

Installation and Administrator's Guide

Entrust® Datacard® (formerly Sigma)
DSE Direct-to-Card Printer

August 2026

528519-001, Rev D

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 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

© 2025-2026 Entrust Corporation. All rights reserved.

Revision Log

Revision	Date	Description of Changes
A	May 2025	First release of this document
B	April 2025	Updates to secure printing requirements information.
C	June 2026	Updated printer branding to Datacard.
D	August 2026	Added firmware D4.5.2 USBPrinter setting to configure as a Printer Class Device (PCD) or Network printer.



Contents

Chapter 1: Printer Installation 1
- **PC Requirements** 1
- **Ethernet Requirements** 2
- **USB Requirements** 2
- **Electrical Requirements** 2
- **Site Requirements** 3
  - Printer Dimensions 3
    - Single-Hopper Printer 3
  - Clearance Requirements 4
  - Operating Environment 4
- **Secure Printing Requirements** 5
- **Set Up the Printer** 6
  - Unpack the Printer 6
  - Secure the Printer (Optional) 7
    - Use the Optional Cable Lock 7
  - Load Cards 8
  - Install the Print Ribbon 9
    - Load the Print Ribbon Cartridge 9
- **Plug in and Power On the Printer** 11
- **Connect the Printer to a Computer** 12
  - Connect Using a USB Cable 12
    - Changing the USB Connection Between a Printer Class Device (PCD) or Network 12
  - Connect Using a Network Cable 13
- **Use the Top Panel** 14
- **Set Up an Administrator in the Printer Dashboard** 15
- **Set the Printer Network IP Address** 16
  - Use IPv4 Addressing 16
  - Set a Static IPv4 Address 16
  - Use IPv6 Addressing 17
    - Enable IPv6 17
    - Set a Manual IPv6 Address 17
- **Use the Card Printer Driver** 18

Chapter 2: Elements of Card Design **19**
Basic Card Design **19**
Printing Design **20**
Color Printing 20
Full-Panel Ribbon 20
Short-Panel Color Print Ribbon 21
Split-Ribbon Color Printing 21
Manage Color 21
Print Text in Color 21
Print Graphics in Color 22
Types of Color Images 22
Monochrome Printing 22
Monochrome Printing with Full-Color Ribbon 22
Monochrome Ribbon 23
Ribbon Saver 23
Print Text in Monochrome 23
Print Bar Codes 24
Bar Code Guidelines 24
Test Bar Codes 25
Card Design Changes That Affect Bar Codes 26
Print Bar Codes With the Card Printer Driver 26
Apply Topcoat 27
Non-Printing Areas 27
Standard Magnetic Stripe Non-Printing Area 28
Standard Smart Card Non-Printing Area 28
Custom Non-Printing Areas 28
Card Layout 29
Margins 29
Backgrounds 30
Image Placement 30
Magnetic Stripe Design **31**
Magnetic Stripe Data Formats 31
Three-Track Option (ISO/IAT) 31
Single-Track Option (JIS) 32
Magnetic Stripe Coercivity 34
Smart Card Design **34**
Smart Card Processing Requirements 34
Smart Card Codes on the Printer Label 35
Settings for Card Design in the Printer Dashboard **36**

Chapter 3: Supplies and Parts **37**
Print Ribbon **38**
Color Print Ribbon 38
Full-Panel Color Print Ribbon 38
Short-Panel Color Print Ribbon 38
Color Print Ribbon Kits 38
Monochrome Print Ribbon 39
Monochrome Print Ribbon Kits 39
Ribbon Saver 39
Print Ribbon Storage Guidelines 40
Cards **41**
Card Size 41
Card Material 41
Pre-Punched Cards 41
New Cards for Color Printing 42
Adhesive-Backed Cards 42
Card Quality Guidelines 43
Card Surface 43
Card Handling 43
Card Storage 44
Cleaning Supplies **45**
Replacement Parts and Optional Equipment **45**
Print Ribbon Cartridge 45
Cable Lock 45
Cables and Power Supplies **46**
Data Cables 46
USB Cable 46
Network Cable 46
USB Smart Card Cable 46
Printer Power Supply 46
Power Cords 47

Chapter 1: Printer Installation

1

This chapter describes system requirements and provides setup instructions for the Entrust® Datacard® (formerly Sigma) DSE Direct-to-Card Printer.

Your installation may have additional requirements for a card production environment. Consult your system administrator to determine the optimum location for card production.

For Card Printer Driver installation troubleshooting and card production troubleshooting information, refer to the *XPS Card Printer Driver User's Guide* and the printer's *User's Guide*.

PC Requirements

Use a PC that meets or exceeds the following:

- A 32- or 64-bit processor, running at 2 GHz or faster.
- 4 GB or more memory (RAM) and at least 1 GB free space on the hard drive.
- One of the following operating systems:
  - Windows 11
  - Windows 10 versions, 32- and 64-bit
  - Windows Server 2022
  - Windows Server 2019
- ID software or other software to design the card and organize the data to print on each card.
- An USB 2.0 or newer, Ethernet, or Cloud connection.

Ethernet Requirements

You can connect multiple network printers to one PC. The maximum number of printers depends on the capacity of the network to deliver data to the printer.

The following components are required to install a printer on a network:

- An Ethernet network that uses the TCP/IP protocol and can run at one of the following:
  1Gbase-T (1 gigabyte per second) or 100base-T (100 megabits per second).
- An Ethernet cable to connect the printer to the network. (An Ethernet cable is not supplied with the printer.)
- A PC that meets the "PC Requirements" on page 1, and is connected to, and communicating with, the network.
- This device is intended to operate in a network environment protected by firewalls and access controls.

USB Requirements

You can connect up to eight card printers to a PC using USB cables.

To install a printer using a USB connection, the following components are required:

- A high-speed USB port. USB 3.0 is preferred.
- A USB cable to connect the printer to the PC. A USB cable is supplied with the printer.
- A PC that meets the "PC Requirements" on page 1.

If you need to connect two card printers to a PC with one USB port, use a single, independently powered USB hub to which you can connect both printers.

Electrical Requirements

The power supply detects the input voltage and works within the range stated.

Electrical Requirements

Input	Output
Universal 100–240Vac, single-phase/ 50–60 Hz/1.6Amp	24V/3.0Amp/72W

If your system includes additional components, refer to the documentation for the appropriate component for its electrical requirements.

Site Requirements

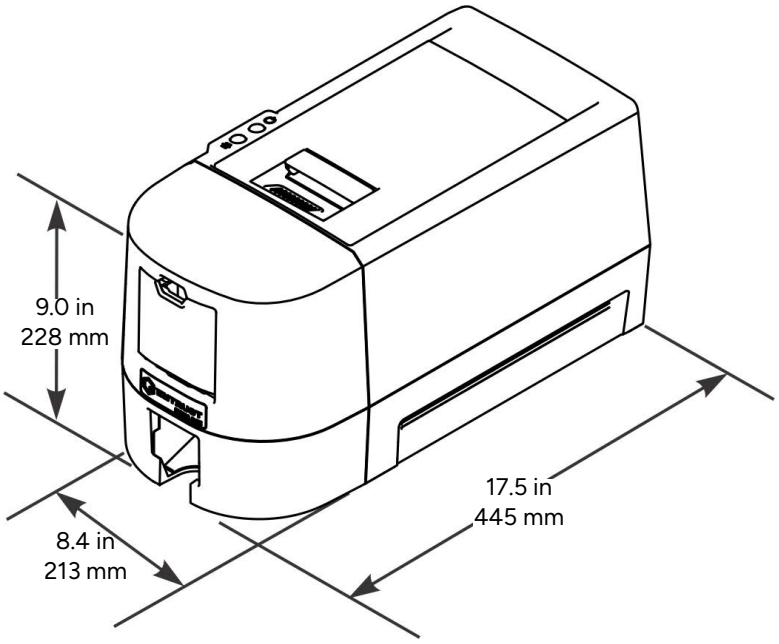
Set up and use the printer in an environment that meets the following requirements.

- Use a single-phase, 3-wire, grounded receptacle.
- Place the system and its supplies in a clean office environment, keeping paper and foreign materials off of the equipment.
- Place the printer on a sturdy, level surface.
- Place the printer away from direct sunlight.
- Do not place the printer near heating ducts, fans, or other air vents.
- Do not use the printer for purposes other than the intended use.
- Provide space for the printer and for clearance around the printer. The printer dimensions and clearance area are shown in the following sections.

Printer Dimensions

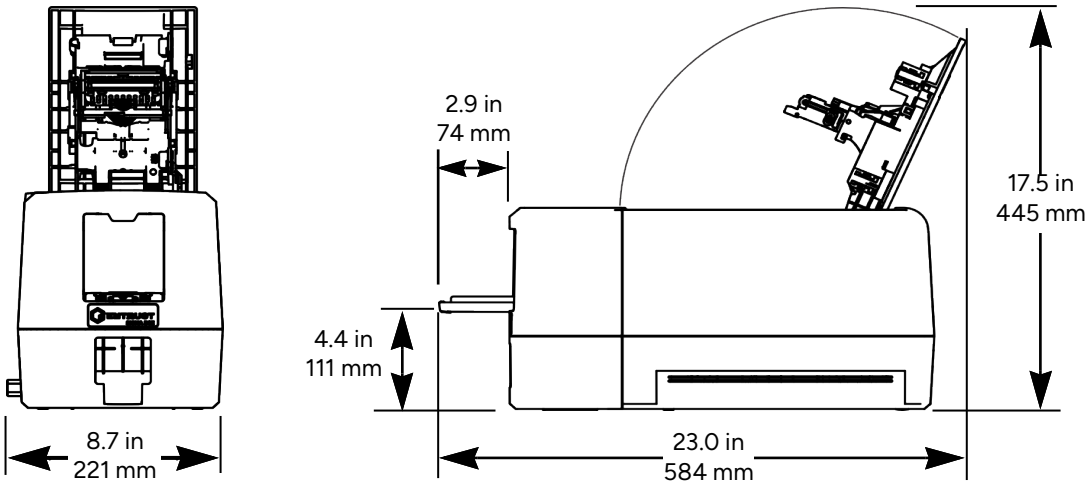
The external printer dimensions are shown in the following illustrations.

Single-Hopper Printer



Clearance Requirements

The following measurements show the printer dimensions when the input hopper and printer cover are open and the power cord is connected. Provide at least 3 inches (76.2 mm) of additional clearance around the system to maintain access to the power cord and data cables, to load and remove cards and supplies, and to provide ventilation.



Operating Environment

Use the following guidelines when operating the printer:

Operating temperature	60°–95° F (15°–35° C)
Operating humidity	20–80%, non-condensing

Secure Printing Requirements

Secure printing requires keeping the printer firmware current and using TLS encryption for all card job commands and data sent to the printer. This will ensure card holder data is kept private as it travels across the network.

If your card production site requires secure printing, use the following:

- An DSE card printer with the TLSEncryptAllCardData setting enabled.
  - Firmware version D4.5.1 or newer is required to use the TLSEncryptAllCardData setting.
  - The printer must be restarted after changing the TLSEncryptAllCardDatasetting for the change to take effect.

  The TLSEncryptAllCardData setting can be enabled at **Configuration** > **Communication** in Printer Dashboard. Refer to "Set Up an Administrator in the Printer Dashboard" on page 15 for details on accessing Printer Dashboard.

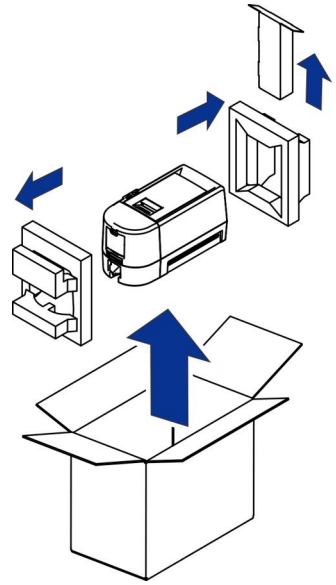
- A PC that meets the PC requirements listed in "PC Requirements" on page 1.
- An Ethernet or USB connection that meets the requirements listed in "Ethernet Requirements" or "USB Requirements" on page 2.
- A current browser.
- The latest released version of printer firmware. New firmware releases integrate updated component versions and patches for increased reliability and security.
- Printers manufactured with D4.5.1 or newer firmware ship with SNMP disabled. If SNMP is required for network management, be aware that SNMP v2 transmits data unencrypted, which could expose printer information. To keep SNMP information secure, use SNMP v3 and configure the printer to not respond to SNMP v2 requests by setting SNMPMinVersion to SNMPv3.

Set Up the Printer

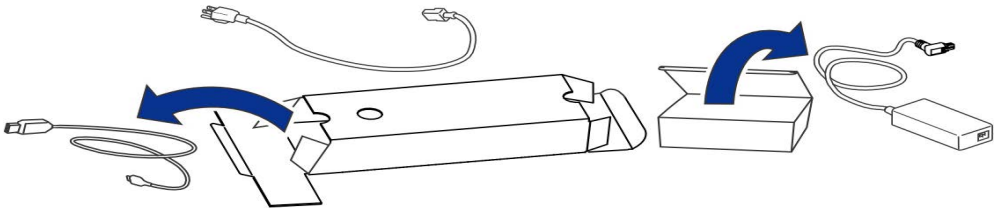
Use the information in the following sections to set up the printer to print cards.

Unpack the Printer

1. Remove the power cord, accessories box and printer from the shipping carton.



2. Open the accessories box to remove the USB cable and power supply.



Save the shipping cartons and packing materials. They are required if you need to store, move, or return the system for service.

3. Place the printer on the selected work surface. Make sure that the surface meets the requirements described in "Site Requirements" on page 3.

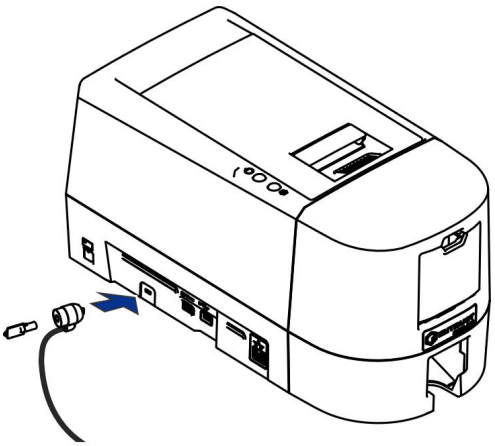
Secure the Printer (Optional)

You can secure the printer using the following:

- An optional cable lock (refer to "Use the Optional Cable Lock").

Use the Optional Cable Lock

The cable lock is a user-installed feature that does not require special tools to install. The package contains a cable lock, a metal security plate, and instructions.



The cable lock is available with either a key or combination lock.
The security plate is not used with the DSE printer.

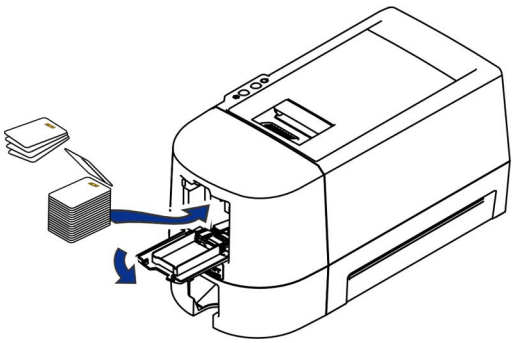
Follow the instructions included with the cable lock to complete the installation.

Load Cards

Load cards into the printer using the following procedures.

- Handle cards by the edges only, or wear approved card inspection gloves.
- Cards can stick together. Slide or fan the cards to separate the edges before placing them in the input hopper.
- Insert ISO magnetic stripe cards with the stripe (back side) facing down and to the right.
- Insert smart cards with the smart card chip facing up and toward the back of the hopper.

1. Open the input hopper door.
2. Load the cards into the input hopper. The hopper can hold up to 125 cards.
3. Close the input hopper.



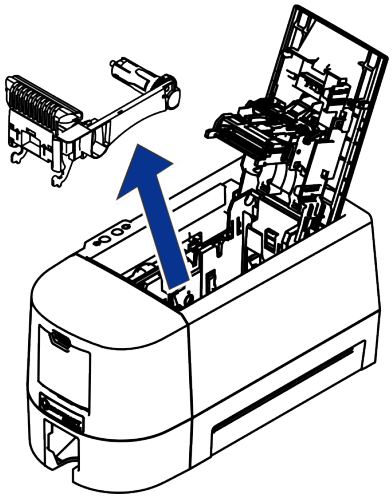
Install the Print Ribbon

The print ribbon is available as a replaceable roll that you install on the print ribbon cartridge.

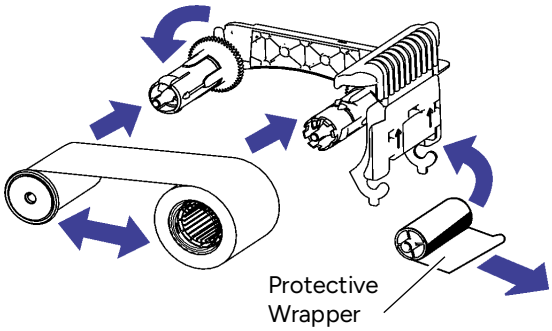
Load the Print Ribbon Cartridge

The print ribbon cartridge ships inside the printer.

1. Pull up the cover latch handle and open the printer cover. Remove the print ribbon cartridge.



2. Load the print ribbon.
   a. Load a full roll of print ribbon (the purple spool) onto the purple spindle closest to the cartridge handle until it clicks into place.
   b. Place the silver take-up spool on the silver take-up spindle until it clicks into place.
   c. Wind the take-up spool counterclockwise one full turn.



3. Load the cleaning roller on the ribbon cartridge.
4. Remove the protective wrapper from the cleaning roller.

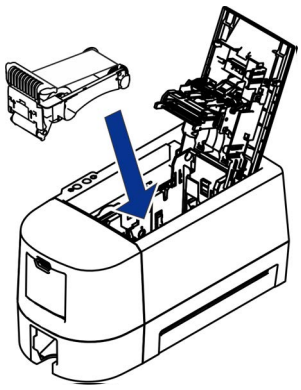
Load a new cleaning roller with each new roll of print ribbon. Replace it between ribbon changes if you notice debris on the printed cards, or if the cleaning roller is no longer sticky.

5. Install the print ribbon cartridge in the printer.

    a. Hold the ribbon cartridge by the handle and lower it into the printer with the handle toward the front of the printer.

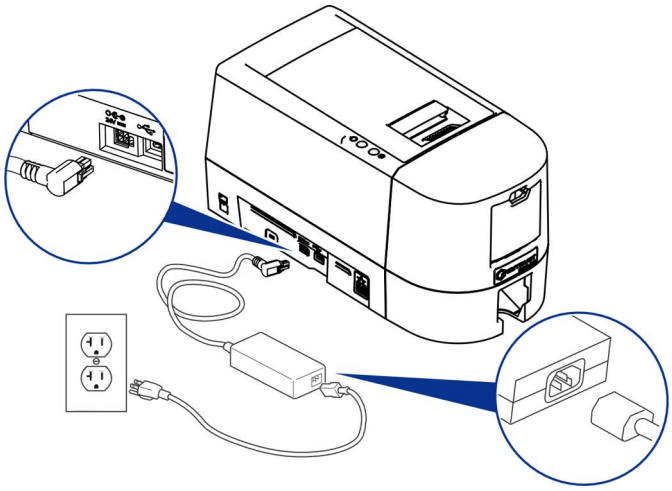
    b. Position the ribbon cartridge in the guides.

6. Close the printer cover. Press down on the ridges on the front of the cover to make sure that it latches completely.

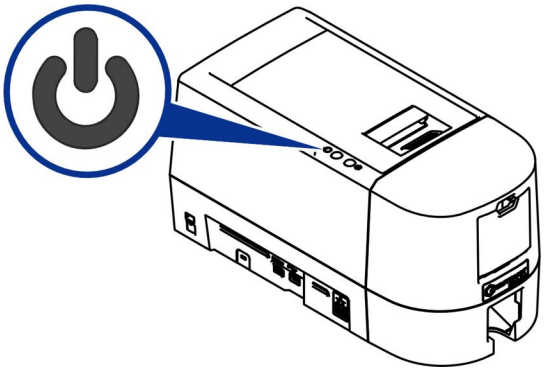


Plug in and Power On the Printer

1. Connect the printer power supply to the printer.
2. Connect the power cord to the power supply.



3. Connect the power cord to the facility power source.
4. Press the POWER button on the top of the printer.



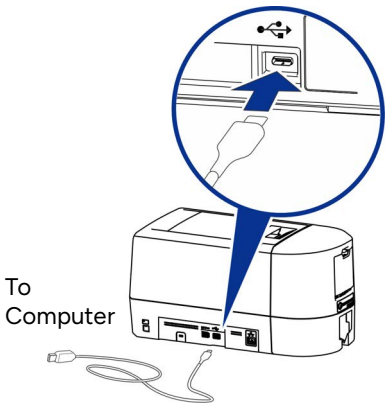
Connect the Printer to a Computer

You can connect the printer to a Windows-based PC using either a USB cable, or through a network using an Ethernet cable (the Ethernet cable is not supplied with the system). Refer to "Set Up an Administrator in the Printer Dashboard" on page 15 to complete the printer connection.

Connect Using a USB Cable

If you plan to use the XPS Card Printer Driver, do not connect the USB cable to the computer until you are prompted during installation of the Driver. Refer to the *XPS Card Printer Driver User's Guide* to set up the Card Printer Driver to work with the printer.

1. Connect one end of the USB cable to the USB port of the printer.
2. Connect the other end to a USB port on the PC.



Changing the USB Connection Between a Printer Class Device (PCD) or Network

The USB connection can be set as a Printer Class Device (PCD) or a network. Changing the UsbDeviceType setting between USBPrinter (for Printer Class Device) or USBNetwork (for network) can be done from Printer Dashboard.

Firmware version D4.5.2 or newer is required to access the UsbDeviceType setting.
XPS Driver v8.8 or newer is required to connect as a Printer Class Device.

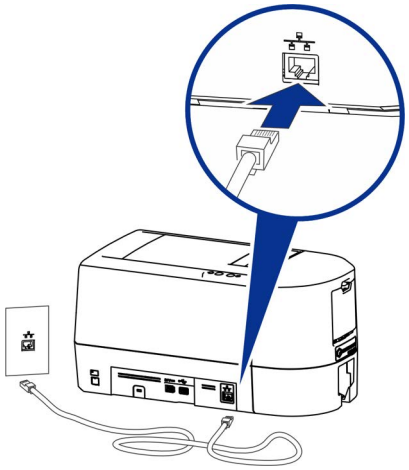
Change the UsbDeviceType setting from Printer Dashboard:

1. Access Printer Dashboard with a Administrators account.
2. Click **Configuration** > **Settings** > **Communication**.
3. Choose between the UsbDeviceType value of **USBPrinter** or **USBNetwork**.
4. Click **Save**. The printer will not have to be restarted for the settings change to apply.
5. Install XPS Driver v8.8 or newer and follow USB connection instructions.

Connect Using a Network Cable

An Ethernet port is only available on specific DSE printer models.

1. Connect one end of the Ethernet cable to the network connection port on the printer.
2. Connect the other end to a network port.

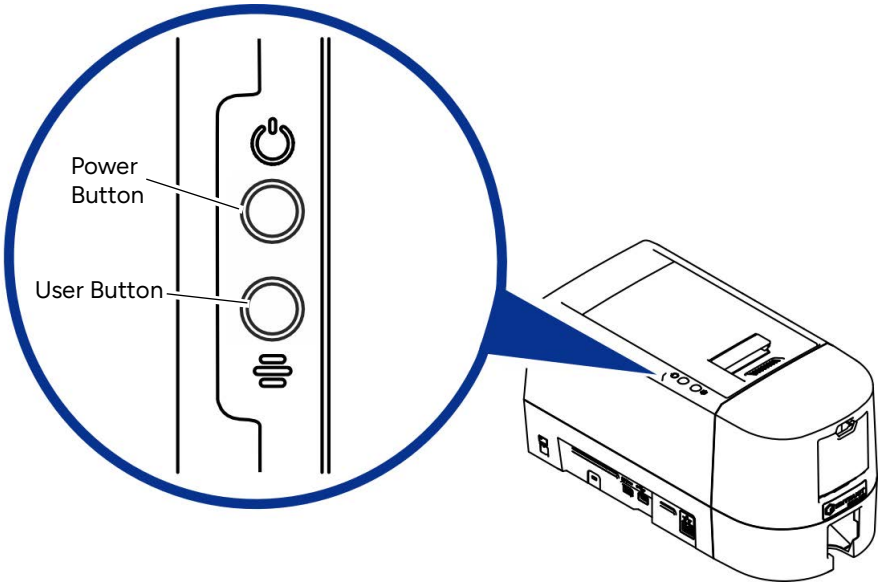


Use the Top Panel

The top panel of the printer provides the controls you need to operate the printer. Refer to the printer's *User's Guide* for complete information about using the top panel.

- Press the POWER button for 1 to 2 seconds to power the printer on and off.
- With the printer in ready status and the User button solid green, press and hold the User button (around three seconds) to print a test card with the printers IP address and auth ID key.
- Press the USER button once when the light is solid green to suspend the printer. The printer is suspended when the USER button is solid blue. Printer cleaning can be run when the printer is suspended. Refer to the printer's *User's Guide* for complete information about using the top panel and cleaning the printer. Press the USER button once when the light is solid blue to unsuspend the printer.

The IP address is required to connect the printer to a computer.
The auth ID is required to connect to card production software such as Instant ID as a Service.



Set Up an Administrator in the Printer Dashboard

The Printer Dashboard is a web-based printer management tool. You can access the Printer Dashboard using one of the following methods:

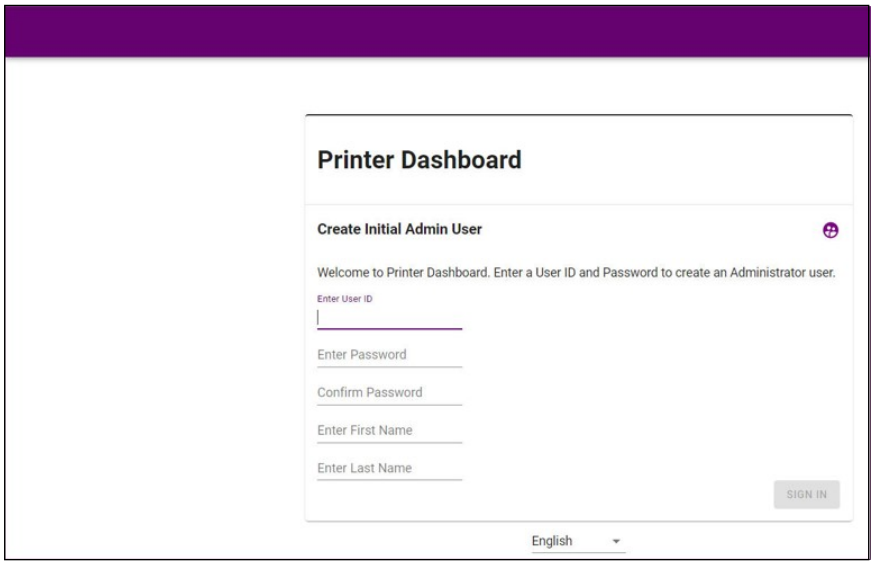
- Enter the printer's IP address in a browser window. For example, https://12.3.45.678.
- Double-click the Printer Dashboard icon on the computer desktop.

The Printer Dashboard icon requires the installation of the XPS card printer driver.

The first time you start the Printer Dashboard, you must set up an administrator account to sign in to the dashboard. The administrator then can set up user accounts for all users who require access to the Printer Dashboard.

Do the following to set up the administrator account.

1. Display the Printer Dashboard sign in window.



2. Complete the Create Initial Admin User fields with the user name and password information, and the name of the Admin user.
3. Click **Sign In** to launch the Printer Dashboard.

After you sign in to the Printer Dashboard, refer to the Printer Dashboard Help for complete information about how to define additional user accounts and use the dashboard.

Set the Printer Network IP Address

You need the printer IP address to perform some tasks. For example, the XPS Card Printer Driver asks you to enter the network IP address during installation. You also can launch the Printer Dashboard by entering the printer IP address in a browser window.

To obtain either a USB or network IP address, print a test card from the top panel of the printer. The printers IP address will be printed on the test card.

The card printers support both IPv4 and IPv6 addressing. If your network environment uses IPv6 you can use Printer Dashboard to enable the IPv6 settings that manage the printer communication over an Ethernet network. You do not need to make any configuration changes to use IPv4. Refer to the Printer Dashboard Help for complete information.

Use IPv4 Addressing

When you use IPv4, the printer can use either of the following network communication methods:

- **DHCP (Dynamic Host Configuration Protocol)**—The network automatically assigns the IP address to the printer. The IP address of a printer that uses DHCP can change if the printer is powered off and back on.
- **Static IP**—You set the IP address, subnet mask, and gateway address, as provided by your network support personnel. A static IP address does not change when the printer is powered off. Some sites may require that the printer has the same IP address at all times. Refer to "Set a Static IPv4 Address" on page 16.

Set a Static IPv4 Address

The default communications method is DHCP (Dynamic Host Configuration Protocol). If you need to assign a static IP address, you can use Printer Dashboard to change the address method and enter the address information.



You can set a static IP address on a printer even if it is not connected to the network.
For example, a group may set up several printers in a central location before installing them at individual sites.

Obtain the following values from your network support personnel. Make sure that you receive all three values:

- IP address
- Subnet mask
- Gateway address

Use IPv6 Addressing

The expanded address space provided by IPv6 is becoming increasingly common in network environments. A printer on an IPv6 network can be configured to use one or more of the following methods, depending on how the network is set up:

- **Link Local IPv6 address:** The printer and PC clients are restricted to the same subnet. Link local is enabled automatically when IPv6 is enabled and offers the best security for your network.
- **DHCPv6:** A DHCPv6 server is externally configured to give out an IPv6 address.
- **Stateless Address AutoConfiguration (SLAAC):** One or more routers with IPv6 enabled on the subnet give out a subnet prefix that allows access to IP addresses.
- **Manual IPv6 Address:** The printer has a designated IPv6 address on a specified subnet. The address does not change without manual intervention. This is similar to an IPv4 static IP address.

To use IPv6 with the card printer, you need to connect to an IPv6 network and enable one or more address configuration methods. Link local, DHCPv6, and SLAAC automatically configure an address, but may require the necessary network support (DHCPv6 and routers).



This Guide assumes that your IPv6 network is configured and that you have the information you need to set up the card printer. If you need information about your network configuration, contact your network administrator.

Enable IPv6

Enable IPv6 using Printer Dashboard. Refer to the Printer Dashboard Help for details.

Set a Manual IPv6 Address

If you want the printer to keep the same IPv6 address at all times, you can enter a manual address using the Printer Dashboard (This is similar to setting a static IPv4 address.)

If you launch the Printer Dashboard from a browser window, you must use an IPv4 address before you can set the IPv6 address. The Printer Dashboard allows you to type the IPv6 information. Refer to the Printer Dashboard Help for more information.

Obtain the following values from your network support personnel. Make sure that you receive all values:

- IPv6 address
- IPv6 subnet prefix length
- Gateway address

Use the Card Printer Driver

The Card Printer Driver uses Microsoft XPS print technology to support printing from currently available Microsoft Windows applications.

To use the printer with the Card Printer Driver, you must install the driver and define the driver options. Refer to the *XPS Card Printer Driver User's Guide* for complete information about installing and using the Card Printer Driver.



Chapter 2: Elements of Card Design

2

Card design is the name given to the combined features of the processed cards. An organization can have multiple card designs.

This chapter provides the following information about card design:

- Basic Card Design on page 19
- Printing Design on page 20
- Magnetic Stripe Design on page 31
- Smart Card Design on page 34
- Settings for Card Design in the Printer Dashboard on page 36

Basic Card Design

Card design includes:

- Color and monochrome printing.
- The various types of data, such as name, account number, and special features such as a magnetic stripe or smart card chip.
- The layout of the data.



Printing Design

Printing design includes color and monochrome printing, bar code printing, non-printing areas, and card layout.

Color Printing

Color print ribbon is available in full-panel and short-panel styles.

Full-Panel Ribbon

Full-panel color printing uses a print ribbon with three color panels: Y (yellow), M (magenta), and C (cyan). The ribbon also includes a K (black) panel and a T (topcoat) panel. The printer applies the YMC color panels to the card first, prints black components using the K panel, and then applies the T (topcoat) to protect the color image from damage.

Full-panel YMCKT Ribbon



Refer to the *XPS Card Printer Driver User's Guide* or your card personalization software documentation for more information about setting up a card design.

Short-Panel Color Print Ribbon

Short-panel ymcKT Ribbon



Use short-panel print ribbon when only a portion of the card design calls for color. For example, a card design may have a color photo on the top or left of the card, and black text on the bottom of the card. The color area for short-panel ribbon is either 1.57 inches (40 mm) or 1.47 inches (37.5 mm), depending on the ribbon configuration. The ymc panels of short-panel ribbon are approximately half the length of a full card.

When you print with short-panel print ribbon, you define the location of the color area in the card design. Color printing begins when the software detects a color pixel and continues for the length of the ymc panels.

Split-Ribbon Color Printing

Split-ribbon color printing lets you use less ribbon to print cards in color. It is available only with the Card Printer Driver. Refer to the *XPS Card Printer Driver User's Guide* for information about how to specify split-ribbon color printing and the split ribbon options available.

Split-ribbon color printing uses a single ribbon panel set from a full-color ribbon to print both sides of a card, rather than two or three panel sets. The ribbon can be a full-panel or short-panel color ribbon. The order in which the color, black, and topcoat sections of the panel set are used to print the card depends on the type of ribbon installed in the printer and the split-ribbon option selected on the printer's Printing Preferences window.

Most types of cards, including cards with magnetic stripes and smart cards, can be printed using split-ribbon printing. Options for color, monochrome, and topcoat are available when you use split-ribbon printing.

Manage Color

Color management is the process of making color on the PC monitor and printed card appear as similar as possible. You specify the color management system using the Printer Dashboard Print menu. Refer to the Printer Dashboard Help for more information.

Print Text in Color

The printer can print text in any color. Small characters are likely to be more readable if they use a sans-serif font formatted as black and printed with the black (K) panel. Refer to "Print Text in Monochrome" on page 23. The printer supports 4-point or larger text.

Print Graphics in Color

The printer produces full-color images from most types of graphics. It can use BMP, JPEG, TIFF, and PNG file formats for photos and logos.

Vector graphics, such as WMF and SVG files, have components such as shapes with lines and fills. Components defined as black normally print with the K panel.

Because the printer uses the print ribbon panels in sequence (YMC first, then K), black images can print over color graphics. For the best appearance of color graphics, or to prevent backgrounds that are black from printing over colored images, use a color that appears black but is not, so that all parts of an image print with the YMC panels. For example, in the RGB color space, 0, 0, 0 is black (and prints with the K panel), but 0, 0, 5 is not black (and prints with the YMC panels).

Types of Color Images

Cards can include both color photos and color logos. The logo is usually the same on each card, and the photo is unique. Follow these guidelines to obtain the best results for printing both logos and photos.

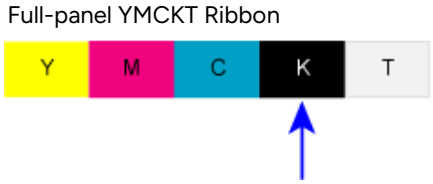
1. Evaluate the color quality of the photos:
    a. Adjust the image capture system to get the best quality photos; work with distance, lighting, and camera settings to obtain consistent, high-quality photos.
    b. Evaluate the quality of printed photos after the image capture system is optimized.
2. Evaluate the other color areas of the card, such as text or logo:
    a. Check your card production application for settings that can help improve the printed color of text.
    b. Use an image editing application to adjust the color of a logo file for optimal printing.

Monochrome Printing

Monochrome printing prints cards using a single color. You can use a full-color ribbon or a monochrome ribbon that has only one color.

Monochrome Printing with Full-Color Ribbon

Full-color print ribbon includes a black panel. The black panel transfers to the card differently than the YMC panels. Text and bar codes usually are printed with the black panel. Full-color print ribbon also prints any monochrome or one-bit-per-pixel graphics using the K panel.



Monochrome Ribbon

Monochrome ribbon produces single-color cards. Monochrome ribbon can be any of the following:

KT Ribbon



- Alternating black and topcoat panels (KT ribbon)

  The printer applies black and one topcoat panels on the same side of the card.

- Continuous black (K ribbon)
- A continuous color, for example, gold or silver (also called a K ribbon). Refer to "Monochrome Print Ribbon Kits" on page 39 for a list of available colors.

Monochrome (K) Ribbon—



Ribbon Saver

Continuous monochrome printing with certified ribbon uses the Ribbon Saver feature. With Ribbon Saver, the printer begins using ribbon at a location that corresponds to the start of printing. The printer continues to spool ribbon for the length of the image but no farther. The printer leaves a small margin between each card to avoid image overlap.

Print Text in Monochrome

Printing text using a K panel can make text look crisp, because it uses only one panel for printing. Fine text is more readable when printed with more power. You set the power for the K panel using the Printer Dashboard. Refer to the Printer Dashboard Help for more information.

The font used also affects legibility. The printer reliably prints 4-point Arial font. Bold, sans-serif fonts are more readable after printing than serif fonts, or fonts with thin strokes, as shown at right. In the example, fonts that print well are shown toward the top of the card.



Print Bar Codes

Bar code design follows a set of standards based on the type of bar code produced. Bar codes contain a series of black lines (bars) separated by white areas (spaces). Each character of encoded data is represented by a set of bars and spaces. A bar code standard specifies the number and width of bars and spaces needed to encode a character. The standard also specifies the minimum size of the white area, or quiet zone, that surrounds the bar code.

Refer to "Print Bar Codes With the Card Printer Driver" on page 26 for information about how to use the Card Printer Driver to improve the probability that a bar code prints using the K panel.

Bar Code Guidelines

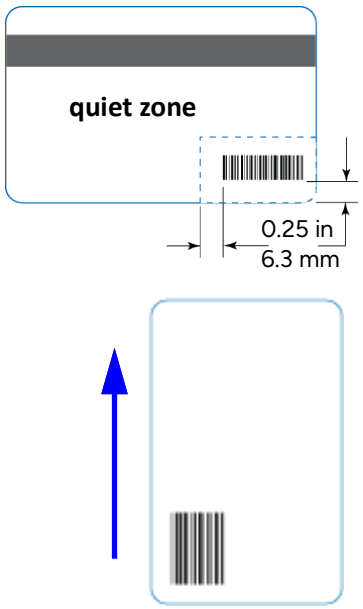
Bar codes print more successfully when you observe the following guidelines. Follow the standards for the type of bar code you are printing.

Bar Code Placement

Maintain the required quiet zone around the actual bar code, as shown in the illustration.

Locate bar codes at least 0.25 inch (6.3 mm) from other printing and from the edge of the card.

For best results, orient the card so that the bars are parallel to the long edges of the card, as shown. This orientation most accurately prints readable bar codes.



Bar Code Size

- A lower density bar code is easier to read, because the bars are wider and spaced farther apart.
- The width of the narrow elements in the bar code must be large enough to be read consistently. The capabilities of the bar code reader can influence this.
- The bar code must be tall enough to be read under normal conditions.

Bar Code Print Settings

- To achieve the best quality printing and improve the readability of the bar code, use the K (black) panel of color print ribbon to print the black bars. Bar codes printed with YMC panels are not as crisp and sharp as those printed with the K panel only. Refer to the *XPS Card Printer Driver User's Guide* or the documentation for your card personalization software for more information about how to print bar codes using the K panel.
- Infrared readers require that the K panel be used to print the bar code.

Test Bar Codes

Always test the readability of bar codes under production conditions. Factors to consider include:

- If you print cards one at a time, print the samples using that method. If you print cards in batch (many cards sent to the printer at the same time), use a production-sized batch and evaluate cards from the beginning, middle, and end of the batch.
- Use exactly the same card stock for testing that you use for production. The card stock can affect the readability of bar codes. Usually, a white surface that reflects light in many directions is needed. Test cards before purchasing production quantities.
- Include other card design components that you use in production, such as topcoat.
- Use the same bar code readers as users have, and test each card multiple times to simulate any wear the card might experience. Also test multiple cards.

Card Design Changes That Affect Bar Codes

If you make substantial changes to the way you produce cards, review your setup tasks to make sure that cards continue to have the quality you require.

Changes that can affect bar codes include:

- Purchasing a new brand of card stock, which can change the color of some images.
- Changing to, or from, preprinted cards, which can change the color of some images.

If you change the design of your cards, or if you start producing an additional card design, test each design as described in "Test Bar Codes" on page 25 to make sure that the bar code prints as expected.

Print Bar Codes With the Card Printer Driver

The Card Printer Driver includes a setting that allows the printer to use the black (K) panel to print the bars of a bar code embedded in a color image, making it more likely to be read by a scanner. Refer to the *XPS Card Printer Driver User's Guide* for complete information about how to specify the "Print black image pixels using monochrome" option.

Apply Topcoat

Full-color printing fades if it lacks topcoat protection. Topcoat protects the printed image on the card. It is applied as an even, consistent film.

Make sure that all color printing is covered with topcoat (except for areas such as a magnetic stripe, smart card chip, or signature panel).

When a ribbon with a topcoat (T) panel is installed, the printer can apply topcoat to the card using the printhead. Most full-color ribbons include topcoat panels.



Topcoat must be requested by the application sending the card to the printer. Most card production software requests topcoat automatically.

Do not apply topcoat over the magnetic stripe, smart card chip, or signature panel of a card. To prevent topcoat application, you must specify a non-printing area.

Non-Printing Areas

The card design can have areas where printing is not allowed, such as a magnetic stripe, signature panel, or smart card chip. Card production software and the Card Printer Driver usually manage such non-printing areas automatically. If you do not use ID software, you can use the dimensions provided in the following sections for magnetic stripe and smart card non-printing areas to customize your print and topcoat areas.Card production software usually manages such non-printing areas automatically. You also can use the dimensions provided in the following sections for magnetic stripe and smart card non-printing areas to customize your print and topcoat areas.

- Blocking for non-printing areas typically extends 0.05 inch (1.27 mm) beyond the edges of a feature. The dimensions listed in the following sections include the extended blocking region.
- Print several cards using your card design and application to verify that printing and topcoat are applied as you intend.

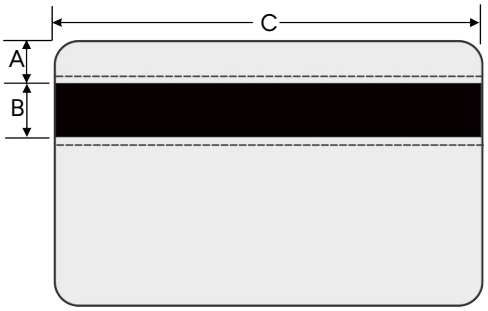
The dimensions shown in the following sections are examples to help you determine the non-printing area. The actual dimensions can vary depending on the card stock you use.

Standard Magnetic Stripe Non-Printing Area

The magnetic stripe typically is located on the back of the card.

The following table shows the standard measurements for magnetic stripes. Use these values if you need to define a non-printing area. The non-print blocking area must extend outside the magnetic stripe by 0.05 in (1.27 mm), indicated by the dotted lines.

	A	B	C
3-track	5.0 mm	13.5 mm	86 mm
2-track	6 mm	9 mm	86 mm
Single-track (JIS)	7.5 mm	7.5 mm	86 mm

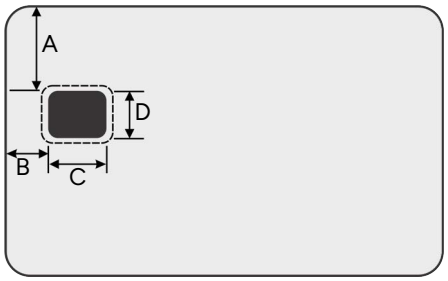


Standard Smart Card Non-Printing Area

The smart card area typically is located on the front of the card.

The following table shows the measurements for a typical smart card chip. The smart card chip can vary in size, shape, and location. Adjust these values based on the card stock you use. The non-print blocking area must extend outside the smart card chip by 0.05 in (1.27 mm), indicated by the dotted line.

A	B	C	D
19.5 mm	10 mm	13 mm	12 mm



Custom Non-Printing Areas

Use ID software, a custom application, or Card Printer Driver escapes to define custom non-printing areas for one or more of the following:

- Blocking printing but not topcoat
- Non-standard areas, such as a preprinted logo or a signature panel
- More than one area on the same side of the card, such as a magnetic stripe and a signature panel

Card Layout

The arrangement or layout of components determines how well your card design works for users. Follow these guidelines to position card design components for best results.

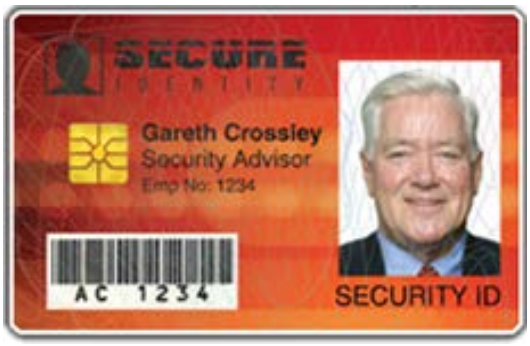
Margins

Any unprinted area at the edge of the card or around the perimeter of a card feature is called the margin.

Margins at the Edge of a Card

The card printers print edge to edge, which means the printing is as close to the edge of the card as possible. When you set up your card design, you specify a margin of 0, or no margin. The printer leaves a small white margin around the edges of the card due to the printhead being lowered and raised as it prints. Keep this in mind if your card design includes a full-card image.

The following illustration shows the margin of white space at the outer edge of the card.



Margins for Card Features

Maintain a margin between printing and card features, such as a signature panel, magnetic stripe, or smart card chip. For best results, do not print closer than 0.05 inch (1.27 mm) from those features.

Backgrounds

Use the following suggestions to help you select a background for a professional-looking card. For best results, make sure that the background design does not emphasize the location of card features, such as embedded electronics.

- Consider using a white background for the card to achieve consistent professional results.
- Consider using smaller blocks of color, patterned areas, or gradients to highlight printed card features such as a name, photo, or logo.
- Avoid using a solid-color background over a large area of the card. It can show flaws on the card (such as an uneven surface) or the location of card features (such as a smart card chip).

Image Placement

Use the following suggestions to help you locate important images, such as a photo, logo, or bar code. When placing images, avoid uneven areas and areas of high wear, which can result in inconsistent print quality.

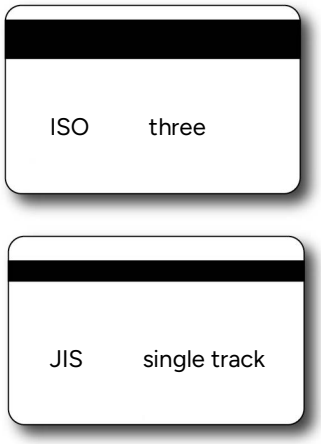
- Do not place an important image on the front of the card in the same area as a magnetic stripe or other machine-readable feature. Frequent use of a card in a reader can wear away the image on the opposite side of the card.
- Do not place an important image directly on the opposite side of a signature panel. This can cause residue from the signature panel to interfere with printing on an adjacent card. Place the image above, below, or to the side of the panel.
- Do not place an important image directly on the opposite side of a smart card chip. The card might not be as flat in that area, and printing voids may occur.

Magnetic Stripe Design

The printer can have a magnetic stripe upgrade module installed that allows the printer to process magnetic stripe data. There are two magnetic stripe configuration options: ISO and JIS. Use the printer configuration update label (described in the printer's *User's Guide*) to determine the type of module installed.

Magnetic stripe is only available as an upgrade on DSE card printers.

Magnetic Stripe Data Formats



The module format (ISO or JIS) defines the type and format of the information to encode. The standard ISO format (also known as IAT) is a three-track option. The JIS format is a single-track option. Both formats include default data settings that determine how many characters can be encoded on each track, and which characters can be encoded.

Your cards can use the default format for each track, or can use a different combination of tracks and data formats.

Three-Track Option (ISO/IAT)

The default data formats for a three-track magnetic stripe option are:

- Track 1 — IATA
- Track 2 — ABA
- Track 3 — TTS

This combination is often abbreviated IAT. This format is also called ISO format.

IATA (International Air Transport Association)

The maximum number of characters for IATA format data is 76 characters. These characters can include spaces, uppercase alphabetic characters (A–Z), numeric characters (0–9), and the following special characters:

! # $ % ' ( ) * + , - . / ; : < @ > = ^] \ [" & _

ABA (American Bankers Association)

The maximum number of characters for ABA format is 37 characters. Numeric characters (0–9) and the following special characters are allowed:

: ; < = >

TTS (Thrift Third Standard)

The maximum number of characters for TTS format is 104 characters. Numeric characters (0–9) and the following special characters are allowed:

: ; < = >

Single-Track Option (JIS)

The default data format for a single-track magnetic stripe module is the JIS (Japanese Industrial Standard) Type II format.

The maximum number of characters for the JIS format is 69 characters. These characters can include spaces, numeric characters (0–9), uppercase alphabetic characters (A–Z), lowercase alphabetic characters (a–z), and the following special characters:

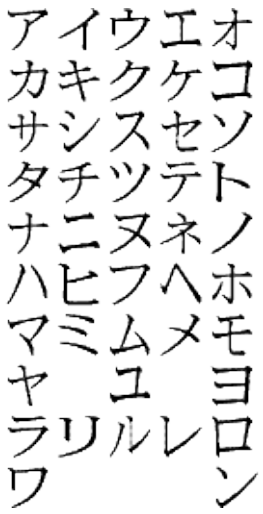
! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ ] ^ _ ~ { | } ~

A PC running a Japanese edition of a supported Windows operating system also supports Japanese-language special characters and 55 Katakana characters. They include the following:

- Special characters:

- 45 Katakana characters:

- 10 Katakana characters:

  ヲァイウエォヤュヨッ

The magnetic stripe data uses shift-JIS, which embeds a hidden "shift-in" and "shift-out" character each time the Japanese-language characters start and end. Each transition between normal characters and shifted characters is surrounded by these two control characters. They are encoded on the magnetic stripe. Thus, each hidden character reduces the number of characters you can encode by one character.

Magnetic Stripe Coercivity

The printer may require additional settings to match the coercivity of the card. When these values are set they remain the same for all cards processed using the same design. The defaults are set to standard ISO format and high coercivity. Refer to the Printer Dashboard Help for information about changing the coercivity.

The type of magnetic stripe cards you use must match the type of module (ISO or JIS) installed. Test your printer to make sure that it is encoding magnetic stripe information properly.

Smart Card Design

Smart card processing differs from other types of card personalization. The "smart card" step of personalization is controlled by an application that is separate from the rest of card personalization.

The smart card reader can be installed later as a field upgrade by a service provider or value-added reseller. The printer configuration update label (a label attached at the time of the field upgrade) shows the type of smart card reader installed. You can request additional information about the smart card reader and the type of cards to use from your service provider or value-added reseller.

Smart Card Processing Requirements

The following items are required to personalize smart cards:

- A smart card reader in the printer
- A cable for the smart card port used
- A card production application that is designed to work with the printer and the smart card application
- Smart cards that work with the reader in the printer

Smart Card Codes on the Printer Label

The configuration label includes codes that identify the type and model of the smart card module installed in the printer. The following table lists the codes used on the configuration label.

Code on Label	Type of Smart Card Module
S1	Integrator Contact/Contactless
S19	Identive Next Gen, Loosely Coupled, Contact/ Contactless

The S1 value on the configuration update label indicates that the printer has the basic smart card components installed. Basic components include the mounting hardware only. An integrator must install a contactless reader.

If the Sx value is included in the configuration code, the printer has the basic components of an S1, plus the appropriate interface installed.



The smart card readers available vary by printer model. Contact your authorized dealer for more information.

Settings for Card Design in the Printer Dashboard

The Printer Dashboard contains card design settings that managers and service providers can use to set up card production. The card design settings include magnetic stripe setup and smart card testing. The Printer Dashboard also contains troubleshooting features such as a log file that can track all processes of a card job. Service providers can use the information in the log file to troubleshoot and relay information when troubleshooting card processing issues. Refer to the Printer Dashboard Help for more information.



Chapter 3: Supplies and Parts

3

This chapter describes the recommended supplies and replacement parts to use with your printer.

This chapter includes the following information:

- Print Ribbon on page 38
- Cards on page 41
- Cleaning Supplies on page 45
- Replacement Parts and Optional Equipment on page 45
- Cables and Power Supplies on page 46

Print Ribbon

Then print ribbon is a replaceable roll that you install on the print ribbon cartridge. The ribbon kit includes the print ribbon, a cleaning card, and a replaceable cleaning roller. For best results, run a cleaning card and replace the cleaning roller with each new print ribbon.

Color Print Ribbon

Color print ribbon is available in either full-panel or short-panel options. Both full-panel and short-panel print ribbons use the following color panels: Y (yellow), M (magenta), C (cyan/blue), K (black), and T (topcoat).

Full-Panel Color Print Ribbon

Use full-panel print ribbon when the card design calls for color printing on the entire card.

Full-panel YMCKT Ribbon



Short-Panel Color Print Ribbon

Use short-panel print ribbon when only a portion of the card design calls for color. For example, a card design may have a color photo on the top or left of the card, and black text on the bottom of the card. The color area for short-panel ribbon is either 1.57 inches (40 mm) or 1.47 inches (37.5 mm), depending on the ribbon configuration. The ymc panels of short-panel ribbon are approximately half the length of a full card.

Short-panel ymcKT Ribbon



When you print with short-panel print ribbon, you define the location of the color area in the card design. Color printing begins when the software detects a color pixel and continues for the length of the ymc panels.

Color Print Ribbon Kits

The following color print ribbon kits are available. Print yield varies depending on the ribbon type. Contact your authorized dealer for complete information when ordering ribbons.

- YMCKT Color Ribbon
- YMCKT-KT Color Ribbon
- ymcKT (short-panel) Color Ribbon
- ymcKT-KT (short-panel) Color Ribbon
- YMCKT-PET-G Color Ribbon

Monochrome Print Ribbon

A monochrome ribbon prints the entire card in one color.

Monochrome ribbon can be:

- Alternating black and topcoat panels (KT ribbon)
- Continuous black (K ribbon)
- A continuous color, such as gold or silver

Monochrome Print Ribbon Kits

The following monochrome print ribbon kits are available:

- Black standard, up to 2500 images per ribbon
- White standard, up to 2500 images per ribbon
- Black premium bold, up to 2500 images per ribbon
- White premium bold, up to 2500 images per ribbon
- Silver standard, up to 2500 images per ribbon
- Silver premium metallic, up to 2500 images per ribbon
- Gold standard, up to 2500 images per ribbon
- Gold premium metallic, up to 2500 images per ribbon

Ribbon Saver

A roll of certified monochrome ribbon enables the Ribbon Saver feature in the printer. Ribbon Saver can increase the number of cards printed with each roll of ribbon because only the printed portion of the ribbon is used. Excess ribbon is not advanced, reducing waste.

Print Ribbon Storage Guidelines

- Store print ribbon in the original package until you load it in the printer. Keep the original packaging closed until you are ready to use the ribbon.
- The print ribbon maintains its quality for about one year. For optimum card quality, purchase and store quantities of print ribbon that can be used within one year.
- The print ribbon and card stock might require secure storage and tracking. Follow your organization's policy for storing and tracking the supplies used to make cards.
- Store the print ribbon in a location away from direct sunlight, with a temperature between 32° and 77°F (0° and 25°C). A range of 40% to 60% non-condensing humidity is recommended.
- Install supply rolls at room temperature. If supplies are stored in an environment that is cooler than the printer environment, allow supplies to reach room temperature before you use them.
- If the printer will not be used for an extended period, remove supplies from the printer and store them with new supplies.

Cards

For best results, use high-quality cards that meet the following specifications and recommendations.

Card Size

Use ISO ID-1 cards (also called CR80 cards). The cards have the following dimensions:

Length	3.37 inches	85.60 mm
Width	2.125 inches	53.98 mm
Thickness	• Print only: 0.024 to 0.040 inches • Magnetic stripe cards: 0.025 to 0.040 inches	• 0.610 to 1.016 mm • 0.635 to 1.016 mm

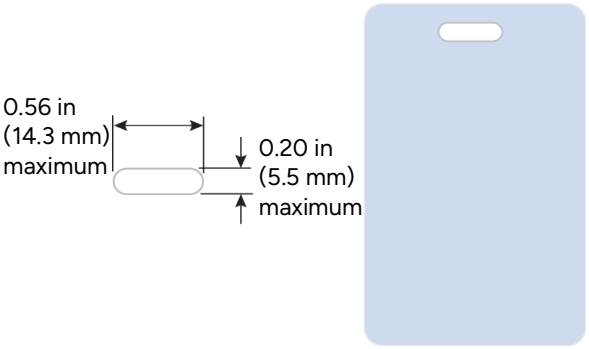
Actual card thickness can vary by up to ten percent from the sizes listed. The card bow must be less than the thickness of the card.

Card Material

Use cards with a glossy PVC surface, either 100% PVC cards or composite cards with a PVC surface. Cards can have a magnetic stripe on one side of the card, and a smart card chip on the front side.

Pre-Punched Cards

For best results, punch cards after printing them. The cards can have a punched area within 1 inch (25 mm) of the left edge, as the cards are loaded in the printer. If the card has a magnetic stripe, the card cannot be punched anywhere in the stripe.



New Cards for Color Printing

The printer is designed to print on new card stock. If you print on cards twice, be careful to avoid getting dirt, fingerprints, or other contaminants on cards before the second printing. Previous printing can interfere with printing and result in cards that do not have the appearance you want. Printing on cards that previously have been issued might introduce substances that interfere with card printing or damage the printer. If a previously printed card has been printed with topcoat, the card cannot be printed a second time.

Adhesive-Backed Cards

Adhesive-backed cards are printed, and then adhered to contactless smart cards when the card surface is not flat enough to print. Use only approved adhesive-backed cards with the printer. The printing surface (white side) of an adhesive-backed card meets the material requirements for use in the printer. Use the following guidelines:

- Store cards in a cool place (such as a refrigerator) to avoid adhesive migration.
- Clean the printer's card tracks to remove any adhesive residue. Use a printhead cleaning swab to remove the residue.
- Fan cards before loading them into the input hopper.
- Use a print margin of at least 0.05 inch when using adhesive-backed cards.

Card Quality Guidelines

Cards must meet the following card quality guidelines for the printer to print high-quality graphics on them successfully.

Card Surface

The card must be smooth and even, and free of irregularities such as raised burrs or particles embedded in the surface. Surface irregularities can cause printing voids, especially when printing edge to edge.

Card Handling

These guidelines apply to unprinted cards.

- Debris or particles on blank card stock reduces card quality and damages the system.
- Grease or oils, such as oils from your fingers, reduces print quality. Keep cards completely clean. Do not touch the print surface of a card with your fingers or hands.
- Handle blank card stock by the edges only, or wear approved card inspection gloves.
- Always place cards on a clean surface when removing them from the printer (for example, during cleaning).
- Do not use a rubber band to bind blank cards together.
- If you drop a card on the floor, clean it using a lint-free cloth before using it in the system.
- Never use solvents to clean the card.

Card Storage

These guidelines apply to both printed and unprinted cards.

- Stack cards so that they do not shift and rub against each other.
- When you store cards, make sure that no two cards contain images or blocks of color that come in contact with each other.
- Make sure that the magnetic stripe on one card does not come in contact with the magnetic stripe on another card.
- Make sure that cards with magnetic stripes are stored away from magnets and other magnetic objects.
- Store cards in a cool, dry, and dark place. Excessive light can cause yellowing of cards on exposed edges.
- Store cards in their original packaging.
- Cards must be at room temperature when they are used. If cards are stored in a cooler environment than the printer, allow them to reach room temperature before you use them.

Cleaning Supplies

All print ribbon kits include a cleaning card. Ribbon kits with a replaceable print ribbon also include a replaceable cleaning roller. For best results, keep additional cleaning supplies on hand.

The following additional cleaning supplies are available:

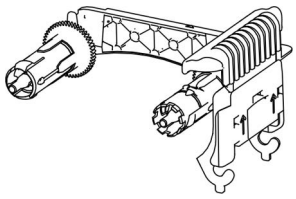
Supply	Description
Isopropanol cleaning cards	Pack of 10 double-sided, isopropanol-coated cleaning cards used to clean the printer card track and transport rollers.
Cleaning rollers	Pack of 5 replaceable, adhesive-coated cleaning rollers, used with the print ribbon cartridge.
Cleaning swabs	Pack of 5 isopropanol-saturated cleaning swabs to clean debris and dust from the printhead and from hard-to-reach internal areas of the printer.

Replacement Parts and Optional Equipment

The following items are available for the printer.

Print Ribbon Cartridge

The ribbon cartridge holds the print ribbon and the replaceable cleaning roller in the printer.



Cable Lock

The printer can be used with a cable lock.

Cables and Power Supplies

The printer uses the following data cables and power supplies.

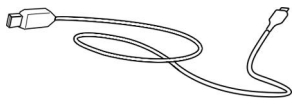
Data Cables

The data cable connects the printer to the network or directly to a PC. You can use one of the following data cables:

- USB
- Network (Ethernet)

Use only one type of data cable with a printer. If you need to connect more than one PC to a printer, use a network connection.

USB Cable



Use a USB-C data cable, 6 feet (2 meters) long, to connect the printer to the PC. Be sure to use a cable rated for USB 3.0 data transmission.

Network Cable

Use a standard Ethernet network cable, also called a Category 5 or Cat 5 cable, to connect the printer to a network port.

USB Smart Card Cable

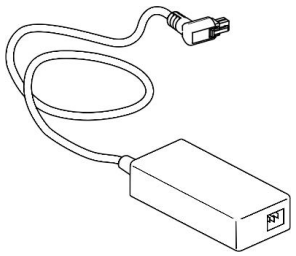
Printers that have a loosely coupled smart card reader use a USB data cable, up to a maximum of 6 feet (2 meters) long, to connect the smart card reader in the printer to the PC.

Printer Power Supply

The printer power supply is rated as follows:

- Input: 110–V240V, 50–V60Hz, 1.5A
- Output: 24V, 3.0A, 72W

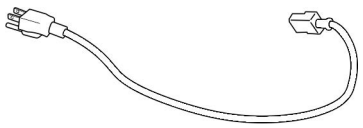
It is self-adjusting within the rated input voltage.



Power Cords

The power cords connect the power supplies for the printer, and any attached component, to the facility power. Be sure to use power cords that ground to the facility power source.

The following country-specific power cords are available:



- USA Power cord
- Australia power cord
- Brazil power cord
- China power cord
- Denmark power cord
- European power cord
- India power cord
- Israel power cord
- Italy power cord
- Japan power cord
- South Africa power cord
- Swiss power cord
- United Kingdom power cord

