

# XPS Card Printer Solution Guide

February 2011 Revision A

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# WELCOME TO CARD PRINTER SOLUTIONS

This manual describes the XPS Card Printer and how to use it to meet your organization's needs for a card printer system.

This manual provides advanced information for site managers, integrators, and others who are responsible for an ID system or planning an ID system. It provides information for setting up a successful card program and for ongoing delivery quality printed cards.

The card printer is a compact printer that applies personalization to plastic cards. Personalization includes printing, encoding magnetic stripe data, and reading or programming smart cards.

A desktop card printer is a self-contained unit that receives data from a PC (or other computer), personalizes the card using the data, and ejects the card. Desktop card printers have one or two cards in them at a time, and are designed to issue cards where the user is, called on-demand or instant issuance.

## FAST FACTS

- The printer is designed to issue cards either one at a time or in batches — up to 100 (0.030-in) cards at a time.
- A busy issuance site might issue up to 10,000 cards a month. During busy times, the site might use more than one printer to keep up with demand.

## NEW PRINTER FAMILY

The printer is part of a new family of printers that use new technology to expand their capabilities. Several notable features of the printer family are:

- A Windows driver which uses XPS print technology for professional, color-managed printing
- A printer-resident Web Server, named Printer Manager, which provides status information, access to printer settings, and troubleshooting tools
- A printer command language, called DPCL, which manages all aspects of printer operation

## INTENDED AUDIENCE

This manual is intended for technical professionals who are implementing a card-based solution. This guide provides information for setting up the advanced features of the printer such as magnetic stripe and smart card options, and provides detailed information on using the Printer Manager. It can also be useful for decision makers who will determine the features of a card-based solution.

This guide can also be helpful by end users who are being guided by their service provider through troubleshooting problems.

Contact your manager or service provider if you need help performing the tasks described in this manual. It is assumed that the user is familiar with the printer, browser-based user interfaces, and windows explorer navigation.

## CARD PRINTERS AND SOLUTIONS

This section describes solutions that include features which a card printer can support. Solutions include all components an organization chooses to implement the functionality needed. For example, a solution can be as simple as a photo ID with name and ID number, or a comprehensive secure access and payment system.

### PAYMENT CARDS, E-PURSE AND CASHLESS VENDING

A payment card can use a contacted or contactless chip.

- Machine-readable chips—contacted or contactless—can link card holders to a database of information, or can contain information about accounts, balances, etc.
- A payment card can use a magnetic stripe.
- Magnetic stripes can be read by inexpensive readers and can contain a variety of data, such as name, id number, and current balances. Magnetic stripe data can also be updated on the spot.
- A payment card can use a bar code.
- Bar codes can be read by inexpensive readers in a variety of environments to link card holders with their data.

### ACCESS CONTROL

An access control card can have a magnetic stripe.

- Magnetic stripes can be read by inexpensive readers and can contain a variety of data, such as name, id number, and/or access profile.
- Custom magnetic stripe formats permit use of the format of your choice.
- An access control card can work with proprietary systems.
- Smart cards are one of several access control systems supported by card printers.
- An access control card can have a bar code.
- Bar codes can be read by inexpensive readers in a variety of environments to link card holders with their data, such as a security profile.

### TIME AND ATTENDANCE

A card can interface with automated systems, such as time and attendance, using a magnetic stripe, a bar code, or smart card.

### MULTIPLE TYPES OF IDS FOR ONE ORGANIZATION

Many organizations plan to use more than one type of card, and need a solution that provides the correct card when needed. For example:

- Schools might need faculty, staff, student, volunteer, and visitor cards.
- Casinos might need loyalty cards and staff IDs.

## MULTI-PURPOSE CARDS

- Many cards serve more than one purpose.
- School IDs can provide building access, access to a payment system, and be used to check out library books, in addition to identifying those authorized in the school. School IDs can also serve as ATM cards, phone cards and bank affinity cards. Affinity cards combine a bank's credit or debit card with the logo of an organization such as the school alumni association. The organization receives a small percentage of the purchases made with the card.
- Business organizations may require secure IDs to provide building access and as part of a two-factor ID for network access. Cards might also be used for cashless payment, transit, and other secure transactions.
- Casino loyalty cards might also need to work as room keys. Casino staff IDs might be used to track time and attendance and provide access to secured areas, in addition to identifying staff members.

## SECURE CARD ISSUANCE

In addition to card feature requirements, organizations can have requirements for the management and issuance of cards to ensure security. Tracking of cards, securing supplies, operating system security, and securing the printer in its location can reduce or eliminate the opportunity for unauthorized users to access the printer. All printers include a lock receptacle for a cable-style lock (a popular brand is a Kensington® lock).

- The printer driver provides card counters and card status which lets you track the result of each card job.
- The Printer Manager can also be used to provide secure access to the printer and its settings.

## HOW THE PRINTER WORKS

The printer performs all actions through jobs. Jobs are submitted using an external source such as the printer driver or an internal source such as the Printer Manager or the Front Panel on the printer. The printer can send two different types of jobs—a card job or an exception job.

A Card Job includes actions such as pick or print and add magnetic stripe data. A card job results in a card processing and being counted as successful or unsuccessful.

An Exception Job also has actions, such as get settings, and can have data, such as an IP address. Any cards picked for exception jobs are counted in total picks, but not in other card counts.

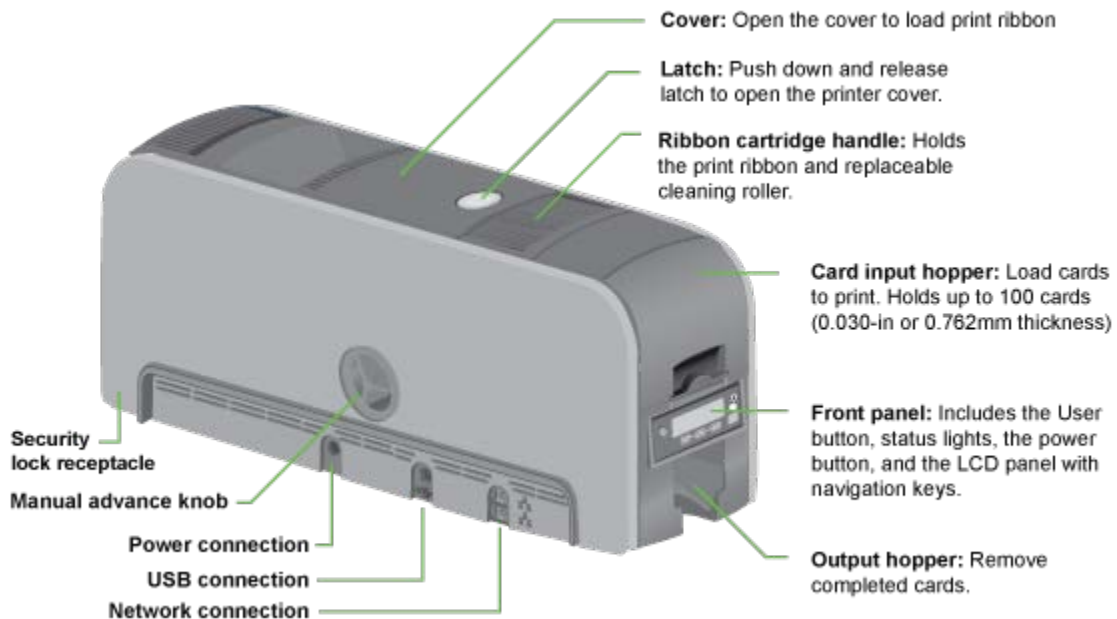
The printer maintains a queue that can up to two jobs in it. Jobs are processed in the order received. If the queue has a print job, the queue accepts the next job submitted. If the queue receives an exception job, the queue blocks any additional jobs from being accepted.

Using the front panel, including suspending the printer and using the menus, blocks other jobs from being accepted. Using the Printer Manager momentarily blocks other jobs, when a request is submitted and the response is provided. Because these actions are very short in duration, blocking is not often noticed. Only one Printer Manager session per printer is allowed. Any additional requests for Printer Manager sessions will be blocked.

## PRINTER COMPONENTS

This section describes the components from the outside of the printer and the internal components of the printer. A duplex-option printer is shown in the illustrations.

### OUTSIDE OF THE PRINTER





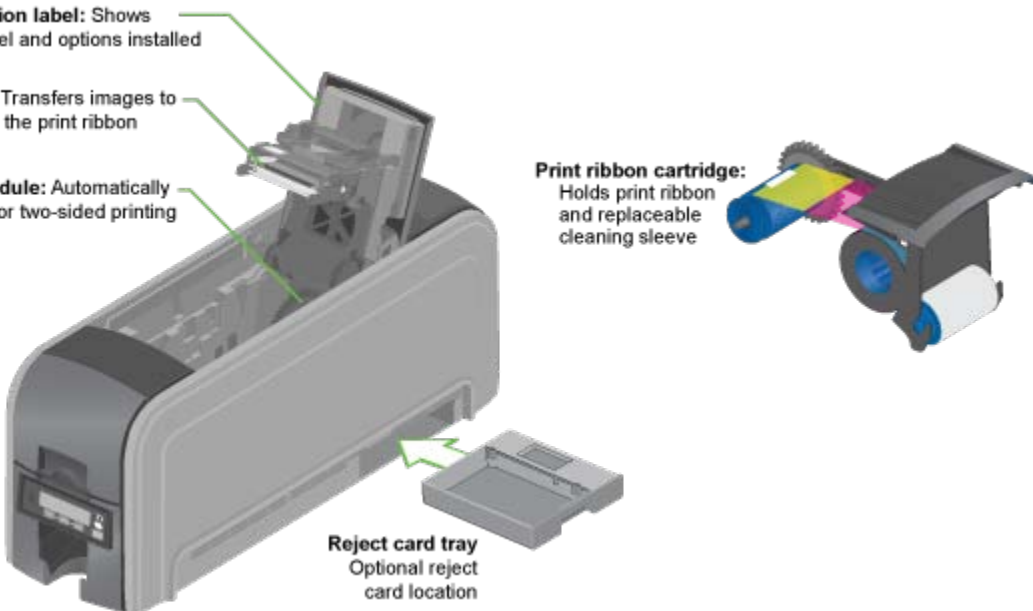
# INSIDE THE PRINTER

**Configuration label:** Shows printer model and options installed

**Printhead:** Transfers images to cards using the print ribbon

**Duplex module:** Automatically turns card for two-sided printing

**Print ribbon cartridge:** Holds print ribbon and replaceable cleaning sleeve



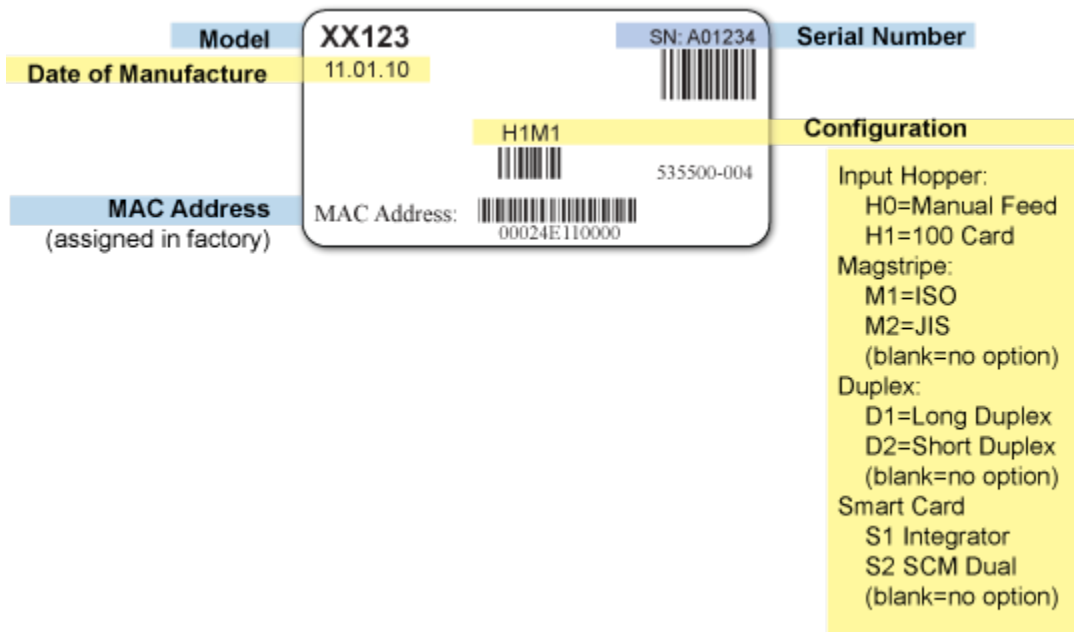
## PRINTER CONFIGURATION LABEL

The printer has a label on the side of the cover arm that shows the components installed. Find the label on the side of the cover arm:

- Printer name, which also appears on the model label
- Configuration, which includes options in the printer:
  - Date and country of assembly
  - The MAC address to use when the printer is connected using an Ethernet network



The printer label provides information that is useful when requesting service. It can also help you know the components installed. Some components might be installed by the dealer or sales group. The information for those items should be hand-written on the label.



## FEATURES SUPPORTED BY PRINTER MODEL

To determine whether your printer has an optional feature, see the configuration label on the printer. The following table lists some of the features available for card printers. For more information about the features of each printer, and options available, see the product data sheet

| Printer Feature               | SD260       | SD360 | CD800 |
|-------------------------------|-------------|-------|-------|
| Full-color printing           | X           | X     | X     |
| Bar code printing             | X           | X     | X     |
| Two-sided (Duplex) printing   | Manual only | X     | X     |
| Print and/or topcoat blocking | X           | X     | X     |
| Magnetic stripe option        | X           | X     | X     |
| Smart card option             | X           | X     | X     |
| Built-in Ethernet             | X           | X     | X     |
| Kensington™ locks             | X           | X     | X     |
| High-Capacity Output Hopper   | X           | X     | X     |
| 200-Card Input Hopper         |             | X     | X     |
| Input Hopper Empty            | X           | X     | X     |
| Reject Card Hopper            |             | X     | X     |
| High Resolution Printing      |             |       | X     |

## PRINTER THROUGHPUT

Throughput is a measure of how many personalized cards a printer produces within a period of time under ideal conditions. The specific throughput, sometimes called speed, is posted on the Web site for the printer and on the printer data sheet, which can be downloaded from the Web site.

For the manual-feed printer, the speed is provided in seconds to print a card. A throughput test assumes that the print ribbon is in place, the card is already placed in the input slot, and that no messages appear during the test.

For all other printers, throughput is measured by printing several sets of cards, measuring the time from the beginning of the second card to the end of the set, and then determining average cards-per-hour.

The “ideal conditions” used to measure throughput include:

- All printer supplies are installed and do not run out
- No errors or messages occur
- All cards are sent to print at the same time, so print jobs are in the print queue waiting for the printer to be ready
- Simple card design
- Non-printing personalization, such as encoding a magnetic stripe or a smart card, is not used
- A PC dedicated to card production with no applications other than ID software running

The throughput numbers are designed to permit product comparison. Throughput numbers should not be used to estimate the time it will take to print your cards. In a production environment, supplies must be loaded, operators take breaks, and the overall environment for printing cards affects how quickly cards print. For example, if you are printing ID badges on demand, the operator will retrieve or enter the name, take the photo, and enter any other data before sending the card to print. The other tasks take longer than printing the card, and so will determine the throughput for the entire system.

## IMPLEMENTATION CHOICES FOR FEATURES

Many features have more than one method or choice available for implementing them. This section describes the choices available.

### MAGNETIC STRIPE

Magnetic stripe encoding requires two steps:

- Settings in the printer to obtain the desired result
- Formatted data to encode

### SETTING VALUES

The Printer Manager provides magnetic strip settings and the ability to customize formats. To use proprietary formats, you must have a business relationship with the owner of the format, who will provide you with the requirements for encoding the format.

The Front Panel of the printer provides the ability to set magnetic stripe coercivity and several addressing features such as setting the type of IP address –static or DHCP, entering IP, Subnet Mask, and Gateway Addresses. You can also view card counts and other printer information from the Front Panel.

### FORMATTING DATA

The following choices are available:

- ID software can format the magnetic stripe data to send. ID software for Windows is commercially available.
- In a Windows environment, you can write an application to format magnetic stripe and other data.
- Magnetic stripe fonts can be used in the Windows environment. Fonts in the Windows driver correspond to format of the track written.
- Escape codes can be used when using the Windows printer driver. Escape codes allow the printer to be compatible with applications that were designed for other printers. Escape codes provide a limited ability to customize magnetic stripe formats.
- The printer can be used to encode the magnetic stripe without printing on a card. The Windows driver contains a setting to enable this feature. For more information on encoding magnetic stripe without printing, see the XPS Card Printer Installation and User Guide.
- The default format for data depends on the type of magnetic stripe module installed:
  - A three-track module encodes IAT data by default. This format is sometimes called ISO format.
  - A single-track module encodes NTT data by default. This format is used in Japan and is sometimes called JIS-II format.

## SMART CARD

A smart card is a card with one or more integrated circuits embedded in the card. Other names are chip card, integrated circuit card, or IC card. Cards can be memory cards or microprocessor cards. Memory cards contain memory storage components. Microprocessor cards contain memory and microprocessor components. All cards can have security features built in.

Cards can be contacted or contactless cards. One card can also include both technologies, called dual-interface cards. Both types take advantage of the power used to program or read the card as the power for card operations. Some smart cards have cryptographic tools to generate key pairs on board, useful for digital signatures and secure IDs. The system used with the smart card might require additional identification methods, such as biometrics. That data can be stored on the card to support multi-factor ID systems.

## SMART CARD READERS

The hardware that communicates with the card is called a reader. In the past, some were called couplers. A smart card module in the printer includes a reader. Depending on the type of card and the type of reader, the reader might have read-only or both read and write functionality.

The system that uses the card, such as an access system or payment system, also includes readers at the location in which the card holder accesses the system. The system reader can be connected to data components (a database), application components, or other parts of the overall system.

Readers must match the card type and features used. For example, a contact card reader cannot read contactless cards, and different types of contactless cards must be matched with readers that read the frequency and proprietary format of the card. Even dual interface readers (which can read contacted and contactless cards) are designed for specific card specifications.

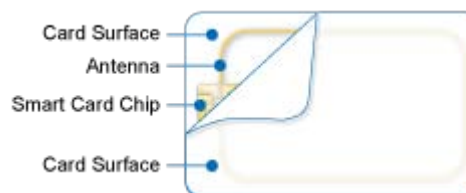
## CONTACT CARDS

Contact cards have electrical contacts on the card. The actual chip is embedded in the card under the contacts. Physical features of the card are specified by the ISO 7816 standard.



## CONTACTLESS CARDS

Contactless cards contain one or more contactless integrated circuits within the card and an antenna. Some cards operate at 125Khz. Newer 13.56 MHz contactless RFID cards are covered by the ISO 14443 (Contactless Smart Card) standard in addition to the ISO 7816 standard. Both types are sometimes called proximity (or prox) cards, although some manufacturers prefer to call those that operate at 125 KHz “prox” cards. Within the ISO 14443 standard, different protocols are possible, and some have proprietary names, including Mifare and iCLASS by HID.

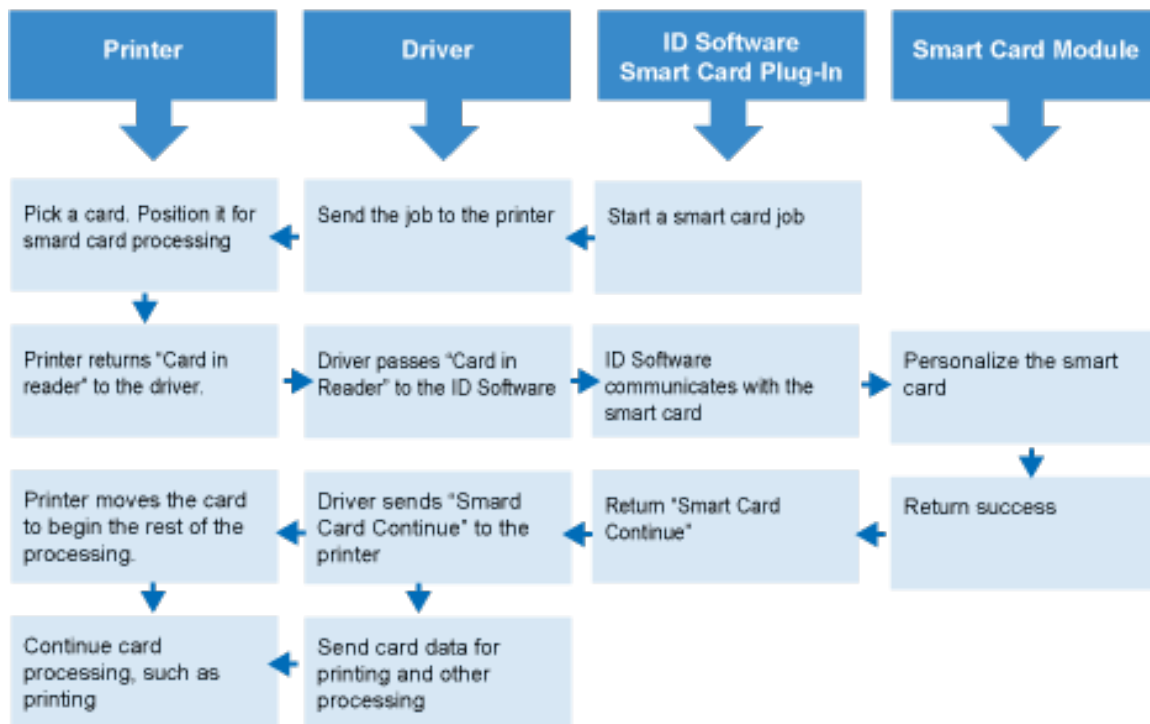


The contactless card reader presents an electrical field and the card is positioned within range of the field. The cards use an integrated circuit chip, a capacitor and a coil to detect and react to the field. Typically, they have a range of 0-4 inches. A more powerful reader and a larger antenna can increase this distance somewhat. Some cards are battery powered and have a range of a few feet. These cards are too thick to be used in the card printer.

Cards used for access control, such as iCLASS cards, can have a serial number, which is the only data transmitted. The security system associates that serial number with a user and their access profile. Serial numbers are created to ensure unique numbers for each card. Often, the first several bits are identical, which is called the facility code or site code.

### SMART CARD PROCESSING

This section presents information about how to set up a system if you are personalizing smart cards. Smart card processing is different from other types of personalization, because the "smart card" step of personalization is controlled by an application module, such as a smart card application plug-in that is different from the rest of card personalization. If you are not using a purchased ID software package that includes a smart card application plug-in, the integrator needs to write this part of the application.



## REQUIREMENTS FOR SMART CARD PROCESSING

To personalize a smart card, you need to obtain or create the following:

- A direct local (USB) data connection between the printer and the PC. The printer cannot be connected using printer sharing or printer pooling. Network connections of any kind are not supported.
- Smart card reader (coupler) in the printer.
- A USB smart card cable to connect the smart card port on the printer with a port on the PC.
- ID software that is customized to work with the card printer and the smart card, using the XPS Driver SDK and one of the following:
  - A smart card plug-in that works with the ID software.
  - A software module written using the SDK for the smart card and reader type.
- Smart card application module (which uses the SDK for the smart card and reader type).
- Smart cards that work with the reader in the printer.

Several smart card options are available, either as factory-installed options or as field upgradable options.

All smart card options require a customized application to communicate with the smart card. An application plug-in or the customized application manages the communication with the driver. (The customized application uses both driver and smart card programming interfaces.)

The options are:

- Dual contacted/contactless The dual smart card reader from SCM Microsystems® can communicate with contacted and Mifare® contactless smart cards, or cards with both contacted and contactless components. SCM drivers for Windows are available on the printer Web site. SCM® also provides a Software Development Kit (SDK).
- iCLASS® by HID® Read / Write The iCLASS® solution supported in the printer is from RFIDeas®. It uses input device drivers for the Windows environment, which are included with Windows. RFIDeas provides a utility to configure the reader. RFIDeas also sells code samples and an SDK for customizing an application. You must write or use a customized application to communicate with the card.



## CARD DESIGN

Card design is the name given to the combined features of the printed cards. Cards are useful only when all cards contain the required information.

Card design includes:

- The card design includes the different types of data (name, ID number, and so on), images (logo, photo, and so on), and special features such as a bar code, magnetic stripe, or smart card on the card.
- Card design also includes the way those components are arranged.
- A card design should be created in one application and all of the information for a card must be sent as one print job.
- Card design includes processes, such as applying topcoat to improve card security or card life.
- Card design frequently includes quality guidelines. For example, corporate style guidelines might require that a specific shade of red be used for a logo.
- An organization might have more than one card design. For example, a health club is likely to produce member cards and employee cards.



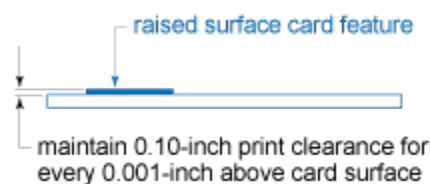
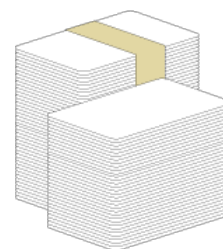
## SEQUENCE OF TASKS

1. Set up all components of the ID system, which might include the printer and driver, ID software, database (if any), photo capture system, and other devices such as a smart card reader.
  - a. Make sure that data transfers correctly to and from each component of the system.
  - b. For the photo capture systems, set up lighting, distance, and backdrop to produce consistent quality images. Choose an area that has consistent lighting throughout the day.
  - c. If photographs are already taken and will be retrieved from a database, some photos might be lower quality than others. Develop a plan for addressing photo quality problems.
2. Set up the card design using the ID software. Be sure the design includes all the data required, such as a logo, a photo, text, and a bar code. Print samples and test any machine-readable components.
3. Test the card design under a variety of real-world conditions.
  - a. If using batch printing, test cards from the beginning, middle, and end of the batch.
  - b. If the card has machine-readable components and you are using both indoor and outdoor readers, test both, especially in unfavorable weather conditions.
  - c. Test a variety of user types, including those who will use the card most often.
4. Address print quality requirements.
5. Begin card production.

## SUPPLIES QUALITY

To achieve the best quality cards, follow these guidelines.

- Choose glossy PVC cards, or composite cards with a glossy PVC surface, which are designed for full-color and monochrome printing.
- Optional features, such as a magnetic stripe or a signature panel, should not be visibly raised from the surface of the cards.
- If you print smart cards, contact your card manufacturer or integrator to learn the recommended areas for printing important features, such as photos, on them.
- Contactless cards up to 0.037 in or 1.0mm thick can be read in a card printer.
- For best results, print on cards only once. Do not print over ink, solvents, or any chemicals. Damage to the printer can result.



The cards you purchase have a substantial impact on the final appearance and performance of the cards you print. To produce printed cards with consistent, quality printing and personalization, compare several brands before you make a purchase decision. The internet provides access to many vendors who provide specific types of plastic cards. Entering the features you want in your chosen search engine, such as PVC cards, high-coercivity magnetic stripe, and so on, can result in a choice of vendors from whom you can purchase small quantities of cards.

If possible, test the cards in real-world conditions to see how the card design performs when printed on each brand of card. Look for consistent printing, no yellowing, physical durability of the card, durability of components such as magnetic stripe, and how well the machine-readable components perform.

Often, the cost per card can be a deciding factor in choosing one type of card over another. However, if cards must be reprinted due to quality problems, such as printing voids or loss of machine readability, the cost per card will increase.

## CARD LAYOUT

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

### BACKGROUNDS

The following suggestions can help you select background components for a professional looking card. The design should not show the location of any card features such as embedded electronics and should avoid variations in the color or evenness of background areas.

- 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 or half tone over a large area of the card. It can show flaws on the card (such as uneven surface) or the location of card features (such as a smart card chip).
- Avoid half tones, especially gray, which can highlight the location of card features and flaws.

## IMAGE PLACEMENT

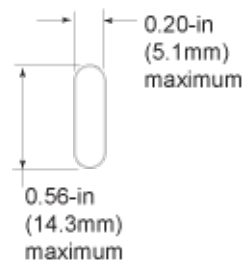
The following suggestions can help you locate important images, such as a photo, logo, or bar code. When placing images, avoid areas of high wear and avoid uneven areas which can result in inconsistent print quality.

- 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.
- Important images can include the photo, logo, and bar code.
- Do not place an important image directly on the opposite side of a signature panel. Residue from the panel can cause printing problems on an adjacent card. Place the image above, below or to the side of the panel.
- Avoid uneven areas which can result in inconsistent print quality.
- Do not place an important image over a contactless chip because the surface of the card might not be even in that area. Contact your card manufacturer to learn the location of the chip in the type of card you use.



## BADGES

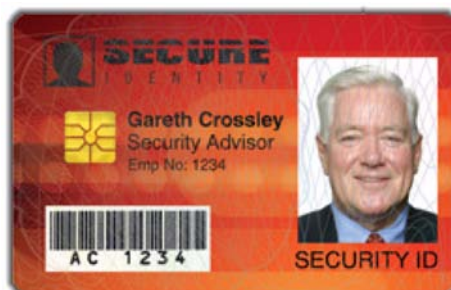
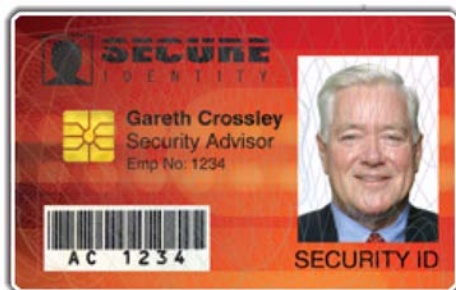
If cards are used as badges, you might want to punch a hole or slot after printing so cards can be attached to clips. The illustration shows the maximum size for a slot. A smaller slot will be stronger and contribute to durability in the slotted area.



## MARGINS

Any unprinted area at the edge of the card is called the margin. Some card printers can print edge to edge, which is the same as a margin of zero (0) or no margin.

- The card printer supports edge-to-edge printing, or printing without margins. The card on the left, below, shows a margin of white space at the outer edge of the card. The card on the right shows edge-to-edge printing.



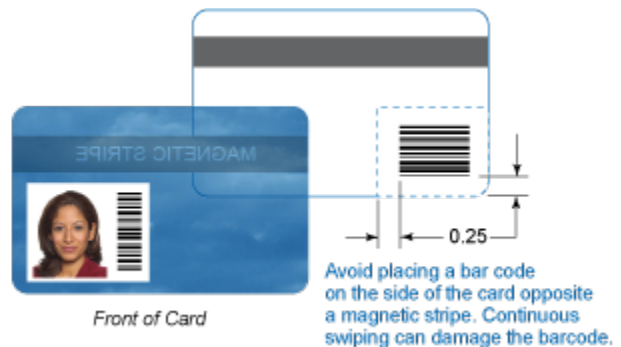
- Some contactless cards also support edge-to-edge printing. Contact your card manufacturer to learn whether the cards you will use support edge-to-edge printing.

- Edge-to-edge printing can require fine-tuning the printer and the card design. Include this task as part of setup.
- 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 0.1 inch (2.5 mm) from such a feature. (The background of the card shown above is litho-printed before the smart card chip is embedded; therefore no margin appears around the chip. The photo, bar code, name and other text are printed by the card printer.)

## BAR CODE PRINTING

Bar codes will print more successfully when you follow these guidelines:

- Maintain the required quiet zone around the actual bar code.
- Locate bar codes at least 0.25 inch (6.3mm) from other printing and from the edge of the card. This space is called a “quiet zone” and is required for reading bar codes.
- Print bar codes with a monochrome ribbon or the monochrome (K) panel of a full-color print ribbon. Make sure the color used to print the bar code works in your bar code readers. (Infrared readers require that the K panel be used to print the bar code.)
- For best results, orient the card so the bars are parallel to the long edges of the card, as shown. This orientation is the most accurate one for printing readable bar codes.



- A bar code that uses more width can be easier to read, because the bars are larger. In the example shown, the format is the same (code 3 of 9). The font size sets the width of the bar code (and therefore the bar code density). (In the example, the font size also controls the height. Your method of generating bar codes might be different.)
- The width of the narrow elements in the bar code must be large enough to be read consistently. The bar code reader might affect this.
- The bar code must be tall enough to be read under normal conditions.
- The ANSI standard for bar code quality (X3.182) assigns a grade to a bar code to indicate its readability. Choose a K power value and bar code size to produce the grade needed by your system.
- Cards used 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.



- Always test the readability of bar codes under production conditions. Factors to consider include:
  - If you will print cards one at a time, make your samples that way. If you will print cards in batches (many cards sent at the same time) use a production-sized batch and test cards from the beginning, middle and end of the batch.
  - Use exactly the same cardstock for testing that you will use for production.
  - Include other card design components, such as topcoat, that you will use in production.
  - Use the same readers as users will have, and test each card multiple times to simulate any wear the card might experience. Also test multiple cards.

## CHANGING A CARD DESIGN

If you make substantial changes to the way you produce cards, review setup tasks to make sure cards continue to have the quality you require. Substantial changes can include:

- Change from batch processing to issuing single cards (or change from issuing single cards to batch processing). Check for differences in K printing and full-color printing.
- If you print bar codes, test several card produced using your new method to make sure they are readable on several “live” readers in the system.
- Purchasing a new brand of unprinted cards, which might change the color of some images.
- Changing to or from pre-printed cards, which might change the color of some images.
- Moving the ID system to a new location, where environmental changes such as amount of light or relative humidity can affect images, supplies, or printer operation.

If you change the design of your cards, or if you start producing an additional card design, review setup tasks to make sure each design prints as required. You might identify changes to your process to support printing of two different designs.

## WHAT IS AN ACCEPTABLE CARD?

An acceptable card is one that meets the requirements for the card. In other words, an acceptable card has all card design features printed or encoded successfully.

If you are setting up the card design and an operator will produce the cards, provide card quality guidelines to the operators. The guidelines should include all requirements that the cards must meet, how to evaluate the quality of the card, and the minimum requirements the card must meet to be issued.

**When establishing requirements for a card, consider the following:**

- The card is oriented correctly and printed elements are in the correct position.
- The magnetic stripe, bar code, or smart card can be read on more than one “live” reader in the system.
- Automated fields, such as a field read from a database or inserted by mail merge, are always produced correctly and do not become corrupted by typical occurrences (such as when an email server is polled).

- If using batch printing (where many cards are sent at a time and the printer operates continuously), test the first card of the batch and the 20th card, and later cards of the batch to verify they have a consistent appearance and functionality.

### **TIPS FOR SUCCESS**

- Handle cards carefully to protect the cards from damage and to ensure consistent printing quality. Do not scratch the cards when opening the package. For example, be very careful if using a knife to open the package.
- Wear gloves when handling unprinted cards. Make sure the gloves are not powdered because powder can affect print quality.
- Do not touch the surface of cards before printing them because oils on your hands can cause discolored or smudged printing. Handle card by the edges if you touch them with your hands.
- Check cards for dust or debris before loading them in the printer. Each package of cards can vary in the amount of dust in the package. If you notice an unusual amount of dust or debris, you can clean unprinted cards with 99% isopropanol (IPA) and a soft, lint-free, non-scratching cloth. As an alternative, you can change the printer's replaceable cleaning sleeve and run a cleaning card more often. Use only isopropanol (IPA) on cards to be personalized in the printer. Other compounds can damage printer components.
- Change the replaceable cleaning sleeve and run a cleaning card at least after every 500 cards. For best print quality, change the replaceable cleaning sleeve and run a cleaning card after every 250 cards (or more often) if your cards or environment require it.
- Clean the printer after every 100 cards when using adhesive-backed cards. Maintain a clean work environment to prevent dust or debris from entering the printer and affecting the quality of printed cards. Do not drop cards. A card that has been dropped can be cleaned with 99% isopropanol (IPA) and a soft, lint-free, non-scratching cloth.
- Do not clean and use damaged cards, which can damage printer components.
- If the printer picks more than one card at a time, slide or fan cards to separate the edges of the cards. Be careful not to bend the cards. Be careful not to touch the printing surface.

### **GUIDELINES FOR USERS**

You can give the following guidelines to card users to improve card life.

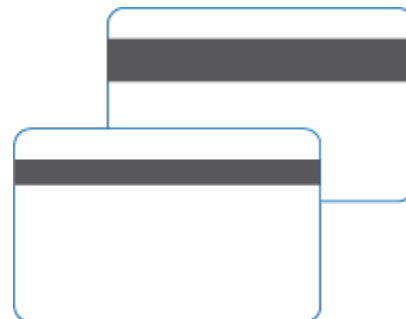
- Keep your card in a protected place such as a purse, wallet, or jacket pocket.
- Keep out of direct sunlight, which can warp the card. Avoid physical damage to the card. Do not bend or twist the card. Do not use the card as a tool, such as for scraping.
- Do not subject the card to physical impact.
- Do not pound on the card or leave it in clothes which are put in a washing machine.
- Do not punch holes in the card. If you need to attach the card to a clip, ask the card issuer to punch the card in an allowed area. (Some cards are not intended to be punched at all.)
- Do not expose the card to extreme temperatures, especially heat.
- Do not expose the personalized card to solvents, such as alcohols, mineral spirits, acetone and so on. The solvents can damage or remove printing on the card. Clean the card with water and a soft, non-scratching cloth.

## MAGNETIC STRIPE

Magnetic stripe is an option available in most printers. Two options are available: Single-track and three track.

This section includes:

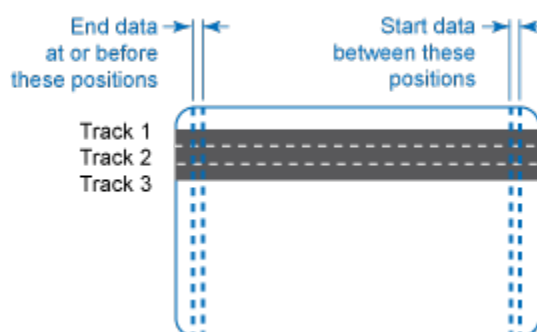
- About Magnetic Stripe Encoding
  - About the Data Format
  - About Coercivity
  - For More Information
- Magnetic Stripe Module
- Magnetic Stripe Data
- Character Sets
- Magnetic Stripe Settings Used by the Printer



### ABOUT MAGNETIC STRIPE ENCODING

Encoding arranges the particles in the magnetic material to represent data. The International Standards Organization (ISO) specifies characteristics of the stripe, the location of data, and other details. (The standard is included in ISO/IEC 7811. The Japanese Industrial Standard 6302 Type I matches the ISO/IEC 7811 standard.)

The illustration shows several of the features that the standard specifies for three-track cards. (Three-track means there are three lines of data on the stripe.) Encoding occurs when a current is introduced, which aligns the magnetic particles on the stripe. The current is measured in milliAmps (mA), and corresponds to the strength of the alignment, called coercivity. Cards can be read by a magnetic stripe reader after they are encoded. The printer both encodes data and then reads it to verify that it was encoded correctly.



If you are encoding cards with data already on a particular track, the track can be turned off using the Printer Manager. See [Printer Manager WebAdmin Access Level](#) for more information.

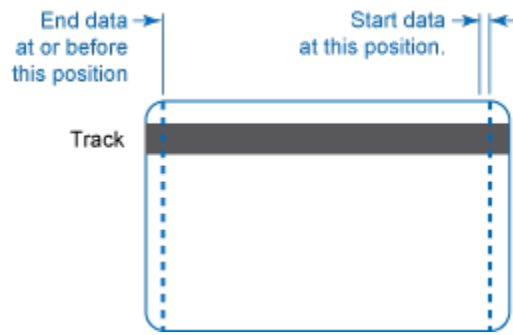
### ABOUT THE DATA FORMAT

A magnetic stripe data format defines the data (characters) that can be encoded, the density of the data, the number of bits per character, and control codes. The data format also specifies the location of the track and the number of tracks. The data format specified for the three-track card by ISO standard 7811 is the default value used by the printer with a three-track magnetic stripe module installed. The standard allows two coercivity values (HiCo and LoCo); the printer uses high coercivity (HiCo or 150 mA) by default.

The Japanese Industrial Standard (JIS) Type II includes specifications for encoding Unicode Katakana characters. It uses a single track and specifies physical characteristics.

The illustration shows several features of a card that meets the JIS Type II standard:

- The printer with a single-track magnetic stripe module uses the format specified by the JIS Type II standard as the default. This standard includes three coercivity values, and the default coercivity for the single-track head is 50 mA (NTT 1 in the driver). Both types of magnetic stripe head can use all coercivity settings supported for the printer.
- You can set the data format, coercivity, location of data, and other values. Some formats meet standards set by organizations that retain rights to the format (proprietary formats). You can also set values not specified by a standard, called a “custom format.” When you create a custom format, it is important to record the values used, because they cannot be retrieved for use in another printer.
- Control codes for a data format include the start sentinel, end sentinel, parity bit, and check digit for each track. See "Magnetic Stripe Settings Used by the Printer" for default control codes and other values for the formats. See "Character Sets" for allowed characters for default formats.



## ABOUT COERCIVITY

Coercivity is a property of the magnetic stripe material on the card. It measures how difficult it is to change the polarity or alignment of magnetic media. (A higher coercivity requires more energy to encode and is more resistant to external magnetic fields.)

The coercivity is a system-wide decision: The magnetic stripe readers which will read the cards encoded by the printer are likely to require a specific coercivity value. Card stock is purchased to match that coercivity value.

The ISO 7811 magnetic stripe specification (IAT) for three-track encoding provides two choices for coercivity:

- High Coercivity (HiCo) 150 mA
- Low Coercivity (LoCo) 25 mA
- The JIS 6302 Type II specification (NTT) for single-track encoding provides three coercivity choices:
  - 50 mA (NTT 1 in the LCD panel)
  - 75 mA (NTT 2 in the LCD panel)
  - 100 mA (NTT 3 in the LCD panel)



## MAGNETIC STRIPE MODULE

The printer can have a three-track magnetic stripe head or a single-track head (or no magnetic stripe module). The printer firmware has default settings, which can be changed if needed.

The default data format in firmware for the three-track head is:

- International Air Transport Association (IATA) on track one
- American Bankers Association (ABA) on track two
- Thrift Third Shift (TTS) on track three

This data format is abbreviated IAT and corresponds to the set of ISO standards for three-track magnetic stripe used on financial cards. The standards are ISO/IEC 7811 / 1 - 6.

The default data format in firmware for the single-track head is Nippon Telephone and Telegraph (NTT), more correctly called the JIS 6302 Type II standard. ISO 7812 and 7813 standards specify compatibility between ISO and JIS standards.

## MAGNETIC STRIPE ENCODING

The printer can receive magnetic stripe data in one of the following ways:

- From a Windows application, such as ID software, that identifies and formats the data using the driver programming interface.
- From a Windows or Linux application that uses magnetic stripe fonts to identify and format the data.
- From a Windows application that uses escape codes to identify and format the data.

Do the following to set up the printer and driver to encode magnetic stripes on cards:

- Identify the encoding format and how it will be formatted (using magnetic stripe fonts or using escape codes).
- Choose which tracks to encode. Use the Printer Manager to select tracks. The track format determines the characters that can be encoded and the number of characters allowed in the track.

### TIPS FOR SUCCESS:

- If you plan to use a custom magnetic stripe format, use the Printer Manager to change printer settings. You must be an Advanced user to set up a custom magnetic stripe format.
- Proprietary formats, used for applications such as driver's licenses or hotels, can be used with the printer. You must have a business relationship with the owner of the format to obtain specifications. Provide guidelines to the customer for settings to use and actions to avoid.

## MAGNETIC STRIPE DEFAULTS

The XPS Card Printer Driver detects the magnetic stripe hardware in the printer and does the following by default:

- For printers with single-track modules, the driver formats the data for encoding using the JIS Type II (NTT) format. The NTT choice is the default in Printing Preferences.
- For printers with three-track modules, the driver formats the data for encoding using the IAT format, which is also called ISO format. The IAT choice is the default in Printing Preferences. If you choose a specific format or coercivity in Printing Preferences, the driver attaches format and/or coercivity data to each magnetic stripe job sent.
- If you set up customized formats, choose “Use Printer Settings” in Printing Preferences (so the driver does not send the format setting with each job). Some custom formats require an application customized using the Software Development Kit (SDK).
- In the driver, HiCo and LoCo are the coercivity choices for a three-track head, and NTT 1 is the default for a single track head.

## MAGNETIC STRIPE SETTINGS USED BY THE PRINTER

The following table presents technical details that apply to encoding magnetic stripe data.

|  | AITA       | ABA      | TTS      | JIS II   |
|--|------------|----------|----------|----------|
| <b>Character Differential</b>  | 32         | 48       | 48       | 0        |
| <b>Start Sentinel (SS) (ASCII character)</b>   | % (37)     | ; (59)   | ; (59)   | (127)    |
| <b>End Sentinel (ES) (ASCII character)</b>   | ? (63)     | ? (63)   | ? (63)   | (127)    |
| <b>Lowest ASCII Character</b>  | Space (32) | 0 (48)   | 0 (48)   | (1)      |
| <b>Highest ASCII Character</b>   | _ (95)     | ? (63)   | ? (63)   | (126)    |
| <b>Character-Level Parity (VRC)</b>  | Odd        | Odd      | Odd      | Even     |
| <b>Cumulative Parity (LRC)</b>   | Even       | Even     | Even     | Even     |
| <b>Density, in dots-per-inch</b>   | 210        | 75       | 210      | 210      |
| <b>Data, in bits-per-character</b>   | 6          | 4        | 4        | 7        |
| <b>Maximum Encodable Characters</b><br><i>(excludes start and end sentinels and LRC bit)</i> | 76         | 37       | 104      | 69       |
| <b>Encode Direction</b>  | SS First   | SS First | SS First | SS First |

## MAGNETIC STRIPE FORMATS

This section lists the default character sets for the printer.

The IATA, ABA, and TTS character sets are the defaults for the three-track magnetic stripe module, and the JIS Type II character set is the default for the single-track module.

### THREE-TRACK OPTION

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 called ISO format.

### IATA (International Air Transport Association)

The maximum number of characters for IATA format is 76 characters. These characters can include spaces, upper case alphabetic characters, numeric characters, and the following special characters:

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

### ABA (American Bankers Association)

The maximum number of characters for ABA format is 37 characters. Numeric characters and the following special characters are allowed:

: ; < = >

TTS (Thrift Third Standard)

The maximum number of characters for TTS format is 104 characters. Numeric characters and the following special characters are allowed:

: ; < = >

### SINGLE-TRACK OPTION

The default data encoding format for a single-track magnetic stripe module is the JIS Type II format.

### JIS (Japanese Industrial Standard)

The maximum number of characters for the JIS format is 69 characters. These characters can include spaces, numeric characters, upper case alphabetic characters, lower case alphabetic characters, and the following special characters:

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

From a PC running a Japanese edition of a supported Windows operating system Japanese-language characters are also supported. They include the following special characters:

。 『 』 、 ・ ー っ 。

45 Katakana characters:

ア イ ウ エ オ  
カ キ ク ケ コ  
サ シ ス セ ソ  
タ チ ツ テ ト  
ナ ニ ヌ ネ ノ  
ハ ヒ フ ヘ ホ  
マ ミ ム メ モ  
ヤ ュ ヨ  
ラ リ ル レ ロ  
ワ                      ン

and the following 10 Katakana characters:

ヲ アイウエオヤユヨツ

Each time you start using Japanese-language characters, or stop using them, a hidden character is added. Each hidden character reduces the number of characters you can encode by one character.

## SMART CARD MODULE

Solutions that include a smart card (including contact cards and contactless cards) require software that can communicate with both the printer and the card reader. Some ID software applications include a smart card plug-in, design tool, or a similar module that can communicate with the card reader. Not all cards will be supported by a smart card plug-in. If the type of smart card that you want to use is supported by the printer but not by an application, you will need to obtain the programming interface (often as part of an SDK) for the smart card, an application and the printer SDK. You will need to develop software to communicate with the reader, printer, and other components of your solution.

The hardware that communicates with the card is called a reader. A smart card module in the printer includes a reader. Depending on the type of card and the type of reader, the reader might have read-only or both read and write functionality.

The system which uses the card, such as an access system or payment system, also includes readers where the card holder accesses the system. The system reader can be connected to data components (a database), application components, or other parts of the overall system.

Readers must match the card type and features used. For example, a contact card reader cannot read contactless cards, and different types of contactless cards must be matched with readers that read the frequency and proprietary format of the card. Even dual interface readers (which can read contacted and contactless cards) are designed for specific card specifications.

| Card             | Feature  | Module   | Technical Details   |
|------------------|--|--|---|
| iCLASS by HID    | Above, plus write data to the card                   | iCLASS by HID Read/Write                                 | <ul style="list-style-type: none"> <li>• 13.56 MHz</li> <li>• Writing to the card requires a custom solution that uses the RFIDeas SDK</li> <li>• Requires access control software</li> <li>• ISO 15693 (Vicinity)</li> </ul>                       |
| Contact card     | ISO 7816 contact cards                               | SCR 331-DI Dual Reader<br>Same as SCM SD1010 Dual Reader | <ul style="list-style-type: none"> <li>• ISO/IEC 7816, Class A and AB</li> <li>• T1 and T0 protocols</li> <li>• EMV Level 1</li> <li>• WHQL 2000, XP, Server 2003, CCID, USB</li> <li>• Windows PC/SC</li> <li>• Memory card API support</li> </ul> |
| Contactless card | All ISO 14443 type A & B compliant contactless cards | SCR 331-DI Dual Reader<br>Same as SCM SD1010 Dual Reader | <ul style="list-style-type: none"> <li>• 13.56 MHz (ISO14443, type A or B)</li> <li>• ISO 14443 Parts 1 to 4</li> <li>• PC/SC contactless interface</li> </ul>  |

## SYSTEM TOOLS

This section describes the tools you use to implement a solution.

- XPS Card Printer Driver
- Front Panel
- Windows Printing Preferences
- Windows Printer Properties
- Printer Manager

The printer includes drivers, a Software Development Kit (SDK), and other tools to help you set up your card-delivery solution.

### THE PRINTER DRIVER

- Windows Printing Preferences
- Windows Printer Properties

### PRINTING PREFERENCES

The Printing Preferences dialog contains settings that Windows uses to manage your card design. The Preferences dialog has the following tabs:

**Layout:** Set duplex printing, number of copies, and card orientation. The Advanced button provides settings for rotating the card and encoding magnetic stripe without printing.

**Print Area:** Use the Print Area tab to define printing and nonprinting areas of your card design.

**Print Mode:** Set the print resolution –Standard or High Resolution.

**Color Adjustment:** Adjust the brightness, contrast, and saturation of the colors printed.

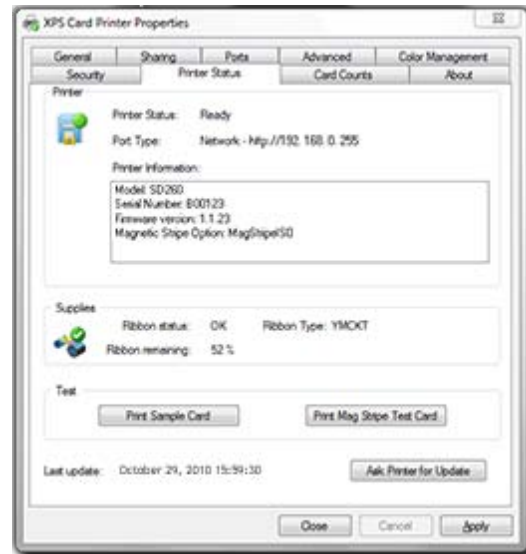
**About:** Review driver version and other information about the driver.



## WINDOWS PRINTER PROPERTIES

The Printer Properties dialog contains settings and values that Windows uses to communicate with and manage the printer. The Printer Properties dialog has the following tabs:

- General
- Ports
- Sharing (not supported)
- Advanced
- Color management
- Security
- Printer Status
- Card Counts
- About



## PRINTER FRONT PANEL

The front panel of the printer provides the controls you need to operate the printer. It includes the following:

### Power switch

Use this button to power the printer off and on.

### LCD panel

The LCD panel displays printer messages and provides a menu system for tasks and settings.

### User Button and Light

The User button is both a button and an indicator light. The light shows whether the printer is ready, busy printing, or not available.

### Down Arrow, Up Arrow, and Enter keys

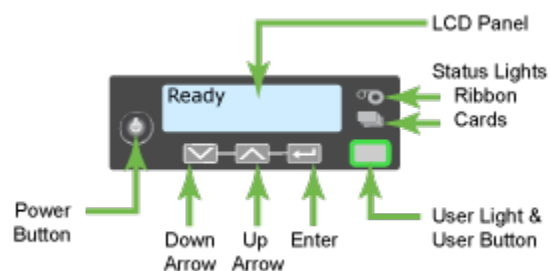
Use the arrow keys to move through the printer menu system and the enter key to make a selection.

### Ribbon Light

The ribbon light glows green when the print ribbon is low and glows amber when there is a problem with the ribbon, such as out of ribbon.

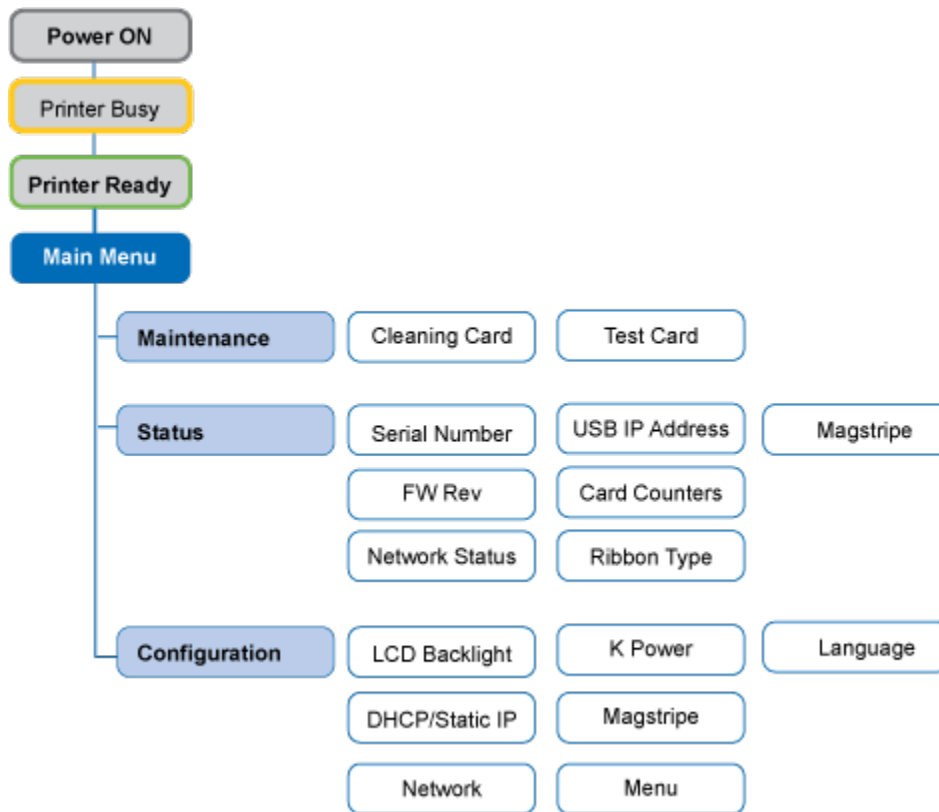
### Card Light

The card light blinks amber when the printer has a card problem, such as out of cards. For printers with a single-feed slot, the card light blinks green when a card needs to be inserted.



## USE THE LCD MENU SYSTEM

The front panel of the printer includes an LCD display with keys. When the printer is not actively printing cards, the LCD menu is available. The LCD menu system contains Status, Configuration, and Maintenance choices. Each of these main menu items contains choices and settings for the printer.





## PRINTER MANAGER

The printer includes the Printer Manager, which displays information about the printer. Managers or service providers can use the Printer Manager to fine tune card appearance, set advanced options, and troubleshoot printing problems. The Printer Manager is accessed using an internet browser and the IP address of the printer.

The Printer Manager includes Access Levels that control the type of information that can be viewed and the information that is displayed. There are three Access Levels to choose from to perform a variety of basic and advanced tasks.

## SNMP

The printer supports SNMP v2. SNMP means "Simple Network Management Protocol." It allows the printer to be queried over the network and to respond with status and feature information.

## CONNECTION ISSUES

The use of a VPN (Virtual Private Network) client may restrict your ability to connect to the Printer Manager. This can happen if your card printer is installed on your local network, but you are using a VPN client to connect to a different network.

For example, if the PC you use to connect to your company's main network using a VPN client is the same PC you use to print cards, access to the Printer Manager may be restricted while you are connected through the VPN client.

If you are logged in to a VPN client and cannot access the Printer Manager there are two solutions:

- Check the settings in your VPN client for an "Allow Local LAN Access" option. Make sure this setting is turned on so you still have access to the local network that your card printer is installed on.
- Log out of the VPN client and reconnect to your local network.

## HOW TO OPEN THE PRINTER MANAGER

The initial Printer Manager screen allows the user to login with a user name and password that will determine their access level. The access level determines which menu items, options and adjustments are available.

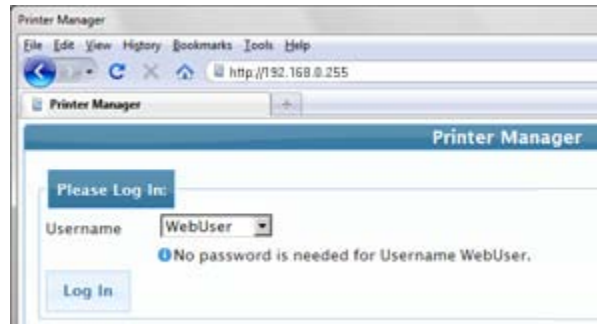
### Open the Printer Manager

1. Obtain the printer Network IP Address or the USB IP Address and record it.
2. Open a Web Browser on the PC.
3. In the Address area of the browser, type the following:

http://printer IP address

For example: http://123.1.23.123 where 123.1.23.123 is replaced by the printer IP address.

4. Press the Enter key.
5. Select the language in which to display the Printer Manager session from the left-hand column.
6. In the Please Log In area, select a Username that best matches your job responsibility.
7. Enter a password if required.
8. Click the Log In button.
9. Use the Log Out button in Printer Manager and close the browser after logging out.



### HINTS & TIPS

- If the Browser cannot connect to the printer, make sure:
  - The printer display shows Ready.
  - Another user does not have a Printer Manager session running.
  - A VPN (Virtual Private Network) client is not restricting your access to the Printer Manager.
- The Printer Manager contains a hover-text feature that shows help information when the cursor hovers over the setting in the description column.

## PRINTER MANAGER ACCESS LEVELS

The Username field controls the level of access to information and settings. Choose the Access Level that matches your job responsibility:

- **WebUsers** can view the following information from the Status menu:
  - Printer Status
  - Card Counts including Audit Data
  - Printer model, driver and firmware versions, and other information about the printer, called Vital Product Data (VPD)
  - The Supplies installed in the printer.

- **WebAdmin** access allows an administrator to set up a test card and make minor adjustments to the printer. The WebAdmin user has access to configuration options and the use of diagnostics tools for troubleshooting.
- **WebService** access has all of the above adjustments with the additional access to make adjustments to offsets.

## USE THE PRINTER MANAGER

The following sections outline the options on the Printer Manager menus that are accessible to the WebUser and WebAdmin access levels and how to use them. For information on settings accessible to the WebService access level, see the Service Manual available from your service provider.

### WEBUSER ACCESS LEVEL

The WebUser access level is typically used by the person responsible for printing cards. They may have other responsibilities for the printer including cleaning the printer, ordering supplies for the printer, or printing a daily or weekly log of card production. To print a page from the Printer Manager, see How to Print a Page from the Printer Manager for the steps to follow.

The WebUser access level displays four menu selections: Status, Printer Setting, Maintenance, and Log Out. From the Status Menu, a WebUser can view and print Vital Product Data (VPD), Printer Status, Supplies installed in the printer, and Audit Data.

From the Printer Setting menu, a WebUser can make the following adjustments:

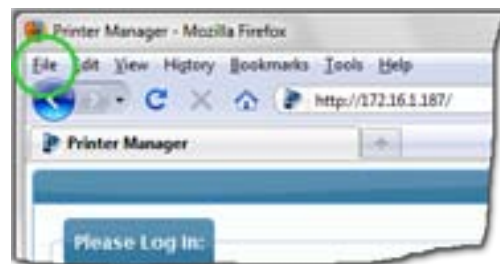
- Behavior –Set ribbon initialize to ON or OFF
- Front Panel –Set LCD backlight, set the sensitivity of the keypad, and turn the printer’s speaker ON or OFF.

### PRINT A PRINTER MANAGER PAGE

To print the information from any Printer Manager page to a paper printer use your Internet browser Print feature.

Choose the Print option from your Internet browser’s main menu.

File > Print



### TIPS FOR SUCCESS

- If the printed page does not display all the information from the Printer Manager, use the Print Preview function of your Internet browser to scale the image to fit the paper. Some Windows operating systems also provide margin adjustment tools in the Print Preview window.

File > Print Preview

## **STATUS MENU**

The Status menu contains information about the printer and its usage statistics. All access levels can view or print Vital Product Data (VPD), Printer Status, Supplies information, Audit Data, and About the Printer Manager.

|                       |  |
|-----------------------|--|
| VPD                   | This page displays the manufacturer and model of the card printer and the options that are installed. Print this page for reference if you need to contact your service provider.  |
| Printer Status        | The Printer Status page displays the mode that the printer is in, the printer state and how many seconds the printer has been powered on.  |
| Supplies              | The Supply page displays information related to the print ribbon currently installed in the printer and the amount of print ribbon remaining. The ribbon percentage shown in the Ribbon Remaining field is in relation to a new full roll of ribbon. |
| Audit Data            | The Audit Data page displays card count and error reporting that the printer collects. This page acts as a general overview for all the counters and can be useful to track card production activity and problem history.                            |
| About Printer Manager | This page displays the versions and build dates of the Printer Manager.  |

## **PRINTER SETTING**

From the Printer Setting menu, a WebUser can view all settings and make adjustments to the following menu choices:

- Behavior –Set ribbon initialize to ON or OFF
- Front Panel –Set LCD backlight, set the sensitivity of the keypad, and turn the printer’s speaker ON or OFF.

## **Communication**

The Communication page of the Printer Manager displays how the card printer is connected to your PC or network.

## **ActivityLog**

The Activity Log menu choice displays technical information about the printer. A WebAdmin or WebService access level can change settings in the Activity Log to help troubleshoot and isolate a card production problem.

## Behavior

A WebUser access level allows the user to Enable or Disable the Ribbon Initialize feature in the printer. The Ribbon Initialize feature automatically advances the ribbon to the beginning of the next color panel set when the printer is powered on. Cards printed immediately after printer power on will print with the correct color panels. Set to Disabled to begin printing using the panel in position.

To Set the Ribbon Initialize feature:

| Description         | Default Value | Current Value (unit) |
|---------------------|---------------|----------------------|
| 1) RibbonInitialize | Enabled       | Enabled ▼            |

- 1) Choose Enable or Disable from the Current Value dropdown list.
- 2) Click the Set Current button.

A message will indicate that the setting has been changed. The Set Current button updates the settings to the values entered. Click the Restore Default button to change to the Default Values listed above.

## VitalProductData

To view or print VPD, choose VPD from the Status menu and use the Internet browser print feature. File> Print.

A WebServer access level is required to change Vital Product Data settings.

## FrontPanel

WebUser access level can make changes to the settings shown in the Front Panel entry. The following settings can be changed:

| Description            | Default Value | Current Value (unit) |
|------------------------|---------------|----------------------|
| 1) BacklightBrightness | 10            | 10                   |
| 2) KeySenseLevel       | 4             | 8                    |
| 3) SpeakerEnabled      | Enabled       | Enabled ▼            |

- 1) Set backlight brightness at the desired level from 1 (dim) to 10 (bright).
- 2) Set the key sensitivity level to a comfortable level. Choose from 4 (barely touch) to 8 (almost a press).
- 3) Choose Enabled or Disabled from the Current Value dropdown list for the Speaker Enabled entry.
- 4) Click the Set Current button to apply your changes.

## Print

Print settings are available for WebAdmin and WebService access levels only. Contact your network administrator for information about changing print intensity, K power, Topcoat settings and other advanced print features.

### ***Pick***

Pick settings are available for WebService access levels only. Contact your service provider for information about changing the printer's pick settings.

### ***Transport***

Transport settings are available for the WebService access level only. Contact your service provider for information about changing the printer's transport settings.

### ***Flipper***

Flipper settings are used to set values for the duplex module in duplex-option printers. Flipper settings are available for WebService access level only. Contact your service provider for information about changing the printer's flipper settings.

### ***MagStripeGeneral***

Magnetic stripe settings are available for WebAdmin and WebService access levels only. Contact your system administrator for information about magnetic stripe settings.

### ***MagStripeCustomTrack1***

Magnetic stripe track settings are available for WebAdmin and WebService access levels only. Contact your system administrator for information about magnetic stripe settings.

### ***MagStripeCustomTrack2***

Magnetic stripe track settings are available for WebAdmin and WebService access levels only. Contact your system administrator for information about magnetic stripe settings.

### ***MagStripeCustomTrack3***

Magnetic stripe track settings are available for WebAdmin and WebService access levels only. Contact your system administrator for information about magnetic stripe settings.

## **MAINTENANCE**

The Maintenance menu provides the WebUser access level with the ability to run a cleaning card from the Printer Manager. To run a cleaning card:

| Description | Default Value | Current Value (unit) |
|-------------|---------------|----------------------|
| 1) Clean    | Printer Card  | Printer Card         |

- 1) Open the printer's top cover and remove the ribbon cartridge.
- 2) Click the Cleaning entry from the Maintenance menu.
- 3) Click the Run button to start the cleaning process. The printer moves the card through the printer several times and ejects it in the output stacker.
- 4) Remove the used cleaning card. Wait a few minutes for the rollers to dry.
- 5) Replace the cards in the input hopper.
- 6) Replace the cleaning sleeve with a new sleeve, and remove the protective cover.
- 7) Replace the ribbon cartridge and close the printer. The printer is ready to print cards again.

## **LOG OUT**

Use the Log out selection to return to the Printer Manager Log in page. To access more settings, log in using WebAdmin or WebService access level.

## WEBADMIN ACCESS LEVEL

The WebAdmin access level provides settings and information used by a system administrator or advanced user. In a card production environment, typical responsibilities for the WebAdmin access level are setting up the card design, verifying communication with external data sources, and tracking printer activity and performance.

The WebAdmin access level displays five menu selections: Status, Printer Setting, Maintenance, Troubleshooting and Log Out. The Status menu displays the same information for all access levels and the information can be printed to a paper printer at any time. To print a page from the Printer Manager, see How to Print a Page from the Printer Manager for the steps to follow.

A WebAdmin access level can make changes and adjustments to the same settings available to a WebUser plus many advanced settings including network address settings, magnetic stripe setup and the ability to set access and passwords for the WebUser access level.

### PRINTER SETTING

From the Printer Setting menu, a WebAdmin can view all settings and make adjustments to the following menu choices:

- Communication –Set the address mode type and enter IP Address, Subnet Mask, and Gateway Address information.
- Activity Log –Use the activity log to help isolate card production issues.
- Behavior –Set ribbon initialize to ON or OFF, enable or disable the Printer Manager, and set the reject hopper location.
- Front Panel –All of the settings available to the WebUser access level, plus advanced settings for setting cleaning reminders and LCD display options.
- Print –WebAdmin access level can use the Print selection to set print parameters for color management, print intensity, and registration settings.
- Magnetic Stripe –WebAdmin access level provides magnetic stripe setup options including coercivity, custom magnetic stripe formats, and data formats.
- Update Password –Set or update passwords for WebUser and WebAdmin access levels.

### Communication

The Communication menu provides the WebAdmin access level with settings to change the Ethernet address method from DHCP to Static. WebAdmin access level users can also enter IP Address, Subnet Mask and Gateway Address to match the settings of the network.

| Description       | Default Value | Current Value (unit) |
|-------------------|---------------|----------------------|
| EthAddressMethod  | DHCP          | DHCP ▼               |
| EthGatewayAddress | 0.0.0.0       | 192.168.1.1          |
| EthIpAddress      | 0.0.0.0       | 192.168.1.106        |
| EthSubnetMask     | 0.0.0.0       | 255.255.255.0        |



- 1) Select DHCP or Static from the Current Value dropdown list.
- 2) Enter the appropriate settings for the choice entered in Step 1.
- 3) Click the Set Current button to apply your changes. If the information on this page has changed, Log Out of the Printer Manager and then restart it to continue to make system changes using the Printer Manager.

## ActivityLog

The Activity Log menu choice displays technical information about the printer. A WebAdmin or WebService access level can change settings in the Activity Log to help troubleshoot and isolate a card production problem.

| Description         | Default Value | Current Value (unit)   |
|---------------------|---------------|--|
| ExternalLog         | Disabled      | Disabled ▼   |
| ExternalLogServer   | 0.0.0.0       | 0.0.0.0  |
| FilterCardActions   | Notice        | Off ▼ (Critical, Error, Warning, Notice, Information, Debug) |
| FilterConfigChanges | Notice        | Off ▼ (Critical, Error, Warning, Notice, Information, Debug) |
| FilterJobStates     | Notice        | Off ▼ (Critical, Error, Warning, Notice, Information, Debug) |
| FilterSoapMega      | Notice        | Off ▼ (Critical, Error, Warning, Notice, Information, Debug) |
| FilterSystem        | Notice        | Off ▼ (Critical, Error, Warning, Notice, Information, Debug) |
| InternalLog         | Enabled       | Enabled ▼  |

Example:

Change the Filter Job States status in the Activity Log to help isolate a card production problem.

### To change the Filter Job States:

1. Log into the Printer Manager with WebAdmin access level.
2. Select Printer Setting> Activity Log.
3. In the FilterJobStates category, select Error from the dropdown list.
4. Click the Set Current button to apply your changes.

## Behavior

A WebAdmin access level allows the system administrator to Enable or Disable the Ribbon Initialize, Reject Hopper, and WebServer features in the printer.

| Description         | Default Value | Current Value (unit) |
|---------------------|---------------|----------------------|
| 1) RejectHopper     | Enabled       | Enable ▼             |
| 2) RibbonInitialize | Enabled       | Enable ▼             |
| 3) WebServer        | Enabled       | Enable ▼             |

- 1) Select Enable or Disable from the Current Value column for the value to change.
- 2) Click the Set Current button to apply your changes.

**Note:** It is not recommended to disable the WebServer. If the WebServer is disabled, it cannot be restored. To restrict access for WebUser or WebAdmin access levels, use the Update Password selection from the Printer Setting menu.

## VitalProductData

To view or print Vital Product Data, choose VPD from the Status menu and use the Internet browser print feature. File> Print.

Vital Product Data settings are available for the WebService access level only.

## FrontPanel

In addition to the settings accessible to the WebUser, the WebAdmin access level can make changes to the following settings:

| Description                     | Default Value | Current Value (unit) |
|---------------------------------|---------------|----------------------|
| 1) BacklightBrightness          | 100           | 100                  |
| 2) KeySenseLevel                | 4             | 8                    |
| 3) LcdConfigMenu                | Enabled       | Enable ▼             |
| 4) LedCardsPickedToCleaning     | 1500          | qty (0-1000000)      |
| 5) LedPrintheadCyclesToCleaning | 2500          | qty (0-1000000)      |
| 6) LedRibbonLow                 | 10            | qty (0-1000000)      |
| 7) SpeakerEnabled               | Enabled       | Enable ▼             |

- 1) Use the LCD Config Menu setting to Enable or Disable the Configuration menu on the LCD menu system.
- 2) Use the LED Cards Picked to Cleaning, LED Printhead Cycles to Cleaning, and LED Ribbon Low selections to set up notifications for printer maintenance and cleaning.
- 3) Click the Set Current button to apply your changes.

## Print

The Print selections provide a WebAdmin access level with the ability to fine tune the card design by adjusting the print intensity, topcoat power, and K (black) power settings.

| Description             | Default Value  | Current Value (unit)       | Allowable Range |
|-------------------------|----------------|----------------------------|-----------------|
| 1) CardRegistration     | 0              | 0mm                        | (-0.5 – 50.8)   |
| 2) ColorManagement      | sRGBColorSpace | sRGBColorSpace ▼ (MatchSP) |                 |
| 3) KPower               | 0              | 40 Special                 | (-100 – 100)    |
| 4) KPower1200DPI        | 0              | 0 Special                  | (-100 – 100)    |
| 5) KPower600DPI         | 0              | 0 Special                  | (-100 – 100)    |
| 6) KPowerDuplex         | 0              | 0 Special                  | (-100 – 100)    |
| 7) KWhiteShade          | 0              | 0 Shades                   | (-100 – 100)    |
| 8) LeadTrim             | 1.27           | 1.27mm                     | (0– 5.08)       |
| 9) SettingsGroupPurpose | Print          | Print None                 |                 |
| 10) TPower              | 0              | 0Special                   | [-100 - 100]    |
| 11) TPowerDuplex        | 0              | 0Special                   | [-100 - 100]    |
| 12) TWhiteShade         | 0              | 0Shades                    | [-100 - 100]    |
| 13) TrailTrim           | 1.27           | 1.27mm                     | [0 - 5.08]      |
| 14) YMCPower            | 0              | 0Special                   | [-100 - 100]    |
| 15) YMCPower600         | 0              | 0Special                   | [-100 - 100]    |
| 16) YMCPowerDuplex      | 0              | 0Special                   | [-100 - 100]    |
| 17) YMCWhiteShade       | 0              | 0Shades                    | [-100 - 100]    |

### Notes:

- 1) sRGB is the name for the standard Red, Green, and Blue color space. The MatchSP selection in the Current Value column will use the color management technology of SP Series printers.
  - Selecting None from the ColorManagement dropdown list disables color management in the printer and color management will be handled by the application.
- 2) Card Registration and Trail Trim are valuable settings when fine tuning the card design.

Card Registration is used to set the starting location of the printed area.

  - Increasing this value moves the printing closer to the leading edge of the card.
  - Decreasing this value moves the printing away from the leading edge of the card.

Trail Trim adjustment help when frequent ribbon break errors occur.

  - Increase the value to increase the length of the printed area.
  - Decrease the value to shorten the length of the printed area.
- 3) Click the Set Current button to apply your changes.

## Pick

Pick settings are available for WebService access levels only. Contact your service provider for information about changing the printer's pick settings.

## Transport

Transport settings are available for WebService access levels only. Contact your system administrator for information about changing the printer's pick settings.

## Flipper

Flipper settings are used to set values for the duplex module in duplex-option printers. Flipper settings are available for WebService access level only. Contact your service provider for information about changing the printer's flipper settings.

## MagStripeGeneral

Magnetic stripe settings are available for WebAdmin and WebService access levels only. WebAdmin access levels can use the following settings to setup basic magnetic stripe options.

| Description    | Default Value | Current Value (unit)                  | Allowable Range |
|----------------|---------------|---------------------------------------|-----------------|
| 1) Attempts    | 3             | 3 quantity                            | [1 - 5]         |
| 2) Coercivity  | HICO          | HICO ▼ (HiCO, LOCO, NTT1, NTT2, NTT3) |                 |
| 3) DataFormat1 | IATA          | IATA ▼                                |                 |
| 4) DataFormat2 | ABA           | ABA ▼                                 |                 |
| 5) DataFormat3 | TTS           | TTS ▼                                 |                 |
| 6) SSA1        | 0             | 0 mm                                  | [-4 - 4]        |
| 7) SSA2        | 0             | 0 mm                                  | [-4 - 4]        |
| 8) SSA3        | 0             | 0 mm                                  | [-4 - 4]        |

### Notes:

- 1) The Attempts entry displays the number of attempts the printer makes to encode the magnetic stripe data. Setting this number to a lower value will increase the throughput of the printer but can decrease the reliability of magnetic stripe encoding.  
Setting the number to a higher value will decrease the throughput of the printer but can increase the reliability of magnetic stripe encoding.
- 2) Choose the coercivity setting that matches the cards you are using. The choices are HICO, LOCO, NTT1, NTT2, NTT3.
- 3) DataFormat1, DataFormat 2, DataFormat3:
  - For Magnetic Stripe Encoding, set DataFormat1 to 'JIS' and DataFormat2 and DataFormat3 to 'NONE.'
4. Click the Set Current button to apply your changes.

## MagStripeCustomTracks

Custom magnetic stripe settings are available for WebAdmin and WebService access levels. WebAdmin access levels can use the following settings to setup custom magnetic stripe options.

| Description              | Default Value | Current Value (unit) | Allowable Range |
|--------------------------|---------------|----------------------|-----------------|
| 1) CustomCharHigh1       | 95            | 95 None              | [1 - 255]       |
| 2) CustomCharLength1     | 6             | 6 quantity           | [1 - 8]         |
| 3) CustomCharLow1        | 32            | 32 None              | [1 - 255]       |
| 4) CustomCharMask1       | 32            | 32 None              | [1 - 255]       |
| 5) CustomCharMax1        | 76            | 76 quantity          | [1 - 255]       |
| 6) CustomDensity1        | 210           | 210 BitsPerInch      | [1 - 255]       |
| 7) CustomEndSentinel1    | 63            | 63 None              | [1 - 255]       |
| 8) CustomLrc1            | EVEN          | EVEN ▼ (ODD)         |                 |
| 9) CustomParity1         | ODD           | ODD ▼ (EVEN)         |                 |
| 10) CustomSdsNulls1      | 0             | 0 quantity           | [0 - 255]       |
| 11) CustomSdsRecords1    | 1             | 1 quantity           | [0 - 255]       |
| 12) CustomSdsSs1         | 1             | 1 quantity           | [1 - 255]       |
| 13) CustomStartSentinel1 | 37            | 37 None              | [1 - 255]       |

### Notes:

1. Using custom magnetic stripe formats is a two-step process. The first step is to use MagStripeCustomTrack1, MagStripeCustomTrack2, and/or MagStripeCustomTrack3 to define the custom track. The second step is to apply the custom track using the settings on the MagStripeGeneral menu selection.
2. To use the custom track defined, open the MagStripeGeneral menu and choose 'CUSTOM' for DataFormat1, DataFormat2, or DataFormat3 to use the custom track.
3. MagStripeCustomTrack1 corresponds to DataFormat1, MagStripeCustomTrack2 corresponds to DataFormat2, and MagStripeCustomTrack3 corresponds to DataFormat3.
4. Click the Set Current button to apply your changes.

## Update Password

WebAdmin access level personnel can choose to password protect the Printer Manager and limit access to the advanced settings. Adding password protection is the preferred method of restricting access to the Printer Manager.

|                           |  |
|---------------------------|--|
| Description               |  |
| Choose Username to Update | WebAdmin ▼ (WebUser, SnmpRoCommunity, SnmpRwCommunity) |
| Current Password          |  |
| New Password              |  |
| Confirm New Password      |  |

- 1) Choose the access level —WebAdmin or WebUser, of the user name to update from the dropdown list. The WebAdmin access level can also update the SNMP read and SNMP write passwords.
- 2) Enter the current password. If the current password field is empty (no entry), leave this box blank.
- 3) Enter the new password in the corresponding field.
- 4) Confirm the new password by typing it again.
- 5) Click the Update Password button to apply your changes.

### Hints & Tips

- Passwords are hierarchical in the following order: WebService, WebAdmin, and WebUser. You can use a password that is higher in the hierarchy to log in to a specific role.
- For example, the WebService password can be used to log in to the WebUser.

## TROUBLESHOOTING

The Troubleshooting menu for the WebAdmin access level contains settings and tools for isolating card production issues. WebAdmin access level for troubleshooting includes printing Test Cards, viewing and printing the Activity Log, Reset Log, Reset Counters, and Reset Printer features.

### Test Card

The Test Card menu selection shows the items available to WebAdmin access levels. Printing test cards can be useful in troubleshooting card production issues.

| Description                                     | Card Front (page 1) | Card Back (page 2) |
|---|---------------------|--------------------|
| Magnetic Stripe                                 |                     | [ ]                |
| Color   | [X]                 | [ ]                |
| Monochrome                                      | [ ]                 | [ ]                |
| Topcoat   | [ ]                 | [ ]                |
| Second Topcoat                                  | [ ]                 | [ ]                |
| Test Pattern to use for Color and/or Monochrome | [TestPattern1 ▼]    | [TestPattern1 ▼]   |

1. Enter the value(s) for the type of test card to print.
  - **MagStripe:** Encode magnetic stripe data on the card.
  - **Color:** Print the card using the YMCK panels of the print ribbon.
  - **Monochrome:** Print the card with monochrome color.
  - **Topcoat:** Print the card with topcoat.
2. Enter the Type of Test Pattern for Color and/or Monochrome printing.
  - **TestPattern1:** This is a full-color test card and will use the YMCK panels of the print ribbon. Choose this test card to see the overall print quality of the card.
  - **TestPattern2:** This is a short panel test card. Use this setting to see the overall print quality when using short panel print ribbon.
  - **TestPattern3:** TestPattern3 is used to see the density of the printed card. This card prints a dense blue color card. This card will identify print intensity issues that can appear as wrinkles on the printed card.
  - **TestPattern4:** This is a color step test card that uses all panels of the print ribbon and displays the steps of each color from darkest to lightest.
  - **TestPattern5:** This card is used to set up the card registration of the printer. Print this card to verify changes to the card registration settings.
3. Click the Run button to send the test card to print.

## **Activity Log**

The Activity Log displays printer information in regards to its activity. The Activity Log includes all actions and errors encountered since last reset. Save and send the Activity Log to your service provider when requesting service; this log provides valuable information when troubleshooting printer performance issues.

Sample:

```
12: 0d 00h 00m 25.202s [SYSTEM__CRIT ] value of flip det <1> value of opt board det <1> value of punch det <0> in printer.cpp
```

```
14: 0d 00h 00m 25.196s [SYSTEM__WARNING] Improper shutdown detected
```

- 1) Click the download button to display and save the activity log information.
- 2) Enter a location on your PC to save the file.
- 3) Save and send the Activity Log to your service provider when requesting service.

## **Reset Log**

The Reset Log feature allows a WebAdmin access level user to reset the Activity Log.

- 1) Click the Run button to reset the Activity Log.
- 2) The page reloads when the log is reset.

## **Reset Counters**

The Reset Counters feature resets the card counter functions in the printer.

Click the Run button to reset the counters.

## **Reset Printer**

The Printer Reset feature restarts (printer reboot) the printer.

Click the Run button to restart the printer.



## **MAINTENANCE**

The Maintenance menu provides the WebAdmin access level with the ability to run a cleaning card from the Printer Manager and upload updates to the printer.

### **Cleaning Card**

| Description | Default Value | Current Value (unit) |
|-------------|---------------|----------------------|
| 1) Clean    | Printer Card  | Printer Card         |

1. Open the printer cover and remove the print ribbon cartridge.
2. Remove blank card stock from the input hopper, if equipped.
3. Open the cleaning card package and remove the cleaning card.
4. Click the Run button to start the cleaning process.
5. Insert the cleaning card in the printer when prompted by the printer LCD panel.

The printer moves the card through the printer several times and ejects it in the output stacker.

6. Remove the used cleaning card. Wait a few minutes for the rollers to dry.
7. Replace the cards in the input hopper.
8. Replace the cleaning sleeve with a new sleeve, and remove the protective cover.
9. Replace the ribbon cartridge and close the printer. The printer is ready to print cards again.

### **Updates**

The Updates entry allows a WebAdmin access level the ability to send an external settings file to the printer.

To Upload a settings file:

- 1) Use the Browse button to select the file to upload.
- 2) Click the Upload File button.

### **LOG OUT**

Use the Log out selection to return to the Printer Manager Log In page. To access more settings, log in using WebService access level.

## How Do I...

### **SOLUTIONS TO COMMON PRINT PRODUCTION ISSUES**

WebAdmin and WebService access levels can use the following troubleshooting section to solve common print production issues.

#### **FIXING RIBBON BREAK ERRORS**

There are several reasons that could cause the print ribbon to break including changing the card stock or supplier of cards and registration settings that are too close or too far from the leading or trailing edge of the card.

##### ***USING A DIFFERENT CARD STOCK***

If you recently started using a new brand or supplier of blank card stock, compare them to the previous brand by performing a visual check of the cards. Verify that the cards are the same physical size. If the new cards are different than the previous cards, settings can be adjusted to accommodate the new card.

##### ***RIBBON BREAK AT TRAILING EDGE***

If the ribbon break occurs at the trailing edge of the card:

1. Log into the Printer Manager at the WebAdmin access level.
2. Select Print from the Printer Setting menu.
3. Adjust the TrailTrim value in the Current Value column. Lower the value by 0.25 to decrease the length of printed area.

For example: if the default value of the TrailTrim is 1.25, change it to 1.00.

4. Print a test card using Monochrome and TestPattern5 to verify that the card prints without a ribbon break error.
5. If the card prints successfully, log out of the Printer Manager and continue printing cards. If the ribbon breaks again, repeat Steps 3 and 4 until the card prints successfully.

##### ***RIBBON BREAK AT LEADING EDGE***

If the ribbon breaks at the onset of printing, the likely cause is that the printhead has moved into position before the card was in position. Adjust the card registration settings to solve a ribbon break at the leading edge of the card.

1. Log into the Printer Manager at the WebAdmin access level.
2. Select Print from the Printer Setting menu.
3. Adjust the CardRegistration value in the Current Value column. Increase the value by 0.25 to move the leading edge of the card closer to the printhead.

For example, if the default value of the CardRegistration is 0, change it to 0.25.

4. Print a test card using Monochrome and TestPattern5 to verify that the card prints without a ribbon break error.
5. If the card prints successfully, log out of the Printer Manager and continue printing cards. If the breaks again, repeat Steps 3 and 4 until the card prints successfully.

## RELATED PUBLICATIONS

This section lists publication about the card printers that might be useful to you.

### USER INFORMATION

The following user information is available:

- The Quick Install Guide is packaged in the carton with the printer.
- The XPS Card Printer Installation and User Guide is available from the Web site. It provides detailed information for installation and use of the printer.
- A Firmware Update Program is available to use with the XPS Card Printer Driver and a firmware file. The download for the Firmware Update Program includes instructions.

### FIELD UPGRADE INSTRUCTIONS

The following field upgrade kits are available. The upgrade kit includes installation instructions. Some field upgrades can be completed by the user without using tools, while others require a service technician to upgrade the printer.

|                       | User Replaceable | Service Technician Installed |
|-----------------------|------------------|------------------------------|
| Printhead             | X                |                              |
| Large Output Hopper   | X                |                              |
| 200-Card Input Hopper | X                |                              |
| Magnetic Stripe       |                  | X                            |
| Smart Card            |                  | X                            |
| Duplex Option         |                  | X                            |

### INFORMATION FOR INTEGRATORS

This Solution Guide provides detailed information about implementing solutions that use features of the printer. The Solution Guide can be downloaded from the service Web site.

For integrators, a Software Development Kit (SDK) download includes the SDK Manual which explains the functions available and how to use them.

### SERVICE INFORMATION

Service Training CD-ROMs and Service CD-ROMs are available for each printer.