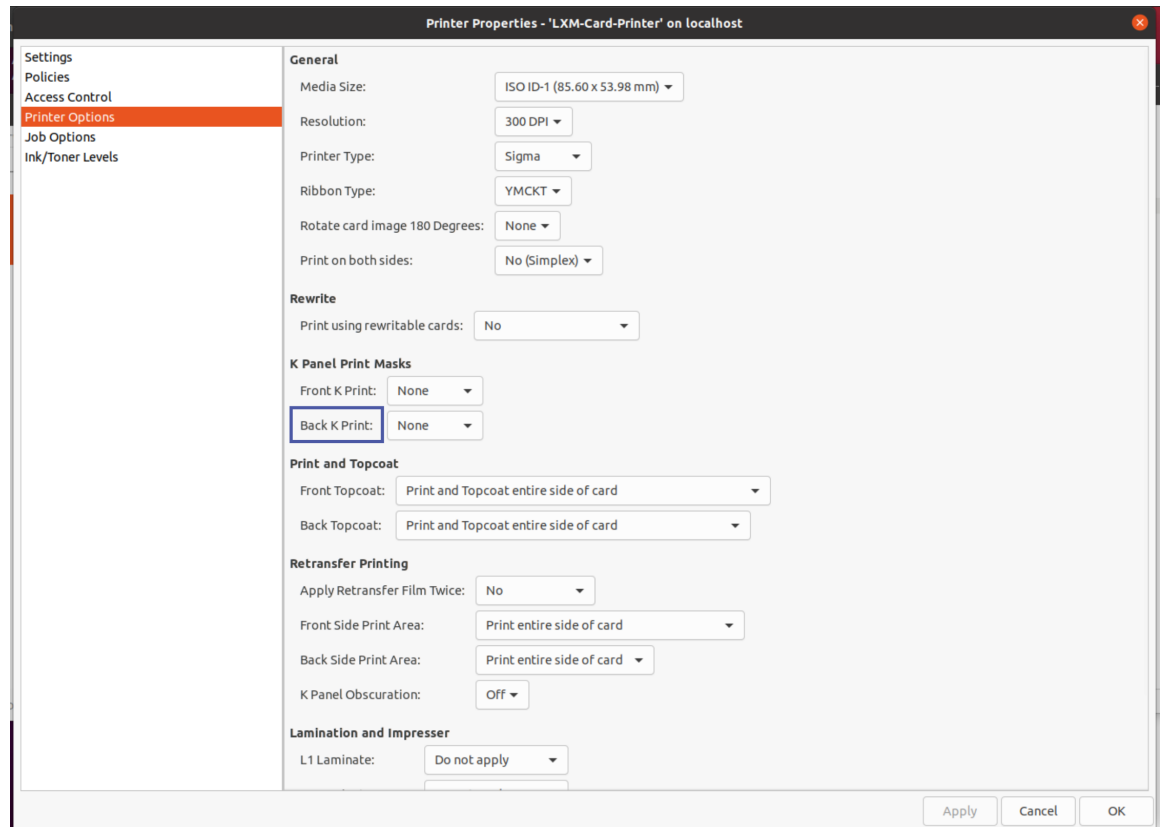


- b. Select one of the following Front K Print options:
- **None** – Do not use a K panel mask.
 - **Use Masks** – Use the mask files to print using the K panel.


i The application's settings may override the settings specified in the Linux driver Printer Options.

4. To select a back panel mask:

- a. Locate the **Back K Print** options.



- b. Select one of the following Back K Print options:
- **None** – Do not use a K panel mask.
 - **Use Masks** – Use the mask files to print using the K panel.

 The application's settings may override the settings specified in the Linux driver Printer Options.

5. Click **Apply** to save the selections, or click **OK** to save the selections and close the Printer Properties window. Click **Cancel** to exit without saving.

K Panel Mask Examples

K panel masks can be configured for specific print scenarios.

Examples of masks used to print cards on a retransfer printer for three different sample situations outlined below, as well as examples of the final, expected outputs for each situation, are provided in the driver installation package.

The files are located in a supplemental tarball called **lxm-card-printer-samples-x.x.x.tar.gz**.

Before the samples can be used, the files must be extracted to disk:

1. Open a terminal window.
2. Enter the following command to extract the files:

```
tar -xvf lxm-card-printer-samples-x.x.x.tar.gz
```

The files are extracted to the computer in two folders:

- DTC (Direct To Card)
- RET (Retransfer)

These two folders follow a similar file structure. The example below outlines the structure for reference.

Directory structure of DTC Documents:

- SimplexDocuments
 - BlackTextOnColorBackground
 - BlackTextOnly
 - KMaskColorGraphics
 - MonoGraphicsWithBlackText
 - RewriteableCard
- DuplexDocuments
 - BlackTextOnColorBackground
 - BlackTextOnly
 - KMaskColorGraphics
 - MonoGraphicsWithBlackText

Directory structure of RET Documents:


- SimplexDocuments
 - BlackTextOnColorBackground
 - BlackTextOnly
 - KMaskColorGraphics
 - MonoGraphicsWithBlackText
- DuplexDocuments
 - BlackTextOnColorBackground
 - BlackTextOnly
 - KMaskColorGraphics
 - MonoGraphicsWithBlackText

Each folder under SimplexDocuments represents a print sample. The example below outlines the structure in the BlackTextOnly folder for reference:

- SimplexDocuments
 - BlackTextOnly
 - Expected_Output
 - BlackTextOnly.odt
 - MaskBlackFrontDTC.png

Where:

- The “Expected_Output” folder contains an image or images of the final printed card as it should appear.
- The mask files contain all mask images used with that sample. These can be copied or clicked/dragged directly into the /usr/local/lxm-card-printer/masks folder.
- The .odt file is the actual sample document which can be opened and printed via LibreOffice or an equivalent editor.

 Please be aware that these samples may produce different results based on which editor is used. The documents were created on Fedora 19, in LibreOffice 4.1.0.0-9.beta2

The subsections below explain how to print the three different types of sample cards using the provided K panel masks.

- [Simplex Card, BlackTextOnly below](#)
- [Simplex Card, KMaskColorGraphics on page 37](#)
- [Duplex Card, MonoGraphicsWithBlackText on page 39](#)

Simplex Card, BlackTextOnly

Scenario: Using a retransfer printer to print a single-sided card in black using the K panel only.

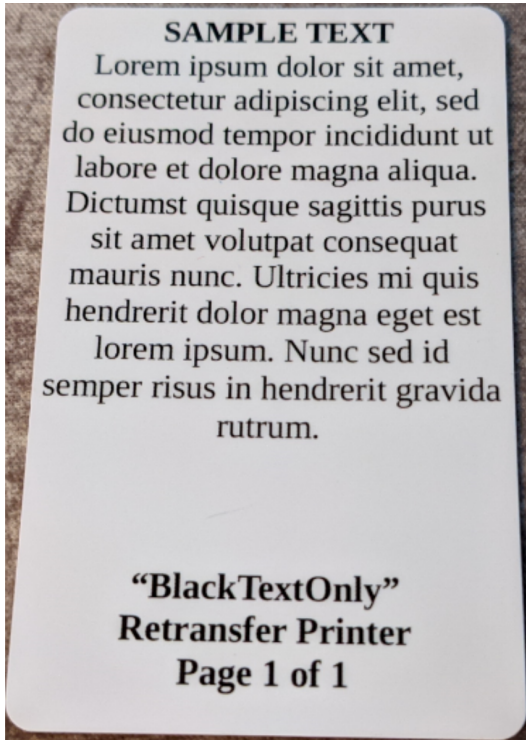
1. Double-click the printer icon or right-click and select **Properties** to open the **Printer Properties** window.
2. Select **Printer Options** in the left pane.
3. Under the “K Panel Print Masks” section, locate the “Front K Print” option.
4. Select **Use Masks** from the drop-down list and click **Apply**.
5. Open a file-explorer program and navigate to <print samples extraction location>/RET/SimplexDocuments/BlackTextOnly.
6. Locate the file **MaskBlackFrontRET.png**. Example of this mask file:



7. Copy **MaskBlackFrontRET.png** and save it to `/usr/local/lxm-card-printer/masks`.
8. Navigate back to `<print samples extraction location>/RET/SimplexDocuments/BlackTextOnly`.
9. Locate and open the file named **BlackTextOnly.odt** using the LibreOffice Writer or equivalent text editor.
10. Print the document.

The front side of the card is printed in black using the mask specified.

The printer's output should look the same as the card pictured in `output_front.jpg`, located at `<print samples extraction location>/RET/SimplexDocuments/BlackTextOnly/Expected_Output`.



output_front

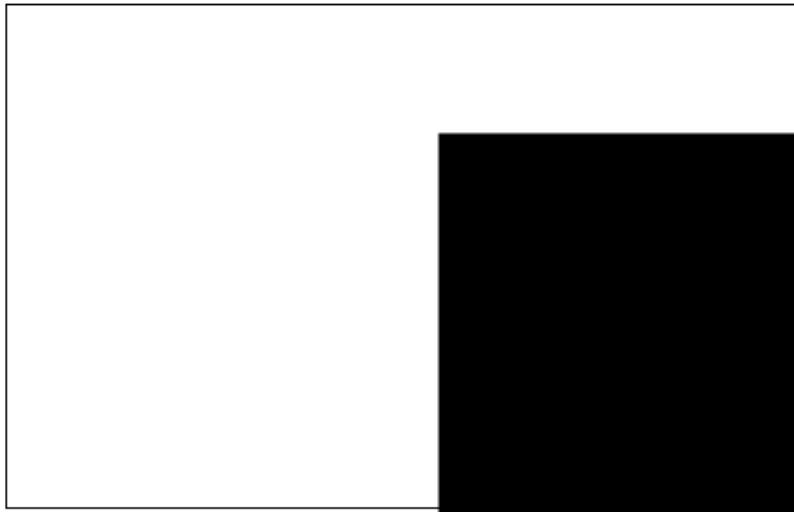
Simplex Card, KMaskColorGraphics

Scenario: Using a retransfer printer to print a single-sided card using a K mask and a graphics mask for dithering grayscale images.

1. Double-click the printer icon or right-click and select **Properties** to open the Printer Properties window.
2. Select **Printer Options** in the left pane.
3. Under the "K Panel Print Masks" section, locate the "Front K Print" option.
4. Ensure that the default setting of **None** appears in the drop-down list.
5. Under the "K Panel Print Masks" section, locate the "Back K Print" option.
6. Select **Use Masks** from the drop-down list and click **Apply**.
7. Open a file-explorer program and navigate to <print samples extraction location>/RET/SimplexDocuments/KMaskColorGraphics.
8. Locate the file **MaskBlackFrontRET.png**. Example of this mask file:



9. Copy **MaskBlackFrontRET.png** and save it to `/usr/local/lxm-card-printer/masks/`.
10. Navigate to `<print samples extraction location>/RET/SimplexDocuments/KMaskColorGraphics`.
11. Locate the file **MaskGraphicsFrontRET.png**. Example of this mask file:



12. Copy **MaskGraphicsFrontRET.png** and save it to `/usr/local/lxm-card-printer/masks`.
13. Go back to `<print samples extraction location>/RET/SimplexDocuments/KMaskColorGraphics`.
14. Locate and open the file named **KMaskColorGraphics.odt** using the LibreOffice or an equivalent editor.
15. Print the document.

The front side of the card is printed exclusively with the K panel, but areas in the graphics mask have been dithered to provide a grayscale look.

The printer's output should look the same as the card pictured in output.jpg, located at <print samples extraction location>/RET/SimplexDocuments/KMaskColorGraphics/Expected_Output, also shown below.



output_front_2

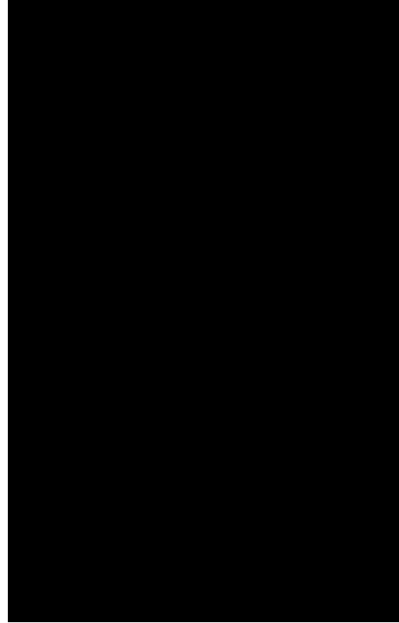
Duplex Card, MonoGraphicsWithBlackText

Scenario: Using a retransfer printer to print a two-sided card with both the front and back sides printed exclusively with the K panel.

1. Double-click the printer icon or right-click and select **Properties** to open the Printer Properties window.
2. Select **Printer Options** in the left pane.
3. Under the "K Panel Print Masks" section, locate the "Front K Print" option.
4. Select **Use Masks** from the drop-down list.
5. Under the "K Panel Print Masks" section, locate the "Back K Print" option.
6. Select **Use Masks** from the drop-down list and click **Apply**.
7. Open a file-explorer program and navigate to <print samples extraction location>/RET/DuplexDocuments/MonoGraphicsWithBlackText.
8. Locate the files **MaskBlackFrontRET.png** and **MaskBlackBackRET.png**. Examples of these mask files (they are identical in appearance):



MaskBlackFrontRET



MaskBlackBackRET

9. Copy both the **MaskBlackFrontRET.png** file and the **MaskBlackBackRET.png** file and save them to `/usr/local/lxm-card-printer/masks`.
10. Navigate to `<print samples extraction location>/RET/DuplexDocuments/MonoGraphicsWithBlackText`.
11. Locate and open the file named **MonoGraphicsWithBlackText.odt** using LibreOffice or an equivalent editor.
12. Print the document.

Both sides of the card are printed using the K panel.

The printer's output should look the same as the two sides of the card pictured in `Output_Front.jpg` and `Output_Back.jpg`, both located at `<print samples extraction location>/RET/DuplexDocuments/MonoGraphicsWithBlackText/Expected_Output`, also shown below.



output_front_3

Creating K Panel Masks

Multiple K panel mask files can be created and saved and can be applied to different card designs. Since an organization can have several card designs, having a different K panel mask file for each design makes it simpler to switch between them.

To create additional K panel masks, follow the steps below (also refer to [Changing the Black Masking Threshold on page 28](#) for additional information).

1. Copy the driver-provided .png files to the /usr/local/lxm-card-printer/masks folder.
2. Open each .png file that matches the orientation of the card design.
3. Modify the files to reflect the first card design.
4. Save the files with a file name that indicates the card design it is used for (for example, national-id-k-mask and national-id-k-mask-graphics).
5. Save the files to the /usr/local/lxm-card-printer/masks folder, or to a different location on the computer.
6. Repeat step 1 through step 5 to create additional mask files for each of the card designs.

Specify a K Panel Mask File

1. Open the Printer Properties window.
2. Select **Printer Options** in the left pane.
3. Select a K Panel Print Masks option (**Front** or **Back**).
4. Select a K Print option (**None** or **Use Masks**). Refer to [Select a K Panel Option on page 31](#) for additional details.

i All of the mask files that the user would like to use must have read/write permissions for all users before inputting the command for mask files being used.

5. Open a terminal window.
6. Enter the lp command. For example,

```
lp -d LXM-Card-Printer -o FrontKPrintKMask=<print_filename.png>  
-o FrontKPrintGraphicsMask=<graphics_filename.png>  
</path-to-card-design/cardname.pdf>
```

i If the mask file options are specified in the lp command, but the Front K Print option is set to None on the Printer Properties window, no mask files are used for the print job.

where:

-d The name of the destination printer.

-o The option files to use:

- FrontKPrintKMask <print_filename.png>—Specify the print .png file to use
- FrontKPrintGraphicsMask <graphics_filename.png>—Specify the graphics.png file to use

i These options are not available from the Printer Properties window and must be specified on a command line. The **Front K Print** option selected on the Printer Properties window indicates the orientation of the card design.

pdf The path to the card design pdf to which the mask files apply.

Hints & Tips

- If the mask files are located in the /usr/local/lxm-card-printer/masks folder, the path name to the files does not need to be entered.
- If the mask files are located in a different location on the computer, specify the full path to the files. No other locations are checked for mask files.
- If the mask file options is not specified in the lp command, the default mask files installed with the driver are used.
- If the mask file options are specified in the lp command, but the Front K Print option is set to None on the Printer Properties window, no mask files are used for the print job.

- If only one of the mask file options is specified on the lp command, the driver uses the default mask file for the option that was not specified.
- If the mask files specified on the lp command do not exist, no masking occurs for the job.

LXM Driver Setup Tool

The Linux driver includes a LXM Driver Setup Tool that runs automatically at installation, and can be run at any time using the `sudo lxm-card-printer-driver-setup-tool` command. The program is installed at `/usr/bin/lsx-card-printer-driver-setup-tool`. Only a root user can run the LXM Driver Setup Tool.

The LXM Driver Setup Tool does the following:

- Configures the system to perform detailed logging.
- Runs a series of tests.
- Prints one or more test cards to verify that the printer is able to print.
- Saves the information to a zip file. The file can be sent to technical support for troubleshooting assistance.
- Disables detailed logging, placing the system back into production mode.

Do the following to run the LXM Driver Setup Tool.

1. Log in to the system.
2. Open a terminal window.
3. Enter the following command:

```
sudo lxm-card-printer-driver-setup-tool
```
4. When the LXM Driver Setup Tool starts, select one of the following options:
 - **1) Quit without doing anything** – The LXM Driver Setup Tool does not run.
 - **2) Network Printer (Using manually specified printer IP address)** – The LXM Driver Setup Tool tests a network-connected printer.
 - **3) USB Printer (Single Printer only)** – The LXM Driver Setup Tool tests a USB-connected printer.

The program runs diagnostic tests based on the response. The name of the test being performed and the results of the test are displayed in the terminal window.

Linux Driver Logging

The Linux driver generates log files that can be used for troubleshooting.

i On Ubuntu 20.04 the logs from the LXM processes are recorded under `/var/log/syslog`. Fedora 40 uses `journalctl`, so the logs can be retrieved via `journalctl --no-pager`.

1. Create a zip file with the following logs.
 - a. All files in `/var/log/lxm-card-printer` folder.
 - b. Locate and copy the following log files (list varies by operating system).
 - `/var/log/syslog`
 - `/var/log/messages`
 - `/var/log/journal`
 - `/var/log/audit/audit.log` or `/var/log/audit.log`
 - `/etc/os-release` (so we can see exactly what release we are building on)
 - `/etc/apt/sources.list` (so we can see where packages are downloaded from)
 - c. Get the IP address output.
 - i. Open the terminal.
 - ii. Enter the command `hostname -I` and confirm with [Enter].
 - iii. Enter the command `ip addr` and confirm with [Enter].
2. Forward the zip file to technical support.

Update the Linux Driver

If a previous version of the Linux driver already is installed on the computer, uninstall the driver, then reinstall to the latest version.

Uninstall the Driver

Uninstall the driver:

i You only need to complete the uninstall steps if you are updating an existing driver installation or you simply want to uninstall the driver.

1. Enter `./entrust_driver_uninstall.sh` on the command line.
2. Verify that “Completed `entrust_driver_uninstall.sh` script” displays at the bottom of the command terminal to indicate the uninstall was successful.

i If uninstalling the driver fails, the “Completed `entrust_driver_uninstall.sh` script” notification will not display. Rerun the uninstall script if the notification does not display.

Printer Error Messages

The Linux driver displays printer error messages in a pop-up window.

Refer to the printer's *User's Guide* for complete information about printer error messages and how to resolve them.

Install the needed Python modules to enable the error UI if it is not functioning.

If the Driver does not display error messages, the user can retrieve them by using SDK.

Chapter 3: Linux Driver SDK

3

This chapter provides installation and use instructions for the SDK.

Install the SDK

The Linux driver SDK allows the driver to be used in interactive mode. Installing the SDK installs the SDK library, C++ sample code, and compiled samples that demonstrate how to use the SDK.

The SDK package is included in the self-extractor and is automatically extracted to `/usr/local/lxm-card-printer`.

i The SDK is only installed by the self-extracting shell script installer.

It is not deleted upon driver uninstall/removal. It is not modified if the same version is reinstalled. The user must manually delete the SDK directory if they find the need to do so.

i The Linux driver SDK uses the Cairo programming library to generate PDF files for printing. Download the Cairo library at <https://cairographics.org>.

Manually Installing the SDK

To install the SDK manually, follow these steps.

1. Open a terminal window.
2. Enter the following command to extract the SDK files:

```
tar -xvf /path_to_tar.gz_file/lxm-card-printer-sdk-x.x.x.tar.gz
```

i The Linux SDK files are extracted to the computer in the `/usr/local/lxm-card-printer/lxm-card-printer-sdk-x.x.x` folder.

Developer Environment


The sample code was developed using the following tools.

- GCC version with the CPP11 standard.
- libcairo
- Cups
- Make utility

Interactive Operations

An application must perform the interactive operations in the following order:

- A Start Job request is always the first operation.

 Make sure to clear all printer errors and that the printer is in the **Ready** state before sending the StartJob command.

- An End Job or Cancel Job request is always the last operation.
- An End Job request must not be issued until print operations for the job have been sent to the printer.

StartJob

The SDK client transmits the following XML file.

```
<?xml version="1.0" encoding="utf-8"?>
<StartJob>
  <PrinterName>LXM-Card-Printer</PrinterName>
  <InputHopperSelection>1</InputHopperSelection>
  <CardEjectSide>Back</CardEjectSide>
</StartJob>
```

The driver gets the IP address of the printer specified in the PrinterName element of the XML file. The driver initiates a connection with the printer using the IP address and gets the printer status.

The SDK client waits for the response from the driver. The driver returns the following XML for the response. The XML contains information about whether the request succeeded or failed and, if it failed, information about the error that was detected. The LinuxJobID is 0 because the job has not started yet.



```
<?xml version="1.0" encoding="utf-8"?>
<PrinterStatus>
  <ClientID>STATUSTEST</ClientID>
  <LinuxJobID>0</LinuxJobID >
```

```

<PrinterJobID>780</PrinterJobID>
<ErrorCode>111</ErrorCode>
<ServiceCode></ServiceCode>
<ErrorSeverity>4</ErrorSeverity>
<ErrorString>Message 111: Card not picked.</ErrorString>
<DataFromPrinter><![CDATA[ ]]></DataFromPrinter>
</PrinterStatus>

```

The printer status structure contains the following elements:

Element	Description of the element value
ClientID	<p>A unique identifier of the client that created the job.</p> <div style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; display: inline-block;">  This element is not used at this time. </div>
LinuxJobID	The Linux job ID assigned by the operating system.
PrinterJobID	The print job ID assigned by the driver.
ErrorCode	<p>If the command succeeded, the ErrorCode is 0 (zero). A non-zero value means an error was detected. For non-zero ErrorCode values, the ServiceCode, ErrorSeverity and ErrorString elements also contain values.</p>
ServiceCode	<p>If an error was detected, the printer may return a service code to further identify the cause of the error.</p> <div style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; display: inline-block;">  A service code is not returned by all printers. </div>
ErrorSeverity	<p>Errors are classified into severity levels (1, 2, 3, 4, or 5). The severity level determines which recovery actions are possible.</p>
ErrorString	<p>A short human-readable description of the error, including the error number. This matches the message that displays on the printer LCD panel.</p>
DataFromPrinter	<p>If the command was intended to read data from the card in the printer and the read operation was a success, this element contains the data in the CDATA section.</p>

The ErrorSeverity can have the following values:

Error Severity	Description	Possible Recovery Actions
1	Alert: Unrecoverable issue for job	Cancel job
2	Critical: Unrecoverable issue for job	Cancel job
3	Error: Unrecoverable issue for card; recoverable issue for job	Restart or cancel job
4	Warning: Recoverable issue for card	Resume or cancel job
5	Notice: Information only	None required



If there is an interactive or non-interactive job in progress, StartJob fails with error 506, A card is currently processing.


Resume, Cancel, or Restart

The SDK client connects with the Linux driver and transmits the following XML file. The client fills in the PrinterJobID that it receives from the StartJob command. The driver connects with the printer and sends the Resume, Cancel, or Restart command. The driver does not return any response to the SDK.

```
<?xml version="1.0" encoding="utf-8"?>
<PrinterAction>
  <PrinterName>LXM-Card-Printer</PrinterName>
  <Action>100</Action>
  <PrinterJobID>780</PrinterJobID>
  <ErrorCode>111</ErrorCode>
</PrinterAction>
```

Action Value	Description
100	Cancel

Action Value	Description
101	Resume
102	Restart

 The error code is 0 for smart card programming.

Print

The SDK client creates the PDF print jobs using the Cairo library and sends it to the Linux driver.

EndJob

The SDK client connects with the driver and transmits the following XML file. The driver does not return any response to the SDK. The driver connects with the printer and sends the EndJob command to end interactive mode.

```
<?xml version="1.0" encoding="utf-8"?>
<EndJob>
  <PrinterName>LXM-Card-Printer</PrinterName>
</EndJob>
```

Linux SDK Sample Code

The SDK sample code demonstrates specific card personalization tasks using best practices for job sequencing and basic error handling. Use the samples to better understand how to integrate the driver in the application.

The SDK includes the following samples:

- magstripe_sample.out
- printing_sample.out
- status_sample.out
- kiosk_emboss_sample.out
- smartcard_sample.out
- smartcard_singlewire_mifare_duali_sample.out
- smartcard_singlewire_omnikey_sample.out

Access the latest version of sample source code and compiled samples through the following URL path: `/usr/local/lxm-card-printer/lxm-card-printer-sdk-x.y.z`

Each sample includes help text that describes the parameters and options that can be entered. To view the help, enter the following command prompt with no parameters:

```
./path_to_samples/samplename_sample.out
```

The Linux driver monitors the printer for errors and job status when a print job is sent.

Note that only one application can submit jobs to a printer at a time using the SDK. The SDK does not support two or more applications connecting to the printer at the same time.

If an SDK job is submitted to the printer while the printer is busy, the following error message appears:

```
Checking for printer ready...
Printer NOT READY!
Printer is not ready! Please ensure no jobs are currently running and
the printer is not in an error state and retry.
```

Magstripe Sample

The driver supports magstripe read and magstripe encode. The magstripe sample programs call the driver to start a job, encode a magstripe, read the magstripe, print, and ends the job. The print and magstripe data is hardcoded in the sample.

Magstripe Features

Magstripe Encode

The commands used to encode only the magnetic stripe on a card are:

1. **StartJob** - The printer starts the job and picks the card.
2. **MagstripeEncode** - The application sends the encode location and XML magnetic stripe track data.
3. **EndJob** - The printer ejects the card into the output hopper

XML Magnetic Stripe Track Data Format

When using interactive mode magnetic stripe encoding, the magnetic stripe track data must be provided in the XML format the printer expects. The track data itself must be encoded as UTF-8 and then converted to base64 ASCII. Your application also is responsible for sending track data that is valid for the magnetic stripe format configured at the printer.

The following example shows the application that will send the following XML file to encode three tracks of IAT data: track 1 = TRACK1, track 2 = 1122, track 3 = 321.

```
<?xml version="1.0" encoding="UTF-8"?>
<magstripe >
  <track number="1">
    <base64Data>VFJBQ0sx</base64Data>
```

```

</track>
<track number="2">
  <base64Data>MTEyMg==</base64Data>
</track>
<track number="3">
  <base64Data>MzIx</base64Data>
</track>
</magstripe >

```

i The magstripe sample will send above hard code data to encode magstripe on back of the card.

Magstripe Read

Using SDK, data can be read from the tracks of a card's magnetic stripe on the front or back side of the card.

A job consisting of magnetic stripe read, magnetic stripe encode, and printing would use the following operations:

i Magstripe Read and Magstripe Encode can be done in any order.

1. **Start Job** - The printer starts the job and picks the card.
2. **Magnetic Stripe Encode** - The application sends the magnetic stripe track data.
3. **Magnetic Stripe Read** - The application reads the magnetic stripe track data.
4. **Print card side(s)** - Use the Cairo library to generate a PDF file.
5. **End Job** - The printer completes printing and then ejects the card into the output tray

Like all other SDK requests, the printer status XML structure is returned to your application. The magnetic stripe track data is returned inside the CDATA element of the printer status structure. This data comes directly from the printer without any modification from the driver. The track data must be converted from base64 ASCII to the format required by your application.

XML Magnetic Stripe Track Read Data Format

The following example shows the printer status XML structure that is returned by driver SDK.

```

<?xml version="1.0"?>
<PrinterStatus>
  <ClientID>STATUSTEST</ClientID>
  <LinuxJobID>0</LinuxJobID >
  <PrinterJobID>780</PrinterJobID>
  <ErrorCode></ErrorCode>
  <ServiceCode></ServiceCode>

```

```

<ErrorSeverity></ErrorSeverity>
<ErrorString></ErrorString>
<DataFromPrinter>
  <![CDATA[<?xml version="1.0" encoding="UTF-8"?>
  <magstripe xmlns:SOAP-ENV="http://www.w3.org/2003/05/soap-envelope"
  xmlns:SOAPENC="http://www.w3.org/2003/05/soap-encoding"
  xmlns:xsi="http://www.w3.org/2001/
  XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:DPCLMagStripe="urn:dpcl:magstripe:2010-01-19"
  xsi:type="DPCLMagStripe:MagStripe"
  SOAP-ENV:encodingStyle="http://www.w3.org/2003/05/soap-encoding">
    <track number="1">
      <base64Data>zw9PkBBQzw9PkBBQUVJTVFVWV1hZWltcXV5fICEiIyQlJicoK
SorLA==</
      base64Data>
    </track>
    <track number="2">
      <base64Data>MDEyMzQ1Njc4OT07PD0+jc4OT07PD0+MDEyMzQ1Ng==</base6
4Data>
    </track>
    <track number="3">
      <base64Data>MDEyMzQ1Njc4OT07PDDEyMzQ1Njc4OT07PD0+MDEyMzQ1Njc4O
To7PD0=</
      base64Data>
    </track>
  </magstripe>]]>
</DataFromPrinter>
</PrinterStatus>

```



Printer sends magstripe read data as base64 data. Sample will decode the data from base64 and then display it to user.

Magstripe Sample Program

This demonstrates magstripe encoding, magstripe reading, and printing. It uses hardcoded data for magstripe encoding and printing.

Magstripe Usage

```
magstripe_sample.out --printer {printer name} [--encode] [--read] [--print]
[--log {None | Console | File | Both}]
```

Sample always does encode before read.

Magstripe Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
--encode	-e	During the job, driver sends hardcoded magstripe encode data to back side of card.
--read	-r	During the job, driver reads magstripe from back side of card, decodes the data from base64 and then displays it.
--print	-p	During the job, driver prints hardcoded print data to front side of card.
--log	NA	Enable logging and specify the where to direct the log. If --log is not present, logging is not performed. Options: [None Console File Both] Where: <ul style="list-style-type: none">• --log None. No logging is performed. This is the default.• --log Console. Logging information displays on the terminal that sent the job.• --log File. Logging is saved to a file in the directory where the application that sent the job is running.• --log Both. Logging information displays on the terminal and is saved to a file.

Magstripe Examples

```
magstripe_sample.out --printer LXM-Card-Printer -e --log Both
```

Encodes magstripe on back side of card. Logging information displays on the terminal and is saved to a file.

```
magstripe_sample.out --printer LXM-Card-Printer -e -r -p
```

Encodes magstripe on back side of card, reads magstripe from back side of card and prints. No logging is performed.

Printing Sample

The print sample demonstrates print functions of the printer and driver.

Printing Features

The sample has options to do the following:

- Print text or an image, or both, on a card.
- Print simplex (one-sided) or duplex (both sides) of a card.
- Send the print information to a printer.
- Erase and rewrite on an entire card.
- Use K panel mask files to print text and images using the K panel. Specify names of user-defined mask files; for example, for multiple card designs that require different mask areas.
- Apply lamination to the card.
- Rotate the card 180 degrees.
- Log job information. Display the log information on the terminal, save it to a file, or both.

Printing Sample Program

Printing Usage

```
printing_sample.out [--printer {printer name}] [--sample {name}]  
[additional options]
```

This demonstrates print functions of the printer and driver.

Printing Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer. You must specify a printer name or an output file name. You may specify both.

Option Name	Option Abbreviation	Description and Examples
--sample {1 2 3 4}	NA	The name of the sample to print. Where: 1 - (Default) Color printing with image and text 2 - Black and white printing (K panel only) with just text 3 - Rewriteable card 4 - Duplex card
--output-file {name}	NA	The name of the output file to save to. You must specify an output file name or a printer name. You may specify both.
-x {station + mode}	NA	Specifies the type of lamination to perform and where to perform it. There cannot be any spaces between the station and mode values. Valid station values are: <ul style="list-style-type: none"> • 1 • 2 Must come before lamination mode. Valid mode values are: <ul style="list-style-type: none"> • none • front • frontTwice • back • both L1 Front and L2 Twice Example: -x 1front -x 2frontTwice
-r {None Front Back Both}	NA	Rotates the indicated card image side by 180 degrees.

Option Name	Option Abbreviation	Description and Examples
-n {None Front Back Both}	NA	Perform a second application of retransfer film on the indicated side.
-k {None Front Back Both}	NA	Preforms k-mask on the indicated card side
-l {1 2}	NA	Laminator impresser. Where: 1 - Do not apply 2 - Laminator Impress at front
-t {1 2 3}	NA	Print and Topcoat on front. Where: 1 - Do not apply Topcoat entire side of card 2 - Print and Topcoat entire side of card 3 - Block print and Topcoat on ISO 7816 contacted smart card
-q {1 2 3}	NA	Print and Topcoat on back. Where: 1 - Do not apply Topcoat entire side of card 2 - Print and Topcoat entire side of card 3 - Block print and Topcoat on ISO 3-track Magnetic Stripe
-w {1 2 3}	NA	Rewrite Where: 1 - No 2 - Yes (Erase Entire Card) 3 - Use Mask Image File

Option Name	Option Abbreviation	Description and Examples
-p {1 2}	NA	Retransfer front side print area Where: 1 - Print entire side of the card 2 - Block on ISO 7816 Contacted Smart Card
-c {1 2}	NA	K Panel Obscuration Where: 1 - Off 2 - On
-d {1 2}	NA	Laminator debow card. Where: 1 - Do not apply 2 - Apply
--log	NA	Enable logging and specify the where to direct the log. If --log is not present, logging is not performed. Options: [None Console File Both] Where: <ul style="list-style-type: none"> • --log None. No logging is performed. This is the default. • --log Console. Logging information displays on the terminal that sent the job. • --log File. Logging is saved to a file in the directory where the application that sent the job is running. • --log Both. Logging information displays on the terminal and is saved to a file.

Printing Examples



Users will need the correct settings for K-Mask files to print on K-Panel. Refer to [Specify a K Panel Mask File on page 41](#).

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -k Front
```

Print a simplex card with k-mask applied to front side of card.

```
printing_sample.out --printer LXM-Card-Printer --sample 4 -k Both
```

Print a duplex card with k-mask applied to front and back side of card.

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -t 2
```

Print a simplex card with topcoat on entire card side.

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -t 3
```

Print a simplex card with topcoat on entire card except ISO 7816 Contacted Smart Card.

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -w 2
```

Rewrite a simplex card and erase entire card first.

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -p 2
```

Print a simplex card on Retransfer printer using primer with block on ISI 7816 Contacted Smart Card.

```
printing_sample.out --printer LXM-Card-Printer --sample 1 -l 2
```

Print a simplex card and LaminatorImpress on front.

Print a simplex card and LaminatorDebow on front.

Status Sample

The printer status sample retrieves printer options and returns the printer status. It includes options to log job information and to cancel all jobs.

Status Features

Printer Status

The PrinterStatus element contains the state of the printer at the time of the request. An application can use this to determine if the printer is online and ready to accept a job.

PrinterStatus Value	Description
Unavailable	The printer is not connected or is powered off.
Ready	The printer is available to accept a job.
Busy	The printer is processing a job.
Paused	The printer has errors or has been paused.
Suspended	The printer's front panel, or the Printer Manager application, is being used.
Initialize	The printer is powering up and not ready to accept a job.
Shutdown	The printer is powering down and cannot accept a job.


Printer Information

Element Value	Description
PrinterAddress	The IP address of the printer.
PrinterModel	The model of the printer.
PrinterSerialNumber	The serial number of the printer.
PrinterVersion	The firmware version installed on the printer.


Message Number


The MessageNumber element contains the error number if the printer is in an error state. A value of 0 (zero) means there is no error. (Refer to the printer's *User's Guide* for a complete list of messages and their recovery information.)


Printer Connection Information




Element Value	Description
ConnectionPortType	Identifies the physical connection being used to communicate to the printer. The possible values are: <ul style="list-style-type: none">• Network• USB
ConnectionProtocol	Identifies the protocol used to communicate with the printer. The possible values are: <ul style="list-style-type: none">• Version1• Version2• Version2Secure <div data-bbox="657 840 1268 1018" style="border: 1px solid black; border-radius: 10px; padding: 10px;"><p> Version2Secure is required if all the data exchanged between the driver and printer to be encrypted is wanted. It is not available for all printers.</p></div>


Printer Options

Element Value	Description
OptionInputhopper	The input hopper configuration for this printer. The values are: <ul style="list-style-type: none">• SingleFeed• SingleHopper• SingleHopperWithExceptionSlot• MultiHopper6WithExceptionSlot• HopperAutoDetect <div data-bbox="779 1619 1289 1801" style="border: 1px solid black; border-radius: 10px; padding: 10px;"><p> Printers that support hopper detection return the value HopperAutoDetect for OptionInputHopper.</p></div>

Element Value	Description
OptionMagstripe	<p>The magnetic stripe configuration for this printer. The possible values are:</p> <ul style="list-style-type: none"> • None • ISO • JIS
OptionRewritable	<p>Identifies if this printer supports rewritable cards. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed <div data-bbox="781 737 1295 919" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p> For printers that support rewritable cards, the rewritable feature must be enabled and the printer configured correctly.</p> </div>
OptionSecondaryMagstripeJIS	<p>The secondary magnetic stripe configuration for the printer. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
OptionSmartcard	<p>The smart card configuration for this printer. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed • Single wire
OptionDuplex	<p>The duplex configuration for this printer. The possible values are:</p> <ul style="list-style-type: none"> • Manual • Auto

Element Value	Description
OptionPrinterBarcodeReader	<p>Indicates if a bar code reader is installed. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
OptionLocks	<p>The lock configuration for this printer. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
LockState	<p>The lock state if the printer has the lock option installed. The possible values are:</p> <ul style="list-style-type: none"> • Locked • Unlocked <div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-top: 10px;"> <p> This element is missing if the OptionLock value is None.</p> </div>
PrintEngineType	<p>The type of printer reporting the information. The possible values are:</p> <ul style="list-style-type: none"> • DirectToCard_DyeSub • Retransfer_Pigment
PrintHead	<p>Indicates if the printer includes a printhead. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed

Element Value	Description
ColorPrintResolution	<p>The color printing resolutions supported by this printer. This is a list of values separated by a “ ” character. The value list may include:</p> <ul style="list-style-type: none"> • 300x300 • 300x600 <div data-bbox="781 516 1289 621" style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; margin-top: 10px;"> <p> This element is missing if the PrintHead value is None.</p> </div>
MonochromePrintResolution	<p>The monochrome printing resolutions supported by this printer. This is a list of values separated by a “ ” character. The value list may include:</p> <ul style="list-style-type: none"> • 300x300 • 300x600 • 300x1200 <div data-bbox="781 936 1289 1041" style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; margin-top: 10px;"> <p> This element is missing if the PrintHead value is None.</p> </div>
TopcoatPrintResolution	<p>The topcoat resolution supported by this printer. The possible values are:</p> <ul style="list-style-type: none"> • 300x300 • Unknown
ModuleEmbosser	<p>Indicates if this printer includes a CEM embosser. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
EmbosserVersion	<p>The embosser firmware version if the system includes an embosser.</p> <div data-bbox="781 1608 1289 1713" style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; margin-top: 10px;"> <p> The element is missing if the EmbossModule value is None.</p> </div>

Element Value	Description
Laminator	<p>Indicates if the printer includes a laminator and, if so, whether it has one or two lamination stations. The possible values are:</p> <ul style="list-style-type: none"> • None • L1 • L1, L2
LaminatorFirmwareVersion	<p>The laminator firmware version if the system includes a laminator.</p> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-top: 10px;"> <p> This element is missing if the Laminator value is None.</p> </div>
LaminatorImpresser	<p>Indicates if the laminator includes the card impresser option. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
LaminatorScanner	<p>Indicates if the laminator includes the bar code scanner option. The possible values are:</p> <ul style="list-style-type: none"> • None • Installed
ObscureBlackPanel	<p>K Panel Obscuration prints a randomized pattern that make the K panel unreadable.</p> <ul style="list-style-type: none"> • Off • On

Status Printer Info Example

The text on the following pages shows a sample printer status XML file returned by the status request. The information that is returned depends on the values provided by the printer.

For the value PrintRibbonType, the following ribbon type options are defined by the number shown in the table below.

Ribbon Type	Value
CMYKP	151191553
KT	16976897
K	17039361
K	17039362
K	17039363
YMCKT	21037057
YMCKT	16908289
YMCKT	21037058
YMCKT	21102593
YMCKT	16842753

```

<?xml version="1.0" encoding="UTF-8"?>
<PrinterInfo>
  <PrinterStatus>Ready</PrinterStatus>
  <MessageNumber>0</MessageNumber>
  <JobQueueState>0</JobQueueState>
  <PowerState>0</PowerState>
  <Locks>1</Locks>
  <LockState>0</LockState>
  <PortType>0</PortType>
  <OptionRewritable>1</OptionRewritable>
  <PrinterAddress>10.156.1.201</PrinterAddress>
  <PrinterModel>Sigma DS3</PrinterModel>
  <PrinterSerialNumber>XC10025</PrinterSerialNumber>
  <FirmwareNumber>D4.2.3-2</FirmwareNumber>
  <ConnectionProtocol>2</ConnectionProtocol>
  <Magstripe>MagstripeISO</Magstripe>
  <OptionSecondaryMagstripeJIS>0</OptionSecondaryMagstripeJIS>

```

```

<Smartcard>Single wire</Smartcard>
<Duplex>1</Duplex>
<InputHopperType>2</InputHopperType>
<HopperAutoDetect>1</HopperAutoDetect>
<PrintHead>1</PrintHead>
<ColorPrintResoluton>300x300 |300x600</ColorPrintResoluton>
<MonochromePrintResoluton>300x300 |300x600
|300x1200</MonochromePrintResoluton>
<TopcoatPrintResoluton>300x300</TopcoatPrintResoluton>
<EmbossModule>0</EmbossModule>
<MultiHopperVersion>Not Detected</MultiHopperVersion>
<LaminatorHeaterPercentReady>0</LaminatorHeaterPercentReady>
<L1Laminate>0</L1Laminate>
<L2Laminate>0</L2Laminate>
<LaminatorImpresser>0</LaminatorImpresser>
<LaminatorScanner>0</LaminatorScanner>
<TactileImpresser>0</TactileImpresser>
<OptionPrinterBarcodeReader>0</OptionPrinterBarcodeReader>
<RetransferHeaterPercentReady>0</RetransferHeaterPercentReady>
<Kiosk>0</Kiosk>
<RearPick>0</RearPick>
<LaserModule>0</LaserModule>
<LaserVisionRegistration>0</LaserVisionRegistration>
<LaserVersion>Not Detected</LaserVersion>
<ObscureBlackPanel>0</ObscureBlackPanel>
<Cloaking>0</Cloaking>
<Indent>0</Indent>
<UVCureModule>0</UVCureModule>
<PrintRibbonType>21037057</PrintRibbonType>
<RibbonRemaining>48</RibbonRemaining>
<RibbonSerialNumber>E0055000DA03A0D</RibbonSerialNumber>
<RibbonLotCode>072920233</RibbonLotCode>
<RibbonPartNumber>525100004</RibbonPartNumber>, 2936
<RibbonRegionCode>100</RibbonRegionCode>
<UVCurableRibbon>0</UVCurableRibbon>
<PrintEngineType>0</PrintEngineType>
<EnhancedDTCPrinter>1</EnhancedDTCPrinter>
<RetransferFilmSupplyCode>999999</RetransferFilmSupplyCode>

```

```

<RetransferFilmPartNumber>0</RetransferFilmPartNumber>
<RetransferFilmPercentRemaining>0</RetransferFilmPercentRemaining>
<IndentRibbonType>0</IndentRibbonType>
<IndentRibbonRemaining>0</IndentRibbonRemaining>
<IndentRibbonPartNumber>0</IndentRibbonPartNumber>
<TopperRibbonType>0</TopperRibbonType>
<TopperRibbonRemaining>0</TopperRibbonRemaining>
<L1LaminateType>0</L1LaminateType>
<L1LaminateRemaining>0</L1LaminateRemaining>
<L1LaminatePartNumber>0</L1LaminatePartNumber>
<L2LaminateType>0</L2LaminateType>
<L2LaminateRemaining>0</L2LaminateRemaining>
<L2LaminatePartNumber>0</L2LaminatePartNumber>
<TactileImpresserFoilType>0</TactileImpresserFoilType>
<TactileImpresserFoilRemaining>0</TactileImpresserFoilRemaining>
<TactileImpresserPartNumber>0</TactileImpresserPartNumber>
<Inpuhopper>1</Inpuhopper>
<RibbonSequenceNumber>0</RibbonSequenceNumber>
<DPCL1>1</DPCL1>
<DPCL2>1</DPCL2>
<DPCL1Secure>1</DPCL1Secure>
<DPCL2Secure>1</DPCL2Secure>
<ExceptionSlot>1</ExceptionSlot>
<SixInpuhopper>0</SixInpuhopper>
<Outpuhopper>1</Outpuhopper>
<Rejecthopper>1</Rejecthopper>
<MagstripeAamvaEncoding>0</MagstripeAamvaEncoding>
<MagstripeSaflokEncoding>0</MagstripeSaflokEncoding>
<MagstripeTimeloxEncoding>0</MagstripeTimeloxEncoding>
<MagstripeVingEncoding>0</MagstripeVingEncoding>
<SmartCardContactSwitch>0</SmartCardContactSwitch>
<SmartCardDualiDeAbcm>1</SmartCardDualiDeAbcm>
<SmartCardTunnel>1</SmartCardTunnel>
<EmbossModuleIndent>0</EmbossModuleIndent>
<EmbossModuleTop>0</EmbossModuleTop>
<EmbossModuleLocks>0</EmbossModuleLocks>
<PrinterMode>1</PrinterMode>
<CustomMonoChromePanelSupport>1</CustomMonoChromePanelSupport>

```

```
<PrinterName>LXM-Card-Printer</PrinterName>
</PrinterInfo>
```

Status Sample Program

Status Usage

The text below shows SDK status sample usage text, used for the retrieval of printer options and returning of the printer status.

Enter the following in a terminal window to obtain the printer status information:

```
printer_status.out --printer {printer name} [--log {None | Console |
File | Both}] [-c]
```

Status Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
--log	NA	Enable logging and specify the where to direct the log. If --log is not present, logging is not performed. Options: [None Console File Both] Where: <ul style="list-style-type: none">• --log None. No logging is performed. This is the default.• --log Console. Logging information displays on the terminal that sent the job.• --log File. Logging is saved to a file in the directory where the application that sent the job is running.• --log Both. Logging information displays on the terminal and is saved to a file.
-c	NA	Cancels all jobs in the printer.

Status Examples

```
printer_status.out --printer LXM-Card_printer -c --log console
```

Cancels all current jobs in the printer then collects printer status information and displays to the terminal.


Kiosk and Embossing Sample

The kiosk_emboss sample allows the user to utilize the special features of a kiosk system. This includes the ability to select the input hopper used, to select the card dispense location and designate if the dispensed card is facing up or down. The kiosk_emboss sample can also emboss, indent cards, and apply topping foil to a card using a CE-series or DS4 embosser- or RIM-equipped printers. The emboss and indent data is part of the sample and cannot be changed. The sample also includes options to poll for job completion status and error conditions.

The Linux Card Printer Driver supports the CE870 Kiosk system and Sigma Kiosk system. The driver also supports the rear indent module for the Sigma system.


For the Card Printer Driver to support the kiosk system, the driver must be able to recognize the kiosk system. This is controlled by the **DriverEnable** option in the printer firmware. The option is set using one of the following methods:

- The DriverEnable option is enabled during manufacturing.
- Installation of an Enable Driver Upgrade Kit (part number 529425-001) on Sigma DS4k printers.

 The DriverEnable option cannot be changed by a user.

Kiosk Emboss Features

Pick and Output Options Using SDK

 The pick/output options will vary by job when using driver SDK.

CE870 Printer With or Without Embosser

- Pick
 - Front
- Output
 - Rear Dispense

Sigma Printer With Embosser

- Pick
 - Front (includes multi-hopper, single hopper, or manual pick)
 - Rear Manual
- Output
 - Rear Dispense

Sigma Printer With RIM

- Pick
 - Front (includes multi-hopper, single hopper, or manual pick)
 - Rear Manual
- Output
 - Rear Dispense

Sigma Printer Without Embosser

- Pick
 - Front (includes multi-hopper, single hopper, or manual pick)
 - Rear Manual
- Output
 - Front Tray
 - Rear Dispense

CE870 Printer Manager Settings

The following Printer Manager settings also are used with a kiosk system. These are WebService-access level settings. The *CEM/ES1 Embosser Service Manual* contains complete information about setting up a kiosk system.

Printer Setting > Emboss > KioskRetrieveLocation	Specifies where to place a card that was dispensed via kiosk output, but not taken by the user (from the embosser or from an external card reader), from the following: <ul style="list-style-type: none">• OutputHopper—Place cards in the embosser output hopper. This is the default setting.• RejectTray—Place cards in the embosser reject tray.
---	--

Printer Setting > Emboss > KioskWaitDelay	Sets the maximum amount of time that a card is parked inside the kiosk assembly for a user to take until the card is retracted. The default is 60 seconds. When set to 0, the system waits indefinitely for the user to take the card.
--	--

Sigma Printer Dashboard Settings

The following Printer Dashboard settings are used with the Sigma kiosk system. The *Sigma Service Manual*, *Printer Dashboard Help Manual* and *CEM/ES1 Embosser Service Manual* contain complete information about setting up a kiosk system.

Settings > Behavior > EmbosserDispense	Available only for printers with kiosk embosser. If enabled, cards will be dispensed to the embosser. If disabled, cards will be dispensed through the rear of the printer. Default value is enabled.
Settings > Transport > DispenseTimeout	Time in seconds that a user must take card until it will be retracted back into the system.
Settings > Transport > RetrieveLocation	Good cards that are taken back by the printer because they were not taken by the user in time. Options are: <ul style="list-style-type: none"> • RejectTray, • OutputHopper
Settings > Behavior > RejectCardLocation	Failed cards eject location. These cards failed due to printer errors. Options are: <ul style="list-style-type: none"> • RejectTray • OutputHopper (Default) An attached embosser will always reject cards to the reject tray
Settings > Pick > RearPickTimeout	Time in seconds that a user must insert the card for rear pick.

Emboss

Use an emboss SDK to specify the font and position of embossed and indented data.

Embossing will only be supported through driver SDK interface.

For a RIM-equipped printer, only the first line of the XML is processed. For an embosser-equipped printer, all lines of the XML are processed. In the following XML, only line number one would be processed for a RIM-equipped printer.

```
<?xml version="1.0" encoding="UTF-8"?>
<emboss xmlns:SOAP-ENV="http://www.w3.org/2003/05/soap-envelope"
xmlns:SOAP-ENC="http://www.w3.org/2003/05/soap-encoding"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:DPCEmboss="urn:dpci:emboss:2010-01-19"
xsi:type="DPCEmboss:Emboss" SOAP-
ENV:encodingStyle="http://www.w3.org/2003/05/soap-encoding">
  <line number="1">
    <font>1</font>
```

```

    <horz>401</horz>
    <vert>803</vert>
    <stringData>0001 3416 7890 1286</stringData>
</line>
<line number="2">
    <font>2</font>
    <horz>1600</horz>
    <vert>860</vert>
    <stringData>222222</stringData>
</line>
    ....
</emboss>

```

Emboss XML is made up of the following elements.

Emboss Font Number

The font number is what embosser-equipped printers use to specify the emboss or indent character set, the front or back of the card, and in some cases the supply to use. The usable font numbers are based on the emboss wheel installed in the embosser.

The usable font numbers are based on the emboss wheel installed in the embosser. Several fonts from the following list typically are supported by a given wheel:

1	Emboss Standard Gothic [front 10 cpi]
2	Emboss Farrington 7B [front 7 cpi]
3	Indent OCRB [back 10 cpi]
4	Indent Master Card Slanted [back 14 cpi]
5	Indent OCRB Size IV [front 7 cpi]
6	Indent Master Card Slanted [front 14 cpi]
7	Indent OCRB Front [front 10 cpi]
8	Indent Master Card Inverted [back 7 cpi]

9	Indent Helvetica [front 14 cpi white ribbon]*
10	Indent Helvetica [front 14 cpi black ribbon]*
11	Tactile Identifier Mark
<p>Add 20 (decimal) to override default side. This option does not apply for rear indent and should be set to Zero.</p>	

Emboss/Indent Position

Two values that specify the starting location of the emboss/indent operation. The emboss/indent position indicates the start of the emboss or indent data.

horz_offset	Whole number in mils (1/1000 of an inch) from left edge of card to center of first character
vert_offset	Whole number in mils (1/1000 of an inch) from bottom edge of card to the vertical midpoint of the characters. This position does not apply to rear indent and should be set to Zero.

The following restrictions apply to the horizontal and vertical offsets.

Horizontal Offset Limits

Topping	Maximum Value	Minimum Value
On	3025	280
Off	3275	100

Vertical Offset Limits

Topping	Maximum Value	Minimum Value
On	860	135
Off	1460	135

Emboss Data

The text to be embossed or indented at a given location using the font number specified.

Emboss data has the following restrictions for the characters allowed.

- The emboss data range is from 20 hex to FF hex.
- Reserved XML characters (3c hex and 3e hex) are not allowed as emboss characters.

Emboss Topping

Printers that include an embosser typically apply topping foil to the embossed characters on a card. The embosser topping option allows you to specify whether or not to apply topping foil to the embossed characters. The setting applies to all embossed cards.

Card Eject Side

The **Card Eject Side** setting allows you to specify which side of the card is facing up when it is ejected into the output hopper. Cards normally enter the output hopper with the last side printed facing up. For example, a one-sided card always has the front side facing up. A duplex card with printing on both sides enters the output hopper with the back side facing up. However, some sites may want the cards to be stacked in the output hopper with a certain side facing up for easier distribution. By specifying a Card Eject Side option, the printer can flip the card before it enters the output hopper so that the selected side faces up.



The Card Eject Side option is not supported for embosser or desktop laser systems. It is supported for manual and automatic duplex, laminator, and kiosk systems.

Get the Status of an Interactive Job

Your application can retrieve the status for the current interactive job to determine if the printer is still actively processing the card or if the card is complete. The PrinterJobID is used to identify the job. This ID is part of the Printer Status structure returned from the Start Job request.

```
<?xml version=\"1.0\"?>
<!--job status xml-->
```

```
<JobStatus>
  <PrinterJobID>5860</PrinterJobID>
</JobStatus>
```

The Job Status request returns the following xml.

```
<?xml version="1.0" ?>
<!-- Job status xml file. -->
<JobStatus>
  <ClientID>dpclTester</ClientID>
  <LinuxJobID>5</LinuxJobID>
  <PrinterJobID>5680</PrinterJobID>
  <JobState>JobActive</JobState>
  <JobRestartCount>0</JobRestartCount>
  <PrinterName>LXM-Card-Printer</PrinterName>
</JobStatus>
```

Element	Description of the element value
JobState	The state of the job. The value is one of the following: JobActive, JobSucceeded, JobFailed, JobCancelled, or NotAvailable. Kiosk printers have two additional states: CardReadyToRetrieve and CardNotRetrieved.
JobRestartCount	The number of times the job was retried. This is always zero for interactive jobs.

Using the JobState value, your application can determine if the card is still being processed by the printer or, if it has completed, whether it was personalized successfully. Refer to [Printer Job Status below](#).

If your application sends jobs to a kiosk printer, the JobState value indicates if the card is ready to be retrieved, or was not retrieved and moved to the reject tray. Your application needs to poll for job completion after submitting the job until the JobState value is returned.

Printer Job Status

The JobState can be one of these values.

Element Value	Description
JobActive	A card is still being personalized by the printer.
JobSucceeded	The card is complete. The job completed without a detected error.
JobFailed	The card is complete. An error forced the job to terminate before the card personalization process completed.
JobCancelled	The card is complete. The job was cancelled before the card personalization process completed.
NotAvailable	There is no information for the PrinterJobID provided. Either the value provided is wrong or this is no longer the current job.
CardReadyToRetrieve (For Kiosk only)	The card is complete. User can retrieve the card from printer. This support is available for Kiosk printer only.
CardNotRetrieved (For Kiosk only)	The card is complete. Printer took the card back because it was not retrieved in time. This support is available for Kiosk printer only.

Kiosk Emboss Sample Program

Kiosk Emboss Usage

```
kiosk_emboss_sample.out --printer {printer name} [--input {1-6 | r1}] [--output] [--emboss] [--side {front | back}] [--poll] [--log {None | Console | File | Both}]
```

Kiosk Emboss Options

The Kiosk sample has been added to specify the hopper number, output location, optional embossing and indenting, side of dispensed card up, and poll for job completion.


Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
--input {1-6 r1}	-i	Selects which input hopper to pick from. Numbers 1-6 are hoppers 1-6 and r1 is rear pick. Default is 1.
--output	-k	Gives the user the ability to specify the output hopper for Sigma printers with embosser. The default is the card being dispensed to the rear of the printer. If -k is specified, then card will be ejected to the front output tray. If the user does not pick the card within a specified time, the card is always dispensed to the front output hopper.
--emboss	-e	Gives the user the ability to send hard coded emboss data if the printer has the emboss or RIM option installed.
--topping	-t	Gives the user the ability to disable topping on an embossed card. The default is the card will be topped after embossing. If -t is specified then topping will not be applied. This option applies only when -e option is used, otherwise an error is thrown.
--side {front back}	-s	Gives the user the ability to specify which side of the card faces up when dispensed to the output hopper. Values are "front" and "back".
--poll	-j	Poll for job completion. Checks the job and printer status every 2 seconds.
--print	-p	Prints the time and date on a landscape card.

Option Name	Option Abbreviation	Description and Examples
--log	NA	<p>Enable logging and specify the where to direct the log. If --log is not present, logging is not performed.</p> <p>Options: [None Console File Both]</p> <p>Where:</p> <ul style="list-style-type: none"> • --log None. No logging is performed. This is the default. • --log Console. Logging information displays on the terminal that sent the job. • --log File. Logging is saved to a file in the directory where the application that sent the job is running. • --log Both. Logging information displays on the terminal and is saved to a file.

Kiosk Emboss Examples

```
kiosk_emboss.out --printer LXM-Card-Printer -p -i r1 -k -e -j
```

Pick the card from rear input slot, print one-sided landscape card, emboss, apply topping, eject the card to the front of the printer and poll for job completion.

 The -e option performs embossing if an embosser is installed or indenting if a RIM is installed.

```
kiosk_emboss.out --printer LXM-Card-Printer -p
```

Pick the card from input hopper 1, print one-sided landscape card and eject the card to the rear of the printer.

```
kiosk_emboss.out --printer LXM-Card-Printer -p -i r1 -s front -j
```

Pick the card from the rear input, print a one-sided landscape card, eject the card to the rear of the printer with the front side facing up, and will poll for job completion.

```
kiosk_emboss.out --printer LXM-Card-Printer -p -i 2 -k -e -t
```

Pick the card from input hopper 2, print, emboss and prevent topping to a one-sided landscape card, and eject to the front output tray.



The -e option performs embossing if an embosser is installed or indenting if a RIM is installed.

```
kiosk_emboss.out --printer LXM-Card-Printer -p -j
```

Pick the card from hopper 1, print a one-sided landscape card, and poll for job completion.

Read and Write Data to Loosely Coupled Smartcard

The SDK sample programs call the driver to start a job, park a card, and end the job. The smart card sample parks a card in the smart card station and moves the card from the station. It includes options to print text and resume, resume without printing, or cancel the job, and to log job information. The print data is hardcoded in the sample.

Smart Card Features

Smart Card Encode

A job consisting of smart card encoding and printing uses the following operations in the order specified:

1. **StartJob** - The printer starts the job and picks the card.
2. **ParkCard** - The printer parks the card at the smart card station.
3. **ResumeJob** - The printer moves the card from the smart card station so that the card can be processed further.
4. **Print Card Side** - Use the Cairo library to generate a PDF file.
5. Wait for the print data to be sent to the printer.
6. **EndJob** - The printer finishes printing and ejects the card into the output hopper.

Smart Card Read

The SDK client connects with the driver and transmits following XML file. The Linux driver sends the smart card park command to the printer using the Park command.

```
<?xml version="1.0" encoding="utf-8"?>
  <Park>
    <PrinterName>LXM-Card-Printer</PrinterName>
    <Location>SmartCardFront</Location>
  </Park>
```

The SDK client waits for the response from the driver. The Linux driver returns the following XML file for the response. The response indicates if the park action was successful.

```
<?xml version="1.0" encoding="utf-8"?>
  <PrinterStatus>
    <ClientID>STATUSTEST</ClientID>
```

```

<LinuxJobID>0</LinuxJobID >
<PrinterJobID>780</PrinterJobID>
<ErrorCode>111</ErrorCode>
<ServiceCode></ServiceCode >
<ErrorSeverity>4</ErrorSeverity>
<ErrorString>Message 111: Card not picked.</ErrorString>
<DataFromPrinter><![CDATA[ ]]></DataFromPrinter>
</PrinterStatus>

```

Smartcard Sample Program

Smartcard Usage

```

smartcard_sample.out --printer {printer name} [--ask-user] [--log {None |
Console | File | Both}]

```

Smartcard Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
--ask-user	-a	During the job, produces a prompt asking you for the next action to take : print(test) and resume, resume without printing, or cancel.

Option Name	Option Abbreviation	Description and Examples
--log	NA	<p>Enable logging and specify the where to direct the log. If --log is not present, logging is not performed.</p> <p>Options: [None Console File Both]</p> <p>Where:</p> <ul style="list-style-type: none"> • --log None. No logging is performed. This is the default. • --log Console. Logging information displays on the terminal that sent the job. • --log File. Logging is saved to a file in the directory where the application that sent the job is running. • --log Both. Logging information displays on the terminal and is saved to a file.

Smartcard Examples

```
smartcard_sample.out --printer LXM-Card_printer -a --log Both
```

Parks a card in the printer smart card station, and asks the user to select the next action. Logging information displays on the computer and is saved to a file.

```
smartcard_sample.out --printer LXM-Card_printer
```

Parks a card in the printer smart card station and moves it from the station. No other actions or logging are performed.

Read and Write Data to a DUALi Reader Over Single-Wire

This sample demonstrates the smart card operations including reading and writing to the chip for a MIFARE Classic smart card. It uses the single-wire smart card tunnel and DUALi reader commands for a MIFARE Classic application. The sample moves the card into and out of the smart card reader, and includes options to specify whether the smart card chip is on the back of the card, and to print on the front of the card.

The print data is part of all the samples and cannot be changed.

Application Responsibilities with Single-Wire Smart Card

Your application must be able to do the following:

- Verify that the single-wire smart card reader is available in the printer.
- Park the smart card before using the single-wire smart card reader, and move the card out of the reader when the personalization is complete.
- Send data the chip can accept. The driver does not check or alter the data.
- Format the data so it can be understood by the printer and reader. Applications written for PC/SC readers require modification to use the single-wire smart card feature. The PC/SC interface commonly used to interact with USB-connected smart card readers is not directly supported by the driver API.

DUALi Sample Program

DUALi Usage

```
smartcard_singlewire_mifare_duali_sample.out --printer {printer name} [--ask-user] [--log {None | Console | File | Both}]
```

DUALi Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
-back-chip	-b	Indicates that the card should be flipped prior to entering the park position.

Option Name	Option Abbreviation	Description and Examples
--print	-p	Will apply printing on the front of the card after SC operations are complete.
--log	NA	<p>Enable logging and specify the where to direct the log. If --log is not present, logging is not performed.</p> <p>Options: [None Console File Both]</p> <p>Where:</p> <ul style="list-style-type: none"> • --log None. No logging is performed. This is the default. • --log Console. Logging information displays on the terminal that sent the job. • --log File. Logging is saved to a file in the directory where the application that sent the job is running. • --log Both. Logging information displays on the terminal and is saved to a file.

DUALi Examples

```
smartcard_singlewire_mifare_duali_sample.out --printer LXM-Card_Printer -b
--printer --log Both
```

Parks a card in the printer smart card station, programs it (rear placed chip), moves it out of the station, and prints it. Logging information displays on the computer and is saved to a file.

```
smartcard_singlewire_mifare_duali_sample.out --printer LXM-Card_Printer
```

Parks a card in the printer smart card station, programs it, and moves it from the station. No other actions or logging are preformed.

Read and Write Data to an OMNIKEY Reader over Single-Wire

The Single-Wire OMNIKEY smart card sample demonstrates parking a card in the printer OMNIKEY smart card reader, performing single-wire smart card functions, and moving the card from the reader.

Application Responsibilities with Single-Wire Smart Card

Your application must be able to do the following:

- Verify that the single-wire smart card reader is available in the printer.
- Park the smart card before using the single-wire smart card reader, and move the card out of the reader when the personalization is complete.
- Send data the chip can accept. The driver does not check or alter the data.
- Format the data so it can be understood by the printer and reader. Applications written for PC/SC readers require modification to use the single-wire smart card feature. The PC/SC interface commonly used to interact with USB-connected smart card readers is not directly supported by the driver API.

OMNIKEY Features

The OMNIKEY reader supports multiple cards types, allowing you to select the type of card used from the following: Mifare, iCLASS, or HIDProx. For each card type, the OMNIKEY reader performs the following functions:

- Mifare. Reads the card ID and status, and reads and writes data to block 2.
- iCLASS. Reads the card ID and status, and reads and writes data to block 18.
- HIDProx. Reads the reads the card ID (UID) and facility code (FAC).

The sample includes options to print. The print data is part of all the the samples and cannot be changed.

OMNIKEY Sample Program

Demonstrates parking a card in the smart card station, programming it using the OMNIKEY singlewire reader, moving the card from the smart card station, and printing to the front of the card. It uses hardcoded data for printing.

OMNIKEY Usage

```
smartcard_singlewire_omnikey_sample.out --printer {printer name} --card-type {SC type} [--print] [--log {none | Console | File | Both}]
```

OMNIKEY Options

Option Name	Option Abbreviation	Description and Examples
--printer {printer name}	NA	The name of the printer. Example: --printer LXM-Card-Printer.
--card-type {mifare iclass hidprox}	NA	Indicates the card type the reader should expect. Where: <ul style="list-style-type: none">• --card-type mifare. Performs actions necessary to operate with Mifare cards.• --card-type iclass. Performs actions necessary to operate with iCLASS cards.• --card-type hidprox. Performs actions necessary to operate with HIDprox cards.
--print	-p	Will apply printing on the front of the card after the SC operations are complete.
--log	NA	Enable logging and specify the where to direct the log. If --log is not present, logging is not performed. Options: [None Console File Both] Where: <ul style="list-style-type: none">• --log None. No logging is performed. This is the default.• --log Console. Logging information displays on the terminal that sent the job.• --log File. Logging is saved to a file in the directory where the application that sent the job is running.• --log Both. Logging information displays on the terminal and is saved to a file.

OMNIKEY Examples

```
smartcard_singlewire_omnikey_sample.out --printer LXM-Card-Printer --card-type iclass --print --log Both
```

Parks an iCLASS card in the printer smart card station, programs it, moves it out of the station and prints it. Logging information displays on the computer and is saved to a file.

```
smartcard_singlewire_omnikey_sample.out --card-type hidprox --printer LXM-Card_Printer
```

Parks a HIDprox card in the printer smart card station, programs it, and moves it from the user.

Chapter 4: Printer Configuration

4

This chapter provides information about networking.

USB Printers

Printers can be installed and operated as a USB printer with Communication Device Class (CDC) network protocols. Linux driver is designed to work with multiple USB printers and mixed firmware modes.

i With USB installation, the printer and host use the 169.254.x.y subnet, with the printer's IP in the 169.254.2.y/24 range. With network installation, the subnet is set by the host administrator.

Host CDC Module

When a USB cable is connected between the host and the printer, the host kernel dynamically loads the required CDC module. The Linux kernel loads the following CDC modules:

- `cdc_ether` for firmware using CDC ECM.
- `cdc_eem` for firmware using CDC EEM.

The host can connect to multiple USB printers at different ECM and EEM CDC modes. In this case, the host has both `cdc_ether` and `cdc_eem` modules loaded.

Use the following instructions to retrieve the CDC module loaded from host:

1. Connect the USB cable between the host and the printer.
2. Open a terminal session.
3. Enter the `lsmod | grep cdc` command.

USB Network Device PCI Enumeration

On the host, the USB network device is enumerated on the PCI bus. Use the following instructions to check if the printer is enumerated:

1. Connect the USB cable between the host and the printer.
2. Open a terminal session.
3. Enter the `lsusb` command.

Rename the USB Network Device Host

Depending on the host Linux distribution, configuration, and kernel startup options, the USB network device may be renamed on the host from the original name outside of the driver. The Entrust driver is designed to work with the new renamed USB interfaces, so the host interface names are not altered.

The following naming options for the USB network device are supported:

- `enx<mac>`
- `eth<x>`
- `usb<x>`
- `enp<path>`

Use the following instructions to check the renaming of the USB network device host:

1. Open a terminal session.
2. Run the `sudo dmesg` or `sudo journalctl -k` commands.

Unmanage the USB Network Interface

The NetworkManager service on host attempts to manage the network interface, including the USB network device. This interferes with the USB network device's functionality.

The Linux driver on host configures the USB network interface as unmanaged by NetworkManager by creating the following ignore file:

`/etc/NetworkManager/conf.d/ignore_lxm_card_printer_interface.conf`

i The Entrust driver configures NetworkManager to unmanage the USB network device as part of the USB network installation.

i All USB network devices that use `cdc_ether` and `cdc_eem` modes are unmanaged.

i The host administrator must leave the USB network interface unmanaged and not configure it under NetworkManager. Otherwise, the Linux driver will fail to install or run on the USB interface.

i Third-party USB network devices connected to the host are configured as unmanaged in NetworkManager.

Host Firewall Configurations

The Linux driver looks only at ufw (Uncomplicated Firewall) and firewalld. If the host uses iptables, there are no changes to the firewall ports. The Linux driver configures the host firewall upon installation when firewalld is active, and trusts the USB network device.


The following table below shows the default firewall on these distributions.


Operating System	ufw	firewalld	iptables
Ubuntu 20.04	Inactive	Not installed or running	Configured to accept all traffic
Fedora 40	Not installed	Installed	Configured to accept all traffic
Kylin 10	Not installed or running	Not installed or running	Configured

Port Numbers

The Linux Driver uses the following port numbers.

- DHCP server port 67
- CUPS port 631
- Ports 1753 through 1762

 The Linux driver does not open these ports when installing the driver.

 It is assumed that the host administrator allows traffic on these ports and does not block them in the firewall.

Chapter 5: Troubleshooting

5

This chapter describes troubleshooting steps for a variety of potential printing issues.

Install and Uninstall Troubleshooting

Issue: Immediately after installing the driver, the Printers window may show an error icon on the LXM-Card-Printer icon (a red circle with a small horizontal line in the middle).

Resolution: After entering a valid IP address, this icon disappears.

Issue: Driver fails to install

Cause:

- Other printers are on the network.
- Network connection setting "Connect Automatically" is checked.

Resolution:

1. Disable the "Connect Automatically" network connection.
2. Turn the Entrust printer on.
3. If installing USB Driver, plug in the USB cable to the PC.
4. Go to settings/Network connections.
5. In the General tab, make sure "Connect Automatically" is unchecked.
6. Save the setting.

Other Troubleshooting

Issue: Installing the driver on Fedora fails with:

Detected cdc_ether kernel module not installed. Check Entrust troubleshooting guide.

Cause: Updating Fedora kernel, is not installing the kernel modules required to run the usb network device which will affect the Entrust driver.

Resolution:

1. Manually install the kernel modules using:

```
sudo dnf install -y kernel-modules-$(uname -r)
```

2. Confirm the cdc_ether and cdc_eem were installed using:

```
find /usr/lib/modules -name cdc_ether.ko* | grep "$(uname -r)"
```

```
find /usr/lib/modules -name cdc_eem.ko* | grep "$(uname -r)"
```

3. Uninstall the driver, then install the driver.

Appendix A: Retrieve the Printer IP Address

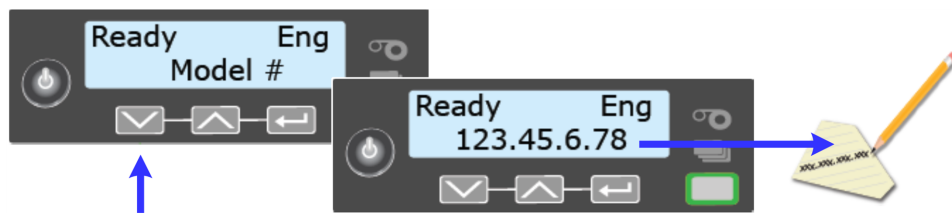


This appendix provides instructions to retrieve a printer's IP address.

Retrieve the Printer's IP Address

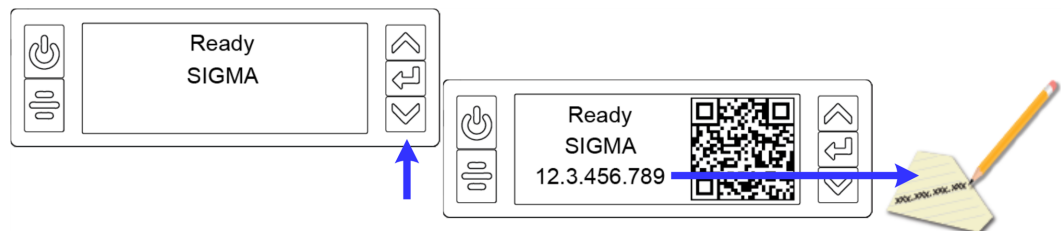
To locate the IP address of the printer, choose from either of the following:

- Press the **Up** or **Down** arrow key when the printer LCD panel displays "Ready."
 - SD260™, SD460™, and CR805™ Retransfer Card Printers:



- Sigma Card Printers:


The LCD panel also displays a QR code that can be used to start the Printer Dashboard to view additional printer information and work with the printer.



- Use the LCD menu system's Status menu.

i When the printer is configured to use a static IP address, the printer's front panel displays the address even when the printer is not connected to a network. In addition, the LCD displays a "+" if the network is active, or a "-" if the network is inactive, as a prefix to the static IP address.

To display an IP address using the Status menu, follow these steps:

 The user may also press the Down or V button twice on any model printer to quickly display the IP address.

1. Make sure the printer is connected.
 - a. Connect the printer power.
 - b. Connect the printer Ethernet cable or the printer USB cable.
2. Press the **POWER** button to power on the printer (if it is not already powered on).
3. Access the Status menu:
 - a. Press the **USER** button to suspend the printer.
 - b. Press **ENTER** to open the menu system.
 - c. Press the **Down** arrow key to display "Status" on line 2.
 - d. Press **ENTER** to open the Status menu.
 - e. Press the **Down** arrow key twice to display "Network IPv4" on line 2.
 - f. Press **ENTER** to display the printer's IP address.
4. Record the IP address for later use.